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PRESENTED BY

*Mr. J. M. Swank*

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STATISTICS  
OF THE  
AMERICAN AND FOREIGN IRON TRADES  
FOR 1907.

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ANNUAL STATISTICAL REPORT  
OF THE  
AMERICAN  
IRON AND STEEL ASSOCIATION,

CONTAINING  
COMPLETE STATISTICS OF THE IRON AND STEEL INDUSTRIES OF THE UNITED STATES FOR 1907 AND IMMEDIATELY PRECEDING YEARS; ALSO STATISTICS OF THE COAL, COKE, AND SHIPBUILDING INDUSTRIES OF THE UNITED STATES, IMMIGRATION, ETC.;  
ALSO STATISTICS OF THE IRON AND STEEL INDUSTRIES OF FOREIGN COUNTRIES.

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PRESENTED TO THE MEMBERS, JULY 12, 1908.

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PHILADELPHIA:  
THE AMERICAN IRON AND STEEL ASSOCIATION,  
No. 261 SOUTH FOURTH STREET.  
1908.

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# LETTER TO THE PRESIDENT.

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JOSEPH WHARTON, Sc. D., LL. D.,

*President of the American Iron and Steel Association, Philadelphia.*

DEAR SIR: The Annual Statistical Report of the American Iron and Steel Association for 1907 is herewith submitted. Copies will be sent to all our members. The utmost pains have been taken to make this Report as comprehensive and complete as possible and to insure its publication at an early day. It will be found on examination to contain all the leading features of previous Reports. The statistics we give of the iron and steel industries of foreign countries and of their iron ore and coal industries are the most complete we have been able to present for a number of years. Extraordinary efforts have been made, by correspondence with foreign statistical bureaus, to secure late and accurate information concerning these industries. The domestic part of the Report contains many new statistical features. A Statistical Abstract leaves nothing in the line of iron and steel statistics to be desired.

Since our last Report appeared the new edition of our Directory which was then nearing completion has been printed and copies were sent to members of the Association in April last. The book makes a volume of 516 pages, the largest we have ever issued. Its preparation and publication have called for a vast amount of clerical labor and have entailed an extraordinary drain upon the resources of the Association. In this connection I may add that the compilation and publication of our Annual Reports also call for great labor and make necessary a large demand on our treasury. The whole truth is that these publications of the Association and also its *Bulletin* are in their very nature expensive. As intimated in our last Report additional clerical help and enlarged contributions to our treasury will certainly be needed if the Directory and Annual Report are to be continued in the style with which our members have long been familiar. The rapid growth in late years of the American iron trade has called for greatly increased attention to statistical details, and this need has been fully met in our Directory and Annual Reports. The *Bulletin* has also fulfilled its mission in giving prompt publication of statistical information of value to the iron trade.

The demand for a revision of the Dingley tariff, originating with President Roosevelt, has resulted in the adoption by the present Republican Congress of a tariff revision policy. The Republican party is therefore committed to this reactionary policy. With such strength as I possessed I have opposed this movement, giving expression not only to my own convictions but also, so far as I have been advised, to those of the whole American iron trade. For illustration: In the *Bulletin* for September 10, 1907, I said: "We hope that the business

men and the workingmen and the protected farmers of the country who class themselves as Republicans will see to it—and see to it in time—that a majority of the delegates to the next Republican National Convention are standpat protectionists, and not theorists merely who do not know a rolling mill from a limekiln, and who appear to have even less regard for the manufacturers and workingmen of their own country than they have for the manufacturers of Germany.” And in our last Annual Report I said: “The tariff interests of American iron and steel manufacturers and of all other domestic manufacturers are seriously menaced to-day by a proposition to revise the Dingley tariff immediately after the next Presidential election. It is the duty of all our people who believe in the protective policy and who have witnessed the beneficent effects of the present tariff to oppose with all their might this entering wedge to tariff reduction, for that is what the advocates of tariff revision mean. I hope that the members of this Association will exert such influence as they possess to prevent this proposed tariff revision. To be effective this influence should be exerted at once. A direct appeal should be made to all members of Congress.” Our iron and steel manufacturers have been sufficiently warned of the impending danger of a revision of the Dingley tariff for the benefit of our foreign competitors.

The action of Congress in committing the Republican party to a revision of the Dingley tariff is embodied in the following proceedings in the Senate and House of Representatives in May, 1908:

In the Senate, on May 16, Mr. Aldrich, from the Committee on Finance, reported the following resolution, which was considered by unanimous consent and agreed to: “Resolved, That the Committee on Finance are authorized, in connection with investigations heretofore ordered by the Senate, with the view of promptly securing the information necessary for an intelligent revision of the customs laws of the United States, to call to their assistance experts in the Executive Departments of the Government and to employ such other assistants as they shall require; and they are especially directed to report what further legislation is necessary to secure equitable treatment for the agricultural and other products of the United States in foreign countries; and they shall also, in the consideration of changes of rates, secure proof of the relative cost of production in this and in principal competing foreign countries of the various articles affected by the tariff upon which changes in rates of duty are desirable.”

In the House, on May 16, Mr. Payne, from the Committee on Ways and Means, moved the passage of the following tariff resolution: “Resolved, That the Committee on Ways and Means is authorized to sit during the recess of Congress and to gather such information, through Government agents or otherwise, as to it may seem fit looking toward the preparation of a bill for the revision of the tariff; and said committee is authorized to purchase such books and to have such printing and binding done as it shall require, and, in addition to requiring the attendance of the committee stenographers, is authorized to employ an additional stenographer, and to incur such other expenses

as may be deemed necessary by said committee ; and all the expenses of said committee shall be paid out of the contingent fund of the House on the usual vouchers approved as now provided by law." The resolution was agreed to by a strict party vote of 154 yeas to 92 nays.

The Republican National Convention, in session at Chicago in June, 1908, adopted the following plank as part of its platform of principles : "The Republican party declare unequivocally for a revision of the tariff by a special session of Congress immediately following the inauguration of the next President, and commends the steps already taken to this end in the work assigned appropriate committees of Congress which are now investigating the operation and effect of existing schedules." This declaration is in harmony with the action of both branches of Congress as above described.

The Republican party is therefore committed to a revision of the Dingley tariff after the 4th of March next, no matter which of the great political parties may then be in power.

The financial condition of the Association during the year 1907 is shown in the following abstract of the statement of our Treasurer, Mr. Andrew Wheeler, Jr., on December 31, 1907 : On January 1, 1907, there was a balance in the hands of the Treasurer of \$4,848.81 ; the receipts from members and from advertisements in the *Bulletin* during the year 1907 were \$16,597.50 ; the expenditures during the year were \$15,925.48 ; leaving a balance in the Treasury on December 31, 1907, of \$5,520.83. The above figures do not include the receipts from the sale of our Directory and Annual Report to railroad officials, iron and steel brokers, and others who are not members of the Association, or the payments from the fund thus derived in defraying in part the cost of printing these publications.

As in former years my acknowledgments are due to Mr. Wm. G. Gray and his assistant, Mr. John F. Hayes, for intelligent and industrious attention to the collection of our statistics and to the collection and analysis of information for our Directory, and they are also due to the other members of our clerical staff for faithful service, some of whom have assisted in the work above referred to. I am also greatly indebted, as in other years, to Hon. O. P. Austin, Chief of the Bureau of Statistics of the Department of Commerce and Labor, Hon. Eugene T. Chamberlain, Commissioner of Navigation of the same Department, Hon. F. P. Sargent, Commissioner-General of Immigration of the same Department, and Hon. E. W. Parker, Statistician-in-Charge of the United States Geological Survey, for valuable statistics relating to their respective bureaus ; to the editors of the *Connellsville Courier* and the *Iron Trade Review* respectively for coke and iron ore statistics ; to Mr. J. Stephen Jeans, the Secretary of the British Iron Trade Association, Dr. Leidig, the Chief of the Statistical Bureau of the *Verein Deutscher Eisen-und Stahl-Industrieller*, General Director Richard Åkerman, of Stockholm, and other European authorities for statistical information of great interest to the iron trade.

Very Truly Yours, JAMES M. SWANK, *General Manager*.  
No. 261 SOUTH FOURTH STREET, PHILADELPHIA, July 12, 1908.



# IRON AND STEEL NECROLOGY.

FROM DECEMBER, 1907, TO JULY, 1908.

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IN the following necrological record we include brief notices of the death of a few persons who were not identified with the iron trade but who were known to many of the readers of this Annual Report.

(1907.) Harrison Loring, who established one of the first plants in the United States for building iron steamships, died at his home in South Boston on December 20, at the age of 85 years. Mr. Loring was born in Duxbury. In 1857 he built a plant for the construction of iron steamships, and he had many contracts with the United States Government. He built the monitor *Canonicus*, which was in the bombardment of Fort Fisher in the civil war, and as late as 1890 he built the United States ship *Marblehead*, which was with Admiral Dewey in the battle of Manila Bay.

(1908.) Robert B. Brown, January 2, at his home in Pittsburgh, aged 61 years. Mr. Brown was one of the organizers of the Duquesne Steel Company, with Joshua Rhodes, W. G. and D. E. Park, and others.—Robert Dickson, during the civil war general manager of the Knapp Foundry, on the site now occupied by Mackintosh, Hemp-hill & Co., at Pittsburgh, at his home in Indianapolis, January 9, aged 89 years.—William Chisholm, Sr., one of the pioneer iron men of Cleveland, Ohio, January 10. Mr. Chisholm was born in Scotland on August 12, 1825, and came to Canada in 1848. After residing in Montreal he went to Cleveland early in the 50's. Mr. Chisholm's brother Henry, who died several years ago, was one of the organizers of the firm known as Chisholm, Jones & Co., and later as Stone, Chisholm & Jones, which in 1857 built in Newburgh a mill to roll rails and bar iron. The Newburgh enterprise later developed into the Cleveland Rolling Mill Company. William Chisholm afterwards founded the Chisholm Steel Shovel Works, at the head of which he remained until his death.—The funeral of James R. Randall, the civil war poet and author of "Maryland, My Maryland," took place at Augusta, Georgia, on January 16, and was one of the largest and most impressive ever held in that city. Mr. Randall was born in Baltimore on January 1, 1837.—George V. Cresson, president of the George V. Cresson Company, engineers, founders, and machinists, of Philadelphia, January 18. Mr. Cresson was born in Philadelphia on September 10, 1836.—Edmund Clarence Stedman, widely known as the "Banker Poet," January 18, at his home in New York. Mr. Stedman was born at Hartford, Connecticut, on October 8, 1833.—Hon. Charles Emory Smith, editor-in-chief of the Philadelphia *Press* during the last twenty-eight years, suddenly, on January 19, aged almost 66 years. Mr. Smith was born at Mansfield, Connecticut, on February 12, 1842. He was United States Minister to Russia in the

Administration of President Harrison and for a time was Postmaster General under President McKinley, holding over for several months under President Roosevelt.—Charles H. Smythe, for many years secretary and superintendent of the Franklin Iron Works, of Clinton, N. Y., January 19, at the age of 68 years, at Princeton, N. J.—Antes Snyder, January 20, at his home in Wilkesburg, Pa., aged 72 years. The deceased was born in Snyder county, Pa., and was a grandson of Simon Snyder, an early Governor of Pennsylvania. He was a civil engineer and practically built the West Penn division of the Pennsylvania Railroad.—Henry L. W. Hyde, treasurer of the Clearfield Steel and Iron Company, of Hyde, Pa., near Clearfield, January 23, at Pinehurst, N. C.—Judge Thomas D. Mellon, retired, one of Pittsburgh's foremost citizens, and well known throughout the country as a banker and capitalist, at Pittsburgh, February 3, on his 95th birthday. He was stricken with apoplexy at 6 o'clock in the morning as he rose from his bed to participate in the celebration of his own birth and the 91st of his wife. He was born at Camp Hill College, County Tyrone, Ireland, on February 3, 1813.—Miss Lucy Maria Osborne, one hundred years old, at Danbury, Connecticut, on February 6. She was one of the few real Daughters of the American Revolution. Her father, who died when she was a child, was a soldier in the Revolution.—A dispatch from Reading, Pa., dated February 8, says that John Connor Barron, founder of the Carpenter Steel Works of that city, died in New York City on February 7, aged 71 years.—Frank W. Gould, president of the Union Malleable Iron Company, of Moline, Illinois, committed suicide in his bedroom on February 8, by shooting himself in the mouth while temporarily insane.—We regret to learn of the recent death of our old and valued European correspondent, Professor Franz Kupelweiser, of Leoben, Austria.—Eben Francis Barker, at Overbrook, near Philadelphia, on February 14, in his 75th year. Mr. Barker was for about twenty-five years the secretary of the Pennsylvania Steel Company, from which position he retired only a few years ago. He was a native of Massachusetts and a son-in-law of the late Samuel M. Felton.—Lewis N. Taylor, founder of the Taylor Iron and Steel Works, at High Bridge, New Jersey, at his home at High Bridge, on February 18, aged 97 years. His father, Robert Taylor, made cannon balls for the American soldiers at a small furnace during the Revolution.—Tom Cobb King, a well-known metallurgist, at East Orange, N. J., on February 27, from appendicitis. He was born at Marion, Alabama, in 1865, and was the son of Porter King, who was a colonel in the Confederate army.—James Oliver, the millionaire plow manufacturer, at South Bend, Indiana, on March 2. He was a native of Scotland, born on August 28, 1823. He came with his parents to the United States in 1835. He began the manufacture of plows in 1855.—Jawood Lukens, the well-known iron manufacturer, March 10, at his home in Conshohocken, Pa., aged 64 years. He was a graduate of the Polytechnic College, Philadelphia. He built the Longmead Iron Works in 1882 and had ever since been president of the Longmead Iron Com-

pany.—David A. Clarke, purchasing agent of the Phoenix Iron Company, at his home in West Philadelphia, on March 16, aged about 58 years. Mr. Clarke entered the service of the Phoenix Iron Company as a clerk forty-two years ago.—John A. Brill, one of the founders of the J. G. Brill Car Works, of Philadelphia, March 25. He was born in Philadelphia in 1852 and entered the works of his father, J. G. Brill, at an early age.—William H. Pfahler, who had for many years been prominently identified with the foundry trade, at Pasadena, California, on March 29. He was born at Columbia, Pa., March 26, 1842. In 1886 he accepted the position of superintendent of the Abram Cox Stove Company, of Philadelphia, afterwards becoming its treasurer.—William R. Jenkins, of Bellefonte, Pa., a prominent inventor and treasurer and general manager of the Howard Iron and Tool Company, April 9.—Frithrof Lundahl, chief engineer of the Bethlehem Steel Company, at Philadelphia, on April 11, aged about 54 years. He was a native of Sweden, and had been employed by the Carnegie Steel Company before going to Bethlehem.—Major Charles D. Rhodes, of Sharon, Pa., April 16, at Sharon. Mr. Rhodes was 62 years old and was the Cleveland representative of the Lackawanna Iron and Steel Company. For a number of years he was general sales agent of the same company. He was formerly connected with P. L. Kimberly and Company, of Sharon, Pa., and the Illinois Steel Company, of Chicago.—Jesse J. Cassidey, editor of the *Canadian Manufacturer*, at Toronto, April 23, aged 75 years. Mr. Cassidey was for many years secretary of the Canadian Manufacturers' Association and was a recognized authority on tariff matters and legislation bearing on the industrial development of Canada. He was a native of Wilmington, N. C.—Abram Reese, a brother of the late Jacob Reese, April 24, aged 79 years. Like his brother he began life as a puddler, but later occupied many responsible positions as manager and part owner of iron manufacturing plants.—Dr. Samuel Findley, well known in Ohio as an educator and as founder and for many years editor of the *Ohio Educational Monthly*, at his home in Akron, Ohio, on May 7. Mr. Findley was the father of A. I. Findley, one of the editors of the *Iron Age*.—Dr. Hermann Wedding, the eminent German metallurgist, died in Germany on May 7. Dr. Wedding was well known in this country, having been one of the German commissioners at the Centennial Exhibition in 1876 and one of the distinguished foreign guests of the American iron trade in 1890. He was born in Berlin in 1834. In 1896 he received the Bessemer medal.—Captain Samuel Mitchell, of Negaunee, Michigan, one of the prominent mining men of the Upper Peninsula, particularly in connection with the development of mines on the Marquette range, May 10, of pneumonia, at the Streeter Hospital in Chicago. He was born in Devonshire, England, on April 11, 1846.—Walter Hatfield, vice president and treasurer of Hughes & Patterson, Incorporated, owners of the long idle Philadelphia Iron and Tinplate Works, at the Hotel Stenton, Philadelphia, on May 18, aged about 50 years. He was unmarried.—Wilbur Fisk Lunt, for the past seventeen years a member of the

Board of United States General Appraisers, at his residence in New York City on May 28, aged 60 years. He was appointed by President Harrison from Maine in 1891. He served in the Union army, and a wound received at the battle of Antietam was the direct cause of his death.—Julius G. Wagner of Milwaukee, Wis., on May 31, aged 74 years. He was the founder of the J. G. Wagner Company, which a few years ago became a part of the American Bridge Company.—Ex-Senator James K. Jones, of Arkansas, on June 1. Senator Jones was a native of Mississippi, where he was born on September 29, 1839. He took an active part in passing through the Senate the Wilson tariff bill.—Caleb B. Wick, of Youngstown, Ohio, one of the best known financiers and business men of the Mahoning Valley, June 3, aged 72 years.—John R. Johnson, who was for many years president of the Johnson Forge Company, of Wilmington, Delaware, at his residence in Philadelphia on June 4, aged about 69 years.—Peter White, of Marquette, a pioneer in the copper and iron ore development of Michigan, dropped dead at Detroit, on June 6. Mr. White's biography has been entertainingly written by Mr. Ralph D. Williams, editor of the *Marine Review*, of Cleveland, in a volume entitled "The Honorable Peter White."—John Baker Roach, president of the Delaware River Iron Shipbuilding and Engine Works, June 16, from a stroke of apoplexy, at his home in Chester, Pa. Mr. Roach was born in New York on December 7, 1839. He was the son of John and Emeline (Johnson) Roach.—William B. Leeds, at one time a leading factor in the American tinplate industry, suddenly, at Paris, France, on June 23. Born in Indiana in 1861 he began life as a florist at Richmond in that State.—Grover Cleveland, President of the United States from 1885 to 1889 and again from 1893 to 1897, died at his home in Princeton, New Jersey, on Wednesday, June 24, and was buried there on the following Friday. Mr. Cleveland was born in the little town of Caldwell, in Essex county, New York, on March 18, 1837, and was consequently at the time of his death 71 years and 3 months old.—Samuel Disston, who recently resigned the position he had long held as general manager of the firm of Henry Disston and Sons, Incorporated, at his home in Philadelphia on June 27, in his 70th year.—Joshua W. Rhodes, of Pittsburgh, on June 30, at Grosse Pointe, Michigan. Mr. Rhodes was 36 years old. He was the son of Joshua Rhodes, one of Pittsburgh's most prominent men.—Joseph Bailey, son of the late Joseph L. Bailey, on July 4, the latter until his death being one of the best-known ironmasters in Pennsylvania. He was aged 42 years and 11 months. He was at one time associated with the Central Iron and Steel Company, the Pine Iron Works, and the Lucknow Iron and Steel Company.—Captain M. J. Urquhart, at Steubenville, Ohio, in July. He was born in 1839 in Jefferson county, Ohio, and during the civil war served in the Union army. For many years he was connected with the old Jefferson Iron Works, at Steubenville, now the La Belle Iron Works. Later he was president and general manager of the Laughlin and Junction Steel Company, at Mingo Junction, Ohio.

# STATISTICS OF THE AMERICAN IRON TRADE FOR 1907.

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## REVIEW OF THE AMERICAN IRON TRADE IN 1907 AND 1908.

IN our Annual Report for 1906, which was printed at the close of 1907, we briefly described the financial panic of October, 1907, which was soon followed by a serious reaction in the activity and prosperity of all the leading industries of the country, except the agricultural industry. The farmers had in the main harvested good crops and had obtained good prices for them. But the mining and manufacturing industries and the railroads were hard hit. The iron and steel industries were especially affected. Throughout the fall and winter following the panic so general was the cancellation or postponement of orders for iron and steel, and so general was the refusal to place new orders, that the monthly production of most forms of iron and steel declined an average of more than 50 per cent. So violent, instant, and widespread a reaction in the iron trade is entirely without precedent. Naturally, with the greatly decreased demand for iron and steel and the raw materials which enter into their production, the business of the railroads at once declined.

The conditions in the iron trade above mentioned continued without material change until May and June of the present year, in which months there was an increased demand for most products. This increased demand was partly due to a reduction in the prices of pig iron and some other products which had previously been maintained by the concerted action of the manufacturers, the most notable and general decline in prices taking place in June. The conditions prevailing in May and June have been continued in July. But it must not be supposed that the active and favorable conditions which prevailed during the greater part of 1907, and during the whole of 1906 and some previous years, have been re-established. They have not been.

A particularly noticeable and far-reaching interruption to the activity of the iron trade in recent years is the great falling off since October last in the placing of orders for steel rails, cars, and locomotives, due to the great shrinkage in the business of the railroads, compelling the strictest economy in their management.

Many cars and locomotives have been idle since the beginning of the panic, and for this reason alone new cars and locomotives were not needed. The worst blow that many of the railroads have received has been caused by the greatly reduced tonnage of iron and steel and of their raw materials, coal and coke, iron ore, and limestone, above referred to.

We can not better illustrate the effect upon the iron trade of the present reaction than by reproducing the monthly statistics, compiled by the *Iron Age*, of the production of anthracite and bituminous pig iron in the eight months beginning with the panic month, October, in which month, strange as it may seem, the production of pig iron reached a larger total than in any preceding month in our history. Statistics of the production of charcoal pig iron in the months named were not obtained by the *Iron Age*. The total production of charcoal pig iron in 1907 was 437,397 tons. The figures of the *Iron Age* are as follows:

Months.	Gross tons.	Months.	Gross tons.
October, 1907.....	2,336,972	February, 1908.....	1,077,740
November.....	1,828,125	March.....	1,228,204
December.....	1,234,279	April.....	1,149,602
January, 1908.....	1,045,250	May.....	1,163,997

Our total production of pig iron in 1906 was 25,307,191 tons, of which 12,582,250 tons were produced in the first half and 12,724,941 tons in the second half. In the first six months of 1907 the production was 13,478,044 tons. In the six months beginning with December, 1907, the production, exclusive of charcoal, has been 6,899,072 tons, or 54.8 per cent. of the total production in the first half of 1906, 54.2 per cent. of the total production in the second half of 1906, and 51.1 per cent. of the total production in the first half of 1907. It is generally understood that more pig iron was produced in some months following the panic than was consumed, but this condition does not exist to-day.

Whether or not the remainder of this year will witness an improvement or a further reaction in the general trade conditions which now prevail, including the iron trade, no man can now with safety predict. While money is again abundant and seeking investment it must be considered that we are just entering upon a heated Presidential and Congressional campaign, with the result far more uncertain than it was four years ago or eight years ago, for the reason that new political issues have been forced upon the

attention of the public by the party in power, one of which, a proposed revision of the tariff, is certainly not popular with a large number of voters who usually support that party. Our views of the unwisdom of this policy of tariff revision have been freely expressed in the *Bulletin* and need not be here repeated. In addition to the uncertainty of the contest for political supremacy this year the reopening of the tariff question, and particularly the certainty that if the tariff is to be revised duties will be reduced for the benefit of foreigners, must have an unfavorable effect upon the industries of the country and upon general business conditions.

The fact is worthy of notice that this country has suffered from three serious business depressions within the last fifteen years—the first in 1893, the next in 1903, and the last in 1907. The silver question and the threat of tariff reduction caused the panic of 1893. President Roosevelt's attitude toward the railroads and other corporate interests of the country had much to do with the reaction of 1903 and the panic of 1907, although there were contributory causes. Political policies and conditions have been factors in producing all three of these business reactions. But for the tariff threats and political uncertainties of the present year that have been above alluded to the country ought to emerge from the existing depression in a very short time.

Returning to 1907, to which year this Report especially relates, it may be said that, while the interruption to the prosperity of the iron trade in that year was serious and widespread, it occurred so late in the year that the statistical record for the whole year shows few important decreases in production as compared with the preceding exceptionally prosperous year. There were some notable increases. We give a few of the general results in 1907 as compared with 1906. The production of Bessemer steel decreased 608,281 tons, Bessemer steel rails 411,434 tons, all kinds of rails 344,233 tons, structural shapes 178,420 tons, all kinds of steel 35,542 tons, and tinplates and terne plates 62,787 tons. Upon the other hand, the production of pig iron increased 474,170 tons, open-hearth steel 569,323 tons, all kinds of steel castings 29,412 tons, wire rods 145,969 tons, and the tonnage of iron and steel vessels 99,683 tons. The production of iron and steel wire nails increased 244,397 kegs but that of iron and steel cut nails decreased 80,101 kegs. Our imports of iron and steel increased from \$34,827,132 in value in 1906 to \$38,789,851 in 1907, and our exports of iron and steel increased from \$172,555,588 in value in 1906 to \$197,066,781 in 1907.

## PRICES OF UNITED STATES STEEL CORPORATION STOCK.

The Philadelphia News Bureau reports to us the range of prices of the preferred and common stock of the United States Steel Corporation from January 1, 1905, to June 20, 1908. Preferred reached 113½ in January, 1906, and common 50½ in January, 1907.

Months.	Preferred stock.		Months.	Common stock.	
	Low.	High.		Low.	High.
January, 1905.....	91½	95½	January, 1905.....	28½	31½
February.....	94½	96	February.....	30	35½
March.....	93½	97½	March.....	33½	37½
April.....	95½	104½	April.....	30½	38½
May.....	90½	101½	May.....	24½	33½
June.....	91	100	June.....	25½	32½
July.....	98½	104	July.....	31½	35½
August.....	103½	105½	August.....	34½	37½
September.....	101½	105½	September.....	34½	38½
October.....	103½	105½	October.....	37	39½
November.....	100½	105½	November.....	35½	38½
December.....	102½	107	December.....	36	43½
January, 1906.....	105	113½	January, 1906.....	42	46½
February.....	105½	113	February.....	40½	46½
March.....	104½	107½	March.....	38½	41½
April.....	105½	107½	April.....	39½	46½
May.....	102	107	May.....	36½	41½
June.....	99½	107½	June.....	34	42
July.....	98½	107½	July.....	32½	40
August.....	105	109½	August.....	39½	47½
September.....	105	108	September.....	43½	47½
October.....	105½	108½	October.....	45½	50½
November.....	104	107½	November.....	45½	49½
December.....	102½	105½	December.....	46½	49½
January, 1907.....	104	107½	January, 1907.....	42½	50½
February.....	103½	106½	February.....	42½	46½
March.....	91½	103½	March.....	31½	44½
April.....	97½	102	April.....	35½	39½
May.....	96	102½	May.....	31½	38½
June.....	96½	99½	June.....	31½	35½
July.....	98½	101	July.....	35½	39
August.....	91½	100½	August.....	29½	35½
September.....	87½	96	September.....	26½	33½
October.....	81½	89½	October.....	21½	27½
November.....	79½	85½	November.....	22½	25½
December.....	84½	90½	December.....	24	28½
January, 1908.....	87½	95½	January, 1908.....	25½	31½
February.....	89½	93½	February.....	26½	30½
March.....	92½	100	March.....	28½	36½
April.....	97½	101½	April.....	32½	37
May.....	100	103½	May.....	35½	39½
June 1-20.....	100½	103	June 1-20.....	36½	39½

## GENERAL STATISTICAL SUMMARY.

The following table gives the shipments in 1906 and 1907 of Lake Superior iron ore, the shipments of coke and of anthracite coal, the total production of all kinds of iron and steel, iron ore, coal, and coke, the imports and exports of iron and steel, etc. The statistics of the production of iron ore, coal, and coke have been received from the United States Geological Survey. The authority for other statistics in the table additional to our own iron and steel statistics is given in the body of this Report.

Articles—Gross tons, except for coke and nails.	1906.	1907.
Shipments of iron ore from Lake Superior.....	38,523,439	42,245,070
Production of iron ore.....	47,749,728	51,720,619
Shipments of Pennsylvania anthracite coal.....	55,698,595	67,109,393
Production of all kinds of coal.....	369,783,284	428,973,251
Production of coke, in net tons.....	36,401,217	40,779,564
Shipments of Connellsville coke, in net tons.....	19,999,326	19,029,058
Shipments of Pocahontas Flat Top coke, net tons	2,056,006	2,314,938
Production of pig iron, including spiegel and ferro.	25,307,191	25,781,361
Production of spiegeleisen and ferro-manganese .....	300,500	339,348
Production of Bessemer steel ingots and castings....	12,275,830	11,667,549
Production of open-hearth steel ingots and castings	10,980,413	11,549,736
Production of all kinds of steel ingots and castings	23,398,136	23,362,594
Production of structural shapes, not including plates	2,118,772	1,940,352
Production of plates and sheets, except nail plate...	4,182,156	4,248,832
Production of iron and steel wire rods .....	1,871,614	2,017,583
Production of all rolled iron and steel, except rails	15,610,581	16,231,168
Production of Bessemer steel rails.....	3,791,459	3,380,025
Production of all kinds of rails.....	3,977,887	3,633,654
Production of all rolled iron and steel, including rails	19,588,468	19,864,822
Production of iron and steel cut nails, in kegs.....	1,189,239	1,109,138
Production of iron and steel wire nails, in kegs.....	11,486,647	11,731,044
Imports of iron ore.....	1,060,390	1,229,168
Exports of iron ore.....	265,240	278,608
Imports of iron and steel, foreign value.....	\$34,827,132	\$38,789,851
Exports of iron and steel, home value.....	\$172,555,588	\$197,066,781
Miles of new railroad built in the calendar year...	5,643	5,499
Tonnage of iron and steel vessels built, cal. year...	336,500	436,183

In addition to the increases and decreases in the production of iron and steel in 1907 as compared with 1906 which are enumerated on page 17 there was an increase of 3,721,631 gross tons in the shipments of Lake Superior iron ore and an increase of 3,970,891 tons in the production of all kinds of iron ore. The shipments of Pennsylvania anthracite coal increased 11,410,798 gross tons and the production of Pennsylvania anthracite coal increased 12,787,411 gross tons. Bituminous coal increased

46,402,556 gross tons and the total production of all kinds of coal increased 59,189,967 gross tons. The total production of coke increased 4,378,347 net tons but the shipments of Connellsville coke decreased 970,268 net tons. In the production of iron and steel plates and sheets there was an increase of 66,676 gross tons and in the production of all kinds of finished rolled iron and finished rolled steel an increase of 276,354 gross tons. Our imports of iron ore increased 168,778 gross tons and our exports of iron ore increased 13,368 gross tons.

#### SHIPMENTS OF ANTHRACITE COAL AND CUMBERLAND COAL.

The shipments of anthracite coal from the Pennsylvania mines in 1907 amounted to 67,109,393 gross tons, against 55,698,595 tons in 1906, 61,410,201 tons in 1905, 57,492,522 tons in 1904, 59,362,831 tons in 1903, 31,200,890 tons in 1902, (the year of the great anthracite coal strike,) 53,568,601 tons in 1901, and 45,107,484 tons in 1900. The increase in 1907 over 1906 was 11,410,798 tons. These figures are furnished to us by Mr. W. W. Ruley, of Philadelphia, the anthracite coal statistician.

The shipments of Cumberland coal from the mines of Western Maryland and West Virginia in 1907 amounted to 7,360,336 gross tons, against 7,188,037 tons in 1906. Since the beginning of the Cumberland coal trade in 1842 the total shipments of Cumberland coal to the close of 1907 amounted to 160,038,392 tons. The year of maximum shipment was 1907. For the above statistics we are indebted to Mr. E. T. Dixon, auditor of the Cumberland and Pennsylvania Railroad Company.

#### SHIPMENTS OF COAL AND COKE ON THE MONONGAHELA RIVER.

We are advised by Major H. C. Newcomer, of the Corps of Engineers, U. S. Army, stationed at Pittsburgh, that in the fiscal year ended on June 30, 1907, there were shipped 9,907,052 net tons of coal and 2,675 net tons of coke through the locks and pools of the Monongahela river, against 9,474,668 net tons of coal and 2,325 net tons of coke shipped in the fiscal year 1906.

#### PRODUCTION OF COAL.

The following table, for which we are indebted to Mr. E. W. Parker, statistician in charge of the Division of Mining and Mineral Resources of the United States Geological Survey, gives the production of all kinds of coal by States in the United States from 1904 to 1907 in the order of their prominence in 1907. Net tons of 2,000 pounds are used throughout the table.

State or Territory—Net tons.	1904.	1905.	1906.	1907.
Pennsylvania (bituminous)...	97,938,287	118,413,637	129,293,206	150,321,437
Illinois.....	36,475,060	38,434,363	41,480,104	51,317,146
West Virginia.....	32,406,752	37,791,580	43,290,350	48,091,583
Ohio.....	24,400,220	25,552,950	27,731,640	32,142,419
Alabama.....	11,262,046	11,866,069	13,107,963	14,250,454
Indiana.....	10,842,189	11,895,252	12,092,560	13,985,713
Colorado.....	6,658,355	8,826,429	10,111,218	10,790,236
Kentucky.....	7,576,482	8,432,523	9,653,647	10,753,124
Iowa.....	6,519,933	6,798,609	7,266,224	7,574,322
Kansas.....	6,333,307	6,423,979	6,024,775	7,322,449
Tennessee.....	4,782,211	5,766,690	6,259,275	6,810,243
Wyoming.....	5,178,556	5,602,021	6,133,994	6,252,990
Maryland.....	4,813,622	5,108,539	5,435,453	5,532,628
Virginia.....	3,410,914	4,275,271	4,254,879	4,710,895
Missouri.....	4,168,308	3,983,378	3,758,008	3,906,294
Washington.....	3,137,681	2,864,926	3,276,184	3,680,532
Oklahoma (Indian Territory)	3,046,539	2,924,427	2,860,200	3,642,658
Arkansas.....	2,009,451	1,934,673	1,864,268	2,670,438
New Mexico.....	1,452,325	1,649,933	1,964,713	2,628,959
Michigan.....	1,342,840	1,473,211	1,346,338	2,035,858
Montana.....	1,358,919	1,643,832	1,829,921	2,016,857
Utah.....	1,493,027	1,332,372	1,772,551	1,947,607
Texas.....	1,195,944	1,200,684	1,312,873	1,648,069
Georgia and North Carolina.	390,191	353,548	332,107	362,401
North Dakota.....	271,928	317,542	305,689	347,760
Oregon.....	111,540	109,641	79,731	70,981
California and Alaska.....	79,582	80,824	30,831	24,089
Idaho, Nevada, and Neb.....	3,480	5,882	6,165	7,588
Total bituminous.....	278,659,689	315,062,785	342,874,867	394,845,730
Pennsylvania anthracite.	73,156,709	77,659,850	71,282,411	85,604,312
Grand total.....	351,816,398	392,722,635	414,157,278	480,450,042

The bituminous figures in the table include small quantities of anthracite coal which are mined annually in Colorado and New Mexico. Until recently some coal was also mined in Massachusetts and Rhode Island which was classed as anthracite. It was, however, a graphitic and not an anthracite coal and is no longer used as a fuel, but is included in the production of graphite.

In 1907 the total production of anthracite and bituminous coal in Pennsylvania amounted to 235,925,749 net tons, as compared with 200,575,617 tons in 1906, 196,073,487 tons in 1905, and 171,094,996 tons in 1904. In the four years covered by the table Pennsylvania has annually produced about one-half of the total coal production of the whole country.

The total production of coal in the United States in 1907

was greater than in any preceding year, exceeding the production of 1906, the next largest year, by 66,292,764 net tons.

SHIPMENTS OF CONNELLSVILLE AND POCAHONTAS COKE.

Mr. H. P. Snyder, the editor of the *Connellsville Courier*, reports that the shipments of coke from the Connellsville region in 1907 amounted to 19,029,058 net tons, against 19,999,326 tons in 1906, a decrease of 970,268 tons, or over 4.8 per cent. The shipments in 1906 were much the largest in the history of the Connellsville region, but in 1907 they fell short of the record in 1906 by almost a million tons. The *Courier* says that the shipments in 1907 were made in 691,757 cars, a daily average of 2,210 cars. In 1906 the number of cars required was 745,274 and the daily average was 2,385 cars. In the Connellsville region the *Courier* includes all the districts which produce Connellsville coke, which it classifies as Connellsville and as Lower Connellsville, the former shipping 12,867,039 tons and the latter 6,162,019 tons in 1907. The Lower Connellsville district made almost one-third of the total shipments in 1907, as compared with over one-fourth in 1906. Of the shipments in 1907 there were 6,127,094 tons sent to the Pittsburgh district, 11,351,927 tons to points west of Pittsburgh, and 1,550,037 tons to points east of the Connellsville region. At the close of 1907 there were on hand in the coke yards 708,795 tons of coke that had been produced in that year in excess of the shipments.

The average price of all coke shipped from the Connellsville region in 1907 was \$2.90 per net ton, against \$2.75 per ton in 1906, \$2.26 in 1905, and \$1.75 in 1904. With the single exception of 1903, when the average price of coke was \$3 per ton, the average reached in 1907 was the highest that has prevailed in the last twenty-eight years. The lowest average price during the same period was reached in 1894, when the exceptionally low average of \$1 per ton prevailed.

In the early months of 1907 the price of foundry coke reached \$4.50 and furnace coke \$3.85. Prices declined sharply, however, after the panic in October. Furnace coke dropped from \$2.75 in October to \$2.15 and \$2 in December, and foundry coke from \$3.25 to \$2.75 and \$2.50. The gross revenue received from the sale of Connellsville coke in 1907 was \$55,184,268, against \$54,998,146 in 1906, an increase of \$186,122.

The wage scale established in 1905, and which was continued all through 1906, was continued substantially without change in

1907, but on the last day of the year the H. C. Frick Coke Company announced a general reduction of wages averaging 12½ per cent. Other companies followed, but previous to this a number of smaller operators who were no longer able to pay the high rate of wages had cut wages from 15 to 20 per cent.

The shipments of Pocahontas Flat Top coke in 1907, for which we are indebted to the Norfolk and Western Railway Company, amounted to 2,314,938 net tons, against 2,056,006 net tons in 1906, 2,156,805 tons in 1905, 1,617,801 tons in 1904, 1,693,403 tons in 1903, 1,191,436 tons in 1902, and 1,279,949 tons in 1901.

#### PRODUCTION OF COKE.

The following table gives the production of coke in the United States from 1903 to 1907, by States, in the order of their prominence in 1907. The statistics were collected by Mr. E. W. Parker for the Division of Mining and Mineral Resources of the United States Geological Survey. Net tons of 2,000 pounds are used.

State or Territory. Net tons.	1903.	1904.	1905.	1906.	1907.
Pennsylvania.....	15,650,932	14,861,064	20,573,736	23,060,511	26,513,214
West Virginia.....	2,707,818	2,283,086	3,400,593	3,713,514	4,112,896
Alabama.....	2,693,497	2,340,219	2,576,986	3,034,501	3,021,794
Maryland, Mass., Mich., Minn., New Jersey, New York, Wis., and Wy.....	932,428	1,451,172	1,660,857	2,085,617	2,528,739
Virginia.....	1,176,439	1,101,716	1,499,481	1,577,659	1,545,280
Colorado and Utah..	1,053,840	789,060	1,378,824	1,455,905	1,421,579
Tennessee.....	546,875	379,240	468,092	483,428	467,499
Illinois.....		4,439	10,307	268,693	372,697
Ohio.....	143,913	109,284	277,130	293,994	270,634
New Mexico.....	11,050	58,259	89,638	147,747	265,125
Georgia.....	85,546	75,812	70,593	70,280	74,934
Kentucky.....	115,362	64,112	79,487	74,064	67,068
Washington.....	45,623	45,432	53,137	45,642	52,028
Montana.....	45,107	41,497	31,482	38,182	40,714
Oklahoma (Ind. Ty.)	49,818	44,808	54,781	49,782	19,089
Kansas.....	14,194	9,460	4,425	1,698	6,274
Missouri.....	1,839	2,446	1,580	.....	.....
Total.....	25,274,281	23,661,106	32,231,129	36,401,217	40,779,564

The production of coke in 1907 was the greatest in the history of the country. The increase over 1906 amounted to 4,378,347 net tons. Pennsylvania makes annually a little less than two-thirds of our total production of coke.

## CARS AND LOCOMOTIVES.

The *Railroad Gazette* has ascertained the number of railroad cars built in the United States and Canada in 1907 as follows: "Official returns from 36 carbuilding companies in the United States and Canada (estimating two small plants not heard from) give the total number of railroad cars built during 1907 as 289,645, an increase of 19 per cent. over the record-breaking output of 1906. This includes subway and elevated cars but does not include electric street and interurban cars. No estimate has been made of the number of cars, both freight and passenger, built by the railroads in their own shops. Of the total number of cars built by manufacturers 284,188 were for freight service and 5,457 for passenger service; 280,216 were for domestic use and 9,429 for export. The number of passenger cars built during the year shows an increase of more than 70 per cent. over last year's output. About 72 per cent. of the freight cars built were of steel or of steel underframe construction. Canada built 9,159 freight cars and 106 passenger cars, an increase of 30 per cent. over the output in 1906; all these cars were for domestic use. The single company building cars in Mexico retired from business during the year and no returns were received from it."

In 1906 the number of cars built by manufacturers in the United States, Canada, and Mexico was 243,670, of which 240,503 were freight and 3,167 were passenger. Of the total 236,451 were for domestic use and 7,219 were for export. In 1906 the United States built 233,241 freight and 3,078 passenger cars; Canada, 7,059 freight and 83 passenger cars; and Mexico, 203 freight and 6 passenger cars.

Returns received by the *Gazette* from the 12 locomotive builders in the United States and Canada show that 7,362 locomotives were built in 1907, against 6,952 in 1906, an increase of 410 locomotives. Of the 1907 total 6,564 were for domestic use and 798 were for export. In 1907 the Canadian output was 264, against 217 in 1906. These totals do not include locomotives built by railroads in their own shops; nor do they include locomotives which were repaired or rebuilt. Electric locomotives are included in the figures for both years.

The Baldwin Locomotive Works built 2,663 locomotives in 1907, against 2,666 in 1906, a loss of 3 locomotives. Of the 1907 total 2,371 were steam and 292 were electric locomotives. The Westinghouse Electric and Manufacturing Company, of Pittsburgh, built 350 locomotives in 1907, against 245 in 1906.

## MILEAGE OF STEAM RAILROAD.

From *Poor's Manual* we learn that at the close of 1907 the total number of miles of all kinds of steam railroad track in the United States, including sidings, switches, and second, third, and fourth tracks, etc., amounted to 324,033 miles. Of the total mileage at the close of 1907 there were 314,713 miles laid with steel rails and 9,320 miles laid with iron rails.

The total number of miles of steam railroad in operation in the United States at the close of 1907, not including side tracks, switches, and second, third, and fourth tracks, etc., or the tracks of elevated city passenger railways, was 228,128 miles.

The number of miles of steam railroad track built in this country in 1907, not including double track, sidings, etc., amounted to 5,499 miles, against 5,643 miles in 1906, a decrease of 144 miles. In 1887 the new mileage built aggregated 12,984 miles, the greatest in any year in our history.

## MILEAGE OF STREET RAILWAYS.

We are indebted to the editor of the *Electric Railway Journal*, of New York, for the following information: At the end of 1907 there were about 41,210 miles of street and suburban railway lines in the United States, against 36,931 miles at the close of 1906, 33,150 miles at the close of 1905, and 30,187 miles at the close of 1904. Of the total in 1907 about 40,500 miles were operated by electricity and about 710 miles by cable, etc., against 36,212 miles by electricity and 719 miles by cable, etc., in 1906.

## LAKE SUPERIOR IRON ORE SHIPMENTS.

The *Iron Trade Review* (Cleveland) gives full details of the shipments of iron ore from the Lake Superior region in 1907 and preceding years. These details have been verified for this Report by the mining editor of the *Review*. The total shipments by water and by all-rail routes in 1907 amounted to 42,245,070 gross tons, against 38,523,439 tons in 1906, an increase of 3,721,631 tons, or over 9.6 per cent. The shipments of ore by water in 1907 amounted to 41,288,755 tons, against 37,514,789 tons in 1906, an increase of 3,773,966 tons, and by rail to 956,315 tons, against 1,008,650 tons in 1906, a decrease of 52,335 tons. The *Review* says: "Of the total tonnage moved in 1907 65.08 per cent. was shipped from the Mesabi range, 3.99 per cent. from the Vermilion, 8.61 per cent. from the Gogebic, 10.39 per cent. from the Marquette, 11.75 per cent. from the Menominee, and 0.18 per cent. from other mines. Approximately 60 per cent. was of Bessemer grade."

The following table gives the total shipments in gross tons of Lake Superior iron ore in the last four years by ranges. There was a large addition in 1907 to the number of producing mines, principally in the Mesabi, Menominee, and Marquette ranges.

Ranges—Gross tons.	1904.	1905.	1906.	1907.
Marquette Range.....	2,843,703	4,210,522	4,057,187	4,388,073
Menominee Range.....	3,074,848	4,495,451	5,109,088	4,964,728
Gogebic Range.....	2,398,287	3,705,207	3,643,514	3,637,907
Vermilion Range.....	1,282,513	1,677,186	1,792,355	1,685,267
Mesabi Range.....	12,156,008	20,153,699	23,792,553	27,492,949
Miscellaneous.....	67,480	111,391	128,742	76,146
Total.....	21,822,839	34,353,456	38,523,439	42,245,070

Under "miscellaneous" are included all shipments from the Baraboo district and from the Iron Ridge mine in Wisconsin.

In 1904 the Mesabi mines shipped 12,156,008 tons; in 1905, 20,153,699 tons; in 1906, 23,792,553 tons; and in 1907, 27,492,949 tons. The increase in the Mesabi shipments in 1907 as compared with 1904 amounted to 15,336,941 tons, or over 126 per cent., while the increase in all the other ranges in the same period, including miscellaneous shipments, amounted to only 5,085,290 tons, or less than 53 per cent.

The Marquette range is wholly in Michigan, the Menominee and Gogebic ranges are partly in Michigan and partly in Wisconsin, and the Vermilion and Mesabi ranges are in Minnesota.

The Iron Ridge mine, owned by the Illinois Steel Company, is located in Dodge county, Wisconsin, and the recently developed Baraboo district, containing the Illinois mine, is in the adjoining counties of Sauk and Columbia, in Southern Wisconsin. Prior to 1903 the shipments from the Iron Ridge mine, which amounted to 17,913 tons in 1903, 19,558 tons in 1904, 39,978 tons in 1905, 61,624 tons in 1906, and 3,966 tons in 1907, were not included in Lake Superior statistics. The production of the Baraboo district in 1903 was a little less than 19,000 tons but no ore was shipped. Shipments from this district began in 1904, in which year they amounted to 47,922 tons. In 1905 they amounted to 71,413 tons, in 1906 to 67,118 tons, and in 1907 to 72,180 tons.

The increase in iron ore shipments in 1907 as compared with 1906 was participated in only by the Mesabi and Marquette ranges, the former range showing an increase of 3,700,396 tons and the latter range an increase of 330,886 tons. All the other ranges show decreased shipments as follows: Menominee, 144,360

tons; Gogebic, 5,607 tons; Vermilion, 107,088 tons; and miscellaneous, 52,596 tons. Beginning with 1903 the Mesabi range has annually shipped more than one-half of the iron ore that has been shipped from the Lake Superior region.

The shipments of iron ore from the Lake Superior region for the account of the United States Steel Corporation from mines owned wholly or in part by the Corporation amounted in 1907 to 23,148,467 gross tons, or almost 54.8 per cent. of the total, as compared with similar shipments of 20,885,774 tons, or 54.2 per cent., in 1906, 19,251,872 tons, or over 56 per cent., in 1905, and 11,746,409 tons, or 53.8 per cent., in 1904. In each year the ore shipped from the Iron Ridge mine is included.

The following table shows the shipments by ports in the last four years, with the all-rail shipments added. Shipments to local furnaces are included. Gross tons of 2,240 pounds are used.

Ports—Gross tons.	1904.	1905.	1906.	1907.
Escanaba.....	3,644,267	5,307,938	5,851,050	5,761,988
Marquette.....	1,907,301	2,977,828	2,791,033	3,013,826
Ashland.....	2,288,400	3,485,344	3,389,635	3,437,672
Two Harbors.....	4,566,542	7,779,850	8,180,125	8,188,906
Gladstone.....	553	.....	.....	.....
Superior.....	4,169,990	5,118,385	6,083,057	7,440,386
Duluth.....	4,649,611	8,807,559	11,219,889	13,445,977
Total lake.....	21,226,664	33,476,904	37,514,789	41,288,755
All rail.....	596,175	876,552	1,008,650	956,315
Grand total.....	21,822,839	34,353,456	38,523,439	42,245,070

Shipments from the Helen mine of the Lake Superior Corporation in Ontario, Canada, are not included in the above tables.

#### LARGEST SHIPPERS OF LAKE SUPERIOR IRON ORE.

The Lake Superior mines which shipped the largest quantities of iron ore in 1907 were the following: Mesabi range: Hull-Rust, 2,900,493 tons; Morris, 2,076,388 tons; Mountain Iron, (Aetna,) 1,973,519 tons; Fayal, 1,878,812 tons; Mahoning, 1,564,332 tons; Burt, 1,501,272 tons; Stevenson, 1,142,977 tons; Adams, 1,136,513 tons; and Virginia, (group,) 1,015,717 tons. In the Gogebic range the largest shippers were the Norrie group, 1,109,085 tons; Newport, 551,873 tons; Tilden, 312,496 tons; Ashland, 298,056 tons; and Cary and Superior, 209,407 tons. In the Menominee range Chapin shipped 855,308 tons; Pewabic, 457,796 tons; Aragon, 441,636 tons; Penn Iron Mining, 381,128 tons; and Bristol,

345,676 tons. In the Marquette range the Cleveland-Cliffs group shipped 1,030,928 tons; Lake Superior, 674,066 tons; Hartford, 328,161 tons; Queen, (Blue,) 309,917 tons; Negaunee, 296,170 tons; and Lake Angeline, 283,373 tons. In the Vermilion range Pioneer shipped 830,700 tons; Chandler, 245,684 tons; Zenith, 235,751 tons; and Sibley, 226,835 tons.

The nine mines named in the Mesabi range shipped almost three-fifths of the total ore shipments from that range in 1907.

#### RECEIPTS OF IRON ORE AT LAKE ERIE PORTS.

The *Iron Trade Review* annually publishes full statistics of the receipts of Lake Superior iron ore at Cleveland, Ashtabula, Conneaut, Buffalo, and other ports on Lake Erie, the principal receipts being at Ashtabula, Cleveland, Conneaut, Fairport, Erie, and Buffalo and Tonawanda; also the quantity left on the docks at the close of navigation. From these statistics we compile the following table of total receipts and total tonnage left on docks.

Years.	Receipts. Gross tons.	On dock. Gross tons.	Years.	Receipts. Gross tons.	On dock. Gross tons.
1890.....	6,874,664	3,893,487	1899.....	15,222,187	5,530,283
1891.....	4,939,684	3,508,489	1900.....	15,797,787	5,904,670
1892.....	6,660,734	4,149,451	1901.....	17,014,076	5,859,663
1893.....	5,333,061	4,070,710	1902.....	22,649,424	7,074,254
1894.....	6,350,825	4,834,247	1903.....	19,681,731	6,371,085
1895.....	8,112,228	4,415,712	1904.....	17,932,814	5,763,399
1896.....	8,026,432	4,954,984	1905.....	28,941,259	6,438,967
1897.....	10,120,906	5,923,755	1906.....	32,076,757	6,252,455
1898.....	11,028,321	5,136,407	1907.....	35,195,758	7,385,728

The receipts of Lake Superior iron ore at Lake Erie ports in the last six years are given by the *Review* in detail in gross tons. The figures for Buffalo include the receipts at Tonawanda.

Ports.	1902.	1903.	1904.	1905.	1906.	1907.
Toledo.....	1,037,571	652,305	508,793	1,006,855	1,423,741	1,314,140
Sandusky.....	165,556	130,532	48,356	51,202	35,847	83,043
Huron.....	520,646	486,106	231,364	825,278	778,453	971,430
Lorain.....	1,442,417	990,490	972,931	1,605,823	2,191,965	2,621,025
Cleveland.....	4,873,318	4,434,160	3,572,228	5,854,745	6,604,661	6,495,998
Fairport.....	1,538,744	1,434,342	1,157,858	2,008,621	1,861,498	2,437,649
Ashtabula.....	4,796,805	4,242,160	3,639,250	6,373,779	6,833,352	7,521,859
Conneaut.....	4,300,301	3,903,937	4,083,655	5,327,552	5,432,370	5,875,937
Erie.....	1,717,268	1,257,798	1,284,778	2,112,476	1,986,539	2,294,239
Buffalo.....	2,256,798	2,149,901	2,433,601	3,774,928	4,928,331	5,580,438
Total.....	22,649,424	19,681,731	17,932,814	28,941,259	32,076,757	35,195,758

In 1907 the ore shipped by rail and to ports other than those on Lake Erie amounted to 7,049,312 tons, as compared with similar shipments of 6,446,682 tons in 1906, 5,412,197 tons in 1905, 3,890,025 tons in 1904, and 4,608,147 tons in 1903.

#### PRICES OF LAKE SUPERIOR IRON ORE.

We give below the base prices at which Lake Superior iron ore was sold on season contracts in 1904 and 1905, per gross ton, delivered at lower Lake Erie ports; also the prices at which sales were made in December, 1905, for delivery in 1906; in November, 1906, for delivery in 1907; and the prices prevailing for delivery in 1908. Owing to the large stock of ore on hand at the close of 1907 and the existing business depression the buying movement for the season of 1908 was not started until June 15, 1908. These prices and the comments which follow have been furnished for this Report by the editor of the *Iron Trade Review*.

Grades—Gross tons.	1904.	1905.	1906.	1907.	1908.
Old range Bessemer.....	\$3.00 @ \$3.25	\$3.75	\$4.25	\$5.00	\$4.50
Old range non-Bessemer.....	2.60 @ 2.80	3.20	3.70	4.20	3.70
Mesabi Bessemer.....	2.75 @ 3.00	3.50	4.00	4.75	4.25
Mesabi non-Bessemer .....	2.35 @ 2.50	3.00	3.50	4.00	3.50

The classification of ores given above conforms to that adopted by the Lake Superior Iron Ore Association, which was organized for statistical purposes on January 14, 1905, by the ore selling firms located in Cleveland. Up to the year 1907 the base for old range Bessemer ores was a supposititious ore containing 63 per cent. of metallic iron, 0.045 per cent. of phosphorus, and 10 per cent. of moisture, giving a natural iron content of 56.70 per cent. The base for the non-Bessemer ores up to 1907 was an ore supposed to contain 60 per cent. of metallic iron and 12 per cent. of moisture, giving a natural iron content of 52.80 per cent., except for Mesabi non-Bessemer for 1905 and 1906, when the natural iron content was 53 per cent. Before the sales for 1907 delivery were made the natural iron content for the base was changed to 55 per cent. for the old range and Mesabi Bessemer and 51.50 per cent. for the old range and Mesabi non-Bessemer. On the old basing schedule the prices for 1907 would have been about \$5.15 per ton for old range Bessemer, \$4.90 for Mesabi Bessemer, \$4.30 for old range non-Bessemer, and \$4.10 for Mesabi non-Bessemer. The prices quoted in the table for 1907 and 1908 are on the new base schedule.

## IMPORTS OF IRON ORE.

The following table, for which we are indebted to the Bureau of Statistics of the Department of Commerce and Labor, gives the quantities and values of iron ore imported into the United States in the calendar years 1905, 1906, and 1907. The imports in 1907 included 26,878 tons from the Dominion of Canada, valued at \$51,328, received chiefly at Lake Erie ports; also 89,685 tons, valued at \$97,735, from Newfoundland, received at Philadelphia. In 1906 the iron ore imported from Canada amounted to 57,890 tons, valued at \$100,125, also received chiefly at Lake Erie ports. The duty on iron ore is 40 cents per gross ton.

Customs districts. Gross tons.	1905.		1906.		1907.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Baltimore .....	504,618	\$1,290,420	617,866	\$1,937,610	639,602	\$2,436,457
New York.....	34,296	70,419	3,475	8,400	7,405	19,989
Philadelphia....	201,853	455,342	383,651	914,242	554,104	1,422,503
Puget Sound ...	.....	.....	9	77	1,976	6,365
Vermont.....	529	1,043	53	378	167	1,244
All other.....	104,355	244,937	55,336	106,727	25,914	50,925
Total.....	845,651	\$2,062,161	1,060,390	\$2,967,434	1,229,168	\$3,937,483

For the following table, which gives the countries from which iron ore was imported into the United States during the calendar years 1905, 1906, and 1907, we are also indebted to the Bureau of Statistics of the Department of Commerce and Labor.

Countries. Gross tons.	1905.		1906.		1907.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Cuba .....	539,935	\$1,437,900	639,362	\$2,178,997	657,133	\$2,522,710
Spain.....	191,861	366,436	171,870	418,922	296,318	760,801
Greece.....	.....	.....	48,630	61,560	23,800	42,927
Newfoundland.....	5,600	5,600	125,395	125,395	89,685	97,735
United Kingdom...	408	2,396	231	1,955	5,765	16,491
Germany.....	1	42	1,084	8,949	273	2,096
Canada .....	104,096	240,303	57,890	100,125	26,878	51,328
Belgium .....	400	3,370	400	6,662	125	1,102
Russia in Europe.	.....	.....	.....	.....	54,995	161,697
French Africa.....	.....	.....	.....	.....	65,940	252,897
Other countries....	3,350	6,114	15,528	64,869	8,256	27,699
Total .....	845,651	\$2,062,161	1,060,390	\$2,967,434	1,229,168	\$3,937,483

The following table gives the imports of iron ore into the United States in the calendar years 1879 to 1907 inclusive. In 1879 this country for the first time imported iron ore largely

from Europe. Prior to that year such iron ore as was imported came chiefly from Canada, more than one-half coming from that country in 1873, 1874, and 1875. In recent years considerably more than one-half of the ore annually imported has come from Cuba. Gross tons are used in the table.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1879.....	284,141	1889.....	853,573	1899.....	674,082
1880.....	493,408	1890.....	1,246,830	1900.....	897,831
1881.....	782,887	1891.....	912,856	1901.....	966,950
1882.....	589,655	1892.....	806,585	1902.....	1,165,470
1883.....	490,875	1893.....	526,951	1903.....	980,440
1884.....	487,820	1894.....	168,541	1904.....	487,613
1885.....	390,786	1895.....	524,153	1905.....	845,651
1886.....	1,039,433	1896.....	682,806	1906.....	1,060,390
1887.....	1,194,301	1897.....	489,970	1907.....	1,229,168
1888.....	587,470	1898.....	187,093	.....	.....

#### SHIPMENTS OF IRON ORE FROM THE HELEN MINE.

According to statistics furnished us by the Lake Superior Corporation the total shipments of iron ore in 1907 from the Helen mine in Canada amounted to 142,832 tons. Of these shipments 24,512 tons were sent to the United States. In 1906 the total shipments from the Helen mine amounted to 121,556 tons, in 1905 to 169,526 tons, in 1904 to 118,355 tons, and in 1903 to 203,419 tons. Of the total 54,145 tons were sent to the United States in 1906, 104,266 tons in 1905, 77,391 tons in 1904, and 170,672 tons in 1903. Earlier yearly shipments are not at hand.

#### SHIPMENTS OF IRON ORE FROM CUBA.

In the calendar year 1907 shipments of iron ore from Cuba were made by two companies, the Juragua Iron Company and the Spanish-American Iron Company. The shipments by the Juragua Company amounted to 183,250 tons and by the Spanish-American Company to 489,111 tons: total, 672,361 tons. All the shipments were made to the United States. In 1906 these two companies were also the only shippers of iron ore from Cuba, the total shipments of the Juragua Company amounting to 142,226 tons and of the Spanish-American Company to 507,195 tons: total, 649,421 tons.

The total shipments of iron ore from Cuba to all countries from the opening of the mines in 1884 to the close of 1907 were as follows in gross tons: the Juragua Iron Company, Limited, and the Juragua Iron Company, 4,565,491 tons; the Sigua Iron Com-

pany, 20,438 tons; the Spanish-American Iron Company, 4,018,494 tons; and the Cuban Steel Ore Company, 41,241 tons: total since 1884, 8,645,664 tons. With the exception of 5,932 tons shipped to Pictou, Nova Scotia, 4,177 tons to Santiago, and 82,242 tons shipped to other foreign countries all the above ore was shipped to the United States. Over 20,000 tons were lost at sea.

#### PRODUCTION OF IRON ORE.

The following table, compiled from statistics obtained by the Division of Mining and Mineral Resources of the United States Geological Survey, gives the production of iron ore from 1903 to 1907, by States, in gross tons, in the order of their prominence in 1907. The production of iron ore in any given year must not be confounded with the shipments of iron ore in that year.

States—Gross tons.	1903.	1904.	1905.	1906.	1907.
Minnesota.....	15,371,396	12,728,835	21,735,182	25,364,077	28,969,658
Michigan.....	10,600,330	7,089,887	10,885,902	11,822,874	11,830,342
Alabama.....	3,684,960	3,699,881	3,782,831	3,995,098	4,039,453
New York.....	540,460	842,303	1,139,937	1,041,992	1,375,020
Mont., Nev., New Mex., Utah, Wy., Tex., Ark., Cal., and Wash.....	426,292	210,945	718,299	828,850	938,211
Virginia.....	801,161	550,253	785,314	875,021	849,664
West Virginia.....					
Kentucky.....	32,227	35,000			
Maryland.....	9,920	9,645	859,283	848,133	838,744
Wisconsin.....	675,053	483,475			
Pennsylvania.....	644,599	397,107	808,717	949,429	837,287
Tennessee.....	852,704	500,982	734,770	870,734	813,690
New Jersey.....	484,796	499,949	526,271	542,518	549,760
Georgia.....	443,452	293,802	200,842	411,230	444,114
Missouri and Iowa	63,380	49,285	113,112	80,910	111,768
North Carolina....	75,252	64,347	56,282	56,057	50,439
Conn. and Mass....	30,729	21,990	25,931	31,343	37,166
Ohio.....	29,688	15,672	19,989	17,384	23,589
Colorado.....	252,909	150,972	133,471	14,078	11,714
Total.....	35,019,308	27,644,330	42,526,133	47,749,728	51,720,619

The production of iron ore in 1907 exceeded that of 1906 by 3,970,891 gross tons. Minnesota in 1905, 1906, and 1907 produced more than one-half of the iron ore mined in the whole country. Michigan, Alabama, and New York, in the order named, were the next largest producers in these three years, which were the years of largest production. The increase in production in New York since 1903 is a noticeable feature of the table.

## SHIPMENTS OF IRON ORE FROM LEADING DISTRICTS.

The shipments of iron ore from some of the leading iron ore districts of the country in the last three years were as follows.

Shipments of iron ore from leading districts.	1905. Gross tons.	1906. Gross tons.	1907. Gross tons.
Lake Superior mines of Michigan and Wis.	*12,522,571	*12,938,531	*13,066,854
Vermilion and Mesabi mines of Minnesota..	21,830,885	25,584,908	29,178,216
Missouri mines.....	68,549	88,736	104,815
Cornwall mines, Pennsylvania.....	617,060	763,788	704,004
New Jersey mines (production in 1906-7).	544,002	542,518	549,760
Chateaugay mines on Lake Champlain.....	112,379	117,461	138,890
Port Henry mines.....	604,468	563,695	641,891
Hudson (Forest of Dean) mine, New York.	.....	2,639	27,800
Salisbury region, Connecticut.....	18,273	19,198	22,025
Cranberry mines, North Carolina.....	56,282	56,058	50,604
Tennessee Coal, Iron, and Railroad Com- pany's mines in Alabama and Georgia..	1,382,415	1,581,216	1,554,008
Total of the above districts.....	37,756,884	42,258,748	46,038,867

\* Include the Iron Ridge mine and the Illinois mine in Southern Wisconsin.

## PRODUCTION AND IMPORTS OF MANGANESE ORE.

Our supply of manganese ore is chiefly obtained abroad. The following States produced manganese ore in 1907: California, 100 tons; South Carolina, 800 tons; Tennessee, 100 tons; and Virginia, 4,604 tons: total, 5,604 tons. The imports of manganese ore have been as follows in late years: 1898, 114,885 tons; 1899, 188,349 tons; 1900, 256,252 tons; 1901, 165,722 tons; 1902, 235,576 tons; 1903, 146,056 tons; 1904, 108,519 tons; 1905, 257,033 tons; 1906, 221,260 tons; and 1907, 209,032 tons. These are Government figures. Manganese ore is in the free list.

## IMPORTS AND EXPORTS OF COAL AND COKE.

Domestic exports of anthracite coal in 1907 amounted to 2,698,072 gross tons, against 2,216,969 tons in 1906. Domestic exports of bituminous coal in 1907 amounted to 10,454,677 tons, against 7,704,850 tons in 1906. The total domestic exports in 1907 amounted to 13,152,749 tons, against 9,921,819 tons in 1906. Bituminous bunker coal used by vessels engaged in the foreign trade is not included. Over 5,750,000 tons were so used in 1907. Domestic exports of coke in 1907 amounted to 979,652 net tons, against 857,013 net tons in 1906.

Imports of anthracite coal amounted in 1907 to 9,896 gross tons, against 32,357 tons in 1906. Imports of bituminous coal amounted in 1907 to 2,116,122 tons, against 1,712,150 tons in

1906. The total imports of coal amounted in 1907 to 2,126,018 tons, against 1,744,507 tons in 1906. British North America was the principal source of supply. Gross tons of 2,240 pounds are used for coal. Imports of coke in 1907 amounted to 148,435 net tons of 2,000 pounds, against 143,876 net tons in 1906.

## IMPORTS OF IRON AND STEEL.

The following table, compiled from statistics obtained from the Bureau of Statistics of the Department of Commerce and Labor, gives the quantities and values of our imports of iron and steel and manufactures thereof in the calendar years 1906 and 1907.

Articles—Gross tons.	1906.		1907.	
	Tons.	Values.	Tons.	Values.
Pig iron, spiegel, ferro-mang., etc...	379,828	\$11,851,210	489,475	\$13,418,982
Scrap iron and scrap steel.....	19,091	248,106	27,652	368,847
Bar iron.....	35,793	1,590,592	39,746	1,774,441
Iron and steel rails.....	4,943	137,104	3,752	104,958
Hoop, band, and scroll iron or steel.	10,231	256,836	1,508	82,706
Steel ingots, billets, blooms, etc....	21,337	3,010,589	19,334	3,004,178
Sheet, plate, and taggers'.....	3,231	325,276	3,748	367,140
Building forms and all other struc- tural shapes fitted for use.....	28,573	802,471	2,294	123,179
Tinplates and terne plates.....	56,983	3,883,225	57,773	4,462,522
Wire rods of iron or steel.....	17,799	876,270	17,076	851,571
Wire and articles made from.....	.....	1,079,868	.....	1,551,415
Cutlery.....	.....	2,110,463	.....	2,294,009
Fire-arms.....	.....	351,335	.....	323,898
Shotgun barrels, in single tubes....	.....	222,608	.....	195,278
Machinery.....	.....	4,410,000	.....	4,566,897
Needles, hand sewing and darning...	.....	462,071	.....	498,699
Other iron and steel manufactures...	.....	3,209,108	.....	4,801,131
Total tons where specified.....	577,809	\$34,827,132	662,358	\$38,789,851

Of the pig iron, spiegeleisen, ferro-manganese, etc., imported in 1907 434,276 tons came from the United Kingdom, 4,702 tons from Austria-Hungary, 14,085 tons from Germany, 23,885 tons from other parts of Europe, 7,063 tons from China, (3,973 tons at New York and 3,090 tons at Pacific Coast ports,) and 5,464 tons from other countries. These articles formed more than one-third of the total value of our imports of iron and steel in both 1906 and 1907. Almost all the tinplates and terne plates imported in these two years came from the United Kingdom.

In recent years a large part of the pig iron imported was spiegeleisen, ferro-manganese, and ferro-silicon. These imports are included in the statistics of imports of pig iron given above.

The imports for consumption of spiegeleisen, ferro-manganese, ferro-silicon, and Bessemer, foundry, forge, and other grades of pig iron in the last three years were as follows in gross tons.

Articles. Gross tons.	1905.		1906.		1907.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Ferro-manganese.	52,841	\$1,884,651	84,359	\$4,953,644	87,400	\$5,354,656
Spiegeleisen.....	55,457	1,336,104	103,267	2,942,940	48,995	1,399,381
Ferro-silicon.....	11,044	558,906	11,863	788,085	14,825	1,049,283
Total.....	119,342	\$3,779,661	199,489	\$8,684,669	151,220	\$7,803,320
Found., forge, etc.	93,124	1,406,123	180,339	3,166,541	338,255	5,615,662
Grand total...	212,466	\$5,185,784	379,828	\$11,851,210	489,475	\$13,418,982

The average value per ton of the ferro-manganese imported in 1907 was \$61.27, as compared with \$58.72 in 1906 and \$35.67 in 1905; spiegeleisen, \$28.56 in 1907, as compared with \$28.50 in 1906 and \$24.09 in 1905; ferro-silicon, \$70.78 in 1907, as compared with \$66.43 in 1906 and \$50.61 in 1905; and Bessemer, basic, foundry, forge, and all other grades of pig iron, \$16.60 in 1907, as compared with \$17.56 in 1906 and \$15.10 in 1905.

#### EXPORTS OF AGRICULTURAL IMPLEMENTS.

The value of the agricultural implements exported from this country in the eighteen years from 1890 to 1907 was as follows:

Years.	Values.	Years.	Values.	Years.	Values.
1890.....	\$3,264,995	1896.....	\$4,643,729	1902.....	\$17,981,597
1891.....	3,310,183	1897.....	5,302,807	1903.....	22,951,805
1892.....	4,210,684	1898.....	9,073,384	1904.....	21,654,892
1893.....	5,191,223	1899.....	13,594,524	1905.....	22,124,312
1894.....	4,765,793	1900.....	15,979,909	1906.....	24,744,762
1895.....	5,319,885	1901.....	16,714,308	1907.....	25,597,272

Of the agricultural implements exported in 1907 mowers and reapers were valued at \$14,455,061; plows and cultivators, \$3,300,102; and all other agricultural implements, \$7,842,109.

#### EXPORTS OF IRON AND STEEL.

We are indebted to the Bureau of Statistics of the Department of Commerce and Labor for the statistics of our exports of iron and steel in the calendar years 1906 and 1907 as follows. The increase in the value of our exports of these articles in 1907 over 1906 amounted to \$24,511,193.

## 36 STATISTICS OF THE AMERICAN IRON TRADE FOR 1907.

Articles—Gross tons.	1906.		1907.	
	Tons.	Values.	Tons.	Values.
Pig iron.....	83,317	\$1,506,774	73,703	\$1,508,938
Scrap and old.....	11,742	166,437	25,689	399,631
Bar iron.....	56,025	2,575,905	23,743	1,092,634
Steel bars or rods other than wire rods.....	32,077	1,756,819	74,464	3,588,177
Steel wire rods.....	5,895	221,679	10,698	465,757
Steel rails.....	328,036	8,903,411	338,906	10,411,072
Billets, ingots, and blooms.....	192,616	4,094,659	79,991	2,013,319
Hoop, band, and scroll.....	5,405	242,776	8,601	395,758
Iron sheets and plates.....	17,054	1,139,526	40,651	2,902,025
Steel sheets and plates.....	93,646	4,081,915	82,045	4,262,582
Tinplates and terne plates.....	12,082	1,001,688	10,203	897,645
Structural iron and steel.....	112,555	6,140,861	138,442	7,784,618
Wire, wire fencing, etc.....	174,014	8,770,042	161,223	9,164,829
Cut nails and spikes.....	7,568	340,526	6,929	354,802
Wire nails and spikes.....	46,237	2,232,051	42,189	2,367,544
All other, including tacks.....	5,687	498,970	7,673	647,259
Pipes and fittings.....	141,784	8,541,050	176,831	11,789,631
Car-wheels.....No.	35,974	295,458	43,082	348,142
Castings not elsewhere specified.....		2,033,527		2,866,754
Cutlery.....		586,960		739,513
Fire-arms.....		2,493,979		3,032,992
Cash registers.....No.	26,471	2,664,113	22,885	2,477,425
Locks, hinges, etc.....		6,395,583		6,476,893
Saws.....		749,535		909,895
Tools not elsewhere specified.....		7,128,019		8,516,624
Electrical machinery.....		8,274,753		9,735,230
Laundry machinery.....		652,331		711,912
Metal-working machinery.....		7,913,327		10,142,835
Mining machinery.....		*2,837,240		6,125,951
Printing presses and parts of.....		2,047,773		1,802,458
Pumps and pumping machinery.....		4,122,703		3,722,847
Sewing machines and parts of.....		7,845,228		8,472,176
Shoemaking machinery.....		1,470,900		1,219,013
Fire engines.....No.	19	25,978	3	9,250
Locomotive engines.....“	767	7,430,277	885	9,080,337
Stationary engines.....“	6,333	1,931,038	8,689	2,489,691
Parts of engines and boilers.....		2,633,210		3,242,959
Typew'g machines and parts of.....		5,694,244		6,664,164
Windmills and parts of.....		*440,691		1,216,235
Wood-working machinery.....		936,288		1,386,881
All other machinery.....		26,334,097		26,688,256
Safes.....No.	5,493	327,031	6,234	354,387
Scales and balances.....		947,538		996,266
Stoves, ranges, and parts of.....		1,317,929		1,326,505
All other mfrs. of iron and steel.....		14,810,749		16,264,969
Total tons where specified.....	1,325,740	\$172,555,588	1,301,981	\$197,066,781
Iron ore.....gross tons.	265,240	\$771,839	278,608	\$763,422

\* Included in "all other machinery" prior to July 1, 1906.

The exports of steel billets, ingots, and blooms from the United States in 1907 amounted to 79,991 gross tons, of which 73,767 tons were sent to the United Kingdom, 5,787 tons to British North America, and 437 tons to other countries. Of the steel rails exported in 1907 34,922 tons were sent to Japan, 89,470 tons to other Asia and Oceanica, 85,919 tons to South America, 37,216 tons to British North America, 32,930 tons to Mexico, 28,715 tons to the various Central American States and British Honduras, 28,165 tons to the West Indies and Bermuda, and the remainder to Europe, British Africa, and other points in Africa. Over one-half of the structural shapes exported in 1907 were sent to British North America; the other leading consumers were Mexico, Japan, and South America. Of the wire exported in 1907 the leading consumers were British North America, Argentina, British Australasia, Brazil and other South America, Mexico, Cuba, British Africa, and the United Kingdom. British North America took 216 of the 885 steam locomotives exported in 1907, Japan 71, British Australasia 78, the Philippine Islands 10, and other Asia and Oceanica 132. Pipes and fittings were largely exported in 1907 to British North America, British East Indies, Mexico, the United Kingdom, Cuba, Japan, and Belgium in the order named. Practically all the iron ore exported in 1907 was sent to Canada.

#### IMPORTS AND EXPORTS OF IRON AND STEEL.

The following table, compiled from the reports of the Bureau of Statistics of the Department of Commerce and Labor, gives the foreign value of our imports of iron and steel and manufactures thereof in the calendar years from 1884 to 1907, including tinplates; also the home value of our exports of iron and steel and manufactures thereof, except farm implements, in the same years.

Calendar years.	Imports—Values.	Exports—Values.	Calendar years.	Imports—Values.	Exports—Values.
1884.....	\$37,078,122	\$19,290,895	1896.....	\$19,506,587	\$48,670,218
1885.....	31,144,552	16,622,511	1897.....	13,835,950	62,737,250
1886.....	41,630,779	14,865,087	1898.....	12,474,572	82,771,550
1887.....	56,420,607	16,235,922	1899.....	15,800,579	105,690,047
1888.....	42,311,689	19,578,489	1900.....	20,443,911	129,633,480
1889.....	42,027,742	23,712,814	1901.....	20,395,015	102,534,575
1890.....	44,540,413	27,000,134	1902.....	41,468,826	97,892,036
1891.....	41,983,626	30,736,507	1903.....	41,255,864	99,035,865
1892.....	33,882,447	27,900,862	1904.....	21,621,970	128,553,613
1893.....	29,656,539	30,159,363	1905.....	26,401,283	142,930,513
1894.....	20,843,576	29,943,729	1906.....	34,827,132	172,555,588
1895.....	25,772,136	35,071,563	1907.....	38,789,851	197,066,781

## AVERAGE MONTHLY PRICES OF IRON AND STEEL.

In the following table we give the average monthly prices of iron and steel in Pennsylvania in 1906, 1907, and the first six months of 1908. The prices are averaged from weekly quotations and are per gross ton, except for bar iron, which is quoted by the 100 pounds from store at Philadelphia and from mills at Pittsburgh, and for steel bars by the 100 pounds at Pittsburgh.

Months.	Old iron T rails, at Philadelphia.	No. 1 foundry pig iron, at Philadelphia.	Gray forge pig iron, at Philadelphia.	Gray forge pig iron, at Pittsburgh.	Bessemer pig iron, at Pittsburgh.	Steel rails, at mills, in Pennsylvania.	Steel billets, at mills, at Pittsburgh.	Best refined bar iron, from store, Phila.	Best refined bar iron, at mills, Pittsburgh.	Bar steel, at mills, at Pittsburgh.
January, 1906	\$24.50	\$19.00	\$16.87	\$17.30	\$18.35	\$28.00	\$26.25	\$1.96	\$2.20	\$2.00
February.....	22.87	19.00	16.62	17.29	18.35	28.00	26.75	1.96	2.15	1.75
March.....	21.10	19.00	16.50	16.91	18.35	28.00	26.80	1.96	2.10	1.50
April.....	21.50	19.12	16.50	16.66	18.19	28.00	27.00	1.96	1.80	1.50
May.....	21.10	19.25	16.50	16.49	18.10	28.00	26.40	1.96	1.80	1.50
June.....	20.50	19.25	16.25	16.35	18.47	28.00	26.62	1.96	1.85	1.50
July.....	20.25	19.25	16.25	16.41	18.60	28.00	27.25	1.96	1.85	1.50
August.....	21.20	19.80	17.10	17.75	19.10	28.00	27.80	1.96	1.85	1.50
September.....	24.25	22.62	18.50	18.35	19.66	28.00	28.00	1.96	1.85	1.50
October.....	25.25	24.00	18.94	19.47	20.51	28.00	28.00	1.96	1.90	1.50
November.....	26.20	25.00	21.20	22.45	23.00	28.00	29.00	2.06	1.90	1.56
December.....	27.69	26.50	22.25	22.85	23.85	28.00	29.50	2.06	1.90	1.60
January, 1907	27.30	27.50	22.90	22.58	23.35	28.00	29.40	2.08	1.90	1.60
February.....	27.00	27.37	23.12	22.20	23.25	28.00	29.50	2.16	1.90	1.60
March.....	27.00	26.87	23.44	21.76	22.95	28.00	29.00	2.16	1.90	1.60
April.....	27.00	26.56	23.12	21.72	23.55	28.00	30.25	2.16	1.90	1.60
May.....	27.40	26.60	22.80	22.88	24.05	28.00	30.30	2.16	2.00	1.60
June.....	27.37	25.75	22.75	23.15	24.50	28.00	29.62	2.16	2.00	1.60
July.....	25.25	23.62	22.06	22.96	23.80	28.00	30.00	2.16	2.00	1.60
August.....	21.10	22.50	20.15	21.90	22.95	28.00	29.40	2.16	2.00	1.60
September.....	20.50	21.19	19.12	21.15	22.85	28.00	29.37	2.16	2.00	1.60
October.....	20.50	20.40	18.50	20.40	22.90	28.00	28.20	2.06	1.90	1.60
November.....	18.62	19.44	17.62	19.17	20.35	28.00	28.00	1.96	1.90	1.60
December.....	17.50	18.94	17.12	18.40	19.60	28.00	28.00	1.96	1.90	1.60
January, 1908	16.70	18.70	16.50	17.00	19.00	28.00	28.00	1.76	1.70	1.60
February.....	17.87	18.75	16.50	15.99	17.90	28.00	28.00	1.76	1.70	1.60
March.....	17.50	18.62	16.50	15.90	17.86	28.00	28.00	1.76	1.70	1.60
April.....	17.00	18.15	16.15	15.45	17.49	28.00	28.00	1.76	1.70	1.60
May.....	17.25	17.44	15.50	14.90	16.96	28.00	28.00	1.76	1.70	1.60
June.....	18.00	17.12	15.12	14.90	16.90	28.00	25.75	1.66	1.65	1.40

## AVERAGE YEARLY PRICES OF IRON AND STEEL.

The following table gives the average yearly prices of leading articles of iron and steel in Pennsylvania and of wire nails at Chicago from 1903 to 1907. These prices are obtained by averaging weekly and monthly quotations, and are per ton of 2,240

pounds, except for bar iron and bar steel and cut and wire nails, which are quoted by the 100 pounds and in 100-pound kegs.

Articles.	1903.	1904.	1905.	1906.	1907.
Old iron T rails, at Philadelphia.....	\$21.17	\$16.22	\$22.08	\$23.03	\$23.88
No. 1 foundry pig iron, at Philadelphia	19.92	15.57	17.88	20.98	23.89
Gray forge pig iron, at Philadelphia..	17.13	13.67	15.58	17.79	21.06
Gray forge pig iron, at Pittsburgh.....	17.52	12.89	15.62	18.19	21.52
Bessemer pig iron, at Pittsburgh.....	18.98	13.76	16.36	19.54	22.84
Steel rails, at mills, in Pennsylvania..	28.00	28.00	28.00	28.00	28.00
Steel billets, at mills, at Pittsburgh..	27.91	22.18	24.03	27.45	29.25
Best bar iron, from store, at Philada...	2.00	1.72	1.92	1.98	2.11
Best bar iron, at mills, at Pittsburgh.	1.77	1.48	1.87	1.93	1.94
Bar steel, at mills, at Pittsburgh.....	1.56	1.32	1.58	1.58	1.60
Cut nails, from store, at Philadelphia..	2.36	2.01	2.00	2.13	2.36
Wire nails, base price, at Chicago.....	2.13	1.96	1.93	1.98	2.18

The average annual prices of iron and steel which prevailed in 1907 were generally higher than those which have ruled for many years. Old iron T rails at Philadelphia were higher than in any year since 1890, when the average annual price was \$25.18. No. 1 foundry pig iron at Philadelphia reached a higher annual average in 1907 than in any year since 1882, when the average was \$25.77, or \$1.88 higher than that for 1907. The average for gray forge pig iron at Philadelphia was also higher in 1907 than in any year since 1882, when it was \$22.60. So was the average for gray forge pig iron at Pittsburgh, which reached \$23.84 in 1882. Our average annual prices of Bessemer pig iron at Pittsburgh go back to 1886 only, but in no year since 1886 did the yearly average exceed that of 1907.

Steel rails remained in 1907 at the average annual price which has prevailed during the last six years, while the annual average price for steel billets in 1907 was higher than in any year since 1902, when it was \$30.57. Best bar iron from store at Philadelphia was also higher in 1907 than in any year since 1902, the average for the latter year being slightly higher than for 1907, namely, \$2.13 per 100 pounds. Best bar iron at mills at Pittsburgh also reached a higher annual average in 1907 than in any year since 1902, when the average was the same as in 1907. The average annual price for steel bars at mills at Pittsburgh was slightly higher in 1902 than in 1907, namely, \$1.67 per 100 pounds as compared with \$1.60, but in no intervening year did the annual average go above \$1.58. Cut nails at Philadelphia averaged exactly the same price per keg in 1907 as in 1903, namely, \$2.36,

while wire nails at Chicago reached a higher annual average in 1907 than in any year since 1901, when it was \$2.41 per keg.

#### AVERAGE MONTHLY PRICES OF STEEL BARS AT PITTSBURGH.

The following table gives the average monthly prices of steel bars, per 100 pounds, at mills in Pittsburgh for eight years. It has been compiled from weekly quotations in the *American Manufacturer* and its successor, the *Industrial World*.

Months.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
January....	\$2.25	\$1.20	\$1.58	\$1.64	\$1.30	\$1.45	\$2.00	\$1.60
February...	2.25	1.27	1.50	1.60	1.30	1.45	1.75	1.60
March.....	2.25	1.44	1.50	1.60	1.33	1.50	1.50	1.60
April.....	2.12	1.50	1.67	1.60	1.35	1.50	1.50	1.60
May.....	1.94	1.50	1.80	1.60	1.32	1.50	1.50	1.60
June.....	1.79	1.50	1.80	1.60	1.30	1.50	1.50	1.60
July.....	1.24	1.52	1.72	1.60	1.30	1.50	1.50	1.60
August.....	1.05	1.50	1.75	1.60	1.31	1.50	1.50	1.60
September..	1.12	1.50	1.75	1.60	1.33	1.62	1.50	1.60
October.....	1.15	1.52	1.69	1.60	1.30	1.70	1.50	1.60
November..	1.18	1.60	1.60	1.37	1.32	1.80	1.56	1.60
December..	1.20	1.60	1.68	1.30	1.38	1.97	1.60	1.60
Average...	\$1.63	\$1.47	\$1.67	\$1.56	\$1.32	\$1.58	\$1.58	\$1.60

The lowest quoted price at which steel bars were sold at Pittsburgh within the last ten years was 95 cents per 100 pounds, this price prevailing in April, May, June, and July, 1898.

#### AVERAGE MONTHLY PRICES OF CUT NAILS AT PHILADELPHIA.

The following table gives the average monthly base prices of cut nails, per keg of 100 pounds, from store at Philadelphia, since 1900, as reported to us by the Duncannon Iron Company.

Months.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
January....	\$2.80	\$2.25	\$2.30	\$2.33	\$2.05	\$2.05	\$2.05	\$2.30
February...	2.80	2.27	2.20	2.36	2.00	2.10	2.10	2.35
March.....	2.80	2.27	2.25	2.36	2.00	2.10	2.10	2.35
April.....	2.62	2.30	2.30	2.41	2.05	2.10	2.10	2.35
May.....	2.45	2.30	2.30	2.41	2.05	2.10	2.10	2.35
June.....	2.42	2.30	2.30	2.41	2.05	2.00	2.10	2.35
July.....	2.30	2.30	2.30	2.41	2.05	1.95	2.10	2.40
August.....	2.30	2.30	2.30	2.41	2.00	1.90	2.10	2.40
September..	2.25	2.35	2.30	2.41	1.95	1.87	2.15	2.40
October.....	2.28	2.30	2.30	2.41	1.90	1.92	2.20	2.40
November..	2.30	2.30	2.30	2.20	2.00	1.95	2.20	2.35
December..	2.25	2.30	2.30	2.20	2.05	2.01	2.30	2.35
Average...	\$2.46	\$2.29	\$2.29	\$2.36	\$2.01	\$2.00	\$2.13	\$2.36

## AVERAGE MONTHLY PRICES OF STEEL SHIP PLATES.

The following table gives the average monthly prices of steel ship plates per gross ton free on board at Pittsburgh from January, 1901, to December, 1907. We have no monthly average prices of steel ship plates prior to October, 1900, in which month the average was \$24.64 per ton. In November of the same year the monthly average was \$28 and in December it was \$30.24.

Months.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
January.....	\$31.36	\$35.84	\$35.84	\$35.84	\$33.60	\$35.84	\$38.08
February.....	31.36	35.84	35.84	35.84	35.35	35.84	38.08
March .....	33.15	35.84	35.84	35.84	35.84	35.84	38.08
April.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08
May.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08
June.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08
July.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08
August.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08
September.....	35.84	35.84	35.84	32.48	35.84	35.84	38.08
October.....	35.84	35.84	35.84	31.36	35.84	35.84	38.08
November.....	35.84	35.84	35.84	31.36	35.84	35.84	38.08
December.....	35.84	35.84	35.84	32.37	35.84	35.84	38.08
Average.....	\$34.87	\$35.84	\$35.84	\$34.52	\$35.61	\$35.84	\$38.08

The average monthly price of steel ship plates at Pittsburgh in the first five months of 1908 was \$38.08; in June it was \$36.59.

## AVERAGE MONTHLY PRICES OF WIRE NAILS AT CHICAGO.

The following table, compiled from quotations in the *Iron Age*, gives the average monthly base prices of standard sizes of wire nails, per keg of 100 pounds, in carload lots, free on board at Chicago, in the eight years from 1900 to 1907 inclusive.

Months.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
January.....	\$3.53	\$2.35	\$2.16	\$2.08	\$2.04	\$1.90	\$1.94	\$2.15
February ...	3.53	2.45	2.20	2.12	2.05	1.95	1.95	2.15
March .....	3.53	2.45	2.20	2.20	2.09	1.95	1.95	2.15
April.....	3.28	2.45	2.20	2.15	2.10	1.95	1.95	2.15
May.....	2.53	2.45	2.20	2.15	2.10	1.95	1.95	2.15
June.....	2.48	2.45	2.20	2.15	2.07	1.95	1.95	2.18
July.....	2.43	2.45	2.20	2.15	2.05	1.95	1.95	2.18
August .....	2.43	2.45	2.20	2.15	1.90	1.87	1.95	2.18
September..	2.35	2.45	2.15	2.15	1.75	1.87	1.96	2.23
October.....	2.35	2.42	2.05	2.15	1.75	1.95	2.00	2.23
November..	2.35	2.35	2.00	2.15	1.77	1.95	2.04	2.23
December...	2.35	2.25	2.00	2.00	1.88	1.95	2.15	2.23
Average..	\$2.76	\$2.41	\$2.15	\$2.13	\$1.96	\$1.93	\$1.98	\$2.18

## AVERAGE WHOLESALE MONTHLY PRICES OF TINPLATES.

The following table gives the average wholesale monthly prices of domestic tinplates, I. C., 14 by 20, per box of 100 pounds, at tinplate mills in Pennsylvania, from 1900 to 1907 inclusive.

Months.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
January.....	\$4.65	\$4.00	\$4.00	\$3.60	\$3.56	\$3.55	\$3.47	\$3.90
February....	4.65	4.00	4.00	3.60	3.45	3.55	3.50	3.90
March.....	4.65	4.00	4.00	3.80	3.45	3.55	3.50	3.90
April.....	4.65	4.00	4.00	3.80	3.45	3.55	3.57	3.90
May.....	4.65	4.00	4.00	3.80	3.45	3.55	3.66	3.90
June.....	4.65	4.00	4.00	3.80	3.45	3.55	3.75	3.90
July.....	4.65	4.00	4.00	3.80	3.41	3.55	3.75	3.90
August.....	4.65	4.00	4.00	3.80	3.30	3.55	3.75	3.90
September..	4.50	4.00	4.00	3.80	3.30	3.55	3.75	3.90
October.....	4.00	4.00	4.00	3.80	3.30	3.36	3.75	3.90
November..	4.00	4.00	3.60	3.65	3.39	3.34	3.90	3.90
December...	4.00	4.00	3.60	3.60	3.47	3.40	3.90	3.90
Average..	\$4.47	\$4.00	\$3.93	\$3.74	\$3.41	\$3.50	\$3.69	\$3.90

During the first six months of 1908 the average monthly price of domestic tinplates at Pennsylvania mills was \$3.74 in January and \$3.70 in February, March, April, May, and June.

## AVERAGE YEARLY PRICES OF FOREIGN TINPLATES.

The following table gives the average yearly prices of imported coke Bessemer tinplates, I. C., 14 x 20, per box of 108 pounds, at New York, freight and duty paid, from 1890 to 1898.

Years.	Price.	Years.	Price.	Years.	Price.
1890.....	\$4.80	1893.....	\$5.37	1896.....	\$3.80
1891.....	5.34	1894.....	4.89	1897.....	3.90
1892.....	5.30	1895.....	3.87	1898.....	4.00

In recent years tinplates have been imported chiefly by the oil and canning interests to obtain the benefit of the drawback.

## AVERAGE YEARLY PRICES OF DOMESTIC TINPLATES.

The following table gives the average yearly prices of domestic tinplates, I. C., 14 x 20, per box of 100 pounds, at tinplate mills in Pennsylvania, from 1899 to the end of 1907.

Years.	Price.	Years.	Price.	Years.	Price.
1899.....	\$4.06	1902.....	\$3.93	1905.....	\$3.50
1900.....	4.47	1903.....	3.74	1906.....	3.69
1901.....	4.00	1904.....	3.41	1907.....	3.90

## AVERAGE QUARTERLY PRICES OF BEAMS AND CHANNELS.

The following table, which gives the average quarterly prices of steel beams and channels at Pittsburgh from 1894 to June 30, 1908, has been compiled for this Report by one of the leading manufacturers of structural shapes in Western Pennsylvania.

Years.	Average price per 100 pounds.					Years.	Average price per 100 pounds.				
	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Average.		First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Average.
1894...	\$1.21	\$1.20	\$1.27	\$1.25	\$1.23	1902...	\$1.60	\$1.60	\$1.60	\$1.60	\$1.60
1895...	1.21	1.25	1.56	1.58	1.40	1903...	1.60	1.60	1.60	1.60	1.60
1896...	1.44	1.49	1.55	1.50	1.49	1904...	1.60	1.60	1.55	1.41	1.54
1897...	1.55	1.33	.98	1.09	1.24	1905...	1.55	1.60	1.63	1.70	1.62
1898...	1.15	1.15	1.19	1.20	1.17	1906...	1.70	1.70	1.70	1.70	1.70
1899...	1.35	1.60	2.12	2.25	1.83	1907...	1.70	1.70	1.70	1.70	1.70
1900...	2.25	2.21	1.68	1.50	1.91	1908...	1.70	1.68	.....	.....	.....
1901...	1.51	1.60	1.60	1.60	1.58	.....	.....	.....	.....	.....	.....

During the above period the lowest average quarterly price for beams and channels was in the third quarter of 1897, when the ruling price was 98 cents per 100 pounds. The highest average quarterly price was in the last quarter of 1899 and the first quarter of 1900, when it was \$2.25 per 100 pounds.

## PRODUCTION OF PIG IRON.

Twenty-three States made pig iron in 1907, against 20 States in 1906, Indiana, Washington, and California returning to the active list after an absence of several years. Indiana last made pig iron in 1893 and Washington in 1903, while California had been a non-producer since 1886, when it made 1,562 tons of charcoal pig iron. In 1907 Indiana used coke for fuel, Washington used charcoal, and California used charcoal and electricity.

The total production of all kinds of pig iron in 1907 was 25,781,361 gross tons, against 25,307,191 tons in 1906. The production in 1907 exceeded that of 1906 by 474,170 tons, or almost 1.9 per cent. The following table gives the production of pig iron in half-yearly periods from 1902 to 1907 in gross tons.

Periods.	1902.	1903.	1904.	1905.	1906.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
First half...	8,808,574	9,707,367	8,173,438	11,163,175	12,582,250	13,478,044
Second half.	9,012,733	8,301,885	8,323,595	11,829,205	12,724,941	12,303,317
Total .....	17,821,307	18,009,252	16,497,033	22,992,380	25,307,191	25,781,361

The following table gives the half-yearly production of pig iron by States in 1907 arranged according to geographical position.

States.	Blast furnaces.				Production.		
	In blast June 30, 1907.	December 31, 1907.			Gross tons of 2,240 pounds. (Includes spiegeleisen and ferro-manganese.)		
		In.	Out.	Total.	First half of 1907.	Second half of 1907.	Total for 1907.
Massachusetts..	2	2	0	2	8,746	10,373	19,119
Connecticut....	2	3	0	3			
New York.....	17	9	17	26	859,125	800,627	1,659,752
New Jersey.....	8	5	6	11	195,245	177,944	373,189
Pennsylvania..	141	70	87	157	5,964,884	5,383,665	11,348,549
Maryland.....	4	1	4	5	221,145	190,688	411,833
Virginia.....	16	7	19	26	260,912	217,859	478,771
Georgia.....	2	1	3	4	26,173	29,652	55,825
Texas.....	1	0	4	4			
Alabama.....	34	15	34	49	861,771	824,903	1,686,674
West Virginia..	4	0	4	4	151,643	139,423	291,066
Kentucky.....	5	1	7	8	79,013	48,933	127,946
Tennessee.....	14	9	12	21	193,371	199,735	393,106
Ohio.....	58	17	51	68	2,815,174	2,435,513	5,250,687
Illinois.....	24	11	13	24	1,263,258	1,194,510	2,457,768
Indiana.....	0	1	0	1	197,330	239,177	436,507
Michigan.....	12	8	5	13			
Wisconsin.....	6	2	4	6	160,045	162,038	322,083
Minnesota.....	1	1	0	1			
Missouri.....	2	1	1	2	220,209	248,277	468,486
Colorado.....	6	3	3	6			
Oregon.....	0	0	1	1			
Washington....	0	0	1	1			
California.....	0	0	0	0			
Total, 1907..	359	167	276	443	13,478,044	12,303,317	25,781,361
Total, 1906..	323	340	89	429	12,582,250	12,724,941	25,307,191

The production of pig iron in the second half of 1907 was 1,174,727 tons less than in the first half. Oregon, which has one furnace, is the only State having one or more blast furnaces which did not make pig iron in 1907. California, which does not have a blast furnace, produced a few tons of pig iron and ferro-silicon in a Heroult electric furnace.

Nine States which produced pig iron in 1906 increased their production in 1907, namely, Massachusetts, New York, Pennsylvania, Maryland, Alabama, Kentucky, Illinois, Michigan, and Colorado, while 11 States decreased their production, namely, Connecticut, New Jersey, Virginia, West Virginia, Tennessee, Georgia, Texas, Ohio, Minnesota, Wisconsin, and Missouri.

## PRODUCTION OF PIG IRON ACCORDING TO FUEL.

The production of pig iron in 1907, classified according to the fuel used, was as follows, compared with the four preceding years.

Fuel used—Gross tons.	1903.	1904.	1905.	1906.	1907.
Bituminous, chiefly coke	15,592,221	14,931,364	20,964,937	23,313,498	23,972,410
Anthracite and coke.....	1,864,199	1,196,867	1,644,424	1,535,614	1,335,286
Anthracite alone.....	47,148	31,273	30,091	25,072	36,268
Charcoal.....	504,757	337,529	352,928	433,007	437,397
Mixed charcoal and coke	927	.....	.....	.....	.....
Total.....	18,009,252	16,497,033	22,992,380	25,307,191	25,781,361

The production of mixed charcoal and coke pig iron in 1906 was about 500 tons, which is included in the charcoal figures. No pig iron was made with this mixed fuel in 1904, 1905, or 1907. The pig iron made in California in 1907 with charcoal and electricity is also included in the charcoal figures. Bituminous, anthracite alone, and charcoal pig iron gained 674,498 tons in 1907 over 1906, while mixed anthracite and coke lost 200,328 tons.

The following table gives the production of bituminous pig iron by States in 1906 and 1907 in gross tons of 2,240 pounds.

States—Gross tons.	1906.	1907.	States—Gross tons.	1906.	1907.
Pennsylvania.....	9,857,861	10,091,994	Maryland .....	385,300	411,833
Ohio.....	5,321,683	5,248,262	Tennessee .....	424,341	390,606
Illinois.....	2,156,866	2,457,768	Indiana.....	354,391	358,268
New York.....	1,505,201	1,659,752	Michigan.....		
Alabama.....	1,649,018	1,651,533	Wisconsin.....		
Virginia.....	550,327	517,095	West Virginia....	304,534	291,066
Georgia.....			New Jersey.....	253,507	255,901
Texas.....			Kentucky.....	95,945	125,984
Minnesota.....	454,524	512,348	.....	.....	.....
Missouri.....			Total.....	23,313,498	23,972,410
Colorado.....					

The following table gives the production by States of pig iron made with anthracite coal alone and with mixed anthracite coal and coke in 1907, compared with the five preceding years.

States.	1902.	1903.	1904.	1905.	1906.	1907.
Pennsylvania	919,775	1,615,701	1,091,641	1,485,092	1,387,345	1,254,266
New Jersey...	136,929	284,018	134,762	{ 104,244 85,179 }	173,341	117,288
New York.....	58,543					
Maryland.....	.....	11,628	1,737	.....	.....	.....
Total.....	1,115,247	1,911,347	1,228,140	1,674,515	1,560,686	1,371,554

The following table gives the production of charcoal pig iron by States in 1906 and 1907. Michigan annually makes about two-thirds of our total production of charcoal pig iron.

States—Gross tons.	1906.	1907.	States—Gross tons.	1906.	1907.
Michigan .....	281,368	294,922	Massachusetts.....	20,239	19,119
Wisconsin.....	65,536	61,538	Connecticut.....		
Missouri.....			Ohio.....	5,450	2,425
Washington.....			Pennsylvania.....	2,663	2,289
California.....	25,830	35,141	Maryland.....	4,903	1,444
Alabama.....			Virginia.....		
Georgia.....	27,018	20,519	.....	.....	.....
Kentucky.....			Total.....	433,007	437,397
Tennessee.....					

#### PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

The production of Bessemer and low-phosphorus pig iron in 1907 was 13,231,620 tons, against 13,840,518 tons in 1906, a decrease of 608,898 tons, or almost 4.4 per cent. In the second half of 1907 the production was 6,045,742 tons, as compared with 7,185,878 tons in the first half, a decrease of 1,140,136 tons. The production of low-phosphorus pig iron alone in 1907 amounted to 204,537 tons, against 228,769 tons in 1906 and 186,907 tons in 1905.

The following table gives the production of Bessemer and low-phosphorus pig iron by States in recent years. Bessemer and low-phosphorus pig iron made with charcoal are included.

States.	1902.	1903.	1904.	1905.	1906.	1907.
Pennsylvania.....	5,130,022	5,213,143	4,511,999	5,939,042	6,360,694	5,736,301
Ohio.....	2,927,605	2,422,676	2,138,442	3,207,793	3,870,204	3,711,001
Illinois.....	1,495,298	1,386,683	1,424,030	1,656,280	1,676,822	1,782,740
New York.....	66,681	129,323	250,483	536,937	790,002	929,519
New Jersey.....						
Maryland.....	296,971	322,784	292,642	331,870	380,323	421,958
Virginia.....						
West Virginia.....	192,683	227,843	292,714	315,700	342,666	324,323
Kentucky.....						
Tennessee.....	82,328	111,340	76,031	91,673	167,988	103,239
Alabama.....						
Colorado.....	201,580	176,116	112,318	327,821	251,819	222,539
California.....						
Wisconsin.....	82,328	111,340	76,031	91,673	167,988	103,239
Michigan.....						
Minnesota.....	82,328	111,340	76,031	91,673	167,988	103,239
Total.....	10,393,168	9,989,908	9,098,659	12,407,116	13,840,518	13,231,620

Of the total production of Bessemer and low-phosphorus pig iron in Pennsylvania in 1907 the Lehigh and Schuylkill Valleys made 144,482 tons, against 147,147 tons in 1906; the Lower Susquehanna Valley, 414,759 tons, against 556,200 tons in 1906; Allegheny County, 3,443,741 tons, against 3,787,318 tons in 1906; the Shenango Valley, 1,190,269 tons, against 1,322,128 tons in 1906; and the remainder of the State, 543,050 tons, against 547,901 tons in 1906: total, 5,736,301 tons in 1907, against 6,360,694 tons in 1906 and 5,939,042 tons in 1905.

In Ohio the Mahoning Valley produced 1,569,686 tons of Bessemer and low-phosphorus pig iron in 1907, against 1,451,843 tons in 1906; the Hanging Rock bituminous district, 88,402 tons, against 125,630 tons in 1906; the Lake Counties, 1,136,915 tons, against 1,189,501 tons in 1906; and other parts of Ohio, 915,998 tons, against 1,103,230 tons in 1906: total, 3,711,001 tons in 1907, against 3,870,204 tons in 1906 and 3,207,793 tons in 1905.

#### PRODUCTION OF BASIC PIG IRON BY STATES.

The production of basic pig iron in 1907, not including charcoal of basic quality, was 5,375,219 tons, against 5,018,674 tons in 1906, an increase of 356,545 tons, or over 7.1 per cent. In the second half of 1907 the production amounted to 2,704,083 tons, against 2,671,136 tons in the first half, an increase of 32,947 tons. The following table gives the production of basic pig iron by States from 1903 to 1907 according to geographical position.

States—Gross tons.	1903.	1904.	1905.	1906.	1907.
New York and New Jersey	117,802	113,688	172,206	263,947	215,197
Penna.—Allegheny County	791,175	1,245,142	1,537,909	1,719,839	1,812,007
Penna.—other counties.....	626,078	560,605	1,420,097	1,642,483	1,772,401
Virginia, Tenn., and Ala....	267,999	319,329	448,487	569,972	542,256
Ohio, Ind., Ill., Mo., & Col.	237,672	244,340	526,480	822,433	1,033,358
Total.....	2,040,726	2,483,104	4,105,179	5,018,674	5,375,219

Basic pig iron was made in 1907 in 10 States by 47 plants as follows: Pennsylvania, 24 plants; Alabama, 3; Ohio, 6; Illinois, 1; New Jersey, 4; Colorado, 1; Virginia, 5; New York, 1; Indiana, 1; and Missouri, 1. Tennessee has not made basic pig iron since 1903. Colorado first became a producer of basic pig iron in that year. Indiana joined the basic list in 1907.

The production of basic pig iron in Pennsylvania in 1907 by districts was as follows: the Lehigh Valley, 220,722 tons; Schuylkill and Lower Susquehanna Valleys, 451,659 tons; Alle-

gheny County, 1,812,007 tons; Shenango Valley, 606,810 tons; and the remainder of the State, 493,210 tons: total, 3,584,408 tons. In Ohio the Mahoning Valley and Lake Counties districts made 111,684 tons in 1907 and the miscellaneous bituminous district made 339,694 tons in the same year: total, 451,378 tons.

PRODUCTION OF SPIEGELEISEN, FERRO-MANGANESE, FERRO-PHOSPHORUS, AND BESSEMER FERRO-SILICON.

The production of spiegeleisen and ferro-manganese in 1907 was 339,348 tons, against 300,500 tons in 1906, an increase of 38,848 tons. The production of ferro-manganese alone in 1907 was 55,918 tons, against 55,520 tons in 1906. Of spiegeleisen alone it was 283,430 tons, against 244,980 tons in 1906. The spiegeleisen and ferro-manganese produced in 1907 were made by New Jersey, Pennsylvania, Maryland, Illinois, and Colorado, as in 1906. The production of both products has been as follows since 1890.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1890.....	133,180	1896.....	131,940	1902.....	212,934
1891.....	127,766	1897.....	173,695	1903.....	192,661
1892.....	179,131	1898.....	213,769	1904.....	219,446
1893.....	81,118	1899.....	219,768	1905.....	289,983
1894.....	120,180	1900.....	255,977	1906.....	300,500
1895.....	171,724	1901.....	291,461	1907.....	339,348

In addition to the above 47 tons of ferro-phosphorus were produced in 1902, 946 tons in 1904, 1,243 tons in 1905, and 142 tons in 1906. In 1903 and 1907 ferro-phosphorus was not reported. There were also made 2,750 tons of Bessemer ferro-silicon in 1905, 5,000 tons in 1906, and 18,941 tons in 1907.

PRODUCTION OF PIG IRON IN PENNSYLVANIA BY DISTRICTS.

The following table gives the production of all kinds of pig iron in Pennsylvania by districts from 1903 to 1907 in gross tons.

Districts—Gross tons.	1903.	1904.	1905.	1906.	1907.
Lehigh Valley.....	648,821	456,028	626,300	645,090	751,228
Schuylkill Valley.....	550,560	409,416	553,694	714,446	754,231
Lower Susquehanna Valley	497,606	397,156	664,779	672,294	631,179
Juniata Valley.....	233,699	120,471	209,769	196,513	255,402
Allegheny County.....	4,211,569	4,383,169	5,410,890	5,702,721	5,438,233
Shenango Valley.....	1,138,161	1,011,440	1,789,016	1,947,179	1,948,475
Other Western Penna. bit.	927,014	864,048	1,321,385	1,366,963	1,567,512
Charcoal.....	4,070	2,593	3,294	2,663	2,289
Total.....	8,211,500	7,644,321	10,579,127	11,247,869	11,348,549

Every district in Pennsylvania except the Lower Susquehanna Valley and Allegheny County increased its production of pig iron in 1907 as compared with 1906, the increase in the Lehigh Valley amounting to 106,138 tons; Schuylkill Valley, 39,785 tons; Juniata Valley, 58,889 tons; Shenango Valley, 1,296 tons; and Western Pennsylvania outside of Allegheny County and the Shenango Valley, 200,549 tons. Production in the Lower Susquehanna Valley decreased 41,115 tons and in Allegheny County 264,488 tons. The charcoal production also decreased 374 tons.

In 1902, 1903, and 1905 Allegheny County made a little more than one-half the production of Pennsylvania but less than one-fourth the country's total production. In 1904 it made 57.3 per cent. of the total production of Pennsylvania and over 26 per cent. of the country's total production; in 1906 over 50.7 per cent. of the total production of Pennsylvania and over 22.5 per cent. of the country's total production; and in 1907 over 47.9 per cent. of the total production of Pennsylvania and almost 21.1 per cent. of the country's total production.

In 1901 Pennsylvania made 46.2 per cent. of the country's total production of pig iron, in 1902 and 1903 about 45.5 per cent., in 1904 about 46.3 per cent., in 1905 over 46 per cent., in 1906 over 44.4 per cent., and in 1907 a little over 44 per cent.

#### PRODUCTION OF PIG IRON IN OHIO BY DISTRICTS.

The following table gives the production of all kinds of pig iron in Ohio by districts from 1903 to 1907 in gross tons.

Districts—Gross tons.	1903.	1904.	1905.	1906.	1907.
Mahoning Valley.....	1,263,959	1,217,186	1,724,927	1,936,936	1,986,227
Hocking Valley .....	26,900	17,600	1,300,447	1,478,730	1,554,282
Lake Counties.....	828,904	807,257			
Miscellaneous bituminous	830,452	687,601	1,198,038	1,502,792	1,350,560
Hanging Rock bituminous	327,679	247,297	358,523	403,225	357,193
Hanging Rock charcoal...	9,540	988	4,175	5,450	2,425
Total.....	3,287,434	2,977,929	4,586,110	5,327,133	5,250,687

There was an increase in production in the Mahoning Valley, the Hocking Valley, and in the Lake Counties district in Ohio in 1907 as compared with 1906 but a decrease in the miscellaneous bituminous and the Hanging Rock bituminous and charcoal districts. In the Mahoning Valley, including the furnaces at Leetonia, the increase amounted to 49,291 tons, and in the Hocking Valley, which has only one furnace, and Lake Counties to 75,552 tons. In the miscellaneous bituminous district the decrease

was 152,232 tons; in the Hanging Rock bituminous district it was 46,032 tons; and in the charcoal district it was 3,025 tons.

Of the country's total production in 1901 Ohio made over 20.9 per cent., in 1902 over 20.3 per cent., in 1903 and 1904 a little over 18 per cent., in 1905 over 19.9 per cent., in 1906 a little over 21 per cent., and in 1907 over 20.3 per cent.

#### NUMBER OF COMPLETED FURNACES.

The following table gives the number of completed furnaces at the end of each year since 1902, omitting abandoned furnaces.

Fuel used.	1902.	1903.	1904.	1905.	1906.	1907.
Bituminous coal and coke.....	272	288	300	300	313	337
Anthracite and anth. and coke...	81	77	73	69	66	56
Charcoal and charcoal and coke..	59	60	56	55	50	50
Total.....	412	425	429	424	429	443

The whole number of completed furnaces at the close of 1907 was 443, against 429 at the close of 1906, a gain of 14 furnaces.

#### FURNACES IN BLAST.

During the first six months of 1907 the number of furnaces actually in blast during a part or the whole of the period was 382 and during the last half of the year the number was 388. In the first half of 1906 the number actually in blast was 361 and in the last half it was 374. The number of furnaces which did not make pig iron in the first half of 1907 was 60 and in the second half it was 55. In the first half of 1906 the number of idle furnaces was 68 and in the second half it was 55.

#### FURNACES IN BLAST IN THE LAST SIX YEARS.

The following table gives the number of furnaces in blast at the close of each year from 1902 to 1907, according to fuel used.

Fuel used.	1902.	1903.	1904.	1905.	1906.	1907.
Bituminous coal and coke.....	222	120	206	242	269	122
Anthracite and anth. and coke...	52	29	38	46	48	23
Charcoal and charcoal and coke..	33	33	17	25	23	22
Total.....	307	182	261	313	340	167

The whole number of furnaces in blast on December 31, 1907, was 167, against 340 on December 31, 1906, and 313 on December 31, 1905. The number of furnaces in blast at the end of 1907 was smaller than at the close of any year since 1896, when

but 159 furnaces were active. At the close of 1907 the number of active furnaces was 192 smaller than on June 30 of the same year and 173 smaller than on December 31, 1906.

At the close of 1907 the number of bituminous coal and coke furnaces that were idle was 215; anthracite alone and mixed anthracite and coke, 33; and charcoal alone and mixed charcoal and coke, 28: total, 276, as compared with 83 idle furnaces on June 30, 1907, and 89 idle furnaces at the close of 1906.

#### BUILDING AND REBUILDING FURNACES.

At the close of 1907 there were 30 furnaces in course of erection, 4 furnaces were being rebuilt, and 1 furnace was to be revived. Of the building furnaces 2 were located in New York, 8 were in Pennsylvania, 1 was in Alabama, 7 were in Ohio, 8 were in Indiana, 2 were in Illinois, 1 was in Michigan, and 1 was in Wisconsin. When completed 29 of these furnaces will use coke or mixed anthracite coal and coke for fuel and 1 will use charcoal. Of the 4 rebuilding furnaces 3 were in Pennsylvania and 1 was in Alabama. When rebuilt all 4 furnaces will use coke. The furnace to be revived will use charcoal. In addition there were 6 furnaces projected and 2 furnaces partly erected on December 31, 1907. The projected furnaces will use mineral fuel.

#### CONSUMPTION OF IRON ORE IN BLAST FURNACES.

We estimate the total consumption of domestic and foreign iron ore in the manufacture of pig iron in 1907 at 50,100,000 gross tons, against 49,375,000 tons in 1906. The mill cinder, scale, scrap, etc., consumed in the manufacture of pig iron in the census year 1904, when the production of pig iron was 16,628,294 tons, amounted to 1,865,385 tons. In addition there were 549,995 gross tons of iron ore consumed in open-hearth steel furnaces and for fettling purposes in rolling mills, etc., in the census year 1904. We have made no iron blooms direct from the ore since 1901.

#### LIMESTONE CONSUMED IN MAKING PIG IRON.

The limestone consumed for fluxing purposes by the blast furnaces in the production of 25,781,361 tons of pig iron in 1907 amounted to 14,194,584 tons. The average consumption of limestone per ton of all kinds of pig iron produced was 1,233.2 pounds in 1907, against 1,178.8 pounds in 1906. The consumption in 1907 by anthracite and bituminous furnaces was 1,247.8 pounds, against 1,192.8 pounds in 1906, and by the charcoal furnaces it was 391.2 pounds in 1907, against 378.6 pounds in 1906.

## PRODUCTION OF PIG IRON BY GRADES.

The following table gives the total production of pig iron by grades in gross tons of 2,240 pounds from 1903 to 1907.

Grades—Gross tons.	1903.	1904.	1905.	1906.	1907.
Bess. and low-phos.	9,989,908	9,098,659	12,407,116	13,840,518	13,231,620
Basic (mineral fuel)	2,040,726	2,483,104	4,105,179	5,018,674	5,375,219
Forge pig iron.....	783,016	550,836	727,817	597,420	683,167
Fdy. and ferro-sil...	4,409,023	3,827,229	4,758,038	4,773,011	5,151,209
Malleable Bessemer	473,781	263,529	635,236	699,701	920,290
Spiegeleisen.....	156,700	162,370	227,797	244,980	283,430
Ferro-manganese....	35,961	57,076	62,186	55,520	55,918
White, mottled, direct castings, etc.	120,137	54,230	69,011	77,367	80,508
Total .....	18,009,252	16,497,033	22,992,380	25,307,191	25,781,361

The Bessemer figures include low-phosphorus pig iron, that is, iron running below 0.04 per cent. in phosphorus. Pig iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. The basic figures do not include the small quantity of basic iron that is made with charcoal. A few thousand tons of castings direct from the furnace are included in the totals for white and mottled and miscellaneous grades of pig iron; also small quantities of ferro-phosphorus. Ferro-silicon, Bessemer ferro-silicon, and high-silicon pig iron are included in the foundry figures.

Prior to 1900 the production of all grades was not ascertained. In that year the production of Bessemer and low-phosphorus pig iron amounted to 7,979,327 tons, in 1901 to 9,596,793 tons, and in 1902 to 10,393,168 tons; basic pig iron made with mineral fuel only, 1,072,376 tons in 1900, 1,448,850 tons in 1901, and 2,038,590 tons in 1902; forge pig iron, 793,092 tons in 1900, 639,454 tons in 1901, and 833,093 tons in 1902; foundry pig iron and ferro-silicon, 3,376,445 tons in 1900, 3,548,718 tons in 1901, and 3,851,276 tons in 1902; malleable Bessemer pig iron, 173,413 tons in 1900, 256,532 tons in 1901, and 311,458 tons in 1902; white and mottled and miscellaneous grades of pig iron and ferro-phosphorus, 129,909 tons in 1900, 87,964 tons in 1901, and 172,132 tons in 1902; spiegeleisen, 207,505 tons in 1900, 231,822 tons in 1901, and 168,408 tons in 1902; ferro-manganese, 48,472 tons in 1900, 59,639 tons in 1901, and 44,526 tons in 1902; and direct castings, 8,703 tons in 1900, 8,582 tons in 1901, and 8,656 tons in 1902: total, 13,789,242 tons in 1900, 15,878,354 tons in 1901, and 17,821,307 tons in 1902.

Of the total production of pig iron in 1907 over 51.3 per cent. was Bessemer and low-phosphorus, compared with over 54.6 per cent. in 1906; over 19.9 per cent. was foundry, Bessemer ferro-silicon, and high-silicon, against over 18.8 per cent. in 1906; over 20.8 per cent. was basic, against over 19.8 per cent. in 1906; over 2.6 per cent. was forge, against over 2.3 per cent. in 1906; over 1.3 per cent. was spiegeleisen and ferro-manganese, against over 1.1 per cent. in 1906; and over 3.5 per cent. was malleable Bessemer, against over 2.7 per cent. in 1906. White and mottled, ferro-phosphorus, and miscellaneous grades of pig iron and castings made direct from the blast furnace did not amount to 1 per cent. in 1906 or 1907.

The following table gives the production by States of Bessemer and low-phosphorus and basic pig iron in 1905, 1906, and 1907. A small quantity of basic pig iron made with charcoal as fuel is not included in the basic production for these years. Gross tons of 2,240 pounds are used throughout the table.

States—Gross tons.	Bessemer and low-phosphorus.			Basic pig iron.		
	1905.	1906.	1907.	1905.	1906.	1907.
N. Y. and N. J.	536,937	790,002	929,519	172,206	263,947	215,197
Pennsylvania..	5,939,042	6,360,694	5,736,301	2,958,006	3,362,322	3,584,408
Maryland.....	331,870	378,223	409,458	.....	.....	.....
Virginia.....	} .....	2,100	12,500	448,487	569,972	542,256
Alabama.....						
W. Va., Ky., and Tenn.....	315,700	342,666	324,323	.....	.....	.....
Ohio.....	3,207,793	3,870,204	3,711,001	} 526,480	822,433	1,033,358
Illinois.....	1,656,280	1,676,822	1,782,740			
Indiana.....	.....	.....	.....			
Mich. and Wis.	91,673	108,945	70,023			
Minn., Mo., Col., & Cal.	327,821	310,862	255,755			
Total.....	12,407,116	13,840,518	13,231,620	4,105,179	5,018,674	5,375,219

In 1907 the production of Bessemer pig iron alone, omitting low-phosphorus pig iron, amounted to 13,027,083 tons, against 13,611,749 tons in 1906, 12,220,209 tons in 1905, 8,907,713 tons in 1904, 9,789,486 tons in 1903, and 10,228,922 tons in 1902. The production of low-phosphorus pig iron alone amounted to 204,537 tons in 1907, against 228,769 tons in 1906, 186,907 tons in 1905, 190,946 tons in 1904, 200,422 tons in 1903, and 164,246 tons in 1902. In 1900 and 1901 the production of low-phosphorus pig iron was not separately ascertained.

The production of foundry and forge pig iron by States in 1905, 1906, and 1907 was as follows. As already stated Bessemer ferro-silicon, ferro-silicon, and high-silicon pig iron are included with foundry iron. A comparatively small quantity of forge pig iron is now made, Pennsylvania making over one-half.

States—Gross tons.	Foundry, ferro-sil., high-sil., etc.			Forge pig iron.		
	1905.	1906.	1907.	1905.	1906.	1907.
Mass. and Conn.	15,987	20,239	19,028	.....	.....	.....
New York .....	483,782	531,234	482,459	38,900	52,007	81,329
New Jersey .....	131,899	133,383	145,408	37,118	17,562	31,036
Pennsylvania.....	1,046,467	973,699	1,276,493	415,226	308,615	359,543
Maryland.....	420,616	348,618	367,669	23,997	14,938	21,210
Virginia.....						
West Virginia...	56,954	58,362	77,743	5,355	11,492	9,907
Kentucky.....						
Tennessee.....	311,880	376,722	337,737	29,686	21,093	23,836
Georgia.....	32,115	82,650	54,305	4,044	8,451	1,320
Texas.....						
Alabama .....	1,094,149	1,117,262	1,113,340	97,506	83,408	76,766
Ohio.....	652,191	635,885	667,428	69,553	74,008	73,058
Indiana.....	106,444	70,890	97,213	.....	.....	.....
Illinois .....						
Michigan .....	251,714	311,949	336,168	.....	.....	.....
Wisconsin.....	118,367	88,588	110,409	.....	.....	.....
Minnesota.....	.....	.....	8,493	.....	.....	.....
Missouri.....	35,473	23,530	15,966	.....	.....	.....
Colorado.....	.....	.....	41,350	.....	.....	.....
Washington.....						
California.....						
Total.....	4,758,038	4,773,011	5,151,209	727,817	597,420	683,167

Included in the 5,151,209 tons of foundry pig iron reported for 1907 are 84,898 tons of ferro-silicon and Bessemer ferro-silicon made in Pennsylvania, Virginia, Kentucky, Tennessee, Ohio, and California. Of the total about 500 tons contained over 50 per cent. of silicon, part being made by electricity. In 1906 there were made 76,694 tons of ferro-silicon and Bessemer ferro-silicon; in 1905, 60,655 tons; in 1904, 69,730 tons; and in 1903, 51,516 tons. Prior to 1903 the production of ferro-silicon was not separately ascertained. Pig iron containing 7 per cent. of silicon and over is classified as ferro-silicon. Nearly all the charcoal iron made is classified as foundry pig iron.

The production of spiegeleisen and ferro-manganese by States in 1905, 1906, and 1907 was as follows in gross tons. Spiegeleisen contains from 9 to 22 per cent. of manganese and ferro-

manganese from 45 to 82 per cent. The standard for spiegel-eisen is 20 per cent. and for ferro-manganese it is 80 per cent.

States—Gross tons.	Spiegeleisen.			Ferro-manganese.		
	1905.	1906.	1907.	1905.	1906.	1907.
New Jersey.....	10,046	9,313	7,039	.....	.....	.....
Pennsylvania ...	128,939	140,305	195,829	60,829	55,520	55,918
Maryland.....	.....	7,077	2,375	} 1,357	.....	.....
Illinois.....	68,556	69,966	65,141		.....	.....
Colorado.....	20,256	18,319	13,046		.....	.....
Total.....	227,797	244,980	283,430	62,186	55,520	55,918

#### PRODUCTION OF BESSEMER STEEL.

The production of Bessemer steel ingots and castings in 1907 was 11,667,549 gross tons, against 12,275,830 tons in 1906, a decrease of 608,281 tons, or almost 5 per cent. It is scarcely necessary to mention that the production in 1906 was the largest in our history. Of the total production in 1907 11,635,092 tons were made by the standard Bessemer process, against 12,244,309 tons in 1906; 13,140 tons by the Tropenas process, against 11,155 tons in 1906; and 19,317 tons by other modifications of the Bessemer process, against 20,366 tons in 1906. The total production in 1906 and 1907 includes small quantities of nickel-Bessemer steel, all made in Pennsylvania.

The following table gives the production by States of Bessemer steel ingots and castings in the last six years in gross tons.

States—Gross tons.	1902.	1903.	1904.	1905.	1906.	1907.
Pennsylvania.....	4,209,326	3,909,436	3,464,650	4,491,445	4,827,725	4,351,841
Ohio.....	2,528,802	2,330,134	2,050,115	3,131,149	3,769,913	3,636,679
Illinois.....	1,443,614	1,366,569	1,257,190	1,651,250	1,684,772	1,723,073
Other States .....	956,621	986,690	1,087,185	1,667,531	1,993,420	1,955,956
Total.....	9,138,363	8,592,829	7,859,140	10,941,375	12,275,830	11,667,549

The decrease in Pennsylvania in 1907 as compared with 1906 amounted to 475,884 tons; in Ohio to 133,234 tons; and in other States to 37,464 tons. Illinois shows an increase of 38,301 tons.

The Bessemer steel made in 1907, including both ingots and castings, was produced by 60 works, located in 18 States and the District of Columbia, as follows: Massachusetts, 2; Connecticut, 1; New York, 3; New Jersey, 3; Pennsylvania, 16; Delaware, 1; Maryland, 1; District of Columbia, 1; Virginia, 1; West Vir-

ginia, 2; Kentucky, 1; Ohio, 12; Illinois, 7; Michigan, 2; Wisconsin, 2; Minnesota, 1; Missouri, 2; Colorado, 1; and Oregon, 1. Rhode Island, Tennessee, and California made Bessemer steel in 1906 but not in 1907. Of the active works in 1907 21 made ingots but not castings, 33 made castings but not ingots, and 6 made both ingots and castings. Fifty-five works in 21 States and the District of Columbia were active in 1906.

There were no Clapp-Griffiths works in operation in 1907 and only 2 Robert-Bessemer plants were active, the same number as in 1906. Twenty-six standard Bessemer plants were at work in both 1907 and 1906 and 17 Tropenas plants were running in 1907, against 16 in 1906. In addition one plant made steel by the Bookwalter process in 1907 and 1906 and 14 plants made steel by other minor Bessemer processes in 1907, as compared with 10 in 1906. All the Tropenas and other modified Bessemer plants make a specialty of castings; some occasionally make ingots.

There were 9 idle Bessemer steel plants in 1907, located as follows: Massachusetts, 1; Rhode Island, 1; Pennsylvania, 4; Tennessee, 1; Wisconsin, 1; and California, 1. Of the total 3 were equipped with standard Bessemer converters, 3 with Tropenas converters, 2 with special converters, and one with a Clapp-Griffiths converter. In 1906 the idle Bessemer steel works numbered 4. In 1907 several Bessemer converters were dismantled.

The following table gives separately the production of Bessemer ingots and castings since 1898, all made by the acid process. Prior to 1898 Bessemer castings were included with ingots. Basic Bessemer steel has not been made in this country since 1897.

States—Gross tons.	Ingots.	Castings.	Total.
Pennsylvania .....	4,345,486	6,355	4,351,841
Ohio .....	3,633,073	3,606	3,636,679
Illinois.....	1,718,680	4,393	1,723,073
Other States.....	1,937,037	18,919	1,955,956
<b>Total for 1907 .....</b>	<b>11,634,276</b>	<b>33,273</b>	<b>11,667,549</b>
<b>Total for 1906 .....</b>	<b>12,243,229</b>	<b>32,601</b>	<b>12,275,830</b>
<b>Total for 1905 .....</b>	<b>10,919,272</b>	<b>22,103</b>	<b>10,941,375</b>
<b>Total for 1904 .....</b>	<b>7,843,089</b>	<b>16,051</b>	<b>7,859,140</b>
<b>Total for 1903 .....</b>	<b>8,574,730</b>	<b>18,099</b>	<b>8,592,829</b>
<b>Total for 1902 .....</b>	<b>9,125,815</b>	<b>12,548</b>	<b>9,138,363</b>
<b>Total for 1901 .....</b>	<b>8,706,538</b>	<b>6,764</b>	<b>8,713,302</b>
<b>Total for 1900 .....</b>	<b>6,678,303</b>	<b>6,467</b>	<b>6,684,770</b>
<b>Total for 1899 .....</b>	<b>7,582,415</b>	<b>3,939</b>	<b>7,586,354</b>
<b>Total for 1898 .....</b>	<b>6,605,478</b>	<b>3,539</b>	<b>6,609,017</b>

## GROWTH OF OUR BESSEMER STEEL INDUSTRY.

The growth of our Bessemer steel industry in the last few years has been almost wholly in the use of the Tropenas and other modifications of the standard Bessemer process, the number of standard plants and converters showing a decrease in November, 1907, as compared with June, 1904. The annual capacity of the standard converters in 1907 was, however, considerably in excess of the annual capacity of the standard converters in 1904.

In June, 1904, there were 51 completed and 1 building steel plants which were equipped or were being equipped to manufacture steel by the standard Bessemer process or some of its many modifications, with 105 converters and an annual capacity of 13,628,600 tons of ingots and castings. In addition 4 plants were projected. In November, 1907, there were 70 completed, 2 building, and 1 partly erected standard Bessemer or modified Bessemer steel plants, with 131 completed, 1 partly erected, and 6 building converters and an annual capacity of 15,020,200 tons of ingots or castings. In addition 4 plants with 7 converters were projected. Two converters which were being built in November, 1907, are to be used for desiliconizing and decarburizing molten metal for open-hearth furnaces. Their capacity is not included above.

From June, 1904, to November, 1907, the number of completed standard Bessemer steel plants decreased from 32 with 75 converters to 30 with 71 converters, a loss of 2 plants and 4 converters, but during this period the annual capacity of the completed standard Bessemer converters increased from 13,551,000 gross tons to 14,818,000 tons, a gain of 1,267,000 tons. The number of plants built to make steel by the Tropenas process increased from 10 with 14 converters to 20 with 29 converters, a gain of 10 plants and 15 converters, and the annual capacity of the converters increased from 20,500 tons to 56,800 tons, a gain of 36,300 tons. The number of plants to make steel by the Robert-Bessemer, Bookwalter, Zenzes, and other modifications of the Bessemer process increased from 9 with 14 converters to 20 with 31 converters, a gain of 11 plants and 17 converters, and the annual capacity of the converters increased from 54,100 tons to 122,400 tons, a gain of 68,300 tons. In the entire Bessemer industry the increase in completed plants was from 51 to 70, a gain of 19 plants; in completed, building, and partly erected converters from 105 to 138, a gain of 33 converters; and in the annual capacity of the converters from 13,628,600 tons to 15,020,200 tons, a gain of 1,391,600 tons.

## TOTAL PRODUCTION OF OPEN-HEARTH STEEL.

The production of open-hearth steel ingots and direct castings in the United States in 1907 was 11,549,736 gross tons, against 10,980,413 tons in 1906, an increase of 569,323 tons, or over 5.1 per cent. The production in 1907 was larger than in any preceding year, and was only 117,813 tons less than the production of 11,667,549 tons of Bessemer steel in the same year. The following table gives the production of open-hearth steel by States in the last six years in gross tons. Several thousand tons of nickel-open-hearth steel are included in the figures for late years.

States—Gross tons	1902.	1903.	1904.	1905.	1906.	1907.
New England....	179,923	169,209	195,901	239,282	251,047	239,797
N. Y. and N. J....	92,763	104,598	165,986	348,072	553,186	706,019
Pennsylvania....	4,375,364	4,442,730	4,306,498	6,471,818	7,718,213	7,868,353
Ohio.....	278,854	369,349	480,906	687,392	818,683	819,642
Illinois.....	435,461	422,919	358,215	617,625	884,472	1,013,251
Other States....	325,364	321,106	400,660	607,187	754,812	902,674
Total.....	5,687,729	5,829,911	5,908,166	8,971,376	10,980,413	11,549,736

## PRODUCTION OF OPEN-HEARTH STEEL INGOTS AND CASTINGS.

The production of open-hearth steel ingots in 1907, excluding castings, amounted to 10,803,211 tons, against 10,260,522 tons in 1906, an increase of 542,689 tons, or over 5.2 per cent. The production of castings alone in 1907 amounted to 746,525 tons, against 719,891 tons in 1906, an increase of 26,634 tons, or almost 3.7 per cent. The following table gives by States the production of open-hearth steel ingots and castings in 1907. Prior to 1898 the production of castings was not separately ascertained.

States—Gross tons.	Ingots.	Castings.	Total.
New England, New York, and New Jersey...	845,607	100,209	945,816
Pennsylvania.....	7,559,421	308,932	7,868,353
Ohio, Indiana, Illinois, and other States.....	2,398,183	337,384	2,735,567
Total for 1907.....	10,803,211	746,525	11,549,736
Total for 1906.....	10,260,522	719,891	10,980,413
Total for 1905.....	8,444,836	526,540	8,971,376
Total for 1904.....	5,605,332	302,834	5,908,166
Total for 1903.....	5,429,563	400,348	5,829,911
Total for 1902.....	5,319,850	367,879	5,687,729
Total for 1901.....	4,354,687	301,622	4,656,309
Total for 1900.....	3,220,644	177,491	3,398,135
Total for 1899.....	2,777,587	169,729	2,947,316
Total for 1898.....	2,109,705	120,587	2,230,292

The open-hearth steel produced in 1907, including ingots and castings, was made by 137 works in 20 States and the District of Columbia as follows: Massachusetts, 4; Connecticut, 3; Rhode Island, 1; New York, 9; New Jersey, 8; Pennsylvania, 64; Delaware, 1; Maryland, 1; District of Columbia, 1; West Virginia, 1; Georgia, 1; Alabama, 4; Ohio, 15; Indiana, 5; Illinois, 7; Michigan, 3; Wisconsin, 4; Minnesota, 1; Missouri, 1; Colorado, 1; and California, 2. The District of Columbia appears among the producers for the first time. In 1906 there were 125 works in 20 States and in 1905 there were 111 works in 17 States which made open-hearth steel ingots or castings.

#### PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL.

In 1907 there were 10,279,315 tons of open-hearth steel made by the basic process and 1,270,421 tons by the acid process, while in 1906 the production by the basic process amounted to 9,658,760 tons and by the acid process to 1,321,653 tons. This is a gain in production in 1907 over 1906 by the basic process of 620,555 tons but a loss by the acid process of 51,232 tons.

The following table gives the production by States of both basic and acid open-hearth steel ingots and castings in 1907.

States—Gross tons.	Basic steel.	Acid steel.	Total.
New England.....	172,960	66,837	239,797
New York and New Jersey .....	665,474	40,545	706,019
Pennsylvania .....	6,826,479	1,041,874	7,868,353
Ohio .....	758,401	61,241	819,642
Illinois .....	1,006,589	6,662	1,013,251
Other States.....	849,412	53,262	902,674
<b>Total for 1907.....</b>	<b>10,279,315</b>	<b>1,270,421</b>	<b>11,549,736</b>
Total for 1906 .....	9,658,760	1,321,653	10,980,413
Total for 1905.....	7,815,728	1,155,648	8,971,376
Total for 1904.....	5,106,367	801,799	5,908,166
Total for 1903.....	4,734,913	1,094,998	5,829,911
Total for 1902.....	4,496,533	1,191,196	5,687,729
Total for 1901.....	3,618,993	1,037,316	4,656,309
Total for 1900.....	2,545,091	853,044	3,398,135
Total for 1899.....	2,080,426	866,890	2,947,316
Total for 1898.....	1,569,412	660,880	2,230,292
Total for 1897.....	1,056,043	552,628	1,608,671
Total for 1896.....	776,256	522,444	1,298,700

In the twelve years covered by the table there was an increase of 10,251,036 tons, or over 789 per cent., in the total production of basic and acid open-hearth steel.

## PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL INGOTS.

The following table gives the production of basic and acid open-hearth steel ingots in the United States in 1907 by States, direct castings being omitted. A table giving the production of basic and acid open-hearth steel castings will be found on page 61. There was an increase of 567,627 tons in 1907 over 1906 in the production of basic ingots but a decrease of 24,938 tons in the production of acid ingots. Gross tons are used throughout.

States—Gross tons.	Basic ingots.	Acid ingots.	Total. Gross tons.
New England, New York, and New Jersey..	782,325	63,282	845,607
Pennsylvania.....	6,766,950	792,471	7,559,421
Ohio, Indiana, Illinois, and other States..	2,363,564	34,619	2,398,183
Total for 1907.....	9,912,839	890,372	10,803,211
Total for 1906.....	9,345,212	915,310	10,260,522
Total for 1905.....	7,609,569	835,267	8,444,836
Total for 1904.....	5,007,448	597,884	5,605,332
Total for 1903.....	4,600,034	829,529	5,429,563
Total for 1902.....	4,384,129	935,721	5,319,850
Total for 1901.....	3,524,052	830,635	4,354,687
Total for 1900.....	2,502,447	718,197	3,220,644
Total for 1899.....	2,040,737	736,850	2,777,587
Total for 1898.....	1,540,952	568,753	2,109,705

In addition to the States named above Massachusetts, Rhode Island, Connecticut, Maryland, West Virginia, Georgia, Alabama, Colorado, and California made open-hearth steel ingots in 1907; also the District of Columbia. The States which made ingots by the basic but not by the acid process in 1907 were Rhode Island, Connecticut, New York, Maryland, West Virginia, Georgia, Alabama, Indiana, Colorado, and California. No State made ingots by the acid process only in 1907. The States which made ingots by both the basic and acid processes were Massachusetts, New Jersey, Pennsylvania, Ohio, and Illinois; also the District of Columbia.

The increase in the production of basic ingots from 1898 to 1907 was 8,371,887 tons, but the increase in the production of acid ingots was only 321,619 tons. In both basic and acid ingots the increase in the same period amounted to 8,693,506 tons.

## PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL CASTINGS.

As already stated the total production of open-hearth steel castings in 1907 amounted to 746,525 tons, as compared with 719,891 tons in 1906. The production in 1907 was the largest in

our history. The year of next largest production was 1906. Of the total production in 1907 380,049 tons, or almost 51 per cent., were made by the acid process and 366,476 tons, or over 49 per cent., were made by the basic process. As compared with 1906, when 406,343 tons of castings were made by the acid process, the decrease in 1907 by this process was 26,294 tons. By the basic process the increase in 1907 was 52,928 tons, the production by this process in 1906 having amounted to 313,548 tons.

The following table gives the production of open-hearth steel castings by the basic and acid processes in 1907 by States. As compared with 1898 the increase in the production of basic open-hearth steel castings in 1907 amounted to 338,016 tons and of acid castings to 287,922 tons, the proportionate growth of the former being much greater than the latter. In both basic and acid castings the increase in the ten years was 625,938 tons.

States—Gross tons.	Basic castings.	Acid castings.	Total. Gross tons.
New England, New York, and New Jersey..	56,109	44,100	100,209
Pennsylvania.....	59,529	249,403	308,932
Ohio, Indiana, Illinois, and other States....	250,838	86,546	337,384
Total for 1907.....	366,476	380,049	746,525
Total for 1906.....	313,548	406,343	719,891
Total for 1905.....	206,159	320,381	526,540
Total for 1904.....	98,919	203,915	302,834
Total for 1903.....	134,879	265,469	400,348
Total for 1902.....	112,404	255,475	367,879
Total for 1901.....	94,941	206,681	301,622
Total for 1900.....	42,644	134,847	177,491
Total for 1899.....	39,689	130,040	169,729
Total for 1898.....	28,460	92,127	120,587

In 1907 New England, New York, and New Jersey produced 12,009 tons more of basic than acid castings, while Pennsylvania made over four times as many tons of acid as of basic castings. On the other hand Ohio, Indiana, Illinois, and the other Southern and Western States made about three times as many tons of castings by the basic process as by the acid process.

In addition to the States named in the table Massachusetts, Connecticut, Delaware, Alabama, Michigan, Wisconsin, Minnesota, Missouri, Colorado, and California made open-hearth steel castings in 1907. Pennsylvania made over 65.6 per cent. of the total production of acid open-hearth castings in 1907 and Illinois made almost 33.5 per cent. of the total production of basic open-hearth

castings in the same year. The following table gives the production of acid and basic open-hearth castings by States since 1898.

Years. Gross tons.	New England, N. Y., and N. J.	Pennsylvania.	Ohio, Ind., Ill., and other States.	Total. Gross tons.
1898 .....	14,657	47,270	58,660	120,587
1899 .....	21,640	69,996	78,093	169,729
1900 .....	21,883	78,584	77,024	177,491
1901 .....	37,154	108,486	155,982	301,622
1902 .....	37,041	152,399	178,439	367,879
1903 .....	36,094	182,021	182,233	400,348
1904 .....	44,478	134,410	123,946	302,834
1905 .....	59,207	234,288	233,045	526,540
1906 .....	89,510	305,062	325,319	719,891
1907 .....	100,209	308,932	337,384	746,525

The increase in the production of open-hearth steel castings in 1907 over 1906 in New England, New York, and New Jersey amounted to 10,699 tons; Pennsylvania, 3,870 tons; and Ohio, Indiana, Illinois, and other States, 12,065 tons.

#### GROWTH OF OUR OPEN-HEARTH STEEL INDUSTRY.

The growth of our open-hearth steel industry during the past few years has been phenomenal, especially in the use of the basic process. In June, 1904, there were 135 completed, 5 building, and 2 partly-erected open-hearth steel plants in the United States, with 549 completed, 22 building, and 6 partly-erected furnaces, a total of 142 plants and 577 furnaces. Thirteen of the building furnaces were being added to existing plants. Of the completed furnaces 364 were equipped to make basic steel and 185 to make acid steel, and of the building and partly-erected furnaces 24 would make basic and 4 would make acid steel, a total of 388 basic and 189 acid furnaces. These furnaces had a total annual capacity of 11,335,100 tons of ingots and castings, of which 9,319,200 tons were basic and 2,015,900 tons were acid. In addition to the above 17 open-hearth plants were projected.

In November, 1907, there were 159 completed, 13 building, and 2 partly-erected open-hearth steel plants in this country, with 691 completed, 97 building, and 3 partly-erected furnaces, a total of 174 plants and 791 furnaces. Thirty-one of the building furnaces were being added to existing plants. Of the completed furnaces 492 were equipped to make basic steel and 199 to make acid steel, and of the building and partly-erected furnaces 96 would make basic and 4 would make acid steel, a total of 588 basic and 203 acid furnaces. The total annual capacity of these

furnaces was 18,824,900 tons of ingots and castings, of which 16,551,500 tons were basic and 2,273,400 tons were acid. In addition 7 plants with 24 furnaces were projected.

From June, 1904, to November, 1907, the increase in the number of completed, building, and partly-erected open-hearth plants was 32, while the increase in the number of completed, building, and partly-erected furnaces was 214, of which 200 were basic and 14 were acid. During the same period the increase in the annual capacity of ingots and castings was 7,489,800 tons, of which 7,232,300 tons, or over 96.5 per cent., were basic and 257,500 tons, or a little less than 3.5 per cent., were acid.

#### PRODUCTION OF CRUCIBLE STEEL.

The production of crucible steel in 1907 amounted to 131,234 tons, against 127,513 tons in 1906, an increase of 3,721 tons, or over 2.9 per cent. Sixty-eight works in 13 States made crucible steel in 1907. The direct castings produced in 1907, included above, amounted to 10,233 tons, against 10,343 tons in 1906. Pennsylvania made 87,556 tons of crucible steel ingots and castings in 1907, including a few tons made experimentally in an electric furnace, against 86,894 tons in 1906. New York was the next largest maker in 1907, its production amounting to 16,922 tons. No other State made 12,000 tons in 1907.

The following table gives separately by States the production of crucible steel ingots and castings in 1907 in gross tons.

States—Gross tons.	Ingots.	Castings.	Total.
Pennsylvania.....	86,409	1,147	87,556
Mass., Conn., New York, and other States.	34,592	9,086	43,678
Total for 1907.....	121,001	10,233	131,234
Total for 1906.....	117,170	10,343	127,513
Total for 1905.....	96,500	5,733	102,233
Total for 1904.....	79,083	4,308	83,391
Total for 1903.....	97,025	5,409	102,434
Total for 1902.....	107,817	4,955	112,772
Total for 1901.....	94,586	3,927	98,513
Total for 1900.....	96,573	3,989	100,562
Total for 1899.....	97,713	3,500	101,213
Total for 1898.....	85,512	4,235	89,747

Of the 68 active crucible steel works in 1907 there were 33 works in 7 States which made ingots but not castings, 33 works in 11 States which made castings but not ingots, and 2 works in 2 States which made both ingots and castings.

## PRODUCTION OF MISCELLANEOUS STEEL.

The production of steel in 1907 by various minor processes amounted to 14,075 tons, against 14,380 tons in 1906 and 8,963 tons in 1905. Eleven works in 7 States made steel in 1907 by minor processes. In 1906 there were 10 works in 6 States which made steel by these processes. Blister, puddled, and "patented" steel, including patented steel castings, are included in these figures. A small quantity of steel that was produced experimentally in Oregon in 1907 with electricity and charcoal is not included. A few tons made in California in 1907 with crude petroleum as fuel are, however, included.

The following table gives the production of all kinds of miscellaneous steel by States in 1907, ingots and bars being separated from castings. Production is given in gross tons of 2,240 pounds.

States—Gross tons.	Ingots or bars.	Castings.	Total. Gross tons.
Pennsylvania.....	548	646	1,194
Conn., New Jersey, Ohio, and other States....	441	12,440	12,881
Total for 1907.....	989	13,086	14,075
Total for 1906.....	3,510	10,870	14,380
Total for 1905.....	2,572	6,391	8,963
Total for 1904.....	2,172	7,018	9,190
Total for 1903.....	3,395	6,409	9,804
Total for 1902.....	2,833	5,553	8,386
Total for 1901.....	214	5,257	5,471
Total for 1900.....	6	4,856	4,862
Total for 1899.....	1,030	3,944	4,974
Total for 1898.....	225	3,576	3,801

## PRODUCTION OF ALL KINDS OF STEEL.

In 1907 there were 234 works in 24 States and the District of Columbia which made steel ingots or castings, against 213 works in 24 States and the District of Columbia in 1906. Of the total active works in 1907 there were 86 works in 15 States and the District of Columbia which made steel ingots but not steel castings, 119 works in 17 States and the District of Columbia which made steel castings but not steel ingots, and 29 works in 10 States which made both steel ingots and castings.

The production of all kinds of steel ingots and castings in 1907 amounted to 23,362,594 tons, against 23,398,136 tons in 1906, a decrease of 35,542 tons. The following table gives the production of all kinds of steel ingots and castings in 1907.

States—Gross tons.	Bessemer.	Open-hearth.	Crucible and all other.	Total ingots and castings.
Mass., Rhode Island, and Conn.....	1,421	239,797	3,980	245,198
New York and New Jersey.....	858,681	706,019	37,969	1,602,669
Pennsylvania.....	4,351,841	7,868,353	88,750	12,308,944
Del., Md., Dist. of Columbia, Va., West Va., Ky., Ga., and Ala.....	840,865	412,656	1,900	1,255,421
Ohio.....	3,636,679	819,642	1,690	4,458,011
Indiana and Illinois.....	1,723,073	1,194,913	6,251	2,924,237
Mich., Wis., Minn., Missouri, Iowa, Colorado, California, and Oregon..	254,989	308,356	4,769	568,114
Total for 1907.....	11,667,549	11,549,736	145,309	23,362,594
Total for 1906.....	12,275,830	10,980,413	141,893	23,398,136
Total for 1905.....	10,941,375	8,971,376	111,196	20,023,947
Total for 1904.....	7,859,140	5,908,166	92,581	13,859,887
Total for 1903.....	8,592,829	5,829,911	112,238	14,534,978
Total for 1902.....	9,138,363	5,687,729	121,158	14,947,250
Total for 1901.....	8,713,302	4,656,309	103,984	13,473,595
Total for 1900.....	6,684,770	3,398,135	105,424	10,188,329
Total for 1899.....	7,586,354	2,947,316	106,187	10,639,857
Total for 1898.....	6,609,017	2,230,292	93,548	8,932,857

## PRODUCTION OF ALL KINDS OF STEEL INGOTS.

The total production of all kinds of steel ingots in 1907 amounted to 22,559,477 tons, against 22,624,431 tons in 1906, a decrease of 64,954 tons. The following table gives the production of steel ingots by States in 1907. All direct castings are omitted.

States—Gross tons.	Bessemer ingots.	Open-hearth ingots.	Crucible and all other.	Total ingots. Gross tons.
Mass., R. I., Conn., N. Y., and N. J....	852,103	845,607	28,049	1,725,759
Pennsylvania.....	4,345,486	7,559,421	86,957	11,991,864
Md., D. of C., W. Va., Ky., Ga., Ala.	838,190	401,881	1,900	1,241,971
Ohio.....	3,633,073	718,062	90	4,351,225
Ind., Ill., Colorado, and California..	1,965,424	1,278,240	4,994	3,248,658
Total for 1907.....	11,634,276	10,803,211	121,990	22,559,477
Total for 1906.....	12,243,229	10,260,522	120,680	22,624,431
Total for 1905.....	10,919,272	8,444,836	99,072	19,463,180
Total for 1904.....	7,843,089	5,605,332	81,255	13,529,676
Total for 1903.....	8,574,730	5,429,563	100,420	14,104,713
Total for 1902.....	9,125,815	5,319,850	110,650	14,556,315
Total for 1901.....	8,706,538	4,354,687	94,800	13,156,025
Total for 1900.....	6,678,303	3,220,644	96,579	9,995,526
Total for 1899.....	7,582,415	2,777,587	98,743	10,458,745
Total for 1898.....	6,605,478	2,109,705	85,737	8,800,920

One hundred and fifteen works in 16 States and the District of Columbia made steel ingots in 1907, against 109 works in 16 States in 1906. Of the total production of steel ingots in 1907 Pennsylvania made over 53.1 per cent., against over 54.4 per cent. in 1906; Ohio over 19.2 per cent. in 1907, against over 19.8 per cent. in 1906; and Illinois over 11.5 per cent. in 1907, against over 10.7 per cent. in 1906. No other State made over 6.3 per cent. in 1907 or over 5.7 per cent. in 1906.

#### PRODUCTION OF ALL KINDS OF STEEL CASTINGS.

In 1907 the production of all kinds of steel castings was 803,117 gross tons, against 773,705 tons in 1906, an increase of 29,412 tons, or over 3.8 per cent. Of the total production in 1907 33,273 tons were made by the Bessemer process or some of its modifications, 746,525 tons by the open-hearth process, 10,233 tons by the crucible process, and 13,086 tons by special and other processes. The maximum production of steel castings was reached in 1907. One hundred and forty-eight works in 19 States and the District of Columbia made steel castings in 1907, against 130 works in 20 States and the District of Columbia in 1906.

The following table gives by States the production of all kinds of direct steel castings in 1907 in gross tons of 2,240 pounds.

States—Gross tons.	Bessemer.	Open-hearth.	Crucible and all other.	Total. Gross tons.
Mass., Conn., New York, and N. J....	7,999	100,209	13,900	122,108
Pennsylvania .....	6,355	308,932	1,793	317,080
Del., Dist. of Col., Va., Ala., and Ohio.	6,281	112,355	1,600	120,236
Indiana, Illinois, and Michigan.....	6,108	157,284	2,865	166,257
Wis., Minn., Mo., Iowa, Col., Ore., Cal.	6,530	67,745	3,161	77,436
Total for 1907.....	33,273	746,525	23,319	803,117
Total for 1906.....	32,601	719,891	21,213	773,705
Total for 1905.....	22,103	526,540	12,124	560,767
Total for 1904.....	16,051	302,834	11,326	330,211
Total for 1903.....	18,099	400,348	11,818	430,265
Total for 1902.....	12,548	367,879	10,508	390,935
Total for 1901.....	6,764	301,622	9,184	317,570
Total for 1900.....	6,467	177,491	8,845	192,803
Total for 1899.....	3,939	169,729	7,444	181,112
Total for 1898.....	3,539	120,587	7,811	131,937

As compared with 1906 there was an increase in 1907 in the production of steel castings in every State or group of States enumerated in the table.

## PRODUCTION OF ALL KINDS OF RAILS.

The production of all kinds of rails in 1907 amounted to 3,633,654 tons, against 3,977,887 tons in 1906, a decrease of 344,233 tons, or over 8.6 per cent. The falling off in Pennsylvania amounted to 169,343 tons and in the remainder of the country to 174,890 tons. The maximum production was reached in 1906. The year of next largest production was 1907. Rails rolled from purchased blooms, crop ends, and "seconds," and rerolled, or renewed, rails are included. Renewed rails are rails that have been in use and after reheating are rolled down to smaller sections. In the following table the production of all kinds of rails in 1907 is given by States, followed by the annual production since 1897.

States—Gross tons.	Bessemer.	Open-hearth.	Iron.	Total.
Pennsylvania.....	1,093,932	36,837	.....	1,130,769
Other States.....	2,286,093	215,867	925	2,502,885
Total for 1907 .....	3,380,025	252,704	925	3,633,654
Total for 1906 .....	3,791,459	186,413	15	3,977,887
Total for 1905 .....	3,192,347	183,264	318	3,375,929
Total for 1904 .....	2,137,957	145,883	871	2,284,711
Total for 1903 .....	2,946,756	45,054	667	2,992,477
Total for 1902 .....	2,935,392	6,029	6,512	2,947,933
Total for 1901 .....	2,870,816	2,093	1,730	2,874,639
Total for 1900 .....	2,383,654	1,333	695	2,385,682
Total for 1899 .....	2,270,585	523	1,592	2,272,700
Total for 1898 .....	1,976,702	1,220	3,319	1,981,241
Total for 1897 .....	1,644,520	500	2,872	1,647,892

Twenty-six works in 13 States rolled or rerolled rails in 1907, as follows: New York, 1; Pennsylvania, 6; Maryland, 2; West Virginia, 2; Tennessee, 1; Georgia, 1; Alabama, 2; Ohio, 4; Indiana, 1; Illinois, 3; Wisconsin, 1; Colorado, 1; and Washington, 1. In 1906 rails were rolled by 22 works in 11 States.

## PRODUCTION OF BESSEMER STEEL RAILS.

The production of Bessemer steel rails in 1907 amounted to 3,380,025 tons, against 3,791,459 tons in 1906, a decrease of 411,434 tons, or over 10.8 per cent. The following table gives the production by States from 1902 to 1907.

Gross tons.	1902.	1903.	1904.	1905.	1906.	1907.
Pennsylvania....	1,148,425	1,186,284	801,657	1,097,154	1,298,409	1,093,932
Other States.....	1,786,967	1,760,472	1,336,300	2,095,193	2,493,050	2,286,093
Total.....	2,935,392	2,946,756	2,137,957	3,192,347	3,791,459	3,380,025

In Pennsylvania the decreased production in 1907 as compared with 1906 amounted to 204,477 tons and in the remainder of the country to 206,957 tons. In addition to Pennsylvania the States which rolled Bessemer rails in 1907 were New York, Maryland, West Virginia, Georgia, Ohio, Indiana, Illinois, Wisconsin, Colorado, and Washington.

The production of Bessemer steel rails by the makers of Bessemer steel ingots, included above, amounted to 3,302,009 tons in 1907, against 3,705,642 tons in 1906, a decrease of 403,633 tons, or over 10.8 per cent. By non-makers of Bessemer ingots the production in 1907 was 78,016 tons, against 85,817 tons in 1906. The following table gives the total production of all kinds of Bessemer steel rails from 1902 to 1907, the rails rolled by makers of domestic ingots being separated from those rolled by companies which did not operate Bessemer converters. During 1907 about 145,600 tons of renewed or rerolled Bessemer steel rails were produced by the makers of Bessemer ingots.

Gross tons.	1902.	1903.	1904.	1905.	1906.	1907.
By makers.....	2,876,293	2,873,228	2,084,688	3,135,729	3,705,642	3,302,009
By all others.....	59,099	73,528	53,269	56,618	85,817	78,016
Total.....	2,935,392	2,946,756	2,137,957	3,192,347	3,791,459	3,380,025

#### PRODUCTION OF OPEN-HEARTH STEEL AND IRON RAILS.

The production of open-hearth steel rails in 1907 was 252,704 tons, against 186,413 tons in 1906, 183,264 tons in 1905, 145,883 tons in 1904, and 45,054 tons in 1903. The increase in production in 1907 over 1906 was 66,291 tons. The maximum production was reached in 1907. Alabama made over 59 per cent. of the open-hearth rails that were rolled in 1907, Colorado, Pennsylvania, Georgia, and New York rolling the remainder in the order named. In 1906 Alabama rolled over 84 per cent.

The production of iron rails in 1907 was 925 tons, all rolled in Tennessee and Illinois, and all weighing less than 45 pounds to the yard. In 1906 the production of iron rails was 15 tons and in 1905 it was 318 tons. The maximum production of iron rails was reached in 1872, when 808,866 tons were rolled.

#### WEIGHT OF ALL KINDS OF RAILS.

The following table gives the production of all kinds of rails from 1897 to 1907 according to the weight of the rails per yard. Street and trolley rails are included in the total production.

Kinds of rails—Gross tons.	Under 45 pounds.	45 pounds and less than 85.	85 pounds and over.	Total. Gross tons.
Bessemer rails.....	279,004	1,407,490	1,693,531	3,380,025
Open-hearth rails.....	15,909	162,495	74,300	252,704
Iron rails.....	925	.....	.....	925
Total for 1907 .....	295,838	1,569,985	1,767,831	3,633,654
Total for 1906 .....	284,612	1,749,650	1,943,625	3,977,887
Total for 1905 .....	228,252	1,601,624	1,546,053	3,375,929
Total for 1904 .....	291,883	1,320,677	672,151	2,284,711
Total for 1903 .....	221,262	1,603,088	1,168,127	2,992,477
Total for 1902 .....	261,887	2,040,884	645,162	2,947,933
Total for 1901 .....	155,406	2,225,411	493,822	2,874,639
Total for 1900 .....	157,531	1,626,093	602,058	2,385,682
Total for 1899 .....	133,836	1,559,340	579,524	2,272,700
Total for 1898 .....	123,881	1,404,150	453,210	1,981,241
Total for 1897 .....	88,896	1,223,435	335,561	1,647,892

The production of rails weighing under 45 pounds to the yard shows an increase of 11,226 tons in 1907 as compared with 1906, but the production of rails weighing 45 pounds and less than 85 pounds shows a decrease of 179,665 tons, and rails weighing 85 pounds and over a decrease of 175,794 tons.

In addition to the rails rolled in 1907 we imported 3,752 tons of iron and steel rails in that year. During the same year we exported 338,906 tons. In 1906 our exports of rails amounted to 328,036 tons and our imports to 4,943 tons, virtually all steel.

#### PRODUCTION OF STRUCTURAL SHAPES.

Our statistics of iron and steel structural shapes embrace the production of beams, beam girders, zee bars, tees, channels, angles, and other structural forms, but they do not include plates or girders made from plates. Plates are provided for under other classifications, and all plates cut to specifications are included in the general statistics of plates.

The total production of strictly structural shapes in 1907 was 1,940,352 tons, against 2,118,772 tons in 1906, a decrease of 178,420 tons, or over 8.4 per cent. Of the total production in 1907 about 1,936,379 tons were rolled from steel and about 3,973 tons from iron, against about 2,114,053 tons rolled from steel and about 4,719 tons rolled from iron in 1906. The maximum production of structural shapes was reached in 1906. The year of next largest production was 1907. The production of structural shapes in 1906 and 1907 by States was as follows:

States—Gross tons.	1906.	1907.	States—Gross tons.	1906.	1907.
New York and New Jersey.....	165,684	181,677	Indiana, Illinois, Wis., Colorado, and California..	215,990	253,094
Pennsylvania.....	1,673,115	1,458,507			
Alabama and Ohio.....	63,983	47,074	Total.....	2,118,772	1,940,352

Ten States made structural shapes in 1906 and 1907. Pennsylvania made over 75.1 per cent. of the total production in 1907, against over 78.9 per cent. in 1906. Illinois, New York, Indiana, Ohio, Wisconsin, and New Jersey were the next largest producers in 1907. In 1907 there were 37 works which rolled structural shapes, against 40 works in 1906.

The following table gives the production of structural shapes from 1892 to 1907. Prior to 1892 structural shapes were not separated from other rolled products in our statistics.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1892.....	453,957	1898.....	702,197	1904.....	949,146
1893.....	387,307	1899.....	850,376	1905.....	1,660,519
1894.....	360,305	1900.....	815,161	1906.....	2,118,772
1895.....	517,920	1901.....	1,013,150	1907.....	1,940,352
1896.....	495,571	1902.....	1,300,326	.....	.....
1897.....	583,790	1903.....	1,095,813	.....	.....

#### PRODUCTION OF WIRE RODS.

The total production of iron and steel wire rods in 1907 amounted to 2,017,583 gross tons, against 1,871,614 tons in 1906, an increase of 145,969 tons, or over 7.7 per cent. Of the total production in 1907 2,016,033 tons were steel rods and 1,550 tons were iron rods. In 1906 the steel wire rods rolled amounted to 1,870,413 tons and the iron rods to 1,201 tons. The maximum production of wire rods was reached in 1907. The year of next largest production was 1906. In 1907 there were 29 works which rolled wire rods, against 30 works in 1906. The following table gives the production by States since 1904 in gross tons.

States—Gross tons.	1904.	1905.	1906.	1907.
Mass., Conn., R. I., N. Y., and N. J.	228,289	249,835	236,380	233,687
Penna., Ky., Ga., Ala., and Ohio....	973,801	1,038,212	1,102,365	1,176,278
Indiana, Illinois, and Colorado.....	496,938	520,641	532,869	607,618
Total.....	1,699,028	1,808,688	1,871,614	2,017,583

In 1907 Pennsylvania rolled over 31.5 per cent. of the total for

the whole country. The following table gives the total production of iron and steel wire rods from 1888 to 1907 in gross tons.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1888.....	279,769	1893...	537,272	1898...	1,071,683	1903...	1,503,455
1889.....	363,851	1894...	673,402	1899...	1,036,398	1904...	1,699,028
1890.....	457,099	1895...	791,130	1900...	846,291	1905...	1,808,638
1891.....	536,607	1896...	623,986	1901...	1,365,934	1906...	1,871,614
1892.....	627,829	1897...	970,736	1902...	1,574,293	1907...	2,017,583

#### PRODUCTION OF PLATES AND SHEETS.

The production of iron and steel plates and sheets in 1907, excluding nail plate, was 4,248,832 tons, against 4,182,156 tons in 1906, an increase of 66,676 tons. The production of nail plate is given on page 74. The following table gives the production by States of plates and sheets since 1905. Gross tons are used.

States—Gross tons.	1905.	1906.	1907.
New England, New York, and New Jer.	76,197	124,725	126,403
Pennsylvania.....	2,308,389	2,624,284	2,651,166
Delaware, Maryland, and Virginia.....	28,481	25,500	28,420
West Virginia .....	93,586	148,684	153,599
Kentucky and Alabama .....	47,303	51,642	54,631
Ohio.....	688,633	818,769	851,987
Ind., Ill., Missouri, Wyoming, and Cal.	289,641	388,552	382,626
Total.....	3,532,230	4,182,156	4,248,832

One hundred and thirty-four works in 17 States rolled plates or sheets in 1907, against 134 works in 16 States in 1906.

The total production of iron and steel plates and sheets, not including nail plate or skelp, from 1887 to 1907 is given below.

Years.	Tons.	Years.	Tons.	Years.	Tons.
1887.....	603,355	1894.....	682,900	1901.....	2,254,425
1888.....	609,827	1895.....	991,459	1902.....	2,665,409
1889.....	716,496	1896.....	965,776	1903.....	2,599,665
1890.....	809,981	1897.....	1,207,286	1904.....	2,421,398
1891.....	678,927	1898.....	1,448,301	1905.....	3,532,230
1892.....	751,460	1899.....	1,903,505	1906.....	4,182,156
1893.....	674,345	1900.....	1,794,528	1907.....	4,248,832

At the request of the manufacturers we have separated for 1905, 1906, and 1907 the production of iron and steel plates of No. 12 gauge and thicker from the production of iron and steel sheets of No. 13 gauge and thinner, classifying the former as

plates and the latter as sheets. Black plates, or sheets, for tinning are included but nail plate and skelp are excluded.

The total production of iron and steel plates in 1907 amounted to 2,660,060 tons, as compared with 2,531,552 tons in 1906, a gain of 128,508 tons, and the total production of iron and steel sheets to 1,588,772 tons, as compared with 1,650,604 tons in 1906, a loss of 61,832 tons, caused entirely by the decreased production in 1907 of black plates, or sheets, for tinning. As shown by the following table there was a steady growth in the production of iron plates from 1905 to 1907 but a continuous decline in the production of iron sheets. Gross tons are used.

Years. Gross tons.	Plates—No. 12 and thicker.			Sheets—No. 13 and thinner.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
1905.....	10,022	2,031,184	2,041,206	62,134	1,428,890	1,491,024
1906.....	23,333	2,508,219	2,531,552	51,040	1,599,564	1,650,604
1907.....	30,277	2,629,783	2,660,060	43,761	1,545,011	1,588,772

Of the total production of iron and steel plates in 1907 Pennsylvania rolled 2,005,403 tons, or over 75.3 per cent., against 1,917,045 tons, or over 75.7 per cent., in 1906. Of the total production of iron and steel sheets in 1907 Pennsylvania rolled 645,763 tons, or over 40.6 per cent., against 707,239 tons in 1906, and Ohio rolled 571,317 tons in 1907, or over 35.9 per cent., against 544,456 tons in 1906. In 1907 there were 36 works which rolled plates but did not roll sheets, 64 works which rolled sheets but did not roll plates, and 34 works which rolled both plates and sheets. Nail plate works are not included.

#### PRODUCTION OF BLACK PLATES, OR SHEETS, FOR TINNING.

The production of black plates, or sheets, for tinning in 1907, which is included in the preceding tables, amounted to 504,072 tons, against 576,079 tons in 1906, a decrease of 72,007 tons, or almost 12.5 per cent. Of the total production in 1907 Pennsylvania made over 50.3 per cent., against over 54.3 per cent. in 1906. Ohio, West Virginia, Indiana, Maryland, and Illinois also made black plates, or sheets, for tinning in 1907 in the order named. Of the total production of black plates, or sheets, for tinning in 1907 about 3,161 tons were rolled from iron and about 500,911 tons were rolled from steel, while in 1906 about 5,666 tons were rolled from iron and about 570,413 tons from steel. In 1905 a little over 3,000 tons were rolled from iron and over

504,000 tons from steel. In 1907 there were 31 active black plate works, as compared with 33 active works in 1906.

The following table gives the production by States of black plates, or sheets, for tinning in the last five years in gross tons.

States—Gross tons.	1903.	1904.	1905.	1906.	1907.
Pennsylvania.....	256,753	252,527	256,329	312,977	253,807
Maryland and West Virginia.	40,812	54,360	69,180	94,076	95,939
Ohio, Ind., Ill., and Mo.....	193,087	165,682	182,078	169,026	154,326
Total.....	490,652	472,569	507,587	576,079	504,072

#### PRODUCTION OF TINPLATES AND TERNE PLATES.

We estimate the production of tinplates and terne plates in 1907 as amounting to 1,153,097,000 pounds, or 514,775 gross tons, as compared with 1,293,740,000 pounds, or 577,562 tons, in 1906, a decrease of 140,643,000 pounds, or 62,787 tons.

The following table gives the production of tinplates and terne plates in the United States from the beginning of the industry in 1891 to the end of 1907. From July 1, 1891, to June 30, 1897, the statistics we present were collected by Colonel Ira Ayer for the Treasury Department. On the latter date the Department abandoned the collection of these statistics. From July 1, 1897, to December 31, 1907, the statistics have been compiled from the most reliable sources. For the census years 1900 and 1904 the statistics were collected by the Bureau of the Census.

Years—Pounds.	Tinplates.	Terne plates.	Total pounds.
1891 (last 6 months).....	368,400	1,868,343	2,236,743
1892 (calendar year).....	13,921,296	28,197,896	42,119,192
1893.....	64,536,209	59,070,498	123,606,707
1894.....	102,223,407	64,120,002	166,343,409
1895.....	165,927,907	88,683,488	254,611,395
1896.....	270,151,785	89,058,013	359,209,798
1897 (first 6 months).....	203,028,258	49,545,643	252,573,901
1897 (last 6 months).....	.....	.....	322,205,619
1898 (calendar year).....	.....	.....	732,289,600
1899.....	.....	.....	808,360,000
1900 (census year ending May 31)	707,718,239	141,285,783	849,004,022
1901 (calendar year).....	.....	.....	894,411,840
1902.....	.....	.....	806,400,000
1903.....	.....	.....	1,075,200,000
1904 (census year ending Dec. 31)	867,526,985	158,857,866	1,026,384,851
1905 (calendar year).....	.....	.....	1,105,440,000
1906.....	1,100,373,000	193,367,000	1,293,740,000
1907.....	996,650,000	156,447,000	1,153,097,000

Of the total production of tinplates and terne plates in 1907 about 996,650,000 pounds, or 444,933 gross tons, were tinplates and about 156,447,000 pounds, or 69,842 tons, were terne plates. As compared with 1906 there was a decrease in tinplates of 103,723,000 pounds and in terne plates of 36,920,000 pounds.

#### PRODUCTION OF NAIL PLATE.

The production of iron and steel nail plate in 1907 was 52,027 tons, against 54,211 tons in 1906, a decrease of 2,184 tons, or over 4 per cent. Of the total production in 1907 about 36,932 tons were steel and about 15,095 tons were iron, against about 37,032 tons of steel and about 17,179 tons of iron in 1906, a decrease in steel nail plate of 100 tons and in iron nail plate of 2,084 tons. Spike plates are included. These figures are not included in the production of plates and sheets given on pages 71-72.

#### PRODUCTION OF MISCELLANEOUS ROLLED PRODUCTS.

The following table gives the production by States in 1906 and 1907 of merchant bars, skelp, spike rods, bolt rods, splice bars, hoops, bands, cotton-ties, strips, rolled axles, rolled armor plate, and other forms of finished rolled iron and steel for which statistics have not already been given. Rolled forging blooms and forging billets are also included for both years. Forged armor plate, hammered axles, and other forgings are not, however, included.

States. Gross tons.	1906.	1907.	States. Gross tons.	1906.	1907.
Me. and Mass....	40,602	41,961	Ohio.....	1,246,615	1,397,514
R. I. and Conn..	86,561	100,631	Indiana.....	294,338	262,065
New York.....	271,528	289,105	Illinois.....	669,683	686,413
New Jersey.....	98,652	99,176	Michigan.....	88,025	91,674
Pennsylvania...	3,792,666	4,173,235	Wisconsin.....	175,646	173,579
Del. and Md....	26,000	28,245	Missouri.....	64,658	75,610
Virginia .....	35,852	30,211	Col. and Wy...	66,303	62,483
West Virginia..	192,579	254,554	Wash., Ore., and Cal.....	47,019	47,428
Ky., Tenn., Ga., and Texas.....	62,079	67,114			
Alabama.....	125,022	91,376	Total.....	7,383,828	7,972,374

Of the products enumerated above about 5,867,869 tons were steel and about 2,104,505 tons were iron in 1907, as compared with 5,294,758 tons of steel and 2,089,070 tons of iron in 1906, showing an increase in steel products of 573,111 tons and in iron products of 15,435 tons, a total increase of 588,546 tons.

The following table gives separately the production in 1907 of

merchant bars, skelp, splice bars, hoops, bands, cotton-ties, and other miscellaneous forms of finished rolled iron and steel. The production of rolled forging blooms and rolled forging billets is included for 1905 and subsequent years. Gross tons are used.

Products in 1907—Gross tons.	Iron.	Steel.	Total.
Merchant bars—all kinds and sizes.....	1,440,356	2,530,632	3,970,988
Skelp, flue, and pipe iron or steel.....	444,536	1,358,091	1,802,627
Splice bars.....	10,115	183,108	193,223
Hoops.....	.....	200,168	200,168
Bands and cotton-ties.....	4,650	469,529	474,179
Rolled forging blooms and forging billets.....	691	227,091	227,782
Spike and chain rods, bolt and nut rods, horse-shoe bars, strips, shovel blanks, shovel bars, blanks for seamless tubes, railroad ties, rail joints, and all other miscellaneous finished rolled forms not above enumerated.....	204,157	899,250	1,103,407
Total for 1907.....	2,104,505	5,867,869	7,972,374
Total for 1906.....	2,089,070	5,294,758	7,383,828
Total for 1905.....	1,950,546	4,447,561	6,398,107
Total for 1904.....	1,662,896	2,934,601	4,597,497

#### PRODUCTION OF ROLLED IRON AND STEEL COMPARED.

The following table gives the production in gross tons of all leading articles of finished rolled steel in 1907 as compared with the production of all leading articles of finished rolled iron. All miscellaneous rolled products are included. Gross tons are used.

Products in 1907—Gross tons.	Iron.	Steel.	Total.
Rails.....	925	3,632,729	3,633,654
Structural shapes.....	3,973	1,936,379	1,940,352
Plates and sheets.....	74,038	4,174,794	4,248,832
Nail plate.....	15,095	36,932	52,027
Wire rods.....	1,550	2,016,033	2,017,583
Rolled forging blooms and forging billets.....	691	227,091	227,782
Merchant bars.....	1,440,356	2,530,632	3,970,988
Skelp.....	444,536	1,358,091	1,802,627
Splice bars.....	10,115	183,108	193,223
Hoops.....	.....	200,168	200,168
Bands and cotton-ties.....	4,650	469,529	474,179
All other finished rolled.....	204,157	899,250	1,103,407
Total for 1907.....	2,200,086	17,664,736	19,864,822
Total for 1906.....	2,186,557	17,401,911	19,588,468
Total for 1905.....	2,059,990	14,780,025	16,840,015
Total for 1904.....	1,760,084	10,253,297	12,013,381

## PRODUCTION OF ALL KINDS OF ROLLED IRON AND STEEL.

By the phrase rolled iron and steel we include all iron and steel rolled into finished forms. Forged armor plate, hammered axles, and other forgings are not included, nor such intermediate rolled forms as muck bars, slabs, blooms, billets, tinplate and sheet bars, etc. Rolled forging blooms and rolled forging billets are, however, included for 1905 and subsequent years.

The production of all kinds of iron and steel rolled into finished forms in 1907, including rolled forging blooms and rolled forging billets, amounted to 19,864,822 gross tons, against 19,588,468 tons in 1906, an increase of 276,354 tons, or over 1.4 per cent. Of the total production in 1907 about 17,664,736 tons were rolled from steel and about 2,200,086 tons from iron, as compared with about 17,401,911 tons rolled from steel and about 2,186,557 tons rolled from iron in 1906. The following table gives the total production by States of all kinds of finished rolled iron and steel from 1903, according to their geographical position.

States. Gross tons.	1903.	1904.	1905.	1906.	1907.
Me. and Mass.....	157,627	158,085	176,562	170,967	166,617
R. I. and Conn...	131,182	108,575	132,354	124,954	120,659
New York.....	255,905	486,870	911,742	1,228,293	1,267,121
New Jersey.....	145,282	140,572	170,690	179,220	179,686
Pennsylvania.....	7,171,982	6,461,681	8,918,290	10,036,639	10,081,956
Delaware.....	47,673	28,521	12,481	18,800	25,415
Maryland.....	372,009	286,553	361,692	430,546	426,673
Virginia.....	43,631	30,746	36,875	37,852	32,211
West Virginia....	252,331	295,939	332,712	363,589	421,704
Kentucky.....	158,280	120,534	156,885	106,675	130,069
Tenn., Ga., Tex.	23,208	31,232	40,765	46,725	62,753
Alabama.....	112,245	195,049	281,978	326,588	283,297
Ohio.....	1,883,643	1,517,054	2,302,142	2,979,367	2,975,137
Indiana.....	405,076	409,739	502,069	604,317	569,146
Illinois.....	1,481,562	1 241,166	1,743,460	2,131,517	2,246,274
Michigan.....	77,593	47,326	89,417	88,025	91,674
Wisconsin.....	204,685	184,511	240,195	242,679	251,533
Missouri.....	75,470	59,210	68,200	79,385	90,360
Col. and Wash....	169,779	175,738	330,035	348,079	395,379
Kan., Wy., Ore., and Cal.....	38,534	34,280	31,471	44,251	47,158
Total.....	13,207,697	12,013,381	16,840,015	19,588,468	19,864,822

Twenty-seven States rolled iron or steel or both iron and steel in 1907, against the same number in 1906. Pennsylvania made over 50.7 per cent. of the total rolled production in 1907.

## COMPARATIVE PRODUCTION OF ROLLED IRON AND STEEL.

The total production of finished rolled iron and steel in 1906 and 1907 by States is given separately below in gross tons. Rolled forging blooms and rolled forging billets are included.

States.	1906—Gross tons.			1907—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Me. and Mass...	26,303	144,664	170,967	25,930	140,687	166,617
R. I. and Conn...	27,624	97,330	124,954	31,079	89,580	120,659
New York.....	85,805	1,142,488	1,228,293	93,971	1,173,150	1,267,121
New Jersey .....	43,344	135,876	179,220	32,277	147,409	179,686
Pennsylvania...	915,003	9,121,636	10,036,639	968,411	9,113,545	10,081,956
Delaware.....	6,979	11,821	18,800	13,695	11,720	25,415
Maryland.....	20,000	410,546	430,546	15,750	410,923	426,673
Virginia .....	34,349	3,503	37,852	30,726	1,485	32,211
West Virginia..	7,445	356,144	363,589	9,492	412,212	421,704
Ky., Tenn., Ga., and Texas....	70,393	83,007	153,400	67,703	125,119	192,822
Alabama .....	47,575	279,013	326,588	44,728	238,569	283,297
Ohio .....	241,914	2,737,453	2,979,367	247,817	2,727,320	2,975,137
Indiana.....	252,783	351,534	604,317	224,865	344,281	569,146
Illinois.....	222,234	1,909,283	2,131,517	211,471	2,034,803	2,246,274
Mich. and Wis.	58,900	271,804	330,704	50,000	293,207	343,207
Missouri.....	63,987	15,398	79,385	73,070	17,290	90,360
Col., Wy., and Wash.....	22,906	329,429	352,335	24,448	378,627	403,075
Ore. and Cal....	39,013	982	39,995	34,653	4,809	39,462
Total .....	2,186,557	17,401,911	19,588,468	2,200,086	17,664,736	19,864,822

## ACTIVE ROLLING MILLS AND STEEL WORKS.

In 1907 there were 522 works in 29 States and the District of Columbia which made steel ingots or castings or rolled iron or steel into finished forms, against 501 similar works in 28 States and the District of Columbia in 1906, a gain of 21 works. Of the total in 1907 there were 383 works which rolled iron or steel into finished forms and 139 works which made steel ingots or castings but not finished forms of rolled iron or steel. Rolled forging blooms and forging billets are classified as finished products.

## TOTAL PRODUCTION OF FINISHED ROLLED IRON AND STEEL.

The total production of iron and steel rolled into finished forms from 1887 to 1907 is given below. These forms embrace rails, plates, sheets, wire rods, structural shapes, nail plate, bars, bands, hoops, skelp, and all other finished rolled products. Rolled forging blooms and forging billets are included from 1905. Prior to 1892 structural shapes were included with bars, hoops, etc.

Years.	Iron and steel rails.	Plates and sheets, except nail plate.	Wire rods.	Structural shapes, not including plates.	Nail plate. Gross tons.	Bars, hoops, and all other forms.	Total. Gross tons.
1887...	2,139,640	603,355	.....	.....	308,432	2,184,279	5,235,706
1888...	1,403,700	609,827	279,769	.....	289,891	2,034,162	4,617,349
1889...	1,522,204	716,496	363,851	.....	259,409	2,374,968	5,236,928
1890...	1,885,307	809,981	457,099	.....	251,828	2,618,660	6,022,875
1891...	1,307,176	678,927	536,607	.....	223,312	2,644,941	5,390,963
1892...	1,551,844	751,460	627,829	453,957	201,242	2,579,482	6,165,814
1893...	1,136,458	674,345	537,272	387,307	136,113	2,104,190	4,975,685
1894...	1,021,772	682,900	673,402	360,305	108,262	1,795,570	4,642,211
1895...	1,306,135	991,459	791,130	517,920	95,085	2,487,845	6,189,574
1896...	1,122,010	965,776	623,986	495,571	72,137	2,236,361	5,515,841
1897...	1,647,892	1,207,286	970,736	583,790	94,054	2,497,970	7,001,728
1898...	1,981,241	1,448,301	1,071,683	702,197	70,188	3,239,760	8,513,370
1899...	2,272,700	1,903,505	1,036,398	850,376	85,015	4,146,425	10,294,419
1900...	2,385,682	1,794,528	846,291	815,161	70,245	3,575,536	9,487,443
1901...	2,874,639	2,254,425	1,365,934	1,013,150	68,850	4,772,329	12,349,327
1902...	2,947,933	2,665,409	1,574,293	1,300,326	72,936	5,383,219	13,944,116
1903...	2,992,477	2,599,665	1,503,455	1,095,813	64,102	4,952,185	13,207,697
1904...	2,284,711	2,421,398	1,699,028	949,146	61,601	4,597,497	12,013,381
1905...	3,375,929	3,532,230	1,808,688	1,660,519	64,542	6,398,107	16,840,015
1906...	3,977,887	4,182,156	1,871,614	2,118,772	54,211	7,383,828	19,588,468
1907...	3,633,654	4,248,832	2,017,583	1,940,352	52,027	7,972,374	19,864,822

#### PRODUCTION OF FORGED IRON AND STEEL.

The production of forged iron and steel car and locomotive axles, shafting, anchors, armor plate, etc., by the rolling mills and steel works of the country in 1907 amounted to 380,805 tons, of which about 23,772 tons were iron and about 357,033 tons were steel. In 1906 the production of forged products by rolling mills and steel works amounted to 352,636 tons, of which about 19,148 tons were iron and about 333,488 tons were steel.

#### PRODUCTION OF CHARCOAL IRON BLOOMS AND BILLETS.

No forges for the manufacture of blooms and billets direct from iron ore have been in operation in the United States since 1901, in which year the blooms and billets so made amounted to 2,310 gross tons, against 4,292 tons in 1900 and 3,142 tons in 1899. All the Catalan forges in the South have been abandoned; so have those in the North and West.

The iron blooms, slabs, billets, and bars made in charcoal bloomeries from pig iron or from pig iron and scrap iron and steel in 1907, for the consumption of the makers or for sale, amounted to 84,623 tons, against 94,999 tons in 1906. Similar statistics for 1905 and preceding years were not collected. In-

cluded in the production for 1907 are 4,513 tons made with natural gas alone and natural gas and charcoal. Of the total production in 1907 67,069 tons were made for the consumption of the makers and 17,554 tons for sale, against 77,166 tons for the consumption of the makers and 17,833 tons for sale in 1906.

The charcoal iron blooms, slabs, etc., produced in 1907 were made in Pennsylvania, Maryland, Kentucky, and Ohio. In 1906 these products were made by these four States and Delaware.

#### PRODUCTION OF ALLEGHENY COUNTY, PENNSYLVANIA.

The following table gives the number of blast furnaces and completed rolling mills and steel works and the production of pig iron, steel ingots and castings, rails, structural shapes, plates and sheets, miscellaneous rolled products, and all finished rolled iron and steel in Allegheny county, Pa., from 1904. Rolled forging blooms and rolled forging billets are included except for 1904.

Details—Gross tons.	1904.	1905.	1906.	1907.
Furnaces built and building....No.	42	42	47	47
Production of pig iron.....	4,383,169	5,410,890	5,702,721	5,438,233
Rolling mills and steel works...No.	64	65	67	66
Production of Bessemer steel.....	2,487,412	3,137,883	3,255,064	2,972,286
Production of open-hearth steel.....	2,737,560	3,410,482	3,799,907	3,883,014
Production of all other steel.....	36,408	44,752	50,530	50,290
Total production of steel.....	5,261,380	6,593,117	7,105,501	6,905,590
Production of all kinds of rails....	586,210	743,612	851,419	770,333
Production of structural shapes.....	601,025	881,932	1,054,747	889,066
Production of plates and sheets.....	839,015	1,232,705	1,300,873	1,346,517
Production of other rolled products.	1,707,545	2,212,322	2,478,978	2,632,314
Production of all rolled products....	3,733,795	5,070,571	5,686,017	5,638,230

#### PRODUCTION OF CUT NAILS.

Our statistics of the production of iron and steel cut nails and cut spikes embrace only standard sizes of nails and spikes cut from plates. They do not embrace railroad and other forged spikes, wire nails of any size, machine-made horseshoe nails, cut tacks, or hob, clout, basket, shoe, or other small sizes of nails. In our statistics cut spikes are always included with cut nails.

The production of cut nails and cut spikes in 1907 amounted to 1,109,138 kegs of 100 pounds each, against 1,189,239 kegs in 1906, a decrease of 80,101 kegs. The following table gives the production of cut nails and cut spikes by States in 1906 and 1907, iron nails being separated from steel nails for both years. In 1907 a little over 72 per cent. was cut from steel plate and almost 28 per cent. from iron plate.

States. Kegs of 100 pounds.	1906.			1907.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Pennsylvania.....	279,607	378,229	657,836	267,065	397,933	664,998
West Va. and Ind.....	.....	208,935	208,935	.....	175,549	175,549
Mass. and Ohio.....	.....	114,400	114,400	.....	102,333	102,333
Ky., Ill., and Cal.....	70,158	137,910	208,068	42,903	123,355	166,258
Total.....	349,765	839,474	1,189,239	309,968	799,170	1,109,138

Sixteen works in 7 States made cut nails in 1907, as compared with 16 works in 8 States in 1906. Indiana was the only State enumerated in the above table which was not a producer in 1907.

The following table gives the production by States of cut nails and cut spikes from 1902 to 1907. With the exception of 1905 there has been a steady decline in production since 1902.

States—Kegs.	1902.	1903.	1904.	1905.	1906.	1907.
Pennsylvania.....	752,729	725,000	698,326	757,407	657,836	664,998
W. Va. and Ind.	271,362	274,808	245,997	210,345	208,935	175,549
Mass. and Ohio.	267,901	203,138	182,981	158,113	114,400	102,333
Md., Va., Ky., Ill., Wis., and California.....	341,770	232,947	156,058	231,684	208,068	166,258
Total.....	1,633,762	1,435,893	1,283,362	1,357,549	1,189,239	1,109,138

In 1907 our exports of cut nails and cut spikes amounted to 15,521,208 pounds, equivalent to 155,212 kegs of 100 pounds, against 16,951,893 pounds, or 169,519 kegs, in 1906. Our imports of cut nails and cut spikes are now only nominal.

#### PRODUCTION OF WIRE NAILS.

The production of wire nails in 1907 amounted to 11,731,044 kegs of 100 pounds, as compared with 11,486,647 kegs in 1906, an increase of 244,397 kegs, or over 2.1 per cent.

The following table gives the production of wire nails by States in 1905, 1906, and 1907 in kegs of 100 pounds.

States—Kegs of 100 pounds.	1905.	1906.	1907.
New Hamp., Mass., R. I., and Conn....	264,024	281,472	263,487
New York, New Jersey, and Penna.....	4,504,376	4,688,071	4,787,311
Maryland, Ky., Ga., Alabama, and Ohio.	2,861,587	3,163,214	3,057,620
Indiana and Illinois.....	2,531,774	2,735,915	2,941,216
Michigan, Wisconsin, and Colorado.....	693,131	617,975	681,410
Total.....	10,854,892	11,486,647	11,731,044

The wire nails produced in 1907 were made by 48 works in 14 States, as compared with 49 works in 14 States in 1906, 54 works in 16 States in 1905, and 56 works in 16 States in 1904. Steel wire nails only were made.

Our exports of wire nails in 1907 amounted to 94,503,450 pounds, or 945,034 kegs, against 103,570,539 pounds, or 1,035,705 kegs, in 1906. We import very few wire nails.

#### COMPARATIVE PRODUCTION OF CUT AND WIRE NAILS.

In the following table we give the production in kegs of 100 pounds of standard sizes of cut nails and spikes cut from plates from 1896 to 1907; also the production of standard sizes of wire nails during the same period. The annual increase of wire nails over cut nails in the twelve years is also shown. The maximum production of 8,160,973 kegs of cut nails was reached in 1886 and the maximum of 11,926,661 kegs of wire nails in 1904.

Years. Kegs of 100 pounds.	Cut nails. Kegs.	Wire nails. Kegs.	Total. Kegs.	Wire nails over cut.
1896.....	1,615,870	4,719,860	6,335,730	3,103,990
1897.....	2,106,799	8,997,245	11,104,044	6,890,446
1898.....	1,572,221	7,418,475	8,990,696	5,846,254
1899.....	1,904,340	7,618,130	9,522,470	5,713,790
1900.....	1,573,494	7,233,979	8,807,473	5,660,485
1901.....	1,542,240	9,803,822	11,346,062	8,261,582
1902.....	1,633,762	10,982,246	12,616,008	9,348,484
1903.....	1,435,893	9,631,661	11,067,554	8,195,768
1904.....	1,283,362	11,926,661	13,210,023	10,643,299
1905.....	1,357,549	10,854,892	12,212,441	9,497,343
1906.....	1,189,239	11,486,647	12,675,886	10,297,408
1907.....	1,109,138	11,731,044	12,840,182	10,621,906

#### STATISTICS OF IMMIGRATION IN THE LAST SIX YEARS.

The following table gives the total number of immigrants who have arrived in the United States in the calendar years 1902 to 1907, except citizens of Canada and Newfoundland coming direct from British North America and citizens of Mexico coming direct from Mexico, who are not included in the table. From March 3, 1903, until June 30, 1907, a tax of \$2 per head has been collected on all immigrants who have arrived since the former date, with the exception of citizens of Mexico, Canada, Cuba, and Newfoundland. By act of Congress this tax was increased to \$4 per head after June 30, 1907. There was an increase of 119,330 in the total immigration of 1907 as compared with 1906 and a large increase in the arrivals from Austria-Hungary

and the United Kingdom, but a decrease in the arrivals from Italy and Russia. Finland and Poland are included with Russia.

Countries.	1902.	1903.	1904.	1905.	1906.	1907.
United Kingdom.....	51,338	88,614	123,563	101,821	107,096	122,002
Germany.....	32,736	49,222	42,848	36,943	38,838	39,948
France.....	3,391	9,385	9,999	9,463	8,903	10,766
Austria-Hungary.....	185,659	233,454	165,815	284,967	296,208	352,983
Russia and Finland.....	123,882	148,587	161,649	177,860	263,269	254,527
Sweden and Norway....	59,172	69,657	47,971	48,072	44,374	40,688
Denmark.....	6,318	7,922	9,193	7,996	7,654	7,076
Netherlands.....	2,484	5,025	4,766	4,840	5,315	8,135
Italy.....	201,269	232,528	156,794	267,541	292,221	277,827
Switzerland.....	2,623	5,331	4,461	3,980	3,655	4,169
Belgium.....	2,822	4,295	4,292	4,709	5,922	6,703
Bulgaria.....	899	2,157	1,252	2,595	5,879	18,918
Greece.....	11,490	13,598	9,617	15,150	28,126	39,173
Turkey in Europe.....	541	3,316	3,101	6,833	13,158	24,290
China.....	1,996	3,759	3,019	1,716	994	1,117
Japan.....	19,298	17,120	12,225	9,603	20,961	28,286
Turkey in Asia.....	7,363	5,043	5,731	6,892	5,936	12,383
British North America.	771	2,502	2,584	1,199	15,150	32,214
Mexico.....	403	670	1,924	2,548	1,650	3,821
West Indies.....	5,267	10,286	13,594	15,016	14,953	15,298
All other countries.....	19,567	24,900	23,859	*44,698	*34,574	33,842
Total.....	739,289	937,371	808,257	1,054,442	1,214,836	1,334,166

\* Includes 20,758 immigrants in 1905 and 12,139 immigrants in 1906 who gave their country of last permanent residence as the United States.

A striking feature of the above table is the large increase in immigration which has taken place in the last six years from Greece, Turkey in Europe, Bulgaria, Japan, Turkey in Asia, and the West Indies. The immigrants from "all other countries" in 1907 came principally from Portugal, Spain, Roumania, South America, Africa, Australia, and India. The immigrants who came from the United Kingdom in the six years covered by the table numbered 594,434; Germany, 240,535; Austria-Hungary, 1,519,086; Russia and Finland, 1,129,774; Sweden and Norway, 309,934; Italy, 1,428,180; Greece, 117,154; China, 12,601; Japan, 107,493; and the West Indies, 74,414. In the six years the total immigration from all countries was 6,088,361, Austria-Hungary, Russia and Finland, and Italy contributing 4,077,040 immigrants, or over 66.9 per cent., of the total. There was a large decrease in immigration in the first half of 1908.

For the above information we are indebted to Hon. F. P. Sargent, Commissioner-General of Immigration.

## IRON AND STEEL SHIPBUILDING.

We have received from the Hon. Eugene T. Chamberlain, Commissioner of Navigation, the following table, which shows the number and gross tonnage of iron and steel vessels launched and officially numbered in the United States during the calendar year 1907. Vessels for the United States Navy are not included.

Ports. Calendar year 1907.	Sailing.		Steam.		Barges.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Bath, Me.....	...	.....	1	2,153	...	.....	1	2,153
Boston, Mass.....	...	.....	9	23,543	...	.....	9	23,543
Bristol, R. I.....	3	132	...	.....	...	.....	3	132
New York, N. Y.....	2	1,020	14	4,510	7	2,422	23	7,952
Philadelphia, Pa.....	...	.....	28	64,752	5	1,958	33	66,710
Wilmington, Del.....	...	.....	12	12,630	...	.....	12	12,630
Newport News, Va....	...	.....	4	15,280	...	.....	4	15,280
Cedar Keys, Fla.....	...	.....	...	.....	1	93	1	93
St. Louis, Mo.....	...	.....	1	541	...	.....	1	541
Dubuque, Iowa.....	...	.....	1	1,103	...	.....	1	1,103
Buffalo, N. Y.....	...	.....	6	5,951	2	2,697	8	8,648
Cleveland, Ohio.....	...	.....	14	85,686	...	.....	14	85,686
Toledo, Ohio.....	...	.....	2	9,632	...	.....	2	9,632
Detroit, Mich.....	...	.....	13	76,678	...	.....	13	76,678
Port Huron, Mich....	...	.....	8	48,600	2	670	10	49,270
Marquette, Mich.....	...	.....	4	25,506	...	.....	4	25,506
Grand Haven, Mich..	...	.....	3	210	1	394	4	604
Chicago, Ill.....	...	.....	7	28,250	1	758	8	29,008
Milwaukee, Wis.....	...	.....	...	.....	2	1,234	2	1,234
San Francisco, Cal...	...	.....	2	17,158	...	.....	2	17,158
Seattle, Wash.....	...	.....	2	2,622	...	.....	2	2,622
Total.....	5	1,152	131	424,805	21	10,226	157	436,183

Two of the 5 sailing vessels built in 1907 were steel and 3 were composite, (steel and wood,) 2 of the 131 steam vessels were iron and 129 were steel, and 1 of the 21 barges was composite and 20 were steel. Of the 157 sailing and steam vessels and barges launched in 1907 57 steam vessels and 8 barges were built at ports on the Great Lakes, their tonnage amounting to 286,266 tons out of a total of 436,183 tons.

The Commissioner also gives us the following details for the first six months of the present year, ended on June 30, 1908: Number of steel steam vessels built, 72, with a total tonnage of 200,923 tons; number of iron steam vessels built, 1, with a tonnage of 194 tons; number of steel barges built, 4, with a total tonnage of 1,630 tons: total number of metal vessels built in the six months, 77: total tonnage, 202,747 tons.

## SUMMARY OF STATISTICS FOR 1906 AND 1907.

Subjects—Calendar years.	1906.	1907.
Production of Iron Ore, gross tons.....	47,749,728	51,720,619
Imports of Iron Ore, gross tons.....	1,060,390	1,229,168
Production of Bituminous Coal, gross tons.....	306,138,274	352,540,830
Production of Pennsylvania Anthracite, gross tons....	63,645,010	76,432,421
Production of all kinds of Coal, gross tons.....	369,783,284	428,973,251
Shipments of Pennsylvania Anthracite, gross tons...	55,698,595	67,109,393
Imports of Coal, gross tons.....	1,744,507	2,126,018
Domestic Exports of Coal, gross tons.....	9,921,819	13,152,749
Production of Coke, net tons.....	36,401,217	40,779,564
Production of Pig Iron, gross tons.....	25,307,191	25,781,361
Production of Spiegeleisen and Ferro-manganese, included in Pig Iron, gross tons.....	300,500	339,348
Production of Bessemer Steel, gross tons.....	12,275,830	11,667,549
Production of Open Hearth Steel, gross tons.....	10,980,413	11,549,736
Production of Crucible Steel, gross tons.....	127,513	131,234
Production of Blister and Patented Steel, gross tons..	14,380	14,075
Production of all kinds of Steel, gross tons.....	23,398,136	23,362,594
Production of Open Hearth Steel Castings, gross tons.	719,891	746,525
Production of all kinds of Steel Castings, gross tons.	773,705	803,117
Production of Bessemer Steel Rails, gross tons.....	3,791,459	3,380,025
Production of Open Hearth Steel Rails, gross tons...	186,413	252,704
Production of Iron Rails, gross tons.....	15	925
Production of all kinds of Rails, gross tons.....	3,977,887	3,633,654
Production of Structural Shapes, gross tons.....	2,118,772	1,940,352
Production of Iron and Steel Wire Rods, gross tons.	1,871,614	2,017,583
Production of Plate and Sheet Iron and Steel, ex- cept Nail Plate, gross tons.....	4,182,156	4,248,832
Production of Nail Plate, gross tons.....	54,211	52,027
Production of Bar, Bolt, Hoop, Skelp, Rolled Axles, Forging Blooms and Billets, etc., gross tons.....	7,383,828	7,972,374
Production of all Rolled Iron and Steel, including both Nail Plate and Rails, gross tons.....	19,588,468	19,864,822
Production of Iron and Steel Cut Nails and Cut Spikes, kegs of 100 pounds.....	1,189,239	1,109,138
Production of Steel Wire Nails, kegs of 100 pounds.	11,486,647	11,731,044
Production of Tinplates and Terne Plates, gross tons.	577,562	514,775
Production of Charcoal Blooms, Slabs, Bars, etc.; for Sale or for Consumption of Makers, gross tons...	94,999	84,623
Imports of Iron and Steel, foreign value.....	\$34,827,132	\$38,789,851
Exports of Iron and Steel, home value.....	\$172,555,588	\$197,066,781
Miles of Steam Railroad in operation on Dec. 31....	222,766	228,128
Miles of New Steam Railroad built.....	5,643	5,499
Tonnage of Iron and Steel Vessels built, cal. year...	336,500	436,183
Immigrants landed in the year ended December 31.	1,214,836	1,334,166

# PRODUCTION OF ALL KINDS OF PIG IRON IN THE UNITED STATES IN 1903, 1904, 1905, 1906, AND 1907, BY STATES.

*The following statistics, giving the total production of pig iron in the United States for the past five years, have been collected directly from the manufacturers by the American Iron and Steel Association. Production in previous years will be found in the Annual Reports of the Association.*

## TOTAL PRODUCTION OF PIG IRON FROM 1903 TO 1907.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1903.	1904.	1905.	1906.	1907.
Massachusetts.....	3,265	3,149	15,987	20,239	19,119
Connecticut.....	14,501	8,922			
New York.....	552,917	605,709	1,198,068	1,552,659	1,659,752
New Jersey.....	211,667	262,294	311,039	379,390	373,189
Pennsylvania.....	8,211,500	7,644,321	10,579,127	11,247,869	11,348,549
Maryland.....	324,570	293,441	332,096	386,709	411,833
Virginia.....	544,034	310,526	510,210	483,525	478,771
North Carolina.....	87,255	75,686	38,699	92,599	55,825
Georgia.....					
Texas.....					
Alabama.....	1,561,398	1,453,513	1,604,062	1,674,848	1,686,674
West Virginia.....	199,013	270,945	298,179	304,534	291,066
Kentucky.....	102,441	37,106	63,735	98,127	127,946
Tennessee.....	418,368	302,096	372,692	426,874	393,106
Ohio.....	3,287,434	2,977,929	4,586,110	5,327,133	5,250,687
Illinois.....	1,692,375	1,655,991	2,034,483	2,156,866	2,457,768
Indiana.....	244,709	233,225	288,704	369,456	436,507
Michigan.....					
Wisconsin.....	283,516	210,404	351,415	373,323	322,083
Minnesota.....					
Missouri.....					
Colorado.....	270,289	151,776	407,774	413,040	468,486
Washington.....					
California.....					
Total.....	18,009,252	16,497,033	22,992,380	25,307,191	25,781,361

## PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND BITUMINOUS PIG IRON FROM 1903 TO 1907.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1903.	1904.	1905.	1906.	1907.
New York.....	284,018	134,762	85,179	47,458	117,288
New Jersey.....			104,244	125,883	
Pennsylvania.....	1,615,701	1,091,641	1,485,092	1,387,345	1,254,266
Maryland.....	11,628	1,737	.....	.....	.....
Total.....	1,911,347	1,228,140	1,674,515	1,560,686	1,371,554

# PRODUCTION OF ALL KINDS OF PIG IRON IN THE UNITED STATES.—CONTINUED.

## PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON FROM 1903 TO 1907.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1903.	1904.	1905.	1906.	1907.
New York .....	430,726	547,184	1,111,885	1,505,201	1,659,752
New Jersey .....	17,464	156,153	206,795	253,507	255,901
Pennsylvania .....	6,591,729	6,550,087	9,090,741	9,857,861	10,091,994
Maryland .....	310,686	290,905	331,870	385,300	411,833
Virginia, North Car., Georgia, and Texas..	574,266	351,498	528,036	550,327	517,095
Alabama .....	1,488,291	1,423,021	1,578,514	1,649,018	1,651,533
West Virginia .....	199,013	270,945	298,179	304,534	291,066
Kentucky .....	102,441	37,106	63,381	95,945	125,984
Tennessee .....	414,821	299,446	370,217	424,341	390,606
Ohio .....	3,277,894	2,976,941	4,581,935	5,321,683	5,248,262
Illinois .....	1,692,375	1,655,991	2,034,483	2,156,866	2,457,768
Indiana .....					
Michigan .....	209,012	218,342	332,057	354,391	358,268
Wisconsin .....					
Minn., Mo., and Col....	283,503	153,745	436,844	454,524	512,348
Total .....	15,592,221	14,931,364	20,964,937	23,313,498	23,972,410

## PRODUCTION OF CHARCOAL PIG IRON FROM 1903 TO 1907.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1903.	1904.	1905.	1906.	1907.
Massachusetts .....	3,265	3,149	16,991	20,239	19,119
Connecticut .....	14,501	8,922			
New York .....	32,376	29,904			
Pennsylvania .....	4,070	2,593	3,294	2,663	2,289
Maryland and Virginia	5,794	5,335	2,071	4,903	1,444
Alabama .....	73,107	30,492	25,548	25,830	35,141
Georgia .....	41,832	24,648	21,857	*27,018	20,519
Texas .....					
Kentucky .....	15,200	8,180			
Tennessee .....					
Ohio .....	9,540	988	4,175	5,450	2,425
Michigan .....	244,709	171,519	210,573	281,368	294,922
Wisconsin, Missouri, Wash., and Cal.....	*60,363	51,799	68,419	65,536	*61,538
Total .....	505,684	337,529	352,928	433,007	437,397

\* Includes 927 tons made with mixed charcoal and coke in Wisconsin and Washington in 1903; also about 500 tons made by Georgia in 1906 with the same fuel; also a small quantity made by California in 1907 with charcoal and electricity.

STATISTICS OF THE UNITED STATES STEEL CORPORATION  
FOR THE CALENDAR YEAR 1907.

Iron ore shipments from Lake Superior and the total iron ore production in the calendar year 1907; also coke production in the same year.		By U. S. Steel Corporation.	By independent companies.	Total shipments and production.	Percentage U. S. Steel Corporation.
Shipments of iron ore from the Lake Superior region in 1907.....		23,148,467	19,096,603	42,245,070	54.7
Total production of iron ore in 1907.....		22,403,801	29,316,818	51,720,619	43.3
Production of coke in 1907.....		12,373,338	28,405,626	40,779,564	30.3
Iron and steel actually produced in the calendar year 1907.					
Gross tons.		Production U. S. Steel Corporation.	Production independent companies.	Total production. Gross tons.	Percentage U. S. Steel Corporation.
Spiegeleisen and ferro-manganese.....		186,472	152,876	339,348	54.9
Bessemer, basic, low-phosphorus, foundry, forge, ferro-silicon, and all other pig iron.		10,633,496	14,808,517	25,442,013	41.7
Total pig iron, including spiegel, ferro-mang., ferro-phos., and Bessemer ferro-sil.		10,819,968	14,961,383	25,781,351	41.9
Bessemer steel ingots and castings.....		7,556,460	4,111,089	11,667,549	64.7
Open-hearth steel ingots and castings.....		5,543,088	6,006,648	11,549,736	47.9
Total Bessemer and open-hearth steel ingots and castings.....		13,099,548	10,117,737	23,217,285	56.4
Bessemer steel rails.....		1,744,578	1,635,447	3,380,025	51.6
Structural shapes.....		1,066,727	873,625	1,940,352	54.9
Plates and sheets, including black plates for tinning but excluding nail plate....		2,372,498	1,876,334	4,248,832	55.8
Wire rods.....		1,443,191	574,392	2,017,583	71.5
Bars, skelp, nail plate, open-hearth and iron rails, and other finished rolled products.		2,814,042	5,463,988	8,278,030	33.9
Total finished rolled products, including rolled forging blooms and billets.....		9,441,036	10,423,786	19,864,822	47.5
Wire nails.....		7,794,546	3,936,498	11,731,044	66.4



# STATISTICS OF THE FOREIGN IRON TRADE FOR 1907.

VERY full statistics of the production of iron and steel in foreign countries in 1907 are available. We give below such details as have been received from statistical sources, except the production of pig iron, steel ingots and castings, and finished rolled iron and steel in Canada, which we have ourselves compiled from returns made directly to us by the manufacturers.

## CANADA.

*Coal.*—The production of coal in Canada in 1907 amounted to 9,384,787 gross tons, against 8,716,608 tons in 1906, an increase of 668,179 tons.

*Iron Ore.*—The shipments of iron ore from the mines in Canada amounted to 277,675 gross tons in 1907, as compared with 222,171 tons in 1906, an increase of 55,504 tons. Statistics of the production of iron ore in the Dominion for late years are not available.

*Pig Iron.*—The total production of all kinds of pig iron in Canada in 1907 amounted to 581,146 tons, against 541,957 tons in 1906, an increase of 39,189 tons, or over 7 per cent. In the first half of 1907 the production amounted to 270,100 tons and in the second half to 311,046 tons, an increase of 40,946 tons. Of the total production in 1907 572,025 tons were made with coke, 8,971 tons with charcoal, and 150 tons with electricity. The production of pig iron in Canada in the last fourteen years is given below. Spiegeleisen and ferro-manganese are included.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1894.....	44,791	1898.....	68,755	1902.....	319,557	1906.....	541,957
1895.....	37,829	1899.....	94,077	1903.....	265,418	1907.....	581,146
1896.....	60,030	1900.....	86,090	1904.....	270,942	.....	.....
1897.....	53,796	1901.....	244,976	1905.....	468,003	.....	.....

The production of basic pig iron in Canada in 1907 amounted to 341,257 tons, against 246,228 tons in 1906; Bessemer pig iron to 154,910 tons, against 165,609 tons in 1906; and malleable Bessemer, foundry, forge, and other miscellaneous grades of pig

iron to 84,979 tons, against 130,120 tons in 1906. Included in the latter classification is a small quantity of ferro-silicon produced in 1907 and a small quantity of ferro-nickel produced in 1906. Basic pig iron was made in 1907 by 4 companies owning 9 furnaces and Bessemer pig iron by 2 companies owning 3 furnaces. The basic and Bessemer pig iron was all made with coke. Canada has not made spiegeleisen or ferro-manganese since 1899, when small quantities were made with charcoal and coke.

On December 31, 1907, Canada had 16 completed furnaces, of which 14 were in blast and 2 were idle. Of the total 13 usually use coke for fuel and 3 use charcoal. In addition 3 coke furnaces upon which work was suspended some time ago were partly erected on December 31.

*Steel Ingots and Castings.*—The production of all kinds of steel ingots and castings in Canada in 1907 amounted to 646,754 tons, against 570,889 tons in 1906, an increase of 75,865 tons. The production in 1907 was the largest in the history of the Dominion. Bessemer and open-hearth steel ingots and castings were made in both 1906 and 1907, the production of Bessemer steel amounting to 202,268 tons in 1907, against 219,791 tons in 1906, a decrease of 17,523 tons, and the production of open-hearth steel amounting to 440,936 tons in 1907, against 347,778 tons in 1906, an increase of 93,158 tons. Almost all the Bessemer steel made in these two years was in the form of ingots and all was produced by the acid process. Of the total production of open-hearth steel in 1907 about 427,250 tons were ingots and about 13,686 tons were castings, against 336,542 tons of ingots and 11,236 tons of castings in 1906. In both years all the ingots were made by the basic process and almost all the castings by the acid process. A few thousand tons of steel castings were also made in 1906 and 1907 by minor processes.

The following table gives the production of all kinds of steel ingots and castings in Canada from 1894 to 1907 in gross tons. There has been a remarkable growth in the Canadian steel industry in the last three years, especially in the open-hearth process.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894.....	25,685	1899.....	22,000	1904.....	148,784
1895.....	17,000	1900.....	23,577	1905.....	403,449
1896.....	16,000	1901.....	26,084	1906.....	570,889
1897.....	18,400	1902.....	182,037	1907.....	646,754
1898.....	21,540	1903.....	181,514	.....	.....

*Finished Rolled Iron and Steel.*—The production of finished rolled iron and steel in Canada in 1907 amounted to about 600,179 tons, as compared with about 571,742 tons in 1906, an increase of 28,437 tons. Of the total production in 1907 about 81,093 tons were iron and about 519,086 tons were steel, against about 78,898 tons of iron and about 492,844 tons of steel in 1906. The production of one rolling mill has been estimated.

The following table gives the production of leading articles of finished rolled iron and steel in Canada in the last four years. Rolled forging blooms and forging billets are included but muck and scrap bars, blooms, billets, sheet bars, and other unfinished rolled forms are not included. Gross tons are used.

Products—Gross tons.	1904.	1905.	1906.	1907.
Rails.....	36,216	178,885	312,877	311,461
Structural shapes and wire rods.....	11,195	48,850	48,351	65,541
Plates and sheets.....	3,102	4,944	15,202	18,493
Nail plate.....	5,030	4,110	2,183	1,720
All other finished rolled forms.....	124,495	149,037	193,129	202,964
Total.....	180,038	385,826	571,742	600,179

Canada is now making over 300,000 tons of steel rails yearly. In 1907 a little less than one-half of the total production was rolled from basic open-hearth steel, while in 1906 over two-fifths of the total production was rolled from steel of this character. Canada is also making gratifying progress in the manufacture of wire rods, plates and sheets, and merchant bars.

The following table gives the production of all kinds of finished rolled iron and steel in Canada from 1895 to 1907 in gross tons. Rolled forging blooms and rolled forging billets are included for 1905 and all subsequent years. Gross tons are used.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1895.....	66,402	1900.....	100,690	1905.....	385,826
1896.....	75,043	1901.....	112,007	1906.....	571,742
1897.....	77,021	1902.....	161,485	1907.....	600,179
1898.....	90,303	1903.....	129,516	.....	.....
1899.....	110,642	1904.....	180,038	.....	.....

*Forged Iron and Steel.*—The total production of forged iron and steel by rolling mills and steel works in Canada in 1907 amounted to 33,064 tons, of which about 12,511 tons were iron and about 20,553 tons were steel.

*Cut Nails and Wire Nails.*—In 1907 the rolling mills and steel

works in Canada which operated cut nail or wire nail factories produced about 313,200 kegs of steel cut nails and steel wire nails of 100 pounds each, as compared with about 347,400 kegs in 1906.

*Active Rolling Mills and Steel Works.*—In 1907 there were 22 works in 5 Provinces which made steel ingots or castings or rolled iron or steel into finished forms, against 16 works in 4 Provinces in 1906, a gain of 6 works. Of the total in 1907 there were 16 works which rolled iron or steel into finished forms and 6 works which made steel ingots or castings but not finished forms of rolled iron or steel, while in 1906 the number of works which rolled iron or steel into finished forms was 12 and the number of works which did not produce finished rolled forms was 4.

Of the 22 active rolling mills and steel works in Canada on December 31, 1907, 5 were located in Nova Scotia, 6 in Quebec, 9 in Ontario, 1 in New Brunswick, and 1 in Manitoba.

*Imports and Exports.*—Canada annually imports considerable quantities of pig iron, especially pig iron suitable for the manufacture of Bessemer and basic open-hearth steel. In 1907 the exports of all kinds of pig iron to Canada from the United States alone amounted to 68,296 gross tons. Canada is also a large exporter of steel billets, slabs, etc., the United States alone importing 64,898 gross tons of these articles in 1907. As shown by the above tables Canada made considerably less pig iron than steel ingots and castings in both 1906 and 1907. In 1907 she also made more steel ingots and castings than finished rolled products.

#### NEWFOUNDLAND.

*Iron Ore.*—The production of iron ore in Newfoundland in 1907 amounted to 864,195 gross tons, as compared with 884,986 tons in 1906, a decrease of 20,791 tons. All the ore was mined on Belle Island, in Conception Bay. The following table gives the iron ore production of Newfoundland during the last eight years. We are indebted to Mr. James P. Howley, Director of the Newfoundland Geological Survey, for the figures. All the iron ore mined in Newfoundland is exported, principally to Nova Scotia and the United States. Gross tons are used in the table.

Years.	Tons.	Years.	Tons.	Years.	Tons.
1900.....	317,216	1903.....	588,795	1906.....	884,986
1901.....	738,206	1904.....	589,739	1907.....	864,195
1902.....	721,867	1905.....	689,970	.....	.....

## GREAT BRITAIN.

For the coal and iron ore statistics given below we are indebted to the Mining Statistics Branch of the Home Office of His Majesty's Government, and for the pig iron, Bessemer and open-hearth steel ingot, and steel rail statistics to the British Iron Trade Association. Statistics of the production of steel castings in Great Britain are not collected.

*Coal.*—The production of all kinds of coal in Great Britain in 1907, including a small quantity obtained from quarries and other workings, amounted to 267,830,962 gross tons, against 251,067,628 tons in 1906. Of the production in 1907 there were 267,812,852 tons mined under the Coal Mines Regulation Act and 18,110 tons obtained from quarries, etc., as compared with 251,050,809 tons mined under the Coal Mines Regulation Act in 1906 and 16,819 tons obtained from quarries, etc.

*Iron Ore.*—The total production of iron ore in the United Kingdom in 1907 was 15,731,604 gross tons, against 15,500,406 tons in 1906. Great Britain is a large importer of iron ore, the imports from Spain alone in 1907 amounting to 5,712,490 tons, as compared with 5,949,361 tons in 1906. In 1907 the total imports from all countries amounted to 7,638,934 tons, as compared with 7,823,084 tons in 1906. Great Britain also imports annually from 600,000 tons to 750,000 tons of purple ore or residuum of cupreous iron pyrites, which is used in blast furnaces.

*Pig Iron.*—The production of pig iron in Great Britain in 1907, as ascertained by the British Iron Trade Association, was 9,923,856 gross tons, as compared with 10,149,388 tons in 1906. The Mining Statistics Branch of the Home Office of His Majesty's Government gives the production in 1906, however, as amounting to 10,109,453 tons. The production by grades in the last four years is given by the Association in the following table.

Grades—Gross tons.	1904.	1905.	1906.	1907.
Forge and foundry pig iron.....	3,841,975	4,276,943	4,587,606	4,512,985
Hematite pig iron.....	3,362,883	4,070,222	3,990,820	3,776,797
Basic pig iron.....	1,192,120	1,057,999	1,263,317	1,406,038
Spiegel., ferro-manganese, etc....	165,680	187,573	307,645	228,036
Total.....	8,562,658	9,592,737	10,149,388	9,923,856

*Bessemer Steel.*—The production of Bessemer steel ingots in Great Britain in 1907 was 1,859,259 gross tons, against 1,907,338 tons in 1906. Of the total production in 1907 there were made

by the basic process 578,944 tons and by the acid process 1,280,315 tons. These figures do not include the production of several small special converters for which statistics can not be had and which do not produce annually more than 30,000 tons. The maximum production of Bessemer steel ingots in Great Britain was reached in 1889, when 2,140,791 tons were made.

*Open Hearth Steel.*—The production of open-hearth ingots in Great Britain in 1907 amounted to 4,663,489 gross tons, against 4,554,936 tons in 1906. Of the total production in 1907 there were made by the basic process 1,278,709 tons and by the acid process 3,384,780 tons. The maximum production of open-hearth steel ingots in Great Britain was reached in 1907.

*Total Production of Steel Ingots.*—We estimate that the total production of steel ingots in Great Britain in 1907 amounted to 6,635,000 gross tons, against an estimated production in 1906 of 6,575,000 tons. Crucible steel ingots are included but steel castings are not included.

*Steel Rails.*—The production of Bessemer steel rails in Great Britain in 1907 was 832,576 gross tons, against 854,740 tons in 1906, and the production of open-hearth steel rails in 1907 was 79,532 tons, against 94,626 tons in 1906. The total production of steel rails in Great Britain in 1907 was therefore 912,108 tons, against 949,366 tons in 1906. In 1907 the exports of all kinds of rails from Great Britain amounted to 433,638 tons, against 460,328 tons in 1906 and 546,644 tons in 1905.

#### GERMANY AND LUXEMBURG.

The Verein Deutscher Eisen-und-Stahlindustrieller has issued detailed statistics of the production of coal, iron ore, pig iron, and steel ingots and direct castings in Germany and Luxemburg in 1907. In all these industries there was a large increase in production over the preceding year.

*Coal.*—The production of stone coal and brown coal in Germany and Luxemburg in 1907 was 205,727,665 metric tons, against 193,537,493 tons in 1906, an increase of 12,190,172 tons. In 1907 the production of stone coal amounted to 143,168,301 tons, as compared with 137,117,926 tons in 1906, an increase of 6,050,375 tons. The production of brown coal in 1907 was 62,559,364 tons, against 56,419,567 tons in 1906, an increase of 6,139,797 tons.

*Iron Ore.*—The production of iron ore in Germany and Luxemburg in 1907 amounted to 27,697,127 metric tons, as compared with 26,734,570 tons in 1906, an increase of 962,557 tons.

*Pig Iron.*—The total production of pig iron in Germany and Luxemburg in 1907, including charcoal pig iron and broken and washed iron, amounted to 12,875,159 metric tons, against 12,292,819 tons in 1906, an increase of 582,340 tons. Spiegeleisen, ferro-manganese, ferro-silicon, etc., are included. Since 1896 the pig iron production of Germany and Luxemburg has more than doubled.

The production of pig iron by grades in Germany and Luxemburg in the last four years was as follows in metric tons.

Grades—Metric tons.	1904.	1905.	1906.	1907.
Foundry pig iron.....	1,740,278	1,797,680	2,003,985	2,048,502
Blast furnace castings.....	56,072	61,320	60,026	71,377
Bessemer pig iron .....	429,577	410,963	490,081	478,011
Thomas pig iron.....	6,371,994	7,032,322	8,039,808	8,428,334
Spiegel., ferro-manganese, etc.	514,012	580,344	755,678	931,140
Forge pig iron.....	932,679	976,986	929,121	900,239
All other pig iron.....	13,661	15,446	14,120	17,556
Total.....	10,058,273	10,875,061	12,292,819	12,875,159

Of the total production in 1904 about 6,348 tons were made with charcoal and about 10,051,925 tons with mineral fuel; in 1905 about 8,658 tons with charcoal and about 10,866,403 tons with mineral fuel; and in 1906 about 8,618 tons with charcoal and about 12,284,201 tons with mineral fuel. Similar statistics for 1907 are not yet available.

*Steel Ingots and Castings.*—The production of steel ingots and castings in Germany and Luxemburg in 1907 was the largest in their history. The following table gives the production of ingots and castings by processes in 1907; also the annual production of acid and basic steel from 1900, all in metric tons.

Products—Metric tons.	Acid.	Basic.	Total.
Bessemer ingots.....	387,120	7,212,454	7,599,574
Open-hearth ingots.....	212,620	4,039,940	4,252,560
Steel castings.....	85,421	126,077	211,498
Total for 1907.....	685,161	11,378,471	12,063,632
Total for 1906.....	715,952	10,591,855	11,307,807
Total for 1905.....	655,495	9,411,058	10,066,553
Total for 1904.....	610,697	8,319,594	8,930,291
Total for 1903.....	613,399	8,188,116	8,801,515
Total for 1902.....	517,996	7,262,686	7,780,682
Total for 1901.....	465,040	5,929,182	6,394,222
Total for 1900.....	422,452	6,223,417	6,645,869

There was a gain in 1907 over 1906 of 755,825 tons in the production of steel ingots and castings. By the basic process the gain was 786,616 tons, but by the acid process there was a loss of 30,791 tons. As is shown by the table over nine-tenths of the steel made annually in Germany and Luxemburg is made by the basic process. As a rule considerably more than one-half of the total output is made in Bessemer converters. In the eight years covered by the table there was a total gain in ingots and castings of 5,417,763 tons, or over 81 per cent.

## FRANCE.

We are indebted to the General Secretary of the Comité des Forges de France for the following statistics for France for 1907 and 1906. The figures given for 1907 are chiefly provisional.

*Coal.*—The production of coal and lignite in France in 1907 was 36,930,250 metric tons, against 34,196,385 tons in 1906.

*Iron Ore.*—The production of iron ore in France in 1906 was 8,481,423 metric tons, against 7,395,409 tons in 1905. Statistics for 1907 are not yet available.

*Pig Iron.*—The production of pig iron in France in 1907, including direct castings from the blast furnace, amounted to 3,588,949 metric tons, against 3,314,162 tons in 1906. By grades the production in the last four years was as follows:

Grades—Metric tons.	1904.	1905.	1906.	1907.
Blast furnace castings.....	143,715	106,209	97,506	112,467
Foundry pig iron.....	463,218	529,463	485,515	539,233
Forge pig iron.....	701,109	705,691	739,037	673,885
Bessemer (acid) pig iron.....	194,118	160,411	152,107	122,046
Thomas (basic) pig iron.....	1,440,666	1,530,671	1,787,146	2,096,063
Spiegeleisen, ferro-manganese, etc....	31,216	44,267	52,851	45,255
Total.....	2,974,042	3,076,712	3,314,162	3,588,949

Of the total production in 1906 there were 3,291,473 tons made with coke, 9,032 tons with charcoal, and 13,657 tons with electricity. Similar details for 1907 are not at hand.

*Steel.*—The production of Bessemer, open-hearth, crucible, and other steel ingots in France in 1907 was 2,677,805 metric tons, against 2,451,509 tons in 1906 and 2,255,223 tons in 1905. The production of all kinds of steel castings in 1907 was 31,505 tons, against 26,549 tons in 1906. The total production of steel ingots and castings in 1907 was 2,709,310 tons, against 2,478,058 tons in 1906. Of the total steel ingot production in 1907

1,707,932 tons were Bessemer, (77,421 tons acid and 1,630,511 tons basic,) 955,555 tons were open-hearth, and 14,318 tons were crucible and other kinds. Similar details for steel castings for 1907 are not yet available, but in 1906 there were produced 9,117 tons by the Bessemer process, 15,726 tons by the open-hearth process, and 1,706 tons by other processes.

*Steel Rails.*—The production of steel rails in France in 1907 amounted to 297,762 metric tons, against 328,474 tons in 1906.

#### ALGERIA.

*Iron Ore.*—The production of iron ore in Algeria in 1906 amounted to 779,826 metric tons, against 568,609 tons in 1905. These figures are official. Statistics for 1907 are not yet available.

#### SPAIN.

*Coal.*—The total production of coal in Spain in 1906, including small quantities of anthracite, bituminous shale, and lignite, was 3,397,838 metric tons, against 3,372,669 tons in 1905.

*Iron Ore.*—The production of iron ore in Spain in 1906 amounted to 9,448,533 metric tons, against 9,077,245 tons in 1905.

*Pig Iron.*—The production of pig iron in Spain in 1906 was 379,241 metric tons, against 393,622 tons in 1905.

*Steel.*—The production of Bessemer and open-hearth steel ingots and castings in Spain in 1906 amounted to 258,455 metric tons, against 239,553 metric tons in 1905.

#### BELGIUM.

*Coal.*—The production of coal in Belgium in 1906 is officially stated to have amounted to 23,569,860 metric tons, against 21,775,280 tons in 1905. For 1907 preliminary statistics show a production of 23,824,499 metric tons.

*Iron Ore.*—The production of iron ore in Belgium in 1906 amounted to 232,570 metric tons, against 176,620 tons in 1905.

*Pig Iron.*—The production of pig iron in Belgium in 1906 was 1,375,775 metric tons, against 1,311,120 tons in 1905. These figures are official. Provisional statistics give the production in 1907 as amounting to 1,427,940 metric tons.

*Steel.*—The production of steel ingots and castings in Belgium in 1906 was 1,440,860 metric tons, against 1,227,110 tons in 1905.

#### ITALY.

*Coal.*—The production of anthracite coal, lignite, and bituminous shale in Italy in 1906 was 473,293 metric tons, nearly all of which was lignite. The production in 1905 was 412,916 tons.

*Iron Ore.*—The production of iron ore in Italy in 1906 amounted to 384,217 metric tons and in 1905 to 366,616 tons.

*Pig Iron.*—The production of pig iron in Italy in 1906, including castings made direct from the blast furnace, amounted to 135,296 metric tons, against 143,079 tons in 1905.

*Steel.*—The production of steel ingots and castings in Italy in 1906 amounted to 390,740 metric tons, against 270,199 tons in 1905 and 201,148 tons in 1904. Included in the total for 1906 are 9,573 tons of steel castings, against 5,460 tons in 1905.

*Finished Steel.*—The production of finished rolled steel in Italy in 1906, not including castings, amounted to 253,390 metric tons, against 181,793 tons in 1905 and 142,009 tons in 1904.

#### SWEDEN.

We have no official statistics of the production of coal, iron ore, pig iron, or steel in Sweden in 1907. Statistics for 1906 will be found in our Annual Report for that year.

#### AUSTRIA.

For the following statistics for coal, iron ore, and pig iron for Austria we are indebted to the Royal Minister of Commerce.

*Coal.*—The total production of coal in Austria in 1907 was 40,112,529 metric tons, against 37,641,021 tons in 1906. Of the production in 1907 26,262,109 tons were brown coal.

*Iron Ore.*—The production of iron ore in Austria in 1907 was 2,540,118 metric tons, against 2,253,662 tons in 1906.

*Pig Iron.*—The production of pig iron in Austria in 1907, including castings, was 1,383,523 metric tons, against 1,222,230 tons in 1906, 1,119,614 tons in 1905, and 988,364 tons in 1904.

#### HUNGARY.

*Coal.*—The total production of brown and bituminous coal in Hungary in 1906 was 7,602,944 metric tons, against a total production in 1905 of 7,176,665 tons. In 1906 the production of bituminous coal amounted to 1,237,730 tons and of brown coal to 6,365,214 tons, against 1,088,087 tons of bituminous and 6,088,578 tons of brown coal in 1905.

*Iron Ore.*—The production of iron ore in Hungary in 1906 was 1,698,291 metric tons, against 1,661,358 tons in 1905.

*Pig Iron.*—The production of pig iron in Hungary in 1906 was 419,691 metric tons, against 421,281 tons in 1905. Of the total production in 1906 17,164 tons were direct blast furnace castings, against 17,563 tons in 1905.

## BOSNIA AND HERZEGOVINA.

*Coal.*—The production of brown coal in Bosnia and Herzegovina in 1906 amounted to 594,172 metric tons, against 540,236 tons in 1905 and 483,617 tons in 1904.

*Iron Ore.*—The production of iron ore in 1907 in Bosnia and Herzegovina amounted to 164,893 metric tons, against 136,513 tons in 1906 and 122,539 tons in 1905.

*Pig Iron.*—The production of pig iron in Bosnia and Herzegovina in 1907 amounted to 48,923 metric tons, against 45,660 tons in 1906 and 43,074 tons in 1905.

*Steel.*—The production of steel ingots and castings in Bosnia and Herzegovina in 1907 amounted to 31,180 metric tons, against 30,263 tons in 1906 and 22,223 tons in 1905.

## AUSTRIA-HUNGARY.

The production of coal, iron ore, and pig iron in Austria, Hungary, Bosnia, and Herzegovina in 1905 and 1906 was as follows:

*Coal.*—Production in 1906, 45,838,137 metric tons, against 42,994,240 tons in 1905.

*Iron Ore.*—Production in 1906, 4,088,466 metric tons, against 3,697,679 tons in 1905.

*Pig Iron.*—Production in 1906, 1,687,581 metric tons, against 1,583,969 tons in 1905. Blast furnace castings are included.

*Steel.*—Statistics of the production of steel ingots and castings in Austria and Hungary are not annually collected.

## GREECE.

*Coal.*—The production of lignite in Greece in 1906 amounted to 11,582 metric tons, against 11,757 tons in 1905.

*Iron Ore.*—The production of iron ore in Greece in 1906 amounted to 680,620 metric tons, against 465,622 tons in 1905.

## RUSSIA.

*Coal.*—The production of coal in Russia in 1906 is reported to have amounted to about 21,643,800 metric tons, against 19,628,008 tons in 1905.

*Iron Ore.*—The production of iron ore in Russia in 1907 was about 4,400,000 metric tons, against 3,873,356 tons in 1906.

*Pig Iron.*—The production of pig iron in Russia in 1906 amounted to 2,661,029 metric tons, against 3,025,790 tons in 1905.

*Steel.*—The production of steel ingots in Russia in 1906 amounted to about 162,896,536 poods, against about 165,966,674 poods in 1905. A pood is equal to about 36 English pounds.

## INDIA.

*Coal.*—The production of coal in India in 1906 amounted to 9,783,250 gross tons, against 8,417,739 tons in 1905.

*Iron Ore.*—In 1906 India mined 74,106 gross tons of iron ore, against 102,529 tons in 1905.

*Manganese Ore.*—The production of manganese ore in India in 1906 amounted to 495,730 tons, against 253,936 tons in 1905.

## AUSTRALASIA.

*Coal.*—In 1907 Queensland produced 683,272 gross tons of coal, against 606,772 tons in 1906, and Tasmania produced 58,891 tons, against 52,896 tons in 1906. Statistics of the production of coal in 1907 in New South Wales, New Zealand, Victoria, and Western Australia are not yet available, but in 1906 New South Wales produced 7,626,362 tons, against 6,632,138 tons in 1905; New Zealand, 1,729,536 tons, against 1,585,756 tons in 1905; Victoria, 160,631 tons, against 155,135 tons in 1905; and Western Australia, 149,755 tons, against 127,364 tons in 1905.

*Iron Ore.*—In 1907 Queensland mined 35,856 tons of iron ore, against 31,401 tons in 1906. In 1907 Tasmania mined about 3,000 tons of iron ore, against 2,600 tons in 1906. In 1906 New South Wales produced 935 gross tons of iron ore, South Australia produced 75,226 gross tons of iron ore, and Western Australia produced 1,280 tons of iron ore. Virtually all of this material was used for fluxing purposes.

## SOUTH AFRICA.

*Coal.*—The production of coal in the Transvaal in the fiscal year ended June 30, 1907, is said to have amounted to 2,912,083 gross tons, against 2,582,504 tons in the calendar year 1906. In the Orange River Colony the production of coal in 1906 was 338,502 gross tons and in Cape Colony it was 127,569 tons.

## JAPAN.

*Coal.*—The production of coal in Japan in 1907 amounted to 13,716,488 gross tons, against 12,980,103 metric tons in 1906.

*Iron Ore.*—The production of iron ore in Japan in 1905 is said to have amounted to about 53,212 metric tons.

*Pig Iron.*—The production of pig iron in Japan in 1907 is said by an English statistical journal to have amounted to 42,919 gross tons, against 42,679 metric tons in 1906.

*Steel.*—The same journal says that the production of steel in Japan in 1907 was 4,520 gross tons, against 3,162 tons in 1906.

# THE WORLD'S IRON TRADE IN 1906.

## THE WORLD'S PRODUCTION OF IRON ORE AND COAL.

THE following table gives the production of iron ore and coal in all countries in 1906. Tons of 2,240 pounds are used in giving the production of the United States, Great Britain, Canada, Cuba, India, Natal, the Transvaal, New South Wales, New Zealand, other Australasia, and "other countries," and metric tons of 2,204 pounds are used for all other countries, the latter being used as the equivalent of English tons in ascertaining the total production of all countries. The statistics are from official sources. The Belgian coal statistics do not include lignite. With the exception of iron ore for Japan the figures are all for 1906.

Countries.	Iron ore.			Coal and lignite.		
	Years.	Production. Tons.	Per- centage.	Years.	Production. Tons.	Per- centage.
United States.....	1906	47,749,728	37.97	1906	369,783,284	36.86
Great Britain.....	1906	15,500,406	12.33	1906	251,067,628	25.03
Germany and Luxem.	1906	26,734,570	21.26	1906	193,537,493	19.29
France.....	1906	8,481,423	6.74	1906	34,196,385	3.41
Belgium.....	1906	232,570	0.18	1906	23,569,860	2.35
Austria *.....	1906	2,390,175	1.90	1906	38,235,193	3.81
Hungary.....	1906	1,698,291	1.35	1906	7,602,944	0.76
Russia and Finland.....	1906	3,873,356	3.08	1906	21,643,800	2.16
Sweden.....	1906	4,502,597	3.58	1906	296,980	0.03
Spain.....	1906	9,448,533	7.51	1906	3,397,838	0.34
Italy.....	1906	384,217	0.31	1906	473,293	0.05
Canada.....	1906	†222,171	0.18	1906	8,716,608	0.87
Newfoundland.....	1906	884,986	0.70	.....	.....	.....
Cuba.....	1906	†649,421	0.52	.....	.....	.....
Transvaal.....	.....	.....	.....	1906	2,582,504	0.26
Natal.....	.....	.....	.....	1906	1,238,713	0.12
India.....	1906	74,106	0.06	1906	9,783,250	0.98
Greece.....	1906	680,620	0.54	1906	11,582	.....
New South Wales.....	1906	935	.....	1906	7,626,362	0.76
New Zealand.....	.....	.....	.....	1906	1,729,536	0.17
Other Australasia.....	1906	110,507	0.09	1906	970,054	0.10
Japan.....	1905	53,212	0.04	1906	12,980,103	1.29
Algeria.....	1906	779,826	0.62	.....	.....	.....
Other countries (about)	1906	1,308,350	1.04	1906	13,656,590	1.36
Total.....	.....	125,760,000	100.00	.....	1,003,100,000	100.00

\* Includes Bosnia and Herzegovina.

† Shipments.

## THE WORLD'S PRODUCTION OF PIG IRON AND STEEL.

In the following table is given the production of pig iron and steel in all countries in 1906. Tons of 2,240 pounds are used for the United States, Great Britain, Canada, and "other countries," and metric tons of 2,204 pounds for all other countries, metric tons being used as the equivalent of English tons in ascertaining the total production for all countries. The statistics of steel production for the United States, Great Britain, Germany and Luxemburg, France, Belgium, Austria-Hungary, Russia and Finland, Sweden, Spain, Italy, and Canada embrace ingots and for some countries direct castings, including the United States.

Countries.	Pig iron.			Steel.		
	Years.	Production. Tons.	Per- centage.	Years.	Production. Tons.	Per- centage.
United States.....	1906	25,307,191	43.15	1906	23,398,136	45.82
Great Britain.....	1906	10,109,453	17.24	1906	6,575,000	12.88
Germany and Luxem..	1906	12,292,819	20.96	1906	11,307,807	22.15
France.....	1906	3,314,162	5.65	1906	2,478,058	4.85
Belgium.....	1906	1,375,775	2.35	1906	1,440,860	2.82
Austria*.....	1906	1,267,890	2.16	1906	†1,500,000	2.94
Hungary.....	1906	419,691	0.71	1906		
Russia and Finland....	1906	2,661,029	4.54	1906	2,669,020	5.23
Sweden.....	1906	604,789	1.03	1906	398,047	0.78
Spain.....	1906	379,241	0.65	1906	258,455	0.51
Italy.....	1906	135,296	0.23	1906	390,740	0.76
Canada.....	1906	541,957	0.92	1906	570,889	1.12
Other countries (about)	1906	240,707	0.41	1906	72,988	0.14
Total.....	.....	58,650,000	100.00	.....	51,060,000	100.00

\* Includes Bosnia and Herzegovina.

† Estimated.

In tables that have appeared in previous issues of our Annual Report we have given the world's total production of pig iron in 1800 as 825,000 English tons; in 1830 as 1,825,000 tons; in 1850 as 4,750,000 tons; in 1870 as 11,900,000 tons; in 1880 as 17,950,000 tons; in 1890 as 27,157,000 tons; in 1900 as 40,400,000 tons; and we now estimate the total production in 1906 as amounting to 58,650,000 tons.

About thirty years ago we estimated the world's production of steel in 1878 as amounting to 3,021,000 English tons. Subsequently we estimated the production in 1889 as amounting to 10,948,000 tons and in 1900 to 27,430,000 tons. The figures given in the above table show that production had increased in 1906 to 51,060,000 tons.

# STATISTICAL ABSTRACT.

## PRODUCTION OF PIG IRON IN THE UNITED STATES BY FUELS.

In the following table pig iron made with mixed anthracite and coke as fuel is included in the anthracite column, pig iron made with both raw coal and coke as fuel is included in the bituminous column, and pig iron made with mixed charcoal and coke, etc., is included in the charcoal column. All the statistics have been compiled by the American Iron and Steel Association.

Years—Gross tons.	Anthracite.	Charcoal.	Bituminous.	Total.
1854.....	303,067	305,623	48,647	657,337
1855*.....	340,952	303,502	55,705	700,159
1856.....	395,637	330,777	62,101	788,515
1857.....	348,558	294,929	69,153	712,640
1858.....	322,705	254,744	52,099	629,548
1859.....	421,201	253,608	75,751	750,560
1860.....	463,581	248,510	109,132	821,223
1861.....	365,383	174,355	113,426	653,164
1862.....	419,924	166,661	116,685	703,270
1863.....	515,748	189,290	141,037	846,075
1864.....	610,730	215,940	187,612	1,014,282
1865.....	428,177	234,234	169,359	831,770
1866.....	669,078	296,946	239,639	1,205,663
1867.....	713,070	307,447	284,506	1,305,023
1868.....	797,322	330,357	303,571	1,431,250
1869†.....	867,098	350,134	494,055	1,711,287
1870.....	830,357	325,893	508,929	1,665,179
1871.....	854,114	343,750	508,929	1,706,793
1872.....	1,223,047	446,953	878,713	2,548,713
1873.....	1,172,102	515,732	873,129	2,560,963
1874.....	1,073,343	514,783	813,136	2,401,262
1875†.....	810,755	366,956	846,022	2,023,733
1876.....	709,445	275,579	883,937	1,868,961
1877.....	834,640	283,789	948,165	2,066,594
1878.....	975,777	261,963	1,063,475	2,301,215
1879.....	1,136,629	320,422	1,284,802	2,741,853
1880.....	1,613,974	479,963	1,741,254	3,835,191
1881.....	1,548,627	570,391	2,025,236	4,144,254
1882.....	1,823,338	623,130	2,176,855	4,623,323
1883.....	1,683,568	510,469	2,401,473	4,595,510
1884.....	1,416,476	409,301	2,272,091	4,097,868
1885.....	1,298,562	357,004	2,388,960	4,044,526
1886.....	1,874,640	410,319	3,398,370	5,683,329
1887.....	2,087,847	516,234	3,813,067	6,417,148

Years—Gross tons.	Anthracite.	Charcoal.	Bituminous.	Total.
1888.....	1,719,401	534,633	4,235,704	6,489,738
1889.....	1,714,602	575,268	5,313,772	7,603,642
1890.....	2,186,411	628,145	6,388,147	9,202,703
1891.....	1,866,108	576,964	5,836,798	8,279,870
1892.....	1,797,113	537,621	6,822,266	9,157,000
1893.....	1,347,529	386,789	5,390,184	7,124,502
1894.....	914,742	222,422	5,520,224	6,657,388
1895.....	1,270,899	225,341	7,950,068	9,446,308
1896.....	1,146,412	310,244	7,166,471	8,623,127
1897.....	932,777	255,211	8,464,692	9,652,680
1898.....	1,203,273	296,750	10,273,911	11,773,934
1899.....	1,599,552	284,766	11,736,385	13,620,703
1900.....	1,677,048	2384,482	11,727,712	13,789,242
1901.....	1,712,527	2383,441	13,782,386	15,878,354
1902.....	1,115,247	2390,169	16,315,891	17,821,307
1903.....	1,911,347	2505,684	15,592,221	18,009,252
1904.....	1,228,140	337,529	14,931,364	16,497,033
1905.....	1,674,515	352,928	20,964,937	22,992,380
1906.....	1,560,686	2433,007	23,313,498	25,307,191
1907.....	1,371,554	2437,397	23,972,410	25,781,361

\* Anthracite passes charcoal. † Bituminous passes charcoal. ‡ Bituminous passes anthracite. § Includes small quantities of mixed charcoal and coke pig iron.

#### PRODUCTION OF PIG IRON IN THE UNITED STATES SINCE 1810.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1810.....	53,908	1862.....	703,270	1885.....	4,044,526
1820.....	20,000	1863.....	846,075	1886.....	5,683,329
1828.....	130,000	1864.....	1,014,282	1887.....	6,417,148
1829.....	142,000	1865.....	831,770	1888.....	6,489,738
1830.....	165,000	1866.....	1,205,663	1889.....	7,603,642
1831.....	191,000	1867.....	1,305,023	1890.....	9,202,703
1832.....	200,000	1868.....	1,431,250	1891.....	8,279,870
1840.....	286,903	1869.....	1,711,287	1892.....	9,157,000
1842.....	215,000	1870.....	1,665,179	1893.....	7,124,502
1846.....	765,000	1871.....	1,706,793	1894.....	6,657,388
1847.....	800,000	1872.....	2,548,713	1895.....	9,446,308
1848.....	800,000	1873.....	2,560,963	1896.....	8,623,127
1849.....	650,000	1874.....	2,401,262	1897.....	9,652,680
1850.....	563,755	1875.....	2,023,733	1898.....	11,773,934
1852.....	500,000	1876.....	1,868,961	1899.....	13,620,703
1854.....	657,337	1877.....	2,066,594	1900.....	13,789,242
1855.....	700,159	1878.....	2,301,215	1901.....	15,878,354
1856.....	788,515	1879.....	2,741,853	1902.....	17,821,307
1857.....	712,640	1880.....	3,835,191	1903.....	18,009,252
1858.....	629,548	1881.....	4,144,254	1904.....	16,497,033
1859.....	750,560	1882.....	4,623,323	1905.....	22,992,380
1860.....	821,223	1883.....	4,595,510	1906.....	25,307,191
1861.....	653,164	1884.....	4,097,868	1907.....	25,781,361

## THE WORLD'S GREAT PIG IRON PRODUCERS.

The following table gives the production of pig iron from 1867 to 1907 by the three great pig iron making countries. For the United States and Great Britain tons of 2,240 pounds are used, and for Germany and Luxemburg metric tons of 2,204 pounds.

Years.	United States. Gross tons.	Great Britain. Gross tons.	Germany and Luxemburg. Metric tons.
1867.....	1,305,023	4,761,023	1,113,606
1868.....	1,431,250	4,970,206	1,264,347
1869.....	1,711,287	5,445,757	1,409,429
1870.....	1,665,179	5,963,515	1,391,124
1871.....	1,706,793	6,627,179	1,563,682
1872.....	2,548,713	6,741,929	1,988,395
1873.....	2,560,963	6,566,451	2,240,575
1874.....	2,401,262	5,991,408	1,906,263
1875.....	2,023,733	6,365,462	2,029,389
1876.....	1,868,961	6,555,997	1,846,345
1877.....	2,066,594	6,608,664	1,781,989
1878.....	2,301,215	6,381,051	2,147,641
1879.....	2,741,853	5,995,337	2,226,587
1880.....	3,835,191	7,749,233	2,729,038
1881.....	4,144,254	8,144,449	2,914,009
1882.....	4,623,323	8,586,680	3,380,806
1883.....	4,595,510	8,529,300	3,469,719
1884.....	4,097,868	7,811,727	3,600,612
1885.....	4,044,526	7,415,469	3,687,434
1886.....	5,683,329	7,009,754	3,528,657
1887.....	6,417,148	7,559,518	4,023,953
1888.....	6,489,738	7,998,969	4,337,121
1889.....	7,603,642	8,322,824	4,524,558
1890.....	9,202,703	7,904,214	4,658,450
1891.....	8,279,870	7,406,064	4,641,217
1892.....	9,157,000	6,709,255	4,937,461
1893.....	7,124,502	6,976,990	4,986,003
1894.....	6,657,388	7,427,342	5,380,039
1895.....	9,446,308	7,703,459	5,464,501
1896.....	8,623,127	8,659,681	6,372,575
1897.....	9,652,680	8,796,465	6,881,466
1898.....	11,773,934	8,609,719	7,312,766
1899.....	13,620,703	9,421,435	8,143,133
1900.....	13,789,242	8,959,691	8,520,540
1901.....	15,878,354	7,928,647	7,880,087
1902.....	17,821,307	8,679,535	8,529,900
1903.....	18,009,252	8,935,063	10,017,901
1904.....	16,497,033	8,693,650	10,058,273
1905.....	22,992,380	9,608,086	10,875,061
1906.....	25,307,191	10,109,453	12,292,819
1907.....	25,781,361	9,923,856	12,875,159

PRODUCTION AND PRICES OF BESSEMER STEEL RAILS IN THE  
UNITED STATES SINCE 1867.

The following table gives the annual production in gross tons of Bessemer steel rails in the United States from 1867 to 1907, together with their average annual price at the works in Pennsylvania and the rates of duty imposed. Prices are in currency.

Years.	Gross tons.	Price.	Duty.
1867.....	2,277	\$166.00	45 per cent. <i>ad valorem</i> to January 1, 1871.
1868.....	6,451	158.46	
1869.....	8,616	132.19	
1870.....	30,357	106.79	
1871.....	34,152	102.52	
1872.....	83,991	111.94	\$28 per ton from January 1, 1871, to August 1, 1872; \$25.20 from August 1, 1872, to March 3, 1875; \$28 from March 3, 1875, to July 1, 1883.
1873.....	115,192	120.58	
1874.....	129,414	94.28	
1875.....	259,699	68.75	
1876.....	368,269	59.25	
1877.....	385,865	45.58	
1878.....	491,427	42.21	
1879.....	610,682	48.21	
1880.....	852,196	67.52	
1881.....	1,187,770	61.08	
1882.....	1,284,067	48.50	\$17 per ton from July 1, 1883, to October 6, 1890.
1883.....	1,148,709	37.75	
1884.....	996,983	30.75	
1885.....	959,471	28.52	
1886.....	1,574,703	34.52	
1887.....	2,101,904	37.08	
1888.....	1,386,277	29.83	
1889.....	1,510,057	29.25	
1890.....	1,867,837	31.78	
1891.....	1,293,053	29.92	\$13.44 per ton from October 6, 1890, to August 28, 1894.
1892.....	1,537,588	30.00	
1893.....	1,129,400	28.12	
1894.....	1,016,013	24.00	
1895.....	1,299,628	24.33	
1896.....	1,116,958	28.00	
1897.....	1,644,520	18.75	
1898.....	1,976,702	17.62	
1899.....	2,270,585	28.12	
1900.....	2,383,654	32.29	\$7.84 per ton from August 28, 1894.
1901.....	2,870,816	27.33	
1902.....	2,935,392	28.00	
1903.....	2,946,756	28.00	
1904.....	2,137,957	28.00	
1905.....	3,192,347	28.00	
1906.....	3,791,459	28.00	
1907.....	3,380,025	28.00	

## PRODUCTION OF ALL KINDS OF STEEL INGOTS AND CASTINGS.

The following table gives the production of all kinds of steel ingots and castings in the United States from 1867 to 1907.

Years—Gross tons.	Bessemer ingots and castings.	Open- hearth ingots and castings.	Crucible ingots and castings.	Miscel- laneous steel products.	Total production of steel.
1867 .....	2,679	.....	16,964		19,643
1868 .....	7,589	.....	19,197		26,786
1869 .....	10,714	893	19,643		31,250
1870 .....	37,500	1,339	29,911		68,750
1871 .....	40,179	1,785	31,250		73,214
1872 .....	107,239	2,679	26,125	6,911	142,954
1873 .....	152,368	3,125	31,059	12,244	198,796
1874 .....	171,369	6,250	32,436	5,672	215,727
1875 .....	335,283	8,080	35,180	11,256	389,799
1876 .....	469,639	19,187	35,163	9,202	533,191
1877 .....	500,524	22,349	36,098	10,647	569,618
1878 .....	653,773	32,255	38,309	7,640	731,977
1879 .....	829,439	50,259	50,696	4,879	935,273
1880 .....	1,074,262	100,851	64,664	7,558	1,247,335
1881 .....	1,374,247	131,202	80,145	2,720	1,588,314
1882 .....	1,514,687	143,341	75,973	2,691	1,736,692
1883 .....	1,477,345	119,356	71,835	4,999	1,673,535
1884 .....	1,375,531	117,515	53,270	4,563	1,550,879
1885 .....	1,519,430	133,376	57,599	1,515	1,711,920
1886 .....	2,269,190	218,973	71,973	2,367	2,562,503
1887 .....	2,936,033	322,069	75,375	5,594	3,339,071
1888 .....	2,511,161	314,318	70,279	3,682	2,899,440
1889 .....	2,930,204	374,543	75,865	5,120	3,385,732
1890 .....	3,688,871	513,232	71,175	3,793	4,277,071
1891 .....	3,247,417	579,753	72,586	4,484	3,904,240
1892 .....	4,168,435	669,889	84,709	4,548	4,927,581
1893 .....	3,215,686	737,890	63,613	2,806	4,019,995
1894 .....	3,571,313	784,936	51,702	4,081	4,412,032
1895 .....	4,909,128	1,137,182	67,666	858	6,114,834
1896 .....	3,919,906	1,298,700	60,689	2,394	5,281,689
1897 .....	5,475,315	1,608,671	69,959	3,012	7,156,957
1898 .....	6,609,017	2,230,292	89,747	3,801	8,932,857
1899 .....	7,586,354	2,947,316	101,213	4,974	10,639,857
1900 .....	6,684,770	3,398,135	100,562	4,862	10,188,329
1901 .....	8,713,302	4,656,309	98,513	5,471	13,473,595
1902 .....	9,138,363	5,687,729	112,772	8,386	14,947,250
1903 .....	8,592,829	5,829,911	102,434	9,804	14,534,978
1904 .....	7,859,140	5,908,166	83,391	9,190	13,859,887
1905 .....	10,941,375	8,971,376	102,233	8,963	20,023,947
1906 .....	12,275,830	10,980,413	127,513	14,380	23,398,136
1907 .....	11,667,549	11,549,736	131,234	14,075	23,362,594

The production of steel in the United States in the census year

1810 is returned at 917 gross tons. We have no further steel statistics until the census year 1860, when 11,838 gross tons are reported to have been made. No additional steel statistics are of record until 1863, when the total production is estimated to have fallen to 8,075 tons. In 1864 the production is estimated to have been 9,258 tons; in 1865, 13,627 tons; and in 1866, 16,940 tons.

#### THE WORLD'S GREAT STEEL PRODUCERS.

The following table gives the production of all kinds of steel ingots and castings in the United States from 1900 to 1907, compared with the production of Bessemer and open-hearth steel ingots and castings in Germany and Luxemburg, and Bessemer, open-hearth, and crucible steel ingots in Great Britain, for the same period. We have no statistics for Germany and Luxemburg of the annual production of crucible steel ingots and castings or of ingots and castings made by the various minor processes. Nor have we any statistics of the annual production in Great Britain of steel castings by any process or of steel ingots by the crucible or minor processes. To the Bessemer and open-hearth ingot figures for Great Britain we have added an estimated annual production of from 100,000 tons to 112,000 tons of crucible steel ingots. Gross tons are used for the United States and Great Britain and metric tons for Germany and Luxemburg.

Years.	United States. Gross tons.	Germany and Luxemburg. Metric tons.	Great Britain. Gross tons.
1900.....	10,188,329	6,645,869	5,001,054
1901.....	13,473,595	6,394,222	4,997,044
1902.....	14,947,250	7,780,682	5,009,067
1903.....	14,534,978	8,801,515	5,134,101
1904.....	13,859,887	8,930,291	5,126,879
1905.....	20,023,947	10,066,553	5,920,000
1906.....	23,398,136	11,307,807	6,575,000
1907.....	23,362,594	12,063,632	6,635,000

In the eight years covered by the table the increase in the production of all kinds of steel ingots and castings in the United States amounted to 13,174,265 gross tons, or over 129 per cent.; in Germany and Luxemburg the increase in the production of Bessemer and open-hearth steel ingots and castings amounted to 5,417,763 metric tons, or over 81 per cent.; while in Great Britain the increase in the production of Bessemer, open-hearth, and crucible steel ingots amounted to only 1,633,946 gross tons, or a little over 32 per cent.

STATISTICS  
OF THE  
AMERICAN AND FOREIGN IRON TRADES  
FOR 1908.

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ANNUAL STATISTICAL REPORT  
OF THE  
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CONTAINING

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PRESENTED TO THE MEMBERS, APRIL 26, 1909.

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

---

WILLIAM METCALF, *Vice President of the American Iron and Steel Association, Pittsburgh, Pennsylvania.*

DEAR SIR: On January 11 of the present year our honored President, Joseph Wharton, could have said, with David of old: "I go the way of all the earth," for that day he died. The Annual Statistical Report of the American Iron and Steel Association for 1908 is therefore submitted to you as its senior vice president, a position to which you were duly elected on December 14, 1884. Like its predecessors for the last thirty-six years this Report will be found upon examination to contain complete statistics of the iron and steel industries of our own country and of our iron ore, coal, coke, shipbuilding, and other contributory industries; also the latest statistics that have been received of the foreign iron and steel, iron ore, and coal industries. No subject of interest to the iron trade has been overlooked or neglected in any of these Reports. The present Report appears much earlier than some of its predecessors, in the hope that it may be found useful in connection with the subject of tariff revision which is now receiving attention at the special session of the 61st Congress.

Since the appearance of our last Annual Report on July 12, 1908, the work of this office has been continued on lines that are well established and well understood by our members. The historical and statistical work of the office, which are interwoven, and the defense of our protective policy have received constant attention; the commercial side of the iron trade is never considered. That is left to other agencies and should never be a feature of the work of this Association. The limiting of production, the fixing of prices and wages, and other matters of a purely commercial character have no place in an office that is devoted to the collection of historical and statistical information relating to the greatest of all our manufacturing industries. It is becoming increasingly difficult to collect from year to year the statistics of the production of iron and steel in our country.

In September, 1908, we published and sent to our members a pocket edition of 24 pages of the metal schedule of the Dingley tariff, without note or comment, and in November we published a pamphlet of 12 pages containing comments on the general question of tariff revision which Congress was about to consider. In November also there was issued from our office a volume of 368 pages entitled "Progressive Pennsylvania," but containing a vast amount of industrial information relating to the whole country, and particularly to its iron trade. In December we published a Supplement of 20 pages to our Directory which had appeared in April, containing a complete list of the blast furnaces, rolling mills, and steel works of Canada, revised to December 1. Eighteen issues of the *Bulletin* appeared during the year.

The financial condition of the Association during the year 1908 is shown in the following abstract of the statement of our Treasurer, Mr. Andrew Wheeler, Jr., on December 31, 1908: On January 1, 1908, there was a balance in the hands of the Treasurer of \$5,520.83; the receipts from members during the year 1908 amounted to \$16,532; the expenditures during the year were \$17,253.91; leaving a balance in the Treasury on December 31, 1908, of \$4,798.92. The above figures do not include the receipts from the sale of our Directory and Annual Reports to railroad officials, iron and steel brokers, and others who are not members of the Association, or the payments from this fund in defraying in part the cost of printing these publications.

My acknowledgments are again due to Mr. Wm. G. Gray and his assistant, Mr. John F. Hayes, for intelligent attention to the collection of our statistics, and they are also due to the other members of our clerical staff for faithful service. I am also greatly indebted, as in other years, to Hon. O. P. Austin, Chief of the Bureau of Statistics of the Department of Commerce and Labor, and to other Government officials for valuable statistics relating to their respective bureaus; to the editors of the *Connellsville Courier* and the *Iron Trade Review* respectively for coke and iron ore statistics; and to the Secretary of the British Iron Trade Association, the Chief of the Statistical Bureau of the Verein Deutscher Eisen und Stahlindustrieller, General Director Richard Åkerman, of Stockholm, and other European authorities for statistical information of interest to the iron trade of this country.

Very Truly Yours, JAMES M. SWANK, *General Manager*.

No. 261 SOUTH FOURTH STREET, PHILADELPHIA, April 15, 1909.

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NOTE.—The following sketch of Mr. Metcalf is extracted from *Who's Who in America* (1908-1909): "William Metcalf, engineer, steel manufacturer; born at Pittsburgh, September 3, 1838; graduated at Rensselaer Polytechnic Institute, Troy, New York, in 1858; in charge of the manufacture of heavy Rodman and Dahlgren guns at Fort Pitt Foundry, Pittsburgh, 1860-1865; steel manufacturer since 1868. Member and past president American Society of Civil Engineers and American Institute of Mining Engineers; member American Society of Mechanical Engineers, British Institution of Civil Engineers, and Engineers' Society of Western Pennsylvania." Mr. Metcalf was for many years a member of the firm of Miller, Metcalf & Parkin, owners of the Crescent Steel Works, at Pittsburgh, and during the last twelve years he has been the president of the Braeburn Steel Company, whose works are located on the Allegheny river, a few miles north of Pittsburgh. Mr. Metcalf is the author of a standard work on the manufacture of steel.

On January 6, 1885, the office of vice president and general manager was created and James M. Swank was elected to the position. Andrew Wheeler, Jr., became treasurer of the Association on November 27, 1903, succeeding his father, Andrew Wheeler, and David Reeves has for many years audited monthly the accounts of the Association.

## IRON AND STEEL NECROLOGY.

FROM JUNE, 1908, TO APRIL, 1909.

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IN the following necrological record we include brief notices of the death of a few persons who were not identified with the iron trade but who were known to many of the readers of this Annual Report.

(1908.) John H. Eckel, of Syracuse, N. Y., June 28, aged 42 years. He was born in Syracuse. In 1899 with his five brothers he established the Eckel Brothers Steel Company.—Wm. F. Niedringhaus, who was associated with his brother, ex-Congressman F. G. Niedringhaus, in the tinplate and sheet industry at Granite City, Illinois, that now forms a part of the National Enameling and Stamping Company, at St. Louis, on July 14, aged 73 years. His brother is president and his uncle, T. K. Niedringhaus, is vice president of the National Enameling and Stamping Company.—The country was startled and grieved on August 4 to learn of the sudden death on that day of Senator William B. Allison, at his home in Dubuque, Iowa, in his 80th year. He was born in Ohio on March 2, 1829, his parents being natives of Pennsylvania. Senator Allison was one of the country's really great men and his death is a national misfortune. He had been a prominent Republican leader ever since the organization of the Republican party. He was a delegate from Iowa to the Republican Convention in 1860 which nominated Abraham Lincoln for the Presidency. In 1862 he was elected a Representative in Congress, taking his seat in March, 1863, on the same day that James G. Blaine and James A. Garfield took their seats in the same body for the first time. In 1872 he was transferred to the Senate. At the time of his death he had been a continuous member of Congress for more than forty-five years. He was an able, wise, and good man. He was the last of the statesmen of the civil war period.—Charles Gordon Zug, vice president and general manager of the Zug Iron and Steel Company, August 10, at his summer home at Flushing, Long Island. Mr. Zug was the son of Charles H. Zug, president of the company bearing his name.—William Weihe, formerly one of the best-known labor leaders in the country, August 24, at his home in Pittsburgh. Mr. Weihe was president of the Amalgamated Association of Iron, Steel, and Tin Workers during the Homestead strike in 1892. At the time of his death he was a member of the board of inquiry of the Bureau of Immigration, stationed at Ellis Island, N. Y.—Eagleton Hanson, secretary of the Trenton Iron Company, at his home in Trenton, on August 27, aged 66 years. Mr. Hanson had been in the employ of the company for 38 years and its secretary during the last 29 years.—The recent death of Wm. F. Niedringhaus, of the National Enameling and Stamping Company, contributed to the death of his brother, Henry L. Niedringhaus, of St. Louis, on August 31. Mr. Niedringhaus was 67 years old. He was

a son of Thomas K. Niedringhaus and had shared the management of the National Enameling and Stamping Works with his brother, the late Wm. F. Niedringhaus, the founder of the business. He was born at Blasheim, Germany.—Joseph Bell, one of the pioneers in the iron business in the Wheeling district, in that city, on August 31, aged 89 years. He entered the iron business in 1850.—Joseph Kountz, one of the original organizers of the Braddock Wire Company, died at Charleston, W. Va., early in September, at the age of 72 years. Aside from the Braddock Wire Company he organized the Pittsburgh Wire Company at Braddock.—Thomas Wightman, Sr., 90 years old, said to be the oldest active glass manufacturer in this country, September 1, at the family home in Pittsburgh. Mr. Wightman began in the glass business as an employé in 1834 and later became a manufacturer, continuing in the trade up to the time of his death.—Oliver Dalrymple, who was known as the "bonanza farmer" of North Dakota, September 3, at his ranch at Casselton, N. D. The Dalrymple farm consisted of seventeen sections of 640 acres each, embracing 10,880 acres, devoted in the main to wheat. At one time he owned and farmed 30,000 acres.—Frank P. Sargent, Commissioner-General of Immigration, September 4. Mr. Sargent was 54 years old. He was born in Vermont. Before beginning his political career he was for 17 years chief of the Brotherhood of Locomotive Firemen.—Thomas M. Richards, first vice president of the Philadelphia and Reading Coal and Iron Company, in Philadelphia, on September 5. He was born at Reading 72 years ago.—Marcus Hanlon, for many years a special agent of the Treasury Department, in Brooklyn, on September 10, aged about 65 years.—Giovanni P. Morosini, a famous Italian banker and philanthropist, September 15, at his country place, in Riverdale, in the upper part of New York City, overlooking the Hudson. He was an enthusiast in the collection of pictures, armor, and ivories. His collection of carved ivories was the handsomest in the world. He was 74 years old.—John Leonard, iron manufacturer, living at Montclair, N. J., 75 years old, was accidentally shot and killed by his private secretary on September 16. He was president of the Manhattan Rolling Mill in New York City.—Bennett H. Brough, Secretary of the Iron and Steel Institute, suddenly, October 8, at the meeting of the Institute at Middlesbrough. Mr. Brough was a comparatively young man, being only in his 48th year. Thoroughly educated as a mining engineer and richly endowed he had achieved a worldwide reputation. In February, 1893, he was appointed Secretary of the Iron and Steel Institute in succession to Mr. J. S. Jeans. He had been connected with the Institute for upwards of 24 years.—Mrs. Charlotte Decker died at Seneca Falls, New York, on October 10. She would have been 110 years old on November 27. Her father, Godfrey Reals, was a soldier in the Continental army and served until the colonies were free. Mrs. Decker could remember her father telling of the privations of the soldiers at Valley Forge. She remembered 1813, when no grain could be raised and wheat was sold for \$5 a bushel.—Captain John Wicks, one of the best known of the old-time iron

mining men of the Lake Superior region, at Iron Mountain, Michigan, on October 12, aged 88 years. He was born in Cornwall, England, and came to Michigan in 1852. He served as mining captain at a number of mines, retiring in 1896.—O. M. Hartzell, for many years identified with the iron trade of Pittsburgh, in San Rafael, California, on October 19. He leaves two sons, one of whom is connected with the Carnegie Steel Company.—H. C. Hitner, for many years treasurer of Potts Brothers Iron Company, of Pottstown, Pa., at Pottstown, on November 5, at the age of 66 years.—John P. Meany, for many years editor of *Poor's Manual of Railroads*, November 6, aged 47 years. When a mere boy Mr. Meany entered the office of the *Manual*. He made the collection and compilation of railroad statistics his life work and became editor of the *Manual* when still a young man.—John W. Thomas, superintendent of the Chicago Heights plant of the Inland Steel Company, at his home at Chicago Heights, Illinois, November 11. He was born at Niles, Ohio, on June 14, 1856.—Oliver Weldon Barnes, a civil engineer, who had been identified with railroad construction work in various parts of this country for the last sixty years, on November 14, in New York City, aged 88 years. He was connected with the original surveys of the Pennsylvania Railroad. He was born at Hartford, Connecticut.—George Tod, president of the Brier Hill Iron and Coal Company, of Youngstown, Ohio, at his home in Youngstown on November 16. Mr. Tod was the third son of the famous War Governor, David Tod, and was born in Warren, Ohio, on October 8, 1840. He served in the army as a private and afterwards studied law but never practiced. He was a director in the Brier Hill Iron and Coal Company, of which he became president upon the death of John Stambaugh in 1888. Mr. Tod was still president of this company at the time of his death. He was a heavy stockholder and a director in the Youngstown Steel Company and a large stockholder, although not a director, in the Youngstown Sheet and Tube Company.—Anthony Francis Keating, of Pittsburgh, November 27, aged 68 years. He was born in Pittsburgh. His first employment was as assistant bookkeeper in the early 60's for John Dunlap, a tin and sheet iron manufacturer and dealer in tinnern's supplies. A few years later he became bookkeeper for the Zug iron mills, and subsequently he rose to the position of manager of this plant, a position which he held until his retirement about fourteen years ago.—Ellis Lea, member of the firm of J. Tatnall Lea & Co., of Philadelphia, November 27, of pneumonia, at his home in Germantown. He was a son of the late James M. Lea and was 49 years old.—William A. Crist, until a few months ago general manager of the Berwind-White Coal Company, at Johnstown, on December 3. He was born on March 8, 1844, at Jersey Shore, Lycoming county, Pennsylvania.—Thomas Searles, at Pottstown, Pa., December 7, of pneumonia, aged 74 years. He was president of the Searles Knitting Company, and prior to embarking in this line of business was a member of the iron manufacturing firm of Ellis & Lessig. Many years ago he helped to establish and operate the Pottstown Tack Manufacturing Company.—Major

George McCully Laughlin, president of the Keystone National Bank, of Pittsburgh, and a member of the Jones and Laughlin Steel Company, December 11, at his home in Woodland Road, Pittsburgh, of pneumonia, aged about 66 years. Mr. Laughlin was born in Pittsburgh in 1842. He served in the civil war, in the last year as personal aide on General Griffin's staff, and in that capacity he was present when General Lee surrendered.—James Corrigan, head of the firm of Corrigan, McKinney & Co., of Cleveland, iron-ore mine, vessel, and blast furnace owners and operators, December 24, at the age of 59 years. He was born in Iroquois, Ontario, in 1849.

(1909.) Joshua Rhodes, one of the men who made Pittsburgh famous, suddenly, on January 5, at the ripe old age of 87 years. He left \$25,000,000. He was born in London, England, and was a poor boy.—Alexander Thomas, secretary of the Crucible Steel Company of America, January 8, at Hamburg, Germany, aged 59 years. For more than thirty years Mr. Thomas was identified with the crucible steel industry, having been connected with the Park Steel Company prior to its amalgamation with the Crucible Steel Company of America.—Joseph Wharton, president of the Wharton Steel Company and of the American Iron and Steel Association, at his residence at Ontalauna, in the suburbs of Philadelphia, on January 11, after a prolonged illness which originated in a paralytic attack in London, England, on July 3, 1907. Mr. Wharton was born in Philadelphia on March 3, 1826.—John D. Bailey, at Pittsburgh, on January 17. He was born in that city in 1826. For a number of years he was connected with the Wayne Iron and Steel Works, and had charge of the manufacture of the plates used on the ironclad vessels built for river service during the civil war.—William G. Park, chairman of the executive committee of the Crucible Steel Company of America, suddenly, at his home in Pittsburgh, on January 19, of apoplexy. He was 59 years old and was the oldest son of James Park, Jr., senior member of the firm of Park, Brother & Co., which firm founded the Black Diamond Steel Works in 1862, which were absorbed by the Crucible Steel Company of America at its organization.—Benjamin Prescott Sherman, a grandson of Roger Sherman, one of the signers of the Declaration of Independence, and a cousin of the late Senators George F. Hoar and William M. Evarts, on January 20, at his home, in Brooklyn, N. Y., in his 89th year.—Henry Roland Curtin, president and general manager of the Curtin Forge Company and superintendent of the Eagle Iron Company, of Roland, Pa., died at Roland, on January 21, aged 59 years. Mr. Curtin was at one time a member of the State Legislature and was also Dairy and Food Commissioner for several years.—Colonel Joseph A. Andrews, president of the Andrews Steel Company and senior member of the Newport Rolling Mill Company and the Globe Iron Roofing and Corrugating Company, of Newport, Ky., on January 26, at his residence in Newport. Colonel Andrews was born in Cincinnati, on November 2, 1839.—Edward P. Townsend, one of the leading manufacturers of Beaver county, Pa., at his home in New Brighton, on January 27,

aged 65 years. Mr. Townsend was born in Pittsburgh in 1843. He was a member of the firm of C. C. & E. P. Townsend, wire and wire nail manufacturers, which business had been established in 1828 by his grandfather, Robert Townsend.—Thomas McBride, one of the best known steel experts in the United States and manager of the crucible steel department of the Crucible Steel Company of America, February 2, at his home in Pittsburgh, of pneumonia. He was born in Ireland 64 years ago, and came to this country when a young man and settled in Allegheny.—E. P. Williams, formerly a member of the Ely and Williams Company, iron and steel dealers in New York City, on February 8, at Los Angeles, California, aged 64 years.—Colonel Galloway C. Morris, a well-known manufacturer, civil war veteran, philanthropist, and for many years colonel on the staff of the 1st Brigade, N. G. P., February 8, at the home of his son, Herbert Morris, at Overbrook, Philadelphia, at the age of 72 years. He served in the civil war with distinction as a member of the Gray Reserves, and later took a prominent part in the reorganization of the National Guard of Pennsylvania.—Harry Wehr, president of the Canton Iron and Steel Company, of Canton, Md., on February 14, aged 38 years. Mr. Wehr was born in Baltimore.—Thomas P. Grasty, vice president of the Manufacturers' Record Publishing Company, of Baltimore, on February 16. Mr. Grasty was born in Yanceyville, N. C., 56 years ago.—The whole country will regret to learn of the death at Worcester, Massachusetts, on February 20, of Colonel Carroll D. Wright, president of Clark College and for many years United States Commissioner of Labor, in his 69th year. His death is a national loss. He was one of the ablest statisticians and one of the foremost economists of his generation. He was born at Dunbarton, N. H., on July 25, 1840.—Benjamin F. Mayhugh, a veteran of the civil war and a full-blooded Indian, February 26, at his home in Philadelphia. He was the last of the remaining full-blooded Delaware Indians. He was the great-grandson, on his father's side, of the great Chief Nugirlas, of the Delawares, who was one of the chiefs to sign the Conestoga treaty.—Colonel Franklin Allen, secretary of the Silk Association of America, died on February 27. Mr. Allen was born in 1838, the third son of Daniel B. Allen and Ethelinda Vanderbilt, the second child of Commodore Cornelius Vanderbilt. He graduated from Williams College in 1857.—William McCully McKelvey, at Pittsburgh, on February 28. Mr. McKelvey was 70 years old and was worth several million dollars, which he amassed in the oil, cement, and iron industries. At the time of his death he was president of the Portland Cement Company and a director in the Lockhart Iron and Steel Company and in the Pittsburgh Foundry Company.—Mrs. Philip E. Chapin, only child of the late Hon. Daniel J. Morrell, and wife of Philip E. Chapin, for several years superintendent of the Cambria Iron Works, of paralysis, at her home in Paris, on March 2.—George Thorndike Angell, "the friend of dumb animals" and the leader in the humane educational movement in the United States, died at his apartments in the Hotel Westminster, Boston, March 16, aged 86 years. Mr. Angell establish-

ed the publication, *Our Dumb Animals*. Since that time he had been actively engaged in the interest of his chosen life work. In 1905 Mr. Angell criticised President Roosevelt for his fondness for hunting wild animals. *Our Dumb Animals* was barred from the Washington public schools. Thereupon Mr. Angell denounced Mr. Roosevelt as an "educated bulldog, with the humane side of his make-up lacking." —William Peddle Henszey, a partner in the firm of Burnham, Williams & Co., proprietors of the Baldwin Locomotive Works, at his home in Philadelphia, on March 23, in his 77th year, having been born on September 24, 1832.—Dr. William Henry Wahl, a scientist of international reputation, who for the last twenty-five years had been secretary of the Franklin Institute, of Philadelphia, March 23, at his home in that city. He retired from active duties on July 21, 1908. Dr. Wahl was 60 years of age.—Jasper Rand, of New York, vice president of the Ingersoll-Rand Drill Company, at St. Mark's Hospital, Salt Lake City, on March 30. His home was at Montclair, N. J.—Joseph Rodenbough, at Easton, Pa., on April 1, aged 68 years. He was a director in the Thomas Iron Company. General T. F. Rodenbough, U. S. A., retired, is a brother of the deceased.—Dr. Persifor Frazer, the noted scientist, geologist, and chemist, April 7, at his home in Philadelphia. He was in his 65th year, having been born in Philadelphia on July 24, 1844.—Ethan Allen Hitchcock, Secretary of the Interior under Presidents McKinley and Roosevelt, at Washington, April 9, aged 74 years. Ethan Allen Hitchcock was a great-grandson on the maternal side of Colonel Ethan Allen, who captured Fort Ticonderoga. Mr. Hitchcock was for a number of years identified with the St. Louis Ore and Steel Company as its president, afterwards as its receiver.—David Roberts, former first vice president of the Tennessee Coal, Iron, and Railroad Company, and a retired capitalist, died at Birmingham, Alabama, on April 16, of pneumonia, aged 63 years. He was born in Wales.

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JOSEPH WHARTON.

## DEATH OF JOSEPH WHARTON.

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JOSEPH WHARTON, president of the Wharton Steel Company and of the American Iron and Steel Association, died at his residence at Ontalauna, in the suburbs of Philadelphia, on Monday morning, January 11, after a prolonged illness which originated in a paralytic attack in London, England, on July 3, 1907, while on a business trip to that country and other European countries. On Wednesday afternoon, January 13, his remains were cremated at Cheltenham Hills Crematory, and on the following day the ashes were deposited in Laurel Hill Cemetery. Mr. Wharton was born in Philadelphia, of Quaker parentage, on March 3, 1826. If he had lived until March 3 of the present year he would have reached the age of 83 years. His father was William Wharton, a descendant of Thomas Wharton, of Westmoreland county, England, who came to this country in 1683. His mother was Deborah Fisher, a descendant of John Fisher, who came to this country with William Penn in the *Welcome* in 1682. When Mr. Wharton was born John Adams and Thomas Jefferson were still living.

Mr. Wharton has been chiefly known to the world as an enterprising and successful manufacturer, but this distinction, although honorable in itself, does not do his memory, now that he is gone, full justice. He was far more than a manufacturer—far more than a mere money-maker. He was a scholar of greatly varied attainments in the sciences, as a linguist, and as a student of classical literature, both of ancient and modern times. He was a chemist, a geologist, a mineralogist, and a metallurgist. He was a writer of the purest and the most forcible English prose, and a writer also of felicitous poetry that would have attracted attention in literary circles if he had sent it to the magazines or preserved it in book form.

Perhaps the most remarkable feature of Mr. Wharton's career is found in the fact that he attained prominence as a man of affairs, as a scholar, as a writer of good literature, as a public speaker, and as a statesman without having in his youth enjoyed the advantages of a liberal education. He was never a student in any college or university, but he studied at home and under private tutors.

Reared a Whig Mr. Wharton was an ardent disciple of Henry Clay's protective policy, which was so ably championed in his early years by Horace Greeley and by those eminent Pennsylvanians, Henry C. Carey, Stephen Colwell, Dr. William Elder, and Andrew Stewart. In 1868, before he had become prominent as a manufacturer, he assisted in the organization of the Industrial League of Pennsylvania, of which he soon became the active head as chairman of its executive committee, composed of himself, Henry C. Lea, and William Sellers, with Daniel J. Morrell as president and Cyrus Elder as secretary. The League was exclusively a protective tariff organization.

The most important work of the Industrial League related to the repeal of the duties on tea and coffee in 1871 and 1872 and in actively resisting the reduction in 1872 of 10 per cent. of the duties on a large number of articles, but which reduction the League was mainly instrumental in restoring early in 1875. Mr. Wharton was prominent in all this work. The duties on tea and coffee have never since been restored.

In 1875 the active and effective work of the Industrial League came to an end, and the tariff work which it had been doing was taken up by the American Iron and Steel Association. Mr. Wharton was made the first vice president of the Association in 1875, which position he held and filled most acceptably to all our members until his elevation to the presidency of the Association on January 1, 1904.

Soon after Mr. Wharton's election to the vice presidency in 1875, and particularly after the death of President Samuel J. Reeves in 1878, he was generally recognized as the spokesman of the American iron trade in all Congressional and other oral controversies affecting our iron and steel industries. From this responsibility Mr. Wharton did not shrink for one moment, and he gave unhesitatingly much of his time to the exacting requirements of this unsought leadership. The iron trade of this country and other great American industries do not know how untiring was his industry and how great was his influence in meeting the assaults upon our protective policy before the House Ways and Means Committee and the Senate Committee on Finance. In all these controversies Mr. Wharton displayed great ability.

Mr. Wharton's carefully prepared contributions to the literature of protection, although unknown to the present generation, were notable at the time of their appearance for their clear presentation of the principles underlying our protective policy and for their literary excellence.

Mr. Wharton's personality had no rough edges. He was genial, cordial, and sympathetic always. He was a kind man. He made friends and kept them. While aggressive and insistent when occasion required the assertion of these qualities he never forgot when in normal health his Quaker training of patience, forbearance, and equanimity of temper. He was a hard worker all his days, and if he had worked less in his later years he would have been with us yet. He had a manly presence. Our personal relations with Mr. Wharton for almost forty years fully illustrate the manner of man that he was. We were necessarily much together as officers of the American Iron and Steel Association, his duties being advisory and ours administrative, and yet in all the years when we worked together in a common cause there never was for one moment a single jar. A few lines from Longfellow's "Three Friends of Mine" may well end this tribute.

Good night! good night! as we so oft have said  
Beneath this roof at midnight, in the days  
That are no more and shall no more return.  
Thou hast but taken thy lamp and gone to bed;  
I stay a little longer, as one stays  
To cover up the embers that still burn.

# STATISTICS OF THE AMERICAN IRON TRADE FOR 1908.

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## REVIEW OF THE AMERICAN IRON TRADE IN 1908 AND 1909.

IN our Annual Report for 1907, which was presented to our members in July, 1908, in referring to the depressed condition of the iron trade in the closing months of 1907, after the October panic of that year, and in the first half of 1908, we said that, but for the political uncertainties of the Presidential year and particularly the reopening of tariff agitation by the dominant party, "the country ought to emerge from the existing depression in a very short time." It did not do this, partly because business men and others soon realized that the tariff revision promised by the Republican party in its platform adopted at Chicago in June, 1908, meant a reduction in many duties for the benefit of foreign manufacturers. The platform declared "unequivocally for a revision of the tariff by a special session of Congress immediately following the inauguration of the next President."

The feeling that tariff revision meant tariff reduction was intensified by the interpretation placed upon the tariff plank in the Chicago platform by Mr. Taft, the Republican candidate for the Presidency. Mr. Taft said in his speech at Bath, Maine, on September 5, 1906, long prior to his nomination, that "those schedules of the tariff which have inequalities and are *excessive* will be *readjusted*," and in his speech at Milwaukee on September 24, 1908, after his nomination, he said that "there are *many* schedules of the tariff in which the rates are *excessive*," adding that "it is *my judgment* that a revision of the tariff in accordance with the pledge of the Republican platform will be on the whole a *substantial revision downward*." In the Milwaukee speech Mr. Taft also plainly implied that the "excessive" rates to which he referred were a tax upon "the consumer." This was virtually a reiteration of the free trade charge that "the tariff is a tax," a charge that has been abundantly refuted by the tables of prices of manufactured goods since protective duties in this country were firmly established during and subsequent to the civil war.

Mr. Taft's statements which we have above quoted, and others

which might be quoted, showed only too plainly during the campaign that he believed in a low tariff, one that would compel manufacturers at home to reduce their prices or else would increase foreign importations. In the first alternative mentioned he forgot that very low home prices for the benefit of "the consumer" must necessarily be accompanied by low wages, and that in the second alternative increased importations must reduce the demand for American labor.

Although Mr. Taft was elected the threat from him of tariff revision "downward" produced a more chilling effect upon the efforts of the business men of the country to revive industrial activity than the tariff declaration in the Chicago platform. As a whole business did not revive during the last six months of 1908, nor has it revived up to the date of this Report. The productive industries of this country have seriously dragged during this period, although production in most industries has increased above the record made in the greatly depressed first half of 1908. There was more activity in the iron trade in the last half of 1908 than in the first half, but this comparative activity has scarcely been maintained in the first three months of 1909; indeed so far as prices are concerned the iron trade to-day is less satisfactory than at any time in the last half of 1908. The country's agricultural industry has not, however, been injuriously affected by the panic of 1907.

To be strictly accurate the failure of the country up to the present time to emerge from the depression caused by the panic of October, 1907, is due to more than one cause, including President Roosevelt's war upon the railroads and other corporate interests, but we insist that the leading cause is the threat of tariff reduction, which threat is being carried out at the special session of Congress that was convened by President Taft on March 15 for the sole purpose of revising the tariff. Months must elapse before the revision is completed, and in the meantime it would be idle to hope for a substantial increase in this country's industrial activity.

As in other years the interruption to the prosperity of the iron trade has been mainly caused by the inability of the railroad companies to freely purchase rails, cars, and locomotives and to build bridges and make other improvements which call for iron and steel in large quantities. The railroads of the country are estimated to consume annually from 35 to 40 per cent. of our total production of iron and steel; hence if they are not prosperous

our iron and steel industries can not be. The railroads were hard hit by the panic of 1907, which greatly diminished railroad earnings. Apprehension concerning the extent to which Government interference with the management of railroads and other corporate interests may be carried has also injuriously affected the iron trade because it has checked enterprises which would have called for large quantities of iron and steel.

The effect of the industrial depression and of Government interference upon the railroads of the country is illustrated in the following synopsis of the annual report for 1908 of President McCrea of the Pennsylvania Railroad Company. Mr. McCrea says that the gross earnings for the entire system showed a shrinkage of \$52,446,722 compared to 1907 earnings, and that the net earnings, despite drastic cuts in operating expenses, decreased \$7,436,297, the cuts in operating expenses including the discharge of thousands of employes. He further shows that there were 334,429,541 tons of freight moved on the entire system, being a decrease of 103,381,275 tons, and 142,676,779 passengers carried, a decrease of 10,885,192, instead of an increase which would have resulted from a continuance of good times. Mr. McCrea notifies the stockholders of his company that the period of depression is not over.

Whether or not the attitude of the new President toward the corporations of the country will be less meddlesome and dictatorial than that of his predecessor is yet to be determined, as is also the exact character of the new tariff bill which is now in preparation by the 61st Congress. If the country could be assured that President Taft will pursue a more conservative course than his predecessor, and that the new Congress will enact a tariff bill that will preserve in its details needed protection for all our industries, we feel sure that all business would at once revive and that the prosperity of the period before the panic of 1907 would be at once restored. The tone of the President's inaugural address is not reassuring. He speaks of the necessity of "the *clinching* of the reforms which properly bear the name of my predecessor," and that "in the making of a tariff bill the prime motive is *taxation* and the securing thereby of a revenue." There is food for thought in both these quotations. The inaugural also says that "there has been such a change in conditions since the enactment of the Dingley act that the measure of the tariff above stated will permit *the reduction of rates* in certain schedules and will require the advancement of *fees, IF ANY.*"

The depression which followed the panic of 1907, and which has now lasted eighteen months, has borne with special severity upon the iron trade. How severe this reaction in the greatest of our manufacturing industries has been is shown in the following comparative statement of production in leading lines of the iron trade and in some contributory industries in 1907 and 1908.

Products, in gross tons, except Connellsville coke, which is in net tons.	1907.	1908.	Percentage of decrease.
Production of pig iron .....	25,781,361	15,936,018	38.1
Production of Bessemer steel.....	11,667,549	6,116,755	47.5
Production of open-hearth steel.....	11,549,736	7,836,729	32.1
Production of all kinds of steel.....	23,362,594	14,023,247	39.9
Production of all kinds of rails.....	3,633,654	1,921,611	47.1
Production of structural shapes.....	1,940,352	1,083,181	44.1
Shipments of Lake Superior iron ore....	42,266,668	26,014,987	38.4
Shipments of Connellsville coke.....	19,029,058	10,700,022	43.7
Locomotives built, total number.....	7,098	2,124	70.0
Locomotives built by Baldwin Works....	2,663	617	76.8
Cars built, total number.....	280,380	69,594	75.1
Number of iron and steel vessels built....	157	99	36.9
Tonnage of iron and steel vessels built....	436,183	221,541	49.2
Miles of steam railroad built.....	5,499	3,214	41.5

These figures call for little comment. Never in the history of the American iron trade has there been relatively so serious a shrinkage in one year in the aggregate production of iron and steel as occurred in 1908 in comparison with 1907. In 1908, also, both our imports and exports of iron and steel materially declined as compared with 1907. Our exports amounted in value in 1908 to \$151,113,114, as compared with \$197,066,781 in 1907, and our imports amounted to \$19,957,261, as compared with \$38,789,851 in 1907.

Now as to prices. Preceding the shrinkage in production in 1908, and even before the panic of 1907, there was a decline in the prices of most iron and steel products, which had risen in the latter part of 1906. This rise in prices in 1906 was continued into 1907, but in March of that year the prices of pig iron began to yield and continued weak until the panic of October, when they broke badly. In July, 1907, the prices of some finished products were shaded, and thereafter until the panic they continued to be shaded. Prices of steel rails and of one or two other products were maintained. When the panic came strong and influential efforts were made to maintain fair prices for iron and steel, which were then not high, the United States Steel

Corporation leading in this movement, the theory being that the cancellation of orders and the general shrinkage in business following the panic would naturally lead to a life-and-death struggle for orders unless this tendency were promptly checked. This was done and demoralization in prices was prevented, as well as a reduction in wages which would have followed deep cuts in prices. From every standpoint the policy adopted was wise and just, and it was beneficial. Nobody was injured by it. All through 1908 the iron trade passed in safety through a great crisis, although suffering severely from a scarcity of orders. The wages of the workmen who were employed were maintained.

The following table will show the monthly range of prices of leading articles of iron and steel in 1907 and 1908, all in gross tons, except for bar iron, which is quoted by the 100 pounds. Steel rails are omitted because the price of standard sections all through both the years mentioned was uniformly \$28 per ton.

Months.	No. 2 foundry pig iron, at Phila.	Basic pig iron, at Phila.	Gray forge pig iron, at Pittsburgh.	Bessemer pig iron, at Pittsburgh.	Steel billets, at mills, at Pittsburgh.	Best refined bar iron, at Phila.
Jan., 1907..	\$26.40	\$25.25	\$22.58	\$23.35	\$29.40	\$2.08
February...	26.37	25.12	22.20	23.25	29.50	2.16
March.....	25.87	25.37	21.76	22.95	29.00	2.16
April .....	25.56	24.56	21.72	23.55	30.25	2.16
May .....	25.60	24.75	22.88	24.05	30.30	2.16
June .....	24.75	24.37	23.15	24.50	29.62	2.16
July .....	23.12	23.12	22.96	23.80	30.00	2.16
August.....	22.00	20.80	21.90	22.95	29.40	2.16
September..	20.69	19.09	21.15	22.85	29.37	2.16
October .....	19.90	18.40	20.40	22.90	28.20	2.06
November..	18.94	17.81	19.17	20.35	28.00	1.96
December..	18.44	17.37	18.40	19.60	28.00	1.96
Jan., 1908..	18.20	17.10	17.00	19.00	28.00	1.76
February...	18.25	17.25	15.99	17.90	28.00	1.76
March.....	18.12	17.25	15.90	17.86	28.00	1.76
April.....	17.65	17.25	15.45	17.49	28.00	1.76
May .....	16.94	16.37	14.90	16.96	28.00	1.76
June.....	16.62	15.50	14.90	16.90	25.75	1.66
July .....	16.50	15.10	14.90	16.83	25.00	1.66
August.....	16.50	15.00	14.71	16.26	25.00	1.66
September..	16.62	15.44	14.46	15.90	25.00	1.66
October .....	16.75	15.80	14.40	15.75	25.00	1.66
November..	17.00	16.19	14.90	16.59	25.00	1.66
December..	17.25	16.70	15.25	17.40	25.00	1.66

The prices prevailing for the above products and for some others were generally maintained during January, 1909, and until

February 19, when the whole country was startled by the announcement that an "open market" for iron and steel had been proclaimed, a statement issued on that day by Judge Gary, chairman of the United States Steel Corporation, giving the reasons for this unexpected action, from which we quote as follows:

It appears that, for one reason or another, including particularly the tariff agitation, many of the smaller concerns who have not been disposed to co-operate during the last year have become more or less excited and demoralized, and have been selling their products at prices below those which were generally maintained. This feeling has been somewhat extended and has influenced unreasonable cutting of prices by some of those who were opposed to changes but felt compelled to meet conditions in order to protect their customers. As a result of these conditions there has been a material decrease in new business during the last month for the reason, as stated by consumers, that they proposed to wait until after they were satisfied bottom prices had been reached.

In view of the circumstances stated, and the further fact that the stocks on hand at the time the panic occurred have been disposed of and the contracts in force at that time have been completed or taken care of so that the necessities for the maintenance of prices which formerly existed have been modified, the leading manufacturers of iron and steel have determined to protect their customers, and for the present at least sell at such modified prices as may be necessary with respect to different commodities in order to retain their fair share of the business. The prices which may be determined upon and the details concerning the same will be given by the manufacturers to their customers direct as occasion may require.

Immediately following the appearance of Judge Gary's statement the prices of most finished iron and steel products fell several dollars per ton, the principal exception being steel rails. Pig iron yielded 50 and 75 cents per ton. A table on page 42 will show the prices prevailing in January, February, March, and April of the present year. It is certain that the reduction which has taken place in prices will be followed by a general, but moderate, reduction in wages. Some reductions have already taken place, notably by the Lackawanna, Pennsylvania, Jones and Laughlin, and Cambria Steel Companies, which have reduced wages 10 per cent., to take effect on April 1, 1909.

#### PRICES OF UNITED STATES STEEL CORPORATION STOCK.

The Philadelphia News Bureau reports to us the range of prices of the preferred and common stock of the United States Steel Corporation from January 1, 1905, to April 1, 1909.

Months.	Preferred stock.		Months.	Common stock.	
	Low.	High.		Low.	High.
January, 1905.....	91½	95½	January, 1905.....	28½	31½
February.....	94½	96	February.....	30	35½
March.....	93½	97½	March.....	33½	37½
April.....	95½	104½	April.....	30½	38½
May.....	90½	101½	May.....	24½	33½
June.....	91	100	June.....	25½	32½
July.....	98½	104	July.....	31½	35½
August.....	103½	105½	August.....	34½	37½
September.....	101½	105½	September.....	34½	38½
October.....	103½	105½	October.....	37	39½
November.....	100½	105½	November.....	35½	38½
December.....	102½	107	December.....	36	43½
January, 1906.....	105	113½	January, 1906.....	42	46½
February.....	105½	113	February.....	40½	46½
March.....	104½	107½	March.....	38½	41½
April.....	105½	107½	April.....	39½	46½
May.....	102	107	May.....	36½	41½
June.....	99½	107½	June.....	34	42
July.....	98½	107½	July.....	32½	40
August.....	105	109½	August.....	39½	47½
September.....	105	108	September.....	43½	47½
October.....	105½	108½	October.....	45½	50½
November.....	104	107½	November.....	45½	49½
December.....	102½	105½	December.....	46½	49½
January, 1907.....	104	107½	January, 1907.....	42½	50½
February.....	103½	106½	February.....	42½	46½
March.....	91½	103½	March.....	31½	44½
April.....	97½	102	April.....	35½	39½
May.....	96	102½	May.....	31½	38½
June.....	96½	99½	June.....	31½	35½
July.....	98½	101	July.....	35½	39
August.....	91½	100½	August.....	29½	35½
September.....	87½	96	September.....	26½	33½
October.....	81½	89½	October.....	21½	27½
November.....	79½	85½	November.....	22½	25½
December.....	84½	90½	December.....	24	28½
January, 1908.....	87½	95½	January, 1908.....	25½	31½
February.....	89½	93½	February.....	26½	30½
March.....	92½	100	March.....	28½	36½
April.....	97½	101½	April.....	32½	37
May.....	100	103½	May.....	35½	39½
June.....	100½	103	June.....	36½	39½
July.....	102½	109½	July.....	37½	45½
August.....	106½	112½	August.....	44	48
September.....	105½	112½	September.....	41½	48½
October.....	107½	111	October.....	45	48½
November.....	110½	114½	November.....	47½	58½
December.....	110½	113½	December.....	51½	56½
January, 1909.....	112½	115	January, 1909.....	51½	55½
February.....	107	115	February.....	41½	53½
March.....	109½	113½	March.....	42½	49½
April 1.....	113½	113½	April 1.....	49	51

## GENERAL STATISTICAL SUMMARY.

The following table gives the shipments in 1907 and 1908 of Lake Superior iron ore, the shipments of coke and of anthracite coal, the production of leading forms of iron and steel, the imports and exports of iron and steel, etc. The statistics of the production of iron ore, coal, and coke for 1908 have not been received from the United States Geological Survey, from which we have received the statistics for 1907 and previous years. The authority for other statistics in the table additional to our own iron and steel statistics is given in the body of this Report.

Articles—Gross tons, except for coke.	1907.	1908.
Shipments of iron ore from Lake Superior.....	42,266,668	26,014,987
Production of iron ore.....	51,720,619	.....
Shipments of Pennsylvania anthracite coal.....	67,109,393	64,665,014
Shipments of Cumberland coal.....	7,360,336	5,784,591
Production of all kinds of coal.....	428,895,914	.....
Production of coke, in net tons.....	40,779,564	.....
Shipments of Connellsville coke, in net tons.....	19,029,058	10,700,022
Shipments of Pocahontas Flat Top coke, net tons	2,314,938	1,819,314
Production of pig iron, including spiegel and ferro.	25,781,361	15,936,018
Production of spiegeleisen and ferro-manganese .....	339,348	152,018
Production of Bessemer steel ingots and castings....	11,667,549	6,116,755
Production of open-hearth steel ingots and castings	11,549,736	7,836,729
Production of all kinds of steel ingots and castings	23,362,594	14,023,247
Production of Bessemer steel rails.....	3,380,025	1,354,236
Production of open-hearth steel rails.....	252,704	567,304
Production of all kinds of rails.....	3,633,654	1,921,611
Production of structural shapes, not including plates	1,940,352	1,083,181
Production of iron and steel wire rods.....	2,017,583	1,816,949
Imports of iron ore.....	1,229,168	776,898
Exports of iron ore.....	278,608	309,099
Imports of iron and steel, foreign value.....	\$38,789,851	\$19,957,261
Exports of iron and steel, home value.....	\$197,066,781	\$151,113,114
Miles of new railroad built in the calendar year...	5,499	3,214
Tonnage of iron and steel vessels built, cal. year...	436,183	221,541

The decrease in shipments of iron ore from the Lake Superior region in 1908 as compared with 1907 amounted to 16,251,681 gross tons; Pennsylvania anthracite coal, 2,444,379 gross tons; Connellsville coke, 8,329,036 net tons; and Pocahontas Flat Top coke, 495,624 net tons. In pig iron the decrease in production amounted to 9,845,343 tons; spiegeleisen and ferro-manganese, 187,330 tons; Bessemer steel ingots and castings, 5,550,794 tons; open-hearth, 3,713,007 tons; total steel, 9,339,347 tons; structural shapes, 857,171 tons; and Bessemer steel rails, 2,025,789 tons.

## TOTAL PRODUCTION OF COAL.

The following table, for which we are indebted to Mr. E. W. Parker, statistician of the United States Geological Survey, gives revised statistics of the production of all kinds of coal by States in 1906 and 1907. Net tons of 2,000 pounds are used in the table. Complete statistics for 1908 have not been compiled.

States. Net tons.	1906.	1907.	States. Net tons.	1906.	1907.
Penna. bit....	129,293,206	150,143,177	Oklahoma.....	2,860,200	3,642,658
Illinois.....	41,480,104	51,317,146	Arkansas.....	1,864,268	2,670,438
West Va.....	43,290,350	48,091,583	New Mexico...	1,964,713	2,628,959
Ohio.....	27,731,640	32,142,419	Michigan.....	1,346,338	2,035,858
Alabama.....	13,107,963	14,250,454	Montana.....	1,829,921	2,016,857
Indiana.....	12,092,560	13,985,713	Utah.....	1,772,551	1,947,607
Colorado.....	10,111,218	10,790,236	Texas.....	1,312,873	1,648,069
Kentucky.....	9,653,647	10,753,124	Georgia.....	332,107	362,401
Iowa.....	7,266,224	7,574,322	North Dakota	305,689	347,760
Kansas.....	6,024,775	7,322,449	Oregon.....	79,731	70,981
Tennessee.....	6,259,275	6,810,243	Cal. & Alaska	30,831	24,089
Wyoming.....	6,133,994	6,252,990	Ida. Nev. Neb.	6,165	7,588
Maryland.....	5,435,453	5,532,628	Total bit.....	342,874,867	394,759,112
Virginia.....	4,254,879	4,710,895	Penna. anth.	71,282,411	85,604,312
Missouri.....	3,758,008	3,997,936	Grand total.	414,157,278	480,363,424
Washington..	3,276,184	3,680,532			

The bituminous figures in the table include small quantities of anthracite coal which are mined in Colorado and New Mexico.

In 1907 the total production of anthracite and bituminous coal in Pennsylvania amounted to 235,747,489 net tons, as compared with 200,575,617 tons in 1906, an increase of 35,171,872 tons.

## SHIPMENTS OF ANTHRACITE COAL AND CUMBERLAND COAL.

The shipments of anthracite coal from the Pennsylvania mines in 1908 amounted to 64,665,014 gross tons, against 67,109,393 tons in 1907. The decrease in 1908 as compared with 1907 was 2,444,379 tons. These figures are furnished to us by Mr. W. W. Ruley, of Philadelphia, the anthracite coal statistician.

The shipments of Cumberland coal from the mines of Western Maryland and West Virginia in 1908 amounted to 5,784,591 gross tons, against 7,360,336 tons in 1907. From the beginning of the Cumberland coal trade in 1842 the shipments of Cumberland coal to the close of 1908 amounted to 165,822,983 tons. For the above statistics we are indebted to Mr. E. T. Dixon, auditor of the Cumberland and Pennsylvania Railroad Company.

## SHIPMENTS OF COAL AND COKE ON THE MONONGAHELA RIVER.

We are advised by Major H. C. Newcomer, of the Corps of Engineers, U. S. Army, stationed at Pittsburgh, that in the fiscal year ended on June 30, 1908, there were shipped 10,376,922 net tons of coal and 1,250 net tons of coke through the locks and pools of the Monongahela river, against 9,907,052 net tons of coal and 2,675 net tons of coke shipped in the fiscal year 1907.

## SHIPMENTS OF CONNELLSVILLE COKE.

Mr. H. P. Snyder, the editor of the *Connellsville Courier*, reports that the shipments of coke from the Connellsville region in 1908 amounted to 10,700,022 net tons, against 19,029,058 tons in 1907, a decrease of 8,329,036 tons, or 43.7 per cent. The shipments in 1908 were made in 368,222 cars, a daily average of 1,173 cars. In 1907 the number of cars required was 691,757 and the daily average was 2,210 cars. In the Connellsville region the *Courier* includes all the districts which produce Connellsville coke, which it classifies as Connellsville and Lower Connellsville, the former shipping 6,807,598 tons and the latter 3,892,424 tons in 1908. The Lower Connellsville district made considerably over one-third of the total shipments in 1908, as compared with almost one-third in 1907. The total production of coke in the Connellsville region in 1908 is said by the *Courier* to have amounted to 9,704,413 net tons, the shipments having exceeded the production by 995,609 tons. The *Courier* says that this difference of almost a million tons between the shipments and the actual production is due to the fact that "there was in the yards of the region on the first of 1908 an immense amount of stock coke, much of which was shipped out during the year, thus making shipments larger than the production."

The average price of all coke shipped from the Connellsville region in 1908 was \$1.80 per net ton, against \$2.90 per ton in 1907, \$2.75 in 1906, \$2.26 in 1905, and \$1.75 in 1904. For furnace coke the average price in 1908 was \$1.70 per ton and for foundry coke it was \$2.10. With the single exception of 1904, when the average price of coke was \$1.75 per ton, the average in 1908 was the lowest that has prevailed since 1898, when the average was \$1.55 per ton. In the last twenty-nine years the lowest annual average price reached was in 1894, when \$1 per ton prevailed. During the same period the highest average yearly price was in 1903, when it was \$3 per ton.

In the early months of 1908 the price of furnace coke was

about \$2 per ton and foundry coke \$2.50, but in April the price of furnace coke had fallen to \$1.30 per ton and foundry coke to below \$2. These figures prevailed until November, when prices advanced smartly, furnace coke selling as high as \$2.15 per ton and foundry coke as high as \$2.50. Early in December prices weakened a little, but toward the end of the month they again strengthened, and the close of 1908 found prices firm and the region shipping coke at a higher rate than at any time during the year. The price of furnace coke on April 1, 1909, was \$1.65 to \$1.75 per ton and of foundry coke \$2 to \$2.25 per ton.

#### SHIPMENTS AND PRICES OF CONNELLSVILLE COKE SINCE 1880.

The following table, for which we are indebted to the editor of the *Courier*, gives the total number of ovens in the Connells-ville region at the close of each year from 1880 to 1908, the annual shipments of coke, and the average annual price at ovens.

Calendar years. Net tons.	Total ovens.	Shipments. Net tons.	Average price.	Calendar years. Net tons.	Total ovens.	Shipments. Net tons.	Average price.
1880.....	7,211	2,205,946	\$1.79	1895.....	17,947	8,244,438	\$1.23
1881.....	8,208	2,639,002	1.63	1896.....	18,351	5,411,602	1.90
1882.....	9,283	3,043,394	1.47	1897.....	18,628	6,915,052	1.65
1883.....	10,176	3,552,402	1.14	1898.....	18,643	8,460,112	1.55
1884.....	10,543	3,192,105	1.13	1899.....	19,689	10,129,764	2.00
1885.....	10,471	3,096,012	1.22	1900.....	20,954	10,166,234	2.70
1886.....	10,952	4,180,521	1.36	1901.....	21,575	12,609,949	1.95
1887.....	11,923	4,146,989	1.79	1902.....	26,329	14,138,740	2.37
1888.....	13,975	4,955,553	1.19	1903.....	28,092	13,345,230	3.00
1889.....	14,458	5,930,428	1.34	1904.....	29,119	12,427,468	1.75
1890.....	16,020	6,464,156	1.94	1905.....	30,842	17,896,526	2.26
1891.....	17,204	4,760,665	1.87	1906.....	34,059	19,999,326	2.75
1892.....	17,256	6,329,452	1.83	1907.....	35,697	19,029,058	2.90
1893.....	17,513	4,805,623	1.49	1908.....	37,842	10,700,022	1.80
1894.....	17,834	5,454,451	1.00	.....	.....	.....	.....

#### SHIPMENTS OF POCAHONTAS COKE.

The shipments of Pocahontas Flat Top coke in 1908, for which we are indebted to Mr. E. H. Alden, secretary of the Norfolk and Western Railway Company, amounted to 1,819,314 net tons, against 2,314,938 tons in 1907 and 2,056,006 tons in 1906.

#### TOTAL PRODUCTION OF COKE.

The following table gives the production of coke in the United States in 1906 and 1907 by States in the order of their prominence in 1907. The statistics were collected by Mr. E. W. Parker

for the Division of Mining and Mineral Resources of the United States Geological Survey. Net tons of 2,000 pounds are used. Complete statistics for 1908 have not been compiled.

States. Net tons.	1906.	1907.	States. Net tons.	1906.	1907.
Pennsylvania...	23,060,511	26,513,214	Ohio.....	293,994	270,634
West Virginia..	3,713,514	4,112,896	New Mexico...	147,747	265,125
Alabama.....	3,034,501	3,021,794	Georgia.....	70,280	74,934
M d., Mass.,	2,085,617	2,528,739	Kentucky.....	74,064	67,068
Mich., Minn.,			Washington...	45,642	52,028
N. J., N. Y.,			Montana.....	38,182	40,714
Wis., & Wy.			Oklahoma.....	49,782	19,089
Virginia.....	1,577,659	1,545,280	Kansas.....	1,698	6,274
Col. and Utah..	1,455,905	1,421,579	.....	.....	.....
Tennessee.....	483,428	467,499			
Illinois.....	268,693	372,697	Total.....	36,401,217	40,779,564

The production of coke in 1907 was the largest in the history of the country. The increase over 1906 amounted to 4,378,347 net tons. Pennsylvania makes annually a little less than two-thirds of the total production of coke in the whole country.

#### CARS AND LOCOMOTIVES.

The *Railroad Age Gazette* has ascertained the number of railroad cars built in the United States and Canada in 1908. In its issue for December 25, 1908, it said: "During the past year 35 carbuilding companies in the United States and Canada built 78,271 cars, which is only 27 per cent. of the number built in 1907. These figures include subway and elevated cars but do not include street railway and interurban cars. Of the cars built in the United States 66,751 were freight cars for domestic service, 1,206 were freight cars for export, 1,566 were passenger cars for domestic service, and 71 were passenger cars for export. Canada built 8,593 freight cars for domestic service in 1908, 5 cars for export, and 79 passenger cars for domestic service."

In 1907 the number of cars built by manufacturers in the United States and Canada was 289,645, of which 284,188 were freight cars and 5,457 were passenger cars. In 1907 the United States built 275,029 freight and 5,351 passenger cars and Canada built 9,159 freight and 106 passenger cars.

Returns received by the *Gazette* from 11 locomotive builders in the United States and Canada show that 2,342 locomotives were built in 1908, against 7,362 in 1907, a decrease of 5,020 locomotives, or over 68 per cent. The number built in the

United States was 2,124, of which 1,668 were for domestic use and 456 were for export. In the total for the United States are included 245 electric locomotives. In 1908 Canada built 218 locomotives, all for domestic service. In 1907 the United States built 7,098 locomotives and Canada built 264. Of the total for that year 6,564 were for domestic use and 798 were for export. The above totals do not include locomotives built by railroads in their own shops or locomotives which were repaired or rebuilt.

As reported to us the Baldwin Locomotive Works built 617 locomotives in 1908, against 2,663 in 1907. Of the number built in 1908 437 were steam, 172 were electric, and 8 were compressed air. The Westinghouse Company built 190 electric locomotives in 1908, as compared with 350 locomotives in 1907.

#### MILEAGE OF STEAM RAILROADS.

The *Railroad Age Gazette* says that the number of miles of new railroad track laid in 1908 was 3,214. *Poor's Manual* gives the number of miles of steam railroad track built in 1907, not including double track, sidings, etc., as amounting to 5,499 miles. The maximum new mileage was reached in 1887—12,984 miles.

#### MILEAGE OF STREET RAILWAYS.

The editor of the *Electric Railway Journal* estimates that the new electric railroad mileage built in 1908 in the United States, Canada, and Mexico aggregated 1,258 miles, computed as single track road. New York led with 184 miles, closely followed by Ohio with 171 miles. Pennsylvania built 114 miles, Texas 91 miles, and Illinois 84 miles, while Wisconsin, Colorado, and Indiana built almost the same number of miles, namely, 73, 68, and 66 miles respectively.

The *Journal's* completed statistics for 1907 show that the number of miles of street, elevated, and electric interurban railways in the United States was 38,812 miles, as compared with 36,932 miles in 1906, a gain of 1,880 miles. The total number of cars operated in 1907 was 86,204, of which 68,636 were electrically equipped. Electric sweepers and locomotives are included in these figures. The mileage of cable, steam, and horse-car railways is not separated from electric railways, but the editor of the *Journal* says that the first class amounted to less than 2 per cent. of the total, or 776 miles. Canada and Newfoundland operated 1,151 miles of street railway in 1907; Cuba, 167 miles; and Hawaii, Porto Rico, the Philippines, and the West Indies, 203 miles.

## LAKE SUPERIOR IRON ORE SHIPMENTS.

The *Iron Trade Review* (Cleveland) gives full details of the shipments of iron ore from the Lake Superior region in 1908 and preceding years. These details have been verified for this Report by the mining editor of the *Review*. The total shipments by water and by all-rail routes in 1908 amounted to 26,014,987 gross tons, against 42,266,668 tons in 1907, a decrease of 16,251,681 tons, or over 38.4 per cent. The shipments of ore by water in 1908 amounted to 25,427,094 tons, against 41,290,709 tons in 1907, a decrease of 15,863,615 tons, and by rail to 587,893 tons, against 975,959 tons in 1907, a decrease of 388,066 tons. Of the total tonnage moved in 1908 66.3 per cent. was shipped from the Mesabi range, 3.2 per cent. from the Vermilion, 10.4 per cent. from the Gogebic, 9.3 per cent. from the Marquette, 10.3 per cent. from the Menominee, and 0.5 per cent. from other mines.

The following table gives the total shipments in gross tons of Lake Superior iron ore in the last four years by ranges. The shipments by ranges and the total annual shipments differ slightly from the figures which have appeared in previous Annual Reports.

Ranges—Gross tons.	1905.	1906.	1907.	1908.
Marquette Range.....	4,215,572	4,057,187	4,388,073	2,414,632
Menominee Range.....	4,495,451	5,109,088	4,964,728	2,679,156
Gogebic Range.....	3,705,207	3,643,514	3,637,102	2,699,856
Vermilion Range.....	1,677,186	1,792,355	1,685,267	841,544
Mesabi Range.....	20,158,699	23,819,029	27,495,708	17,257,350
Miscellaneous.....	132,001	144,589	95,790	122,449
Total.....	34,384,116	38,565,762	42,266,668	26,014,987

The Marquette range is wholly in Michigan, the Menominee and Gogebic ranges are partly in Michigan and partly in Wisconsin, and the Vermilion and Mesabi ranges are in Minnesota.

In 1904 the Mesabi mines shipped 12,156,008 tons; in 1905, 20,158,699 tons; in 1906, 23,819,029 tons; in 1907, 27,495,708 tons; and in 1908, 17,257,350 tons. The decrease in the Mesabi shipments in 1908 as compared with 1907 amounted to 10,238,358 tons, while the decrease in other ranges in the same year, including miscellaneous shipments, amounted to 6,013,323 tons.

The decrease in iron ore shipments by ranges in 1908 as compared with 1907, not including the Mesabi range, which is given above, was as follows: Marquette, 1,973,441 tons; Menominee, 2,285,572 tons; Gogebic, 937,246 tons; and Vermilion, 843,723

tons. As compared with 1907 the shipments from miscellaneous mines in 1908 show an increase of 26,659 tons.

Under "miscellaneous" are included all shipments from the Baraboo district, from the Iron Ridge mine, and from the Mayville mine, all in Southern Wisconsin. No ore was shipped from the Iron Ridge mine in 1908.

The Iron Ridge mine, owned by the Illinois Steel Company, is located in Dodge county, Wisconsin, and the recently developed Baraboo district, containing the Illinois mine, is in the adjoining counties of Sauk and Columbia, in Southern Wisconsin. Prior to 1903 the shipments from the Iron Ridge mine were not included in Lake Superior statistics. Shipments from the Baraboo district began in 1904. Shipments from the Mayville mine, also in Dodge county, are included in Lake Superior statistics since 1892. Shipments from the Southern Wisconsin mines are not included in the shipments from any of the five Lake Superior ranges.

The following table shows the shipments by ports in the last four years, with the all-rail shipments added. Shipments to local furnaces are included. Gross tons of 2,240 pounds are used.

Ports—Gross tons.	1905.	1906.	1907.	1908.
Escanaba.....	5,307,938	5,851,050	5,761,988	3,351,502
Marquette.....	2,977,828	2,791,033	3,013,826	1,487,487
Ashland.....	3,485,344	3,388,106	3,436,867	2,513,670
Two Harbors.....	7,779,850	8,180,125	8,188,906	5,702,237
Superior.....	5,118,385	6,083,057	7,440,386	3,564,030
Duluth.....	8,807,559	11,220,218	13,448,736	8,808,168
Total lake.....	33,476,904	37,513,589	41,290,709	25,427,094
All rail.....	907,212	1,052,173	975,959	587,893
Grand total.....	34,384,116	38,565,762	42,266,668	26,014,987

The shipments of iron ore from the Lake Superior region for the account of the United States Steel Corporation from mines owned wholly or in part by the Corporation amounted in 1908 to 14,579,613 gross tons, or over 56 per cent. of the total, as compared with similar shipments of 23,148,467 tons, or over 54.7 per cent., in 1907, 20,885,774 tons, or over 54.1 per cent., in 1906, 19,251,872 tons, or almost 56 per cent., in 1905, and 11,746,409 tons, or over 53.7 per cent., in 1904. In each year the ore shipped from the Iron Ridge mine is included. In addition to the iron ore shipped from the Lake Superior region the Corporation shipped 1,533,402 tons in 1908 from its mines in Alabama and Georgia.

Shipments from the Helen mine of the Lake Superior Corporation in Ontario, Canada, are not included in the above tables.

#### LARGEST SHIPPERS OF LAKE SUPERIOR IRON ORE.

The Lake Superior mines which shipped the largest quantities of ore in 1908 were the following: Mesabi range: Hull-Rust, 2,926,683 tons; Burt, 1,460,998 tons; Fayal, 1,439,879 tons; Adams, 765,592 tons; Virginia group, 661,329 tons; Mahoning, 611,592 tons; Morris, 528,154 tons; and Stevenson, 516,770 tons. In the Gogebic range the largest shippers were the Norrie group, 773,243 tons; Newport, 579,390 tons; Ashland, 259,611 tons; Montreal, 177,006 tons; Eureka, 122,324 tons; Tilden, 111,184 tons; and Sunday Lake, 111,130 tons. In the Menominee range Chapin shipped 391,620 tons; Pewabic, 365,341 tons; Aragon, 226,354 tons; Bristol, 190,300 tons; Penn Iron Mining, 176,211 tons; Tobin, 161,642 tons; Florence, 140,354 tons; and Hiawatha, 138,190 tons. In the Marquette range the Cleveland-Cliffs group shipped 438,379 tons; Hartford, 278,366 tons; Lake Superior, 261,955 tons; Negaunee, 232,219 tons; Lake Angeline, 220,410 tons; Austin, 111,229 tons; and Queen, (Blue,) 104,098 tons. In the Vermilion range Pioneer shipped 477,506 tons.

The eight mines named in the Mesabi range shipped over one-half of the total ore shipments from that range in 1908.

#### RECEIPTS OF IRON ORE AT LAKE ERIE PORTS.

The *Iron Trade Review* annually publishes full statistics of the receipts of Lake Superior iron ore at Cleveland, Ashtabula, Conneaut, Buffalo, and other ports on Lake Erie, the principal receipts being at Ashtabula, Cleveland, Conneaut, Fairport, Erie, and Buffalo and Tonawanda; also the quantity left on the docks at the close of navigation. From these statistics we compile the following table of total receipts and total tonnage left on docks in the eighteen years from 1891 to 1908. Gross tons are used.

Years.	Receipts. Gross tons.	On dock. Gross tons.	Years.	Receipts. Gross tons.	On dock. Gross tons.
1891.....	4,939,684	3,508,489	1900.....	15,797,787	5,904,670
1892.....	6,660,734	4,149,451	1901.....	17,014,076	5,859,663
1893.....	5,333,061	4,070,710	1902.....	22,649,424	7,074,254
1894.....	6,350,825	4,834,247	1903.....	19,681,731	6,371,085
1895.....	8,112,228	4,415,712	1904.....	17,932,814	5,763,399
1896.....	8,026,432	4,954,984	1905.....	28,941,259	6,438,967
1897.....	10,120,906	5,923,755	1906.....	32,076,757	6,252,455
1898.....	11,028,321	5,136,407	1907.....	35,195,758	7,385,728
1899.....	15,222,187	5,530,283	1908.....	20,414,491	8,441,533

The receipts of Lake Superior iron ore at Lake Erie ports in the last six years are given by the *Review* in detail in gross tons. The figures for Buffalo include the receipts at Tonawanda.

Ports.	1903.	1904.	1905.	1906.	1907.	1908.
Toledo.....	652,305	508,793	1,006,855	1,423,741	1,314,140	680,553
Sandusky.....	130,532	48,356	51,202	35,847	83,043	.....
Huron.....	486,106	231,364	825,278	778,453	971,430	213,377
Lorain.....	990,490	972,931	1,605,823	2,191,965	2,621,025	2,286,388
Cleveland.....	4,434,160	3,572,228	5,854,745	6,604,661	6,495,998	4,240,816
Fairport.....	1,434,342	1,157,858	2,008,621	1,861,498	2,437,649	1,518,961
Ashtabula.....	4,242,160	3,639,250	6,373,779	6,833,352	7,521,859	3,012,064
Conneaut.....	3,903,937	4,083,655	5,327,552	5,432,370	5,875,937	4,798,631
Erie.....	1,257,798	1,284,778	2,112,476	1,986,539	2,294,239	828,602
Buffalo.....	2,149,901	2,433,601	3,774,928	4,928,331	5,580,438	2,835,099
Total.....	19,681,731	17,932,814	28,941,259	32,076,757	35,195,758	20,414,491

In 1908 the ore shipped by rail and to ports other than those on Lake Erie amounted to 5,600,496 tons, as compared with 7,070,910 tons in 1907 and 6,489,005 tons in 1906.

#### PRICES OF LAKE SUPERIOR IRON ORE.

We give below the base prices at which Lake Superior iron ore was sold on season contracts in 1904 and 1905, per gross ton, delivered at lower Lake Erie ports; also the prices at which sales were made in December, 1905, for delivery in 1906; in November, 1906, for delivery in 1907; and the prices prevailing for delivery in 1908. The buying movement for the season of 1908 was not started until June 15, 1908. Prices for 1909 delivery had not been fixed as late as April 1 of that year. The following table of prices and the comments which follow have been furnished for this Report by the editor of the *Iron Trade Review*.

Grades—Gross tons.	1904.	1905.	1906.	1907.	1908.
Old range Bessemer.....	\$3.00 @ \$3.25	\$3.75	\$4.25	\$5.00	\$4.50
Old range non-Bessemer.....	2.60 @ 2.80	3.20	3.70	4.20	3.70
Mesabi Bessemer.....	2.75 @ 3.00	3.50	4.00	4.75	4.25
Mesabi non-Bessemer.....	2.35 @ 2.50	3.00	3.50	4.00	3.50

The classification of ores given above conforms to that adopted by the Lake Superior Iron Ore Association, which was organized for statistical purposes on January 14, 1905, by the ore selling firms located in Cleveland. Up to the year 1907 the base for old range Bessemer ores was a supposititious ore containing 63 per cent. of metallic iron, 0.045 per cent. of phos-

phorus, and 10 per cent. of moisture, giving a natural iron content of 56.70 per cent. The base for the non-Bessemer ores up to 1907 was an ore supposed to contain 60 per cent. of metallic iron and 12 per cent. of moisture, giving a natural iron content of 52.80 per cent., except for Mesabi non-Bessemer for 1905 and 1906, when the natural iron content was 53 per cent. Before the sales for 1907 delivery were made the natural iron content for the base was changed to 55 per cent. for the old range and Mesabi Bessemer and 51.50 per cent. for the old range and Mesabi non-Bessemer. The prices quoted in the table for 1907 and 1908 are on the new base schedule.

#### PRODUCTION OF IRON ORE.

The following table, compiled from statistics obtained by the Division of Mining and Mineral Resources of the United States Geological Survey, gives the production of iron ore in 1906 and 1907 by States. The production of iron ore in any given year must not be confounded with the shipments of iron ore in that year. Complete statistics for 1908 have not been compiled.

States. Gross tons.	1906.	1907.	States. Gross tons.	1906.	1907.
Minnesota.....	25,364,077	28,969,658	Georgia.....	411,230	444,114
Michigan.....	11,822,874	11,830,342	Tex. and Ark.	36,660	118,667
Alabama.....	3,995,098	4,039,453	Mo. and Iowa	80,910	111,768
New York.....	1,041,992	1,375,020	West Virginia	46,940	62,808
Wisconsin.....	848,133	838,744	Kentucky.....		
Pennsylvania..	949,429	837,287	Maryland.....		
Mont., Nev., N.	792,190	819,544	North Car....	56,057	50,439
Mex., Utah,			Conn. & Mass.	31,343	37,166
Wy., Cal.,			Ohio.....	17,384	23,589
and Wash...			Colorado.....	14,078	11,714
Tennessee.....	870,734	813,690	.....	.....	.....
Virginia.....	828,081	786,856			
New Jersey....	542,518	549,760	Total.....	47,749,728	51,720,619

The production of iron ore in 1907 exceeded that of 1906 by 3,970,891 gross tons. Minnesota in 1906 and 1907 produced more than one-half of the iron ore mined in the whole country. Michigan, Alabama, and New York, in the order named, were the next largest producers in these two years.

#### IMPORTS OF IRON ORE.

The following table, for which we are indebted to the Bureau of Statistics of the Department of Commerce and Labor, gives the

quantities and values of iron ore imported into the United States in the calendar years 1906, 1907, and 1908. The imports in 1908 included 5,013 tons from the Dominion of Canada, valued at \$16,321, received chiefly at Lake Erie ports; also 48,285 tons, valued at \$48,285, from Newfoundland, received at Philadelphia. In 1907 the iron ore imported from Canada amounted to 26,878 tons, valued at \$51,328, also received chiefly at Lake Erie ports. The duty on iron ore is 40 cents per ton except from Cuba, the duty under reciprocity with that country being 32 cents per ton.

Customs districts. Gross tons.	1906.		1907.		1908.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Baltimore .....	617,866	\$1,937,610	639,602	\$2,436,457	248,875	\$844,436
New York.....	3,475	8,400	7,405	19,989	4,392	17,424
Philadelphia....	383,651	914,242	554,104	1,422,503	516,619	1,318,182
Puget Sound...	9	77	1,976	6,365	.....	.....
Vermont.....	53	378	167	1,244	676	3,758
All other.....	55,336	106,727	25,914	50,925	6,336	40,448
Total.....	1,060,390	\$2,967,434	1,229,168	\$3,937,483	776,898	\$2,224,248

For the following table, which gives the countries from which iron ore was imported into the United States during the calendar years 1906, 1907, and 1908, we are also indebted to the Bureau of Statistics of the Department of Commerce and Labor.

Countries. Gross tons.	1906.		1907.		1908.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Cuba .....	639,362	\$2,178,997	657,133	\$2,522,710	579,668	\$1,756,091
Spain.....	171,870	418,922	296,318	760,801	126,074	331,070
Greece.....	48,630	61,560	23,800	42,927	4,850	5,311
Newfoundland....	125,395	125,395	89,685	97,735	48,285	48,285
United Kingdom...	231	1,955	5,765	16,491	2,028	32,027
Germany.....	1,084	8,949	273	2,096	602	4,052
Canada .....	57,890	100,125	26,878	51,328	5,013	16,321
Belgium .....	400	6,662	125	1,102	1	28
Russia in Europe. ....	.....	.....	54,995	161,697	5,750	15,220
French Africa.....	.....	.....	65,940	252,897	.....	.....
Other countries....	15,528	64,869	8,256	27,699	4,627	15,843
Total .....	1,060,390	\$2,967,434	1,229,168	\$3,937,483	776,898	\$2,224,248

The following table gives the imports of iron ore into the United States in the calendar years 1879 to 1908 inclusive. In recent years considerably more than one-half of the iron ore we have annually imported has come from Cuba.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1879.....	284,141	1889.....	853,573	1899.....	674,082
1880.....	493,408	1890.....	1,246,830	1900.....	897,831
1881.....	782,887	1891.....	912,856	1901.....	966,950
1882.....	589,655	1892.....	806,585	1902.....	1,165,470
1883.....	490,875	1893.....	526,951	1903.....	980,440
1884.....	487,820	1894.....	168,541	1904.....	487,613
1885.....	390,786	1895.....	524,153	1905.....	845,651
1886.....	1,039,433	1896.....	682,806	1906.....	1,060,390
1887.....	1,194,301	1897.....	489,970	1907.....	1,229,168
1888.....	587,470	1898.....	187,093	1908.....	776,898

## SHIPMENTS OF IRON ORE FROM THE HELEN MINE.

According to statistics furnished us by the Lake Superior Corporation the total shipments of iron ore in 1908 from the Helen mine in Canada amounted to 148,420 tons. Of these shipments 1,806 tons were sent to the United States. In 1907 the total shipments from the Helen mine amounted to 142,832 tons.

## SHIPMENTS OF IRON ORE FROM CUBA.

In the calendar year 1908 shipments of iron ore from Cuba were made by two companies, the Juragua Iron Company and the Spanish-American Iron Company. The shipments by the Juragua Company amounted to 329,606 tons and by the Spanish-American Company to 254,256 tons: total, 583,862 tons. All the shipments were made to the United States. In September, 1908, 5,000 tons were lost at sea. In 1907 these two companies were also the only shippers of iron ore from Cuba, the shipments of the Juragua Company amounting to 183,250 tons and of the Spanish-American Company to 489,111 tons: total, 672,361 tons.

The total shipments of iron ore from Cuba to all countries from the opening of the mines in 1884 to the close of 1908 were as follows in gross tons: the Juragua Iron Company, Limited, and its successor, the Juragua Iron Company, 4,895,097 tons; the Sigua Iron Company, 20,438 tons; the Spanish-American Iron Company, 4,272,750 tons; and the Cuban Steel Ore Company, 41,241 tons: total since 1884, 9,229,526 tons. With the exception of 5,932 tons shipped to Pictou, Nova Scotia, 4,177 tons to Santiago, and 82,242 tons shipped to other foreign countries all the ore was shipped to the United States. Over 25,000 tons were lost at sea.

## SHIPMENTS OF IRON ORE FROM LEADING DISTRICTS.

The shipments of iron ore from some of the leading iron ore districts of the country in the last three years were as follows:

Shipments of iron ore from leading districts.	1906.	1907.	1908.
	Gross tons.	Gross tons.	Gross tons.
Lake Superior mines of Michigan and Wis.	*12,954,378	*13,085,693	*7,916,093
Vermilion and Mesabi mines of Minnesota..	25,611,384	29,180,975	18,098,894
Missouri mines.....	88,736	104,815	65,220
Cornwall mines, Pennsylvania.....	763,788	704,004	344,024
New Jersey mines (production.).....	542,518	549,760	394,767
Chateaugay mines on Lake Champlain.....	117,461	138,890	60,111
Port Henry mines.....	563,695	641,891	383,207
Hudson (Forest of Dean) mine, New York.	2,639	27,800	36,504
Salisbury region, Connecticut.....	19,198	22,025	18,133
Cranberry mines, North Carolina.....	56,058	50,604	48,522
Tennessee Coal, Iron, and Railroad Com- pany's mines in Alabama and Georgia..	1,581,216	1,554,008	1,211,076
Total of the above districts.....	42,301,071	46,060,465	28,576,551

\* Include the Iron Ridge, Illinois, and Mayville mines, all in Southern Wisconsin.

#### IMPORTS OF IRON AND STEEL.

The following table, compiled from statistics obtained from the Bureau of Statistics of the Department of Commerce and Labor, gives the quantities and values of our imports of iron and steel and manufactures thereof in the calendar years 1907 and 1908.

Articles—Gross tons.	1907.		1908.	
	Tons.	Values.	Tons.	Values.
Pig iron, spiegel., ferro-mang., etc...	489,475	\$13,418,982	92,202	\$2,886,339
Scrap iron and scrap steel.....	27,652	368,847	5,090	61,981
Bar iron.....	39,746	1,774,441	19,672	837,585
Iron and steel rails.....	3,752	104,958	1,719	53,128
Hoop, band, and scroll iron or steel.	1,499	82,706	1,110	75,920
Steel ingots, billets, blooms, etc.....	19,334	3,004,178	11,212	1,437,514
Sheet, plate, and taggers'.....	3,748	367,140	2,629	377,549
Building forms and all other struc- tural shapes fitted for use.....	2,294	123,179	3,623	129,029
Tinplates and terne plates.....	57,773	4,462,522	58,490	3,651,576
Wire rods of iron or steel.....	17,076	851,571	11,209	543,170
Wire and articles made from.....	.....	1,551,415	.....	1,003,973
Cutlery.....	.....	2,294,009	.....	1,578,245
Fire-arms.....	.....	323,898	.....	206,385
Shotgun barrels, in single tubes....	.....	195,278	.....	139,359
Machinery.....	.....	4,566,897	.....	3,242,765
Needles, hand sewing and darning....	.....	498,699	.....	366,414
Other iron and steel manufactures....	.....	4,801,131	.....	3,366,329
Total tons where specified.....	662,349	\$38,789,851	206,956	\$19,957,261

Of the pig iron, spiegeleisen, ferro-manganese, etc., imported in 1908 75,757 tons came from the United Kingdom, as com-

pared with 434,276 tons in 1907; 248 tons from Austria-Hungary, as compared with 4,702 tons in 1907; 3,008 tons from Germany, as compared with 14,085 tons in 1907; 7,927 tons from other parts of Europe, as compared with 23,885 tons in 1907; 1,976 tons from Canada, as compared with 1,231 tons in 1907; 3,194 tons from the Chinese Empire, as compared with 7,063 tons in 1907; and 92 tons from other countries, as compared with 4,233 tons in 1907.

In recent years a large part of the pig iron imported was spiegeleisen, ferro-manganese, and ferro-silicon. These imports are included in the statistics of imports of pig iron given above. The imports for consumption of spiegeleisen, ferro-manganese, ferro-silicon, and Bessemer, foundry, forge, and other grades of pig iron in the last three years were as follows in gross tons. The grand totals for pig iron, etc., differ slightly from those given in the preceding table, as they cover imports for consumption only.

Articles. Gross tons.	1906.		1907.		1908.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Ferro-manganese.	84,359	\$4,953,644	87,400	\$5,354,656	44,624	\$1,860,664
Spiegeleisen.....	103,267	2,942,940	48,995	1,399,381	4,579	123,054
Ferro-silicon.....	11,863	788,085	14,825	1,049,283	5,532	281,590
Total.....	199,489	\$8,684,669	151,220	\$7,803,320	54,735	\$2,265,308
Found., forge, etc.	174,540	2,950,610	328,672	5,409,540	32,784	558,796
Grand total..	374,029	\$11,635,279	479,892	\$13,212,860	87,519	\$2,824,104

The average value per ton of the ferro-manganese imported in 1908 was \$41.70, as compared with \$61.27 in 1907 and \$58.72 in 1906; spiegeleisen, \$26.87 in 1908, as compared with \$28.56 in 1907 and \$28.50 in 1906; ferro-silicon, \$50.90 in 1908, as compared with \$70.78 in 1907 and \$66.43 in 1906; and all other alloys and Bessemer, basic, foundry, and forge pig iron, \$17.04 in 1908, as compared with \$16.46 in 1907 and \$16.90 in 1906.

#### EXPORTS OF IRON AND STEEL.

We are indebted to the Bureau of Statistics of the Department of Commerce and Labor for the statistics of our exports of iron and steel in the calendar years 1907 and 1908 as follows. The decrease in the value of our exports of these articles in 1908 as compared with 1907 amounted to \$45,953,667. Prior to July 1, 1908, barbed wire was not separated from other wire and traction engines were included with "all other machinery."

## STATISTICS OF THE AMERICAN IRON TRADE FOR 1908. 39

Articles—Gross tons.	1907.		1908.	
	Tons.	Values.	Tons.	Values.
Pig iron.....	73,703	\$1,508,938	46,696	\$789,318
Scrap and old.....	25,689	399,631	21,834	329,608
Bar iron.....	23,743	1,092,634	8,224	362,909
Steel bars or rods except wire rods	74,464	3,588,177	43,881	2,069,642
Steel wire rods.....	10,697	465,757	7,412	277,694
Steel rails.....	338,906	10,411,072	196,510	6,021,549
Billets, ingots, and blooms.....	79,991	2,013,319	112,177	2,674,524
Hoop, band, and scroll.....	8,601	395,758	4,339	223,073
Iron sheets and plates.....	40,651	2,902,025	44,100	2,985,538
Steel sheets and plates.....	82,045	4,262,582	60,893	3,422,031
Tinplates and terne plates.....	10,203	897,645	11,878	1,021,472
Structural iron and steel.....	138,442	7,784,618	116,881	6,289,610
Wire, barbed.....	161,223	9,164,829	34,718	1,925,699
Wire, all other.....			101,449	5,345,095
Cut nails and spikes.....	6,929	354,802	7,023	364,202
Wire nails and spikes.....	42,189	2,367,544	26,509	1,356,047
All other, including tacks.....	7,672	647,259	5,377	457,737
Pipes and fittings.....	176,831	11,789,631	114,371	7,481,575
Car-wheels.....No.	43,082	348,142	48,380	387,662
Cash registers.....No.	22,885	2,477,425	29,287	2,229,474
Safes.....No.	6,234	354,387	4,951	257,276
Fire engines.....No.	3	9,250	23	35,719
Locomotive engines.....No.	885	9,080,337	566	6,319,309
Stationary engines.....No.	8,689	2,489,691	10,977	3,119,813
Traction engines.....No.			345	544,671
Parts of engines and boilers....		3,242,959		2,704,981
Castings not elsewhere specified		2,866,754		1,546,841
Cutlery.....		739,513		877,600
Fire-arms.....		3,032,992		1,749,080
Locks, hinges, etc.....		6,476,893		5,470,938
Saws.....		909,895		814,266
Tools not elsewhere specified....		8,516,624		6,598,870
Electrical machinery.....		9,735,230		6,956,722
Laundry machinery.....		711,912		627,368
Metal-working machinery.....		10,142,835		5,205,606
Mining machinery.....		6,125,951		3,862,973
Printing presses and parts of....		1,802,458		1,562,948
Pumps and pumping machinery.....		3,722,847		2,827,428
Sewing machines and parts of....		8,472,176		6,204,436
Shoemaking machinery.....		1,219,013		1,029,610
Typew'g machines and parts of.....		6,664,164		6,318,219
Windmills and parts of.....		1,216,235		1,305,878
Wood-working machinery.....		1,386,881		1,069,057
All other machinery.....		26,688,256		22,224,564
Scales and balances.....		996,266		868,294
Stoves, ranges, and parts of.....		1,326,505		1,036,527
All other mfrs. of iron and steel		16,264,969		13,959,661
Total tons where specified.	1,301,979	\$197,066,781	964,272	\$151,113,114
Iron ore.....gross tons.	278,608	\$763,422	309,099	\$1,012,924

Over 51 per cent. of our exports of pig iron in 1908 were sent to Canada, as compared with over 92 per cent. in 1907, the exports to Canada in the former year having amounted to 23,852 tons and in the latter year to 68,296 tons. In 1908 we also sent 6,000 tons of pig iron to Austria-Hungary, 7,190 tons to Italy, 5,439 tons to the United Kingdom, 2,192 tons to Panama, 796 tons to Mexico, 950 tons to Peru, and 277 tons to other countries.

Of the steel billets, ingots, and blooms exported last year 109,615 tons were sent to the United Kingdom, 2,310 tons to British North America, and 252 tons to other countries. Of the steel rails exported in 1908 22,070 tons were sent to Japan, 38,437 tons to other Asia and Oceanica, 28,510 tons to South America, 14,807 tons to British North America, 61,687 tons to Mexico, 8,172 tons to the various Central American States and British Honduras, 19,702 tons to the West Indies and Bermuda, and the remainder to Europe, British Africa, and other points in Africa. About one-third of the structural shapes exported in 1908 were sent to British North America; the other leading consumers were South America, Japan, Mexico, and Cuba. Of the wire exported in 1908 the leading consumers were British Australasia, British North America, Argentina, Brazil, and other South America, Mexico, British Africa, and Cuba. British North America took 99 of the 566 steam locomotives exported in 1908, Mexico 79, Argentina 54, Brazil 46, other South America 51, Japan 39, the Philippine Islands and other Asia and Oceanica 105, Europe 33, and Cuba 26. Pipes and fittings were largely exported in 1908 to British North America, Cuba, Mexico, Japan, Belgium, the Central American States and British Honduras, British East Indies, United Kingdom, and other Europe in the order named. All the iron ore exported in 1908 was sent to Canada, which annually imports about four-fifths of the iron ore it consumes.

#### EXPORTS OF AGRICULTURAL IMPLEMENTS.

The value of the agricultural implements exported from this country in the eighteen years from 1891 to 1908 was as follows:

Years.	Values.	Years.	Values.	Years.	Values.
1891.....	\$3,310,183	1897.....	\$5,302,807	1903.....	\$22,951,805
1892.....	4,210,684	1898.....	9,073,384	1904.....	21,654,892
1893.....	5,191,223	1899.....	13,594,524	1905.....	22,124,312
1894.....	4,765,793	1900.....	15,979,909	1906.....	24,744,762
1895.....	5,319,885	1901.....	16,714,308	1907.....	25,597,272
1896.....	4,643,729	1902.....	17,981,597	1908.....	25,264,939

Of the agricultural implements exported in 1908 mowers and reapers were valued at \$14,622,616 ; plows and cultivators at \$3,231,342 ; and all other agricultural implements at \$7,410,981.

#### IMPORTS OF AGRICULTURAL IMPLEMENTS.

In the calendar year 1908 our imports of plows, harrows, harvesters, reapers, drills, mowers, cultivators, and other agricultural implements amounted in value to only \$37,244, against \$32,656 in 1907, \$34,605 in 1906, \$13,217 in 1905, and \$15,995 in 1904.

#### PRODUCTION AND IMPORTS OF MANGANESE ORE.

Our supply of manganese ore is chiefly obtained abroad. The total production in the United States in 1907 amounted to only 5,604 gross tons, against 6,921 tons in 1906 and 4,118 tons in 1905. The maximum production was reached in 1887, when 34,524 tons were mined. In that year Virginia alone produced 19,835 tons, but in 1907 its production had fallen to 4,604 tons.

The imports of manganese ore have been as follows in late years : 1898, 114,885 tons ; 1899, 188,349 tons ; 1900, 256,252 tons ; 1901, 165,722 tons ; 1902, 235,576 tons ; 1903, 146,056 tons ; 1904, 108,519 tons ; 1905, 257,033 tons ; 1906, 221,260 tons ; 1907, 209,021 tons ; and 1908, 178,203 tons.

#### IMPORTS AND EXPORTS OF COAL AND COKE.

Domestic exports of anthracite coal in 1908 amounted to 2,752,358 gross tons, against 2,698,072 tons in 1907. Domestic exports of bituminous coal in 1908 amounted to 9,100,819 tons, against 10,454,677 tons in 1907. The total domestic exports in 1908 amounted to 11,853,177 tons, against 13,152,749 tons in 1907. Bituminous bunker coal used by vessels engaged in the foreign trade is not included. Domestic exports of coke in 1908 amounted to 696,895 net tons, against 979,652 net tons in 1907.

Imports of anthracite coal amounted in 1908 to 16,483 gross tons, against 9,896 tons in 1907. Imports of bituminous coal amounted in 1908 to 1,487,816 tons, against 2,116,122 tons in 1907. The total imports of coal amounted in 1908 to 1,504,299 tons, against 2,126,018 tons in 1907. British North America was the principal source of supply. Gross tons of 2,240 pounds are used for coal. Imports of coke in 1908 amounted to 145,142 net tons of 2,000 pounds, against 148,440 net tons in 1907.

#### AVERAGE MONTHLY PRICES OF IRON AND STEEL.

In the following table we give the average monthly prices of iron and steel in Pennsylvania in 1906, 1907, and 1908, and

early in 1909. The prices are averaged from weekly quotations and are per gross ton, except for bar iron, which is quoted by the 100 pounds from store at Philadelphia and from mills at Pittsburgh, and for steel bars by the 100 pounds at Pittsburgh.

Months.	Old iron T rails, at Philadelphia.	No. 1 foundry pig iron, at Philadelphia.	Gray forge pig iron, at Philadelphia.	Gray forge pig iron, at Pittsburgh.	Bessemer pig iron, at Pittsburgh.	Steel rails, at mills, in Pennsylvania.	Steel billets, at mills, at Pittsburgh.	Best refined bar iron, from store, Phila.	Best refined bar iron, at mills, Pittsburgh.	Bar steel, at mills, at Pittsburgh.
January, 1906	\$24.50	\$19.00	\$16.87	\$17.30	\$18.35	\$28.00	\$26.25	\$1.96	\$2.20	\$2.00
February.....	22.87	19.00	16.62	17.29	18.35	28.00	26.75	1.96	2.15	1.75
March.....	21.10	19.00	16.50	16.91	18.35	28.00	26.80	1.96	2.10	1.50
April.....	21.50	19.12	16.50	16.66	18.19	28.00	27.00	1.96	1.80	1.50
May.....	21.10	19.25	16.50	16.49	18.10	28.00	26.40	1.96	1.80	1.50
June.....	20.50	19.25	16.25	16.35	18.47	28.00	26.62	1.96	1.85	1.50
July.....	20.25	19.25	16.25	16.41	18.60	28.00	27.25	1.96	1.85	1.50
August.....	21.20	19.80	17.10	17.75	19.10	28.00	27.80	1.96	1.85	1.50
September.....	24.25	22.62	18.50	18.35	19.66	28.00	28.00	1.96	1.85	1.50
October.....	25.25	24.00	18.94	19.47	20.51	28.00	28.00	1.96	1.90	1.50
November.....	26.20	25.00	21.20	22.45	23.00	28.00	29.00	2.06	1.90	1.56
December.....	27.69	26.50	22.25	22.85	23.85	28.00	29.50	2.06	1.90	1.60
January, 1907	27.30	27.50	22.90	22.58	23.35	28.00	29.40	2.08	1.90	1.60
February.....	27.00	27.37	23.12	22.20	23.25	28.00	29.50	2.16	1.90	1.60
March.....	27.00	26.87	23.44	21.76	22.95	28.00	29.00	2.16	1.90	1.60
April.....	27.00	26.56	23.12	21.72	23.55	28.00	30.25	2.16	1.90	1.60
May.....	27.40	26.60	22.80	22.88	24.05	28.00	30.30	2.16	2.00	1.60
June.....	27.37	25.75	22.75	23.15	24.50	28.00	29.62	2.16	2.00	1.60
July.....	25.25	23.62	22.06	22.96	23.80	28.00	30.00	2.16	2.00	1.60
August.....	21.10	22.50	20.15	21.90	22.95	28.00	29.40	2.16	2.00	1.60
September.....	20.50	21.19	19.12	21.15	22.85	28.00	29.37	2.16	2.00	1.60
October.....	20.50	20.40	18.50	20.40	22.90	28.00	28.20	2.06	1.90	1.60
November.....	18.62	19.44	17.62	19.17	20.35	28.00	28.00	1.96	1.90	1.60
December.....	17.50	18.94	17.12	18.40	19.60	28.00	28.00	1.96	1.90	1.60
January, 1908	16.70	18.70	16.50	17.00	19.00	28.00	28.00	1.76	1.70	1.60
February.....	17.87	18.75	16.50	15.99	17.90	28.00	28.00	1.76	1.70	1.60
March.....	17.50	18.62	16.50	15.90	17.86	28.00	28.00	1.76	1.70	1.60
April.....	17.00	18.15	16.15	15.45	17.49	28.00	28.00	1.76	1.70	1.60
May.....	17.25	17.44	15.50	14.90	16.96	28.00	28.00	1.76	1.70	1.60
June.....	18.00	17.12	15.12	14.90	16.90	28.00	25.75	1.66	1.65	1.40
July.....	18.00	17.00	15.00	14.90	16.83	28.00	25.00	1.66	1.50	1.40
August.....	19.50	17.00	15.00	14.71	16.26	28.00	25.00	1.66	1.50	1.40
September.....	20.25	17.12	15.37	14.46	15.90	28.00	25.00	1.66	1.50	1.40
October.....	19.90	17.25	15.50	14.40	15.75	28.00	25.00	1.66	1.50	1.40
November.....	20.25	17.50	15.62	14.90	16.59	28.00	25.00	1.66	1.50	1.40
December.....	21.05	17.75	15.85	15.25	17.40	28.00	25.00	1.66	1.50	1.40
January, 1909	20.81	17.75	16.06	15.40	17.34	28.00	25.00	1.74	1.50	1.40
February.....	19.00	17.50	16.00	15.09	16.77	28.00	25.00	1.73	1.50	1.35
March.....	17.12	16.87	15.44	14.65	16.34	28.00	23.00	1.62	1.50	1.20
April 1.....	17.00	16.75	15.00	14.40	15.90	28.00	23.00	1.62	1.45	1.20

## AVERAGE YEARLY PRICES OF IRON AND STEEL.

The following table gives the average yearly prices of leading articles of iron and steel in Pennsylvania and of wire nails at Chicago from 1904 to 1908. These prices are obtained by averaging weekly and monthly quotations, and are per ton of 2,240 pounds, except for bar iron and bar steel and cut and wire nails, which are quoted by the 100 pounds and in 100-pound kegs.

Articles.	1904.	1905.	1906.	1907.	1908.
Old iron T rails, at Philadelphia.....	\$16.22	\$22.08	\$23.03	\$23.88	\$18.61
No. 1 foundry pig iron, at Philadelphia	15.57	17.88	20.98	23.89	17.70
No. 2 foundry pig iron, at Philadelphia	.....	.....	20.19	23.14	17.20
Gray forge pig iron, at Philadelphia..	13.67	15.58	17.79	21.06	15.72
Gray forge pig iron, at Pittsburgh.....	12.89	15.62	18.19	21.52	15.23
Bessemer pig iron, at Pittsburgh.....	13.76	16.36	19.54	22.84	17.07
Basic pig iron, at Philadelphia.....	.....	16.50	18.91	22.17	16.25
Basic pig iron, at Pittsburgh.....	.....	16.33	19.13	21.98	16.17
Steel rails, at mills, in Pennsylvania..	28.00	28.00	28.00	28.00	28.00
Steel billets, at mills, at Pittsburgh..	22.18	24.03	27.45	29.25	26.31
Best bar iron, from store, at Philada..	1.72	1.92	1.98	2.11	1.70
Best bar iron, at mills, at Pittsburgh.	1.48	1.87	1.93	1.94	1.60
Bar steel, at mills, at Pittsburgh.....	1.32	1.58	1.58	1.60	1.48
Cut nails, from store, at Philadelphia..	2.01	2.00	2.13	2.36	2.20
Wire nails, base price, at Chicago.....	1.96	1.93	1.98	2.18	2.17

## AVERAGE MONTHLY PRICES OF STEEL BARS AT PITTSBURGH.

The following table gives the average monthly prices of steel bars, per 100 pounds, at mills in Pittsburgh, compiled from quotations in the *American Manufacturer* and the *Industrial World*.

Months.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
January....	\$1.20	\$1.58	\$1.64	\$1.30	\$1.45	\$2.00	\$1.60	\$1.60
February...	1.27	1.50	1.60	1.30	1.45	1.75	1.60	1.60
March.....	1.44	1.50	1.60	1.33	1.50	1.50	1.60	1.60
April.....	1.50	1.67	1.60	1.35	1.50	1.50	1.60	1.60
May.....	1.50	1.80	1.60	1.32	1.50	1.50	1.60	1.60
June.....	1.50	1.80	1.60	1.30	1.50	1.50	1.60	1.40
July.....	1.52	1.72	1.60	1.30	1.50	1.50	1.60	1.40
August.....	1.50	1.75	1.60	1.31	1.50	1.50	1.60	1.40
September..	1.50	1.75	1.60	1.33	1.62	1.50	1.60	1.40
October.....	1.52	1.69	1.60	1.30	1.70	1.50	1.60	1.40
November..	1.60	1.60	1.37	1.32	1.80	1.56	1.60	1.40
December..	1.60	1.68	1.30	1.38	1.97	1.60	1.60	1.40
Average...	\$1.47	\$1.67	\$1.56	\$1.32	\$1.58	\$1.58	\$1.60	\$1.48

In April, May, June, and July, 1898, steel bars were sold at Pittsburgh at 95 cents per 100 pounds.

## AVERAGE MONTHLY PRICES OF STEEL SHIP PLATES.

The following table gives the average monthly prices of steel ship plates per gross ton free on board at Pittsburgh from January, 1901, to December, 1908. We have no monthly average prices of steel ship plates prior to October, 1900, in which month the average was \$24.64 per ton. In November of the same year the monthly average was \$28 and in December it was \$30.24.

Months.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
January...	\$31.36	\$35.84	\$35.84	\$35.84	\$33.60	\$35.84	\$38.08	\$38.08
February...	31.36	35.84	35.84	35.84	35.35	35.84	38.08	38.08
March.....	33.15	35.84	35.84	35.84	35.84	35.84	38.08	38.08
April.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08	38.08
May.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08	38.08
June.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08	36.59
July.....	35.84	35.84	35.84	35.84	35.84	35.84	38.08	35.84
August....	35.84	35.84	35.84	35.84	35.84	35.84	38.08	35.84
September	35.84	35.84	35.84	32.48	35.84	35.84	38.08	35.84
October...	35.84	35.84	35.84	31.36	35.84	35.84	38.08	35.84
November	35.84	35.84	35.84	31.36	35.84	35.84	38.08	35.84
December	35.84	35.84	35.84	32.37	35.84	35.84	38.08	35.84
Average	\$34.87	\$35.84	\$35.84	\$34.52	\$35.61	\$35.84	\$38.08	\$36.84

From January 1 to February 17, 1909, the price of steel ship plates was \$35.84; since February 17 it has been about \$29.12.

## AVERAGE MONTHLY PRICES OF WIRE NAILS AT CHICAGO.

The following table, compiled from quotations in the *Iron Age*, gives the average monthly base prices of standard sizes of wire nails, per keg of 100 pounds, in carload lots, free on board at Chicago, in the eight years from 1901 to 1908 inclusive.

Months.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
January.....	\$2.35	\$2.16	\$2.08	\$2.04	\$1.90	\$1.94	\$2.15	\$2.23
February...	2.45	2.20	2.12	2.05	1.95	1.95	2.15	2.23
March.....	2.45	2.20	2.20	2.09	1.95	1.95	2.15	2.23
April.....	2.45	2.20	2.15	2.10	1.95	1.95	2.15	2.23
May.....	2.45	2.20	2.15	2.10	1.95	1.95	2.15	2.23
June.....	2.45	2.20	2.15	2.07	1.95	1.95	2.18	2.13
July.....	2.45	2.20	2.15	2.05	1.95	1.95	2.18	2.13
August.....	2.45	2.20	2.15	1.90	1.87	1.95	2.18	2.13
September..	2.45	2.15	2.15	1.75	1.87	1.96	2.23	2.13
October.....	2.42	2.05	2.15	1.75	1.95	2.00	2.23	2.13
November..	2.35	2.00	2.15	1.77	1.95	2.04	2.23	2.13
December...	2.25	2.00	2.00	1.88	1.95	2.15	2.23	2.13
Average..	\$2.41	\$2.15	\$2.13	\$1.96	\$1.93	\$1.98	\$2.18	\$2.17

## AVERAGE WHOLESALE MONTHLY PRICES OF TINPLATES.

The following table gives the average wholesale monthly prices of domestic tinplates, I. C., 14 by 20, per box of 100 pounds, at tinplate mills in Pennsylvania, from 1901 to 1908 inclusive.

Months.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
January.....	\$4.00	\$4.00	\$3.60	\$3.56	\$3.55	\$3.47	\$3.90	\$3.74
February...	4.00	4.00	3.60	3.45	3.55	3.50	3.90	3.70
March.....	4.00	4.00	3.80	3.45	3.55	3.50	3.90	3.70
April.....	4.00	4.00	3.80	3.45	3.55	3.57	3.90	3.70
May .....	4.00	4.00	3.80	3.45	3.55	3.66	3.90	3.70
June.....	4.00	4.00	3.80	3.45	3.55	3.75	3.90	3.70
July .....	4.00	4.00	3.80	3.41	3.55	3.75	3.90	3.70
August.....	4.00	4.00	3.80	3.30	3.55	3.75	3.90	3.70
September..	4.00	4.00	3.80	3.30	3.55	3.75	3.90	3.70
October.....	4.00	4.00	3.80	3.30	3.36	3.75	3.90	3.70
November..	4.00	3.60	3.65	3.39	3.34	3.90	3.90	3.70
December...	4.00	3.60	3.60	3.47	3.40	3.90	3.90	3.70
Average..	\$4.00	\$3.93	\$3.74	\$3.41	\$3.50	\$3.69	\$3.90	\$3.70

In January and February, 1909, the average monthly price of domestic tinplates at Pennsylvania mills was \$3.70 and in March it was \$3.57. On April 1 the price was \$3.45.

## AVERAGE YEARLY PRICES OF FOREIGN TINPLATES.

The following table gives the average yearly prices of imported coke Bessemer tinplates, I. C., 14 x 20, per box of 108 pounds, at New York, freight and duty paid, from 1890 to 1898.

Years.	Price.	Years.	Price.	Years.	Price.
1890.....	\$4.80	1893.....	\$5.37	1896.....	\$3.80
1891.....	5.34	1894.....	4.89	1897.....	3.90
1892.....	5.30	1895.....	3.87	1898.....	4.00

## AVERAGE YEARLY PRICES OF DOMESTIC TINPLATES.

The following table gives the average yearly prices of domestic tinplates, I. C., 14 x 20, per box of 100 pounds, at tinplate mills in Pennsylvania, from 1899 to the end of 1908.

Years.	Price.	Years.	Price.	Years.	Price.
1899.....	\$4.06	1903.....	\$3.74	1907.....	\$3.90
1900.....	4.47	1904.....	3.41	1908.....	3.70
1901.....	4.00	1905.....	3.50	.....	.....
1902.....	3.93	1906.....	3.69	.....	.....

## AVERAGE MONTHLY PRICES OF CUT NAILS AT PHILADELPHIA.

The following table gives the average monthly base prices of cut nails, per keg of 100 pounds, from store at Philadelphia, since 1901, as reported to us by the Duncannon Iron Company and for 1908 by the Williamsport Iron and Nail Company.

Months.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
January.....	\$2.25	\$2.30	\$2.33	\$2.05	\$2.05	\$2.05	\$2.30	\$2.35
February....	2.27	2.20	2.36	2.00	2.10	2.10	2.35	2.35
March.....	2.27	2.25	2.36	2.00	2.10	2.10	2.35	2.35
April.....	2.30	2.30	2.41	2.05	2.10	2.10	2.35	2.35
May.....	2.30	2.30	2.41	2.05	2.10	2.10	2.35	2.25
June.....	2.30	2.30	2.41	2.05	2.00	2.10	2.35	2.15
July.....	2.30	2.30	2.41	2.05	1.95	2.10	2.40	2.15
August.....	2.30	2.30	2.41	2.00	1.90	2.10	2.40	2.15
September..	2.35	2.30	2.41	1.95	1.87	2.15	2.40	2.15
October.....	2.30	2.30	2.41	1.90	1.92	2.20	2.40	2.10
November..	2.30	2.30	2.20	2.00	1.95	2.20	2.35	2.05
December....	2.30	2.30	2.20	2.05	2.01	2.30	2.35	2.00
Average..	\$2.29	\$2.29	\$2.36	\$2.01	\$2.00	\$2.13	\$2.36	\$2.20

## AVERAGE QUARTERLY PRICES OF BEAMS AND CHANNELS.

The following table, which gives the average quarterly prices of steel beams and channels at Pittsburgh from 1894 to March 31, 1909, has been compiled for this Report by one of the leading manufacturers of structural shapes in Western Pennsylvania.

Years.	Average price per 100 pounds.					Years.	Average price per 100 pounds.				
	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Average.		First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Average.
1894...	\$1.21	\$1.20	\$1.27	\$1.25	\$1.23	1902...	\$1.60	\$1.60	\$1.60	\$1.60	\$1.60
1895...	1.21	1.25	1.56	1.58	1.40	1903...	1.60	1.60	1.60	1.60	1.60
1896...	1.44	1.49	1.55	1.50	1.49	1904...	1.60	1.60	1.55	1.41	1.54
1897...	1.55	1.33	.98	1.09	1.24	1905...	1.55	1.60	1.63	1.70	1.62
1898...	1.15	1.15	1.19	1.20	1.17	1906...	1.70	1.70	1.70	1.70	1.70
1899...	1.35	1.60	2.12	2.25	1.83	1907...	1.70	1.70	1.70	1.70	1.70
1900...	2.25	2.21	1.68	1.50	1.91	1908...	1.70	1.68	1.60	1.60	1.64
1901...	1.51	1.60	1.60	1.60	1.58	1909...	1.45	.....	.....	.....	.....

During the above period the lowest average quarterly price for beams and channels was in the third quarter of 1897, when the ruling price was 98 cents per 100 pounds. The highest average quarterly price was in the last quarter of 1899 and the first quarter of 1900, when it was \$2.25 per 100 pounds.

## IMPORTS AND EXPORTS OF IRON AND STEEL FOR 24 YEARS.

The following table, compiled from the reports of the Bureau of Statistics of the Department of Commerce and Labor, gives the foreign value of our imports of iron and steel and manufactures thereof in the calendar years from 1885 to 1908, including tinplates; also the home value of our exports of iron and steel and manufactures thereof, except farm implements, in the same years.

Calendar years.	Imports—Values.	Exports—Values.	Calendar years.	Imports—Values.	Exports—Values.
1885.....	\$31,144,552	\$16,622,511	1897.....	\$13,835,950	\$62,737,250
1886.....	41,630,779	14,865,087	1898.....	12,474,572	82,771,550
1887.....	56,420,607	16,235,922	1899.....	15,800,579	105,690,047
1888.....	42,311,689	19,578,489	1900.....	20,443,911	129,633,480
1889.....	42,027,742	23,712,814	1901.....	20,395,015	102,534,575
1890.....	44,540,413	27,000,134	1902.....	41,468,826	97,892,036
1891.....	41,983,626	30,736,507	1903.....	41,255,864	99,035,865
1892.....	33,882,447	27,900,862	1904.....	21,621,970	128,455,613
1893.....	29,656,539	30,159,363	1905.....	26,401,283	142,930,513
1894.....	20,843,576	29,943,729	1906.....	34,827,132	172,555,588
1895.....	25,772,136	35,071,563	1907.....	38,789,851	197,066,781
1896.....	19,506,587	48,670,218	1908.....	19,957,261	151,113,114

## PRODUCTION OF PIG IRON.

Twenty-three States made pig iron in 1908, against 23 States in 1907, Washington and California, which had returned to the active list in 1907 after an absence of several years, continuing to make pig iron in 1908, the latter State by charcoal and electricity.

The total production of all kinds of pig iron in 1908 was 15,936,018 gross tons, against 25,781,361 tons in 1907, a decrease of 9,845,343 tons, or over 38.1 per cent. The production of 1908 was therefore a little more than 61.8 per cent. of that of 1907. The following table gives the production of pig iron in half-yearly periods from 1903 to 1908 in gross tons of 2,240 pounds.

Periods.	1903. Gross tons.	1904. Gross tons.	1905. Gross tons.	1906. Gross tons.	1907. Gross tons.	1908. Gross tons.
First half....	9,707,367	8,173,438	11,163,175	12,582,250	13,478,044	6,918,004
Second half.	8,301,885	8,323,595	11,829,205	12,724,941	12,303,317	9,018,014
Total.....	18,009,252	16,497,033	22,992,380	25,307,191	25,781,361	15,936,018

The production in 1908 was only a little more than that of 15,878,354 tons in 1901. There was an increase in production in the second half of 1908 over the first half of 2,100,010 tons,

or 30.3 per cent. Except Indiana and California all the pig-iron producing States made less pig iron in 1908 than in 1907.

States—Gross tons.	1907.	1908.	States—Gross tons.	1907.	1908.
Mass. and Conn.	19,119	13,794	Tennessee .....	393,106	290,826
New York.....	1,659,752	1,019,495	Ohio.....	5,250,687	2,861,325
New Jersey .....	373,189	225,372	Illinois.....	2,457,768	1,691,944
Pennsylvania.....	11,348,549	6,987,191	Ind. and Mich...	436,507	348,096
Maryland.....	411,833	183,502	Wis. and Minn..	322,083	148,938
Virginia.....	478,771	320,458	Missouri, Colo.,	} 468,486	313,071
Georgia and Tex.	55,825	24,345	Wash., and Cal.		
Alabama.....	1,686,674	1,397,014	.....	.....	.....
West Virginia...	291,066	65,551	Total.....	25,781,361	15,936,018
Kentucky.....	127,946	45,096			

#### PRODUCTION OF PIG IRON ACCORDING TO FUEL.

The production of pig iron in 1908, classified according to the fuel used, was as follows, compared with the four preceding years.

Fuel used—Gross tons.	1904.	1905.	1906.	1907.	1908.
Bituminous, chiefly coke	14,931,364	20,964,937	23,313,498	23,972,410	15,331,863
Anthracite and coke.....	1,196,867	1,644,424	1,535,614	1,335,286	353,315
Anthracite alone.....	31,273	30,091	25,072	36,268	1,694
Charcoal.....	337,529	352,928	433,007	437,397	249,146
Total.....	16,497,033	22,992,380	25,307,191	25,781,361	15,936,018

A small quantity of pig iron made with charcoal and electricity is included in the figures for 1907 and 1908. No pig iron has been made since 1906 with mixed charcoal and coke.

The following table gives the production of bituminous pig iron by States in 1907 and 1908 in gross tons of 2,240 pounds.

States—Gross tons.	1907.	1908.	States—Gross tons.	1907.	1908.
Pennsylvania.....	10,091,994	6,662,723	Minnesota.....	} 512,348	310,934
Ohio.....	5,248,262	2,858,925	Missouri.....		
Illinois.....	2,457,768	1,691,944	Colorado.....		
Alabama.....	1,651,533	1,373,199	Washington .....		
New York.....	1,659,752	1,018,795	Tennessee .....	390,606	288,316
Virginia.....	} 517,095	326,465	New Jersey.....	255,901	192,352
Georgia.....			Maryland.....	411,833	183,502
Texas.....			West Virginia....	291,066	65,551
Indiana.....			Kentucky.....	125,984	43,172
Michigan.....	} 358,268	* 315,985	Total.....	23,972,410	*15,331,863
Wisconsin.....					

\* Includes a small quantity of iron made experimentally with manufactured gas.

The following table gives the production by States of pig iron made with anthracite coal alone and with mixed anthracite coal and coke in 1908, compared with 1907 and four preceding years.

States.	1903.	1904.	1905.	1906.	1907.	1908.
Pennsylvania	1,615,701	1,091,641	1,485,092	1,387,345	1,254,266	} 355,009
New Jersey....	} 284,018	134,762	{ 104,244	} 173,341	117,288	
New York.....			{ 85,179			
Maryland.....	11,628	1,737	.....	.....	.....	
Total.....	1,911,347	1,228,140	1,674,515	1,560,686	1,371,554	355,009

The following table gives the production of charcoal pig iron by States in 1907 and 1908, Michigan leading all the States.

States—Gross tons.	1907.	1908.	States—Gross tons.	1907.	1908.
Michigan .....	294,922	143,492	Massachusetts ....	} 19,119	* 14,494
Wisconsin .....	} * 61,538	} * 39,694	Connecticut.....		
Missouri.....			New York.....		
Washington.....			Maryland.....	} 1,444	3,298
California.....			Virginia.....		
Alabama .....	35,141	23,815	Pennsylvania.....	2,289	2,479
Georgia .....	} 20,519	} 19,474	Ohio.....	2,425	2,400
Kentucky.....			Total .....	* 437,397	* 249,146
Tennessee .....					

\* Includes a small quantity of pig iron made with charcoal and electricity.

#### PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

The production of Bessemer and low-phosphorus pig iron in 1908 was 7,216,976 tons, against 13,231,620 tons in 1907, a decrease of 6,014,644 tons, or over 45.4 per cent. In the second half of 1908 the production was 3,828,485 tons, as compared with 3,388,491 tons in the first half, an increase of 439,994 tons. The production of low-phosphorus pig iron alone in 1908 amounted to 130,616 tons, against 204,537 tons in 1907. The production of Bessemer and low-phosphorus pig iron in 1908 was the smallest since 1897, when 5,795,584 tons were made.

Of the total production of Bessemer and low-phosphorus pig iron in Pennsylvania in 1908 the Lehigh and Schuylkill Valleys made 109,188 tons, against 144,482 tons in 1907; the Lower Susquehanna Valley made 69,980 tons, against 414,759 tons in 1907; Allegheny County made 1,922,962 tons, against 3,443,741 tons in 1907; the Shenango Valley and the remainder of the State made 966,885 tons, against 1,733,319 tons in 1907: total, 3,069,015 tons in 1908, against 5,736,301 tons in 1907.

The following table gives the production of Bessemer and low-phosphorus pig iron by States in recent years. Bessemer and low-phosphorus pig iron made with charcoal are included.

States—Gross tons.	1906.	1907.	1908.
Pennsylvania.....	6,360,694	5,736,301	3,069,015
Ohio.....	3,870,204	3,711,001	1,907,529
Illinois.....	1,676,822	1,782,740	1,367,283
New York and New Jersey.....	790,002	929,519	483,900
Maryland and Virginia.....	380,323	421,958	183,879
West Virginia, Tennessee, and Kentucky....	342,666	324,323	121,703
Minnesota, Colorado, and California.....	251,819	222,539	83,667
Wisconsin and Michigan.....	167,988	103,239	.....
Total.....	13,840,518	13,231,620	7,216,976

New Jersey, Wisconsin, and Michigan did not make Bessemer or low-phosphorus pig iron in 1908.

In Ohio the Mahoning Valley produced 966,916 tons of Bessemer and low-phosphorus pig iron in 1908, against 1,569,686 tons in 1907; the Lake Counties, 817,186 tons, against 1,136,915 tons in 1907; the Hanging Rock bituminous district and other parts of Ohio produced 123,427 tons, against 1,004,400 tons in 1907: total, 1,907,529 tons in 1908, against 3,711,001 tons in 1907.

#### PRODUCTION OF BASIC PIG IRON BY STATES.

The production of basic pig iron in 1908, not including charcoal of basic quality, was 4,010,144 tons, against 5,375,219 tons in 1907, a decrease of 1,365,075 tons, or nearly 25.4 per cent. In the second half of 1908 the production amounted to 2,528,532 tons, against 1,481,612 tons in the first half, an increase of 1,046,920 tons. The total production in 1908 was slightly less than that of 1905, when 4,105,179 tons were made. The following table gives the production of basic pig iron by States since 1904.

States—Gross tons.	1904.	1905.	1906.	1907.	1908.
New York and New Jersey	113,688	172,206	263,947	215,197	110,167
Penna.—Allegheny County	1,245,142	1,537,909	1,719,839	1,812,007	1,854,327
Penna.—other counties.....	560,605	1,420,097	1,642,483	1,772,401	843,535
Virginia and Alabama.....	319,329	448,487	569,972	542,256	450,753
Ohio, Ind., Ill., Mo., & Col.	244,340	526,480	822,433	1,033,358	751,362
Total.....	2,483,104	4,105,179	5,018,674	5,375,219	4,010,144

Basic pig iron was made in 1908 in 10 States by 47 plants as follows: Pennsylvania, 23 plants; Alabama, 3; Ohio, 8; Illinois, 1; New Jersey, 2; Colorado, 1; Virginia, 4; New York,

2; Indiana, 2; and Missouri, 1. Tennessee has not made basic pig iron since 1903. Colorado first became a producer of basic pig iron in that year. Indiana joined the basic list in 1907.

The production of basic pig iron in Pennsylvania in 1908 by districts was as follows: the Lehigh Valley, 189,440 tons; Schuylkill and Lower Susquehanna Valleys, 301,386 tons; Allegheny County, 1,854,327 tons; Shenango Valley, 181,194 tons; and the remainder of the State, 171,515 tons: total, 2,697,862 tons. In Ohio the Mahoning Valley and Lake Counties districts made 74,048 tons in 1908 and the miscellaneous bituminous district made 204,338 tons in the same year: total, 278,386 tons.

#### PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

The production of spiegeleisen and ferro-manganese in 1908 was 152,018 tons, against 339,348 tons in 1907, a decrease of 187,330 tons, or over 55 per cent. The production of ferro-manganese alone in 1908 was 40,642 tons, against 55,918 tons in 1907. Of spiegeleisen alone it was 111,376 tons, against 283,430 tons in 1907. The spiegeleisen and ferro-manganese produced in 1908 were made by Pennsylvania, Illinois, and Colorado. The production of both products since 1891 is given in the following table.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1891.....	127,766	1897.....	173,695	1903.....	192,661
1892.....	179,131	1898.....	213,769	1904.....	219,446
1893.....	81,118	1899.....	219,768	1905.....	289,983
1894.....	120,180	1900.....	255,977	1906.....	300,500
1895.....	171,724	1901.....	291,461	1907.....	339,348
1896.....	131,940	1902.....	212,934	1908.....	152,018

#### PRODUCTION OF PIG IRON IN PENNSYLVANIA BY DISTRICTS.

The following table gives the production of all kinds of pig iron in Pennsylvania by districts from 1904 to 1908 in gross tons.

Districts—Gross tons.	1904.	1905.	1906.	1907.	1908.
Lehigh Valley.....	456,028	626,300	645,090	751,228	470,460
Schuylkill Valley.....	409,416	553,694	714,446	754,231	420,077
Lower Susquehanna Valley	397,156	664,779	672,294	631,179	276,537
Juniata Valley.....	120,471	209,769	196,513	255,402	120,168
Allegheny County.....	4,383,169	5,410,890	5,702,721	5,438,233	3,917,938
Shenango Valley.....	1,011,440	1,789,016	1,947,179	1,948,475	1,050,301
Other Western Penna. bit.	864,048	1,321,385	1,366,963	1,567,512	729,231
Charcoal.....	2,593	3,294	2,663	2,289	2,479
Total.....	7,644,321	10,579,127	11,247,869	11,348,549	6,987,191

Every district in Pennsylvania decreased its production in 1908 very largely as compared with 1907, but there was a small increase in the production of charcoal pig iron as compared with 1907—exactly 190 tons.

In 1902, 1903, and 1905 Allegheny county made a little more than one-half the production of Pennsylvania but less than one-fourth the country's total production. In 1904 it made 57.3 per cent. of the production of Pennsylvania and over 26 per cent. of the country's production; in 1906 over 50.7 per cent. of the production of Pennsylvania and over 22.5 per cent. of the country's production; and in 1907 over 47.9 per cent. of the production of Pennsylvania and almost 21.1 per cent. of the country's production. In 1908 it made over 56 per cent. of the production of Pennsylvania and over 24.5 per cent. of the country's production.

In 1901 Pennsylvania made 46.2 per cent. of the country's total production of pig iron, in 1902 and 1903 about 45.5 per cent., in 1904 about 46.3 per cent., in 1905 over 46 per cent., in 1906 over 44.4 per cent., in 1907 a little over 44 per cent., and in 1908 over 43.8 per cent. of the total.

#### PRODUCTION OF PIG IRON IN OHIO BY DISTRICTS.

The following table gives the production of all kinds of pig iron in Ohio by districts from 1904 to 1908 in gross tons.

Districts—Gross tons.	1904.	1905.	1906.	1907.	1908.
Mahoning Valley.....	1,217,186	1,724,927	1,936,936	1,986,227	1,242,084
Hocking Valley .....	17,600	1,300,447	1,478,730	1,554,282	1,050,292
Lake Counties.....	807,257				
Miscellaneous bituminous	687,601	1,198,038	1,502,792	1,350,560	308,875
Hanging Rock bituminous	247,297	358,523	403,225	357,193	257,674
Hanging Rock charcoal...	988	4,175	5,450	2,425	2,400
Total.....	2,977,929	4,586,110	5,327,133	5,250,687	2,861,325

The shrinkage in the production of pig iron in Ohio in 1908, as compared with 1907, which occurred in all the districts, was proportionately greater than in Pennsylvania. In Pennsylvania the decrease was 38.4 per cent. and in Ohio it was 45.5 per cent. Charcoal production in Ohio in 1908 was about the same as in 1907.

Of the country's total production in 1901 Ohio made over 20.9 per cent., in 1902 over 20.3 per cent., in 1903 and 1904 a little over 18 per cent., in 1905 over 19.9 per cent., in 1906 a little over 21 per cent., in 1907 over 20.3 per cent., and in 1908 a little less than 18 per cent.

## FURNACES IN BLAST.

The whole number of furnaces in blast on December 31, 1908, was 236, against 168 on June 30, 1908, and 167 on December 31, 1907. The number of furnaces in blast at the end of 1907 was smaller than at the close of any year since 1896, when but 159 furnaces were active. At the close of 1908 there were 223 idle furnaces, as compared with 276 idle at the close of 1907.

## NUMBER OF COMPLETED FURNACES.

The whole number of completed furnaces at the close of 1908 was 459, against 443 at the close of 1907, a gain of 16 furnaces.

The following table gives the number of completed furnaces at the end of each year since 1903, omitting abandoned furnaces.

Fuel used.	1903.	1904.	1905.	1906.	1907.	1908.
Bituminous coal and coke.....	288	300	300	313	337	365
Anthracite and anth. and coke...	77	73	69	66	56	45
Charcoal and charcoal and coke	60	56	55	50	50	49
Total.....	425	429	424	429	443	459

## FURNACES IN BLAST IN THE LAST SIX YEARS.

The following table gives the number of furnaces in blast at the close of each year from 1903 to 1908, according to fuel used.

Fuel used.	1903.	1904.	1905.	1906.	1907.	1908.
Bituminous coal and coke.....	120	206	242	269	122	205
Anthracite and anth. and coke..	29	38	46	48	23	13
Charcoal and charcoal and coke	33	17	25	23	22	18
Total.....	182	261	313	340	167	236

## ACTIVE AND IDLE PENNSYLVANIA AND OHIO FURNACES.

The total number of active mineral fuel furnaces in Pennsylvania on December 31, 1908, was 86, of which 12 were in the Lehigh Valley, 10 in the Schuylkill Valley, 6 in the Lower Susquehanna Valley, 3 in the Juniata Valley, 32 in Pittsburgh and Allegheny County, 11 in the Shenango Valley, and 12 in other Western Pennsylvania counties. On the same date there were 69 idle mineral fuel furnaces in Pennsylvania, of which 14 were in the Lehigh Valley, 6 in the Schuylkill Valley, 13 in the Lower Susquehanna Valley, 6 in the Juniata Valley, 14 in Allegheny county, 9 in the Shenango Valley, and 7 in other Western Pennsylvania counties. Of the 5 charcoal furnaces in Pennsylvania 1 was active and 4 were idle at the end of 1908.

The total number of active mineral fuel furnaces in Ohio on December 31, 1908, was 38, of which 13 were in the Mahoning Valley, 10 in the Hocking Valley and the Lake counties, 9 in the Hanging Rock district, and 6 in other Ohio river and interior counties. On the same date the idle mineral furnaces in Ohio numbered 29, of which 8 were in the Mahoning Valley, 5 in the Hocking Valley and Lake counties, 6 in the Hanging Rock district, and 10 in other interior and Ohio river counties. Of the 6 charcoal furnaces 1 was active and 5 were idle on December 31.

#### BUILDING AND REBUILDING FURNACES.

On December 31, 1908, there were 17 furnaces in course of erection in the United States, 11 furnaces were being rebuilt, and 1 furnace was to be revived. Of the building furnaces 1 was in New York, 6 in Pennsylvania, 2 in Ohio, 6 in Indiana, 1 in Illinois, and 1 in Michigan. When completed 16 of these furnaces will use coke or mixed anthracite coal and coke for fuel and 1 will use charcoal. Of the 11 rebuilding furnaces 1 was in New Jersey, 6 in Pennsylvania, 1 in Alabama, 1 in Ohio, and 2 in Illinois. When rebuilt 3 will use mixed anthracite coal and coke and 8 will use coke. The furnace to be revived will use charcoal. In addition 8 furnaces were projected and 1 was partly erected on December 31. The projected furnaces will use mineral fuel.

#### CONSUMPTION OF IRON ORE IN BLAST FURNACES.

We estimate the total consumption of domestic and foreign iron ore in the manufacture of pig iron in 1908 at 30,576,000 gross tons, against 50,100,000 tons in 1907. The average consumption of iron ore in 1908 per ton of pig iron made was almost 1.92 tons, as compared with an approximate consumption in 1907 of 1.94 tons. In 1906 the approximate ore consumption was 49,375,000 tons. In addition over 500,000 tons of iron ore are annually consumed by rolling mills and steel works.

#### LIMESTONE CONSUMED IN MAKING PIG IRON.

The limestone consumed for fluxing purposes by the blast furnaces in the production of 15,936,018 tons of pig iron in 1908 amounted to 8,658,558 tons. The average consumption of limestone per ton of all kinds of pig iron produced was 1,217.06 pounds in 1908, against 1,233.2 pounds in 1907. The consumption in 1908 by anthracite and bituminous furnaces was 1,229.4 pounds, against 1,247.8 pounds in 1907, and by the charcoal furnaces it was 438.6 pounds in 1908, against 391.2 pounds in 1907.

## CONSUMPTION OF SCRAP IRON AND STEEL, MILL CINDER, ETC.

In addition to the iron ore which is annually consumed there is an ever-increasing consumption by our blast furnaces of mill cinder, scale, scrap, etc. The consumption of materials of this character has been ascertained by the Bureau of the Census for the census years 1880, 1890, and 1900; also for the calendar year 1904. The Bureau has also ascertained for the same years the consumption of old rails and all kinds of iron and steel scrap by our rolling mills and steel works. By combining these two statements the results shown in the following table are obtained.

Mill cinder, scrap, etc.—Gross tons.	1880.	1890.	1900.	1904.
Blast furnaces.....	316,114	1,145,599	1,600,313	1,865,385
Rolling mills and steel works...	1,198,842	1,726,162	4,113,287	5,124,277
Total.....	1,514,956	2,871,761	5,713,600	6,989,662

The great increase shown in the table in the use of scrap by rolling mills and steel works from 1890 to 1900 and from 1900 to 1904 is explained by the development of the basic open-hearth steel process, which actively began late in the 90's and which has since made wonderful progress. While no accurate figures are available it is probable that in 1904 the open-hearth process alone consumed approximately 3,000,000 tons of iron and steel scrap, and that in 1907, when the production of basic open-hearth steel was more than double that of 1904, the consumption of scrap in the open-hearth approximated 6,000,000 tons.

In the above table the iron and steel scrap consumed by iron foundries, cast-iron pipe works, car-wheel plants, and forges which manufacture scrap bars, etc., is not considered. If the scrap consumed by establishments of this character were included, and due allowance were made for the great increase in consumption by our basic open-hearth steel furnaces, it would probably be found that the total consumption of iron and steel scrap, cinder, scale, etc., in this country in the calendar year 1907 would amount to at least 12,000,000 tons and might reach 12,500,000 tons, or about one-half of our total production of pig iron in that year. The scrap and cinder consumption of 1908 was naturally much less than that of 1907. There was doubtless a large accumulation of scrap.

## PRODUCTION OF PIG IRON BY GRADES.

The following table gives the total production of pig iron by grades from 1904 to 1908 in gross tons of 2,240 pounds.

Grades—Gross tons.	1904.	1905.	1906.	1907.	1908.
Bess. and low-phos.	9,098,659	12,407,116	13,840,518	13,231,620	7,216,976
Basic (mineral fuel)	2,483,104	4,105,179	5,018,674	5,375,219	4,010,144
Forge pig iron.....	550,836	727,817	597,420	683,167	457,164
Found. & ferro-sil..	3,827,229	4,758,038	4,773,011	5,151,209	3,637,622
Malleable Bessemer	263,529	635,236	699,701	920,290	414,957
Spiegeleisen.....	162,370	227,797	244,980	283,430	111,376
Ferro-manganese....	57,076	62,186	55,520	55,918	40,642
White, mottled, direct castings, etc. }	54,230	69,011	77,367	80,508	47,137
Total .....	16,497,033	22,992,380	25,307,191	25,781,361	15,936,018

The Bessemer figures include low-phosphorus pig iron, that is, iron running below 0.04 per cent. in phosphorus. Pig iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. The basic figures do not include the small quantity of basic iron that is made with charcoal. A few thousand tons of castings direct from the furnace are included in the totals for white and mottled and miscellaneous grades of pig iron; also small quantities of ferro-phosphorus. Ferro-silicon, Bessemer ferro-silicon, and high-silicon pig iron are included in the foundry figures given in the table.

Of the total production of pig iron in 1908 over 45.2 per cent. was Bessemer and low-phosphorus, compared with over 51.3 per cent. in 1907; over 22.8 per cent. was foundry, ferro-silicon, and high-silicon, against over 19.9 per cent. in 1907; over 25.1 per cent. was basic, against over 20.8 per cent. in 1907; over 2.8 per cent. was forge, against over 2.6 per cent. in 1907; over 0.9 per cent. was spiegeleisen and ferro-manganese, against over 1.3 per cent. in 1907; and over 2.6 per cent. was malleable Bessemer, against over 3.5 per cent. in 1907. White and mottled, ferro-phosphorus, and miscellaneous grades of pig iron and castings made direct from the blast furnace did not amount to one-third of 1 per cent. in 1907 or 1908.

In 1908 the production of Bessemer pig iron alone, omitting low-phosphorus pig iron, amounted to 7,086,360 tons, against 13,027,083 tons in 1907, 13,611,749 tons in 1906, 12,220,209 tons in 1905, and 8,907,713 tons in 1904. The production of low-phosphorus pig iron alone in 1908 amounted to 130,616 tons, against 204,537 tons in 1907, 228,769 tons in 1906, 186,907 tons in 1905, and 190,946 tons in 1904.

The following table gives the production by States of Bessemer and low-phosphorus and basic pig iron in 1906, 1907, and 1908.

States—Gross tons.	Bessemer and low-phosphorus.			Basic pig iron.		
	1906.	1907.	1908.	1906.	1907.	1908.
N. Y. and N. J.	790,002	929,519	483,900	263,947	215,197	110,167
Pennsylvania.	6,360,694	5,736,301	3,069,015	3,362,322	3,584,408	2,697,862
Maryland.....	378,223	409,458	183,502	.....	.....	.....
Virginia.....	} 2,100	12,500	377	569,972	542,256	450,753
Alabama.....						
W. Va., Ky., and Tenn.....	342,666	324,323	121,703	.....	.....	.....
Ohio.....	3,870,204	3,711,001	1,907,529	449,212	451,378	278,386
Illinois.....	1,676,822	1,782,740	1,367,283	} 253,849	406,395	270,750
Indiana.....	.....	.....	.....			
Mich. and Wis.	108,945	70,023	.....	} 119,372	175,585	202,226
Minn., Mo., Col., & Cal.	310,862	255,755	83,667			
Total.....	13,840,518	13,231,620	7,216,976	5,018,674	5,375,219	4,010,144

A small quantity of basic pig iron made with charcoal as fuel is not included in the basic production for these years.

The production of foundry and forge pig iron by States in 1906, 1907, and 1908 was as follows in gross tons.

States—Gross tons.	Foundry, ferro-sil., high-sil., etc.			Forge pig iron.		
	1906.	1907.	1908.	1906.	1907.	1908.
Mass. and Conn.	20,239	19,028	13,794	.....	.....	.....
New York.....	531,234	482,459	441,138	52,007	81,329	9,603
New Jersey.....	133,383	145,408	119,444	17,562	31,036	14,797
Pennsylvania.....	973,699	1,276,493	765,454	308,615	359,543	295,106
Maryland.....	} 348,618	367,669	274,212	{ 14,938	21,210	17,900
Virginia.....						
West Virginia...	.....	.....	.....	5,846	5,162	.....
Kentucky.....	58,362	77,743	6,865	11,492	9,907	50
Tennessee.....	376,722	337,737	255,945	21,093	23,836	11,490
Georgia.....	} 82,650	54,305	23,888	8,451	1,320	275
Texas.....						
Alabama.....	1,117,262	1,113,340	884,920	83,408	76,766	71,864
Ohio.....	635,885	667,428	463,120	74,008	73,058	36,059
Indiana.....	} 70,890	97,213	70,527	.....	.....	.....
Illinois.....						
Michigan.....	311,949	336,168	185,569	.....	.....	20
Wisconsin.....	88,588	110,409	106,126	.....	.....	.....
Minnesota.....	.....	8,493	6,027	.....	.....	.....
Missouri.....	23,530	15,966	19,983	.....	.....	.....
Colorado.....	} .....	41,350	610	.....	.....	.....
Washington.....						
California.....	.....	.....	.....	.....	.....	.....
Total.....	4,773,011	5,151,209	3,637,622	597,420	683,167	457,164

As already stated ferro-silicon, Bessemer ferro-silicon, and high-silicon pig iron are included with foundry iron. A comparatively small quantity of forge pig iron is now made, Pennsylvania making over one-half. Alabama was the largest producer of foundry pig iron in 1908.

Included in the 3,637,622 tons of foundry pig iron reported for 1908 are 64,412 tons of ferro-silicon and Bessemer ferro-silicon made in New York, Pennsylvania, Virginia, West Virginia, Tennessee, and Ohio. In 1907 there were made 84,898 tons of ferro-silicon and Bessemer ferro-silicon; in 1906, 76,694 tons; in 1905, 60,655 tons; in 1904, 69,730 tons; and in 1903, 51,516 tons. Prior to 1903 the production of ferro-silicon was not separately ascertained. Pig iron containing 7 per cent. of silicon and over is classified as ferro-silicon. Nearly all the charcoal iron made is classified as foundry pig iron.

The production of malleable Bessemer pig iron in 1908 amounted to 414,957 tons, as compared with 920,290 tons in 1907, 699,701 tons in 1906, and 635,236 tons in 1905.

The production of spiegeleisen and ferro-manganese by States in 1906, 1907, and 1908 was as follows in gross tons. Spiegeleisen contains from 9 to 22 per cent. of manganese and ferro-manganese from 45 to 82 per cent. The standard for spiegeleisen is 20 per cent. and for ferro-manganese it is 80 per cent.

States—Gross tons.	Spiegeleisen.			Ferro-manganese.		
	1906.	1907.	1908.	1906.	1907.	1908.
New Jersey.....	9,313	7,039	.....	.....	.....	.....
Pennsylvania ...	140,305	195,829	62,057	55,520	55,918	40,642
Maryland.....	7,077	2,375	.....	}	.....	.....
Illinois.....	69,966	65,141	41,734			
Colorado.....	18,319	13,046	7,585			
Total.....	244,980	283,430	111,376	55,520	55,918	40,642

The production of white and mottled pig iron, direct castings, ferro-phosphorus, etc., in 1908 amounted to 47,137 tons, as compared with 80,508 tons in 1907, 77,367 tons in 1906, 69,011 tons in 1905, 54,230 tons in 1904, and 120,137 tons in 1903.

#### PRODUCTION OF BESSEMER STEEL.

The production of Bessemer steel ingots and castings in 1908 was 6,116,755 gross tons, against 11,667,549 tons in 1907, a decrease of 5,550,794 tons, or over 47.5 per cent. The production in

1908 was the smallest since 1897, when 5,475,315 tons were made. The year of largest production was 1906, when 12,275,830 tons, or over double the production of 1908, were made. Of the total production in 1908 6,096,478 tons were made by the standard Bessemer process, against 11,635,092 tons in 1907; 7,992 tons by the Tropenas process, against 13,140 tons in 1907; and 12,285 tons by other modifications of the Bessemer process, against 19,317 tons in 1907. In the total production for 1907 a small quantity of nickel-Bessemer steel, all made in Pennsylvania, is included, but in 1908 no nickel-Bessemer steel was reported.

The following table gives the production by States of Bessemer steel ingots and castings in the last six years in gross tons.

States—Gross tons.	1903.	1904.	1905.	1906.	1907.	1908.
Pennsylvania.....	3,909,436	3,464,650	4,491,445	4,827,725	4,351,841	2,106,382
Ohio.....	2,330,134	2,050,115	3,131,149	3,769,913	3,636,679	1,955,446
Illinois.....	1,366,569	1,257,190	1,651,250	1,684,772	1,723,073	1,237,747
Other States.....	986,690	1,087,185	1,667,531	1,993,420	1,955,956	817,180
Total.....	8,592,829	7,859,140	10,941,375	12,275,830	11,667,549	6,116,755

The decrease in production in Pennsylvania in 1908 as compared with 1907 amounted to 2,245,459 tons, or over 51.5 per cent.; in Ohio to 1,681,233 tons, or over 46.2 per cent.; in Illinois to 485,326 tons, or over 28.1 per cent.; and in other States to 1,138,776 tons, or over 58.2 per cent. Pennsylvania led Ohio very slightly in 1908, the difference in production amounting to only 150,936 tons. In 1907 Pennsylvania's production exceeded that of Ohio by 715,162 tons.

The Bessemer steel made in 1908, including both ingots and castings, was produced by 52 works, located in 20 States and the District of Columbia, as follows: Massachusetts, 1; Connecticut, 1; New York, 3; New Jersey, 2; Pennsylvania, 13; Delaware, 1; Maryland, 1; District of Columbia, 1; Virginia, 1; West Virginia, 1; Kentucky, 1; Ohio, 10; Illinois, 6; Michigan, 2; Wisconsin, 2; Minnesota, 1; Missouri, 1; Kansas, 1; Colorado, 1; Oregon, 1; and California, 1. Rhode Island and Tennessee did not make Bessemer steel in 1907 or 1908. Kansas joined the producing list in 1908, making a few tons of castings. Of the active works in 1908 17 made ingots but not castings, 30 made castings but not ingots, and 5 made both ingots and castings. Sixty works in 18 States and the District of Columbia were active in 1907.

There were no Clapp-Griffiths works in operation in 1908 and only 2 Robert-Bessemer plants were active, the same number as in 1907. Twenty-one standard Bessemer plants were at work in 1908, as compared with 26 in 1907, and 16 Tropenas plants were running in 1908, against 17 in 1907. In addition one plant made steel by the Bookwalter process in 1908 and 1907 and 12 plants made steel by other minor Bessemer processes in 1908, as compared with 14 in 1907. All the Tropenas and other modified Bessemer plants make a specialty of castings.

There were 18 idle Bessemer steel plants in 1908, located in the following States: Massachusetts, 2; Rhode Island, 1; New Jersey, 1; Pennsylvania, 7; West Virginia, 1; Tennessee, 1; Ohio, 2; Illinois, 1; Wisconsin, 1; and California, 1. Of the total 8 were equipped with standard Bessemer converters, 4 with Tropenas converters, one with a Clapp-Griffiths converter, one with a modified Tropenas converter, and 4 with Fisher, Zenzes, and other special Bessemer converters. In 1907 the idle Bessemer steel works numbered 9. There were 2 standard and 2 special Bessemer converters dismantled in 1908.

The following table gives separately by States the production of Bessemer ingots and castings in 1908, all made by the acid process, followed by the production in 1907. Basic Bessemer steel has not been made in this country since 1897.

States—Gross tons.	Ingots.	Castings.	Total.
Pennsylvania .....	2,102,190	4,192	2,106,382
Ohio.....	1,952,001	3,445	1,955,446
Illinois.....	1,236,057	1,690	1,237,747
Other States.....	805,948	11,232	817,180
Total for 1908 .....	6,096,196	20,559	6,116,755
Total for 1907 .....	11,634,276	33,273	11,667,549

The following table gives the production of Bessemer steel ingots and castings in the last fifteen years in gross tons.

Years. Gross tons.	Ingots and castings.	Years. Gross tons.	Ingots and castings.	Years. Gross tons.	Ingots and castings.
1894.....	3,571,313	1899.....	7,586,354	1904.....	7,859,140
1895.....	4,909,128	1900.....	6,684,770	1905.....	10,941,375
1896.....	3,919,906	1901.....	8,713,302	1906.....	12,275,830
1897.....	5,475,315	1902.....	9,138,363	1907.....	11,667,549
1898.....	6,609,017	1903.....	8,592,829	1908.....	6,116,755

## PRODUCTION OF OPEN-HEARTH STEEL.

The total production of open-hearth steel ingots and direct castings in the United States in 1908 was 7,836,729 gross tons, against 11,549,736 tons in 1907, a decrease of 3,713,007 tons, or over 32.1 per cent. While the open-hearth production in 1908 was much smaller than in 1907 it was much larger than the production of Bessemer steel ingots and castings in 1908, the output of open-hearth steel in that year exceeding that of Bessemer by 1,719,974 tons, or over 28 per cent. This is the first time that the output of open-hearth steel has exceeded that of Bessemer. The maximum production of open-hearth steel was reached in 1907. The year of next largest production was 1906.

The following table gives the production of open-hearth steel ingots and castings by States since 1903 in gross tons. Several thousand tons of nickel-steel ingots and castings are included.

States—Gross tons.	1903.	1904.	1905.	1906.	1907.	1908.
New England....	169,209	195,901	239,282	251,047	239,797	158,417
N. Y. and N. J....	104,598	165,986	348,072	553,186	706,019	350,348
Pennsylvania....	4,442,730	4,306,498	6,471,818	7,718,213	7,868,353	5,322,229
Ohio.....	369,349	480,906	687,392	818,683	819,642	525,171
Illinois.....	422,919	358,215	617,625	884,472	1,013,251	483,104
Other States.....	321,106	400,660	607,187	754,812	902,674	997,460
Total.....	5,829,911	5,908,166	8,971,376	10,980,413	11,549,736	7,836,729

The following table gives the production of open-hearth steel ingots and castings in the last fifteen years. It was not until 1895 that the annual production of open-hearth steel exceeded 1,000,000 tons. The output in 1908 was the smallest since 1904.

Years. Gross tons.	Ingots and castings.	Years. Gross tons.	Ingots and castings.	Years. Gross tons.	Ingots and castings.
1894.....	784,936	1899.....	2,947,316	1904.....	5,908,166
1895.....	1,137,182	1900.....	3,398,135	1905.....	8,971,376
1896.....	1,298,700	1901.....	4,656,309	1906.....	10,980,413
1897.....	1,608,671	1902.....	5,687,729	1907.....	11,549,736
1898.....	2,230,292	1903.....	5,829,911	1908.....	7,836,729

## PRODUCTION OF OPEN-HEARTH STEEL INGOTS AND CASTINGS.

The production of open-hearth steel ingots in 1908, not including castings, amounted to 7,524,952 tons, against 10,803,211 tons in 1907, a decrease of 3,278,259 tons, or over 30.3 per cent. The production of castings alone in 1908 amounted to 311,777 tons, against 746,525 tons in 1907, a decrease of 434,748 tons, or over

58.2 per cent. The following table gives by States the production of open-hearth steel ingots and castings in 1908 in gross tons.

States—Gross tons.	Ingots.	Castings.	Total.
New England, New York, and New Jersey..	455,610	53,155	508,765
Pennsylvania.....	5,208,514	113,715	5,322,229
Ohio, Indiana, Illinois, and other States.....	1,860,828	144,907	2,005,735
Total for 1908.....	7,524,952	311,777	7,836,729
Total for 1907.....	10,803,211	746,525	11,549,736

The open-hearth steel produced in 1908, including ingots and castings, was made by 125 works in 21 States and the District of Columbia as follows: Massachusetts, 4; Connecticut, 2; Rhode Island, 1; New York, 9; New Jersey, 6; Pennsylvania, 59; Delaware, 1; Maryland, 1; District of Columbia, 1; West Virginia, 1; Kentucky, 1; Georgia, 1; Alabama, 2; Ohio, 14; Indiana, 5; Illinois, 6; Michigan, 2; Wisconsin, 4; Minnesota, 1; Missouri, 1; Colorado, 1; and California, 2. Kentucky appears among the producers for the first time since 1900. In 1907 there were 137 works in 20 States and the District of Columbia which made open-hearth steel, in 1906 there were 125 works in 20 States, and in 1905 there were 111 works in 17 States. During 1908 there were 40 works which did not make steel, as compared with 25 in 1907. In 1908 there were 48 open-hearth works which made ingots but not castings, 57 which made castings but not ingots, and 20 which made both castings and ingots.

#### PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL.

In 1908 there were 7,140,425 tons of open-hearth steel made by the basic process and 696,304 tons by the acid process, while in 1907 the production by the basic process amounted to 10,279,315 tons and by the acid process to 1,270,421 tons. This is a loss in production in 1908 as compared with 1907 by the basic process of 3,138,890 tons and by the acid process of 574,117 tons. In 1906 there were made 9,658,760 tons of open-hearth steel by the basic and 1,321,653 tons by the acid process.

Pennsylvania made over 67.5 per cent. of the total production of basic steel ingots and castings in 1908 and over 71.8 per cent. of the total production of acid steel ingots and castings, against over 66.4 per cent. of basic and over 82 per cent. of acid ingots and castings in 1907. Ohio, Illinois, Alabama, Colorado, New York, Indiana, Massachusetts, and New Jersey, in the order named, were the next largest producers of open-hearth steel in 1908.

The following table gives the production by States of both basic and acid open-hearth steel ingots and castings in 1908.

States—Gross tons.	Basic open-hearth steel.	Acid open-hearth steel.	Total. Gross tons.
New England.....	112,037	46,380	158,417
New York and New Jersey .....	307,738	42,610	350,348
Pennsylvania .....	4,822,215	500,014	5,322,229
Ohio .....	477,068	48,103	525,171
Illinois.....	477,615	5,489	483,104
Alabama, Colorado, and other States...	943,752	53,708	997,460
Total for 1908.....	7,140,425	696,304	7,836,729
Total for 1907.....	10,279,315	1,270,421	11,549,736

#### PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL INGOTS.

The following table gives the production of basic and acid open-hearth steel ingots in the United States in 1908 by States, direct castings being omitted. There was a decrease of 2,927,419 tons in 1908 as compared with 1907 in the production of basic ingots and of 350,840 tons in the production of acid ingots. A table giving the production of open-hearth steel castings will be found on page 64. Gross tons are used throughout.

States—Gross tons.	Basic ingots.	Acid ingots.	Total. Gross tons.
New England, New York, and New Jersey	388,681	66,929	455,610
Pennsylvania.....	4,790,944	417,570	5,208,514
Ohio, Illinois, and other States.....	1,805,795	55,033	1,860,828
Total for 1908 .....	6,985,420	539,532	7,524,952
Total for 1907.....	9,912,839	890,372	10,803,211

In addition to the States named above Massachusetts, Rhode Island, Connecticut, Maryland, West Virginia, Kentucky, Georgia, Alabama, Indiana, and California made open-hearth steel ingots in 1908; also the District of Columbia. The States which made ingots by the basic but not by the acid process in 1908 were Rhode Island, Connecticut, New York, Maryland, West Virginia, Georgia, Alabama, Indiana, Colorado, and California. The States which made ingots by both the basic and acid processes were Massachusetts, New Jersey, Pennsylvania, Ohio, Illinois, and Kentucky; also the District of Columbia. No State made ingots by the acid process alone in 1908.

There were 68 works in 1908 which made open-hearth steel ingots, of which 43 made ingots by the basic but not by the acid process, 6 made ingots by the acid but not by the basic process, and 19 made ingots by both the basic and acid processes.

The seven largest makers of open-hearth steel ingots in 1908, in the order named, were Pennsylvania, Ohio, Illinois, Alabama, Colorado, New York, and Indiana. These States in the order named were also the largest makers of basic open-hearth ingots in the same year. The seven largest makers of acid open-hearth ingots were Pennsylvania, Massachusetts, New Jersey, Ohio, Kentucky, District of Columbia, and Illinois, in the order named.

#### PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL CASTINGS.

As already stated the total production of open-hearth steel castings in 1908 amounted to 311,777 tons, as compared with 746,525 tons in 1907. The production in 1907 was the largest in our history. The year of next largest production was 1906. Of the production in 1908 156,772 tons, or over 50.2 per cent., were made by the acid process and 155,005 tons, or over 49.7 per cent., were made by the basic process. As compared with 1907, when 380,049 tons of castings were made by the acid process, the decrease in 1908 by this process was 223,277 tons. By the basic process the decrease was 211,471 tons, the production by this process in 1907 having amounted to 366,476 tons. A table on page 63 gives the production of open-hearth steel ingots.

The following table gives the production of open-hearth steel castings by both the basic and acid processes in 1908 by States.

States—Gross tons.	Basic castings.	Acid castings.	Total. Gross tons.
New England, New York, and New Jersey..	31,094	22,061	53,155
Pennsylvania.....	31,271	82,444	113,715
Ohio, Illinois, and other States.....	92,640	52,267	144,907
Total for 1908.....	155,005	156,772	311,777
Total for 1907.....	366,476	380,049	746,525

New England, New York, and New Jersey made more basic than acid castings in 1908, their combined production of basic castings exceeding that of acid by 9,033 tons, or over 40.9 per cent. So also did Ohio, Indiana, Illinois, Alabama, and other Western and Southern States, their combined production of basic castings in 1908 exceeding acid by 40,373 tons, or over 77.2 per

cent. Pennsylvania, on the other hand, made considerably more castings in 1908 by the acid process than by the basic process, acid exceeding basic by 51,173 tons, or over 163 per cent.

The States which made basic but not acid castings in 1908 were Maryland, Alabama, Missouri, and Colorado; the States which made acid but not basic castings were Massachusetts, Connecticut, Delaware, Indiana, Minnesota, and California; and the States which made both basic and acid castings were New York, New Jersey, Pennsylvania, Ohio, Illinois, Michigan, and Wisconsin.

The five largest makers of open-hearth castings in 1908 were Pennsylvania, Ohio, Illinois, New York, and Missouri, in the order named; the five largest makers of basic castings were Illinois, Ohio, Pennsylvania, New York, and Missouri, also in the order named; while the five largest makers of acid castings were Pennsylvania, Ohio, Indiana, Wisconsin, and Massachusetts, in the order named.

In addition to the States named in the table Massachusetts, Connecticut, Delaware, Maryland, Alabama, Indiana, Michigan, Wisconsin, Minnesota, Missouri, Colorado, and California made open-hearth steel castings in 1908. Pennsylvania made over 52.5 per cent. of the total production of acid open-hearth castings in 1908, while Illinois made over 22 per cent. of the total production of basic open-hearth castings in the same year. Illinois led Ohio very slightly, however, in the production of basic castings in 1908, but was far behind Ohio in the total production of open-hearth castings. The following table gives the production of open-hearth steel castings by States since 1898 in gross tons.

Years. Gross tons.	New England, N. Y., and N. J.	Pennsylvania.	Ohio, Ind., Ill., and other States.	Total. Gross tons.
1898 .....	14,657	47,270	58,660	120,587
1899 .....	21,640	69,996	78,093	169,729
1900 .....	21,883	78,584	77,024	177,491
1901 .....	37,154	108,486	155,982	301,622
1902 .....	37,041	152,399	178,439	367,879
1903 .....	36,094	182,021	182,233	400,348
1904 .....	44,478	134,410	123,946	302,834
1905 .....	59,207	234,288	233,045	526,540
1906 .....	89,510	305,062	325,319	719,891
1907 .....	100,209	308,932	337,384	746,525
1908 .....	53,155	113,715	144,907	311,777

In 1908 there were 77 works which made open-hearth steel castings, of which 23 made castings by the basic but not by the

acid process, 47 made castings by the acid but not by the basic process, and 7 made castings by both the basic and acid process.

#### COMPLETED AND BUILDING OPEN-HEARTH PLANTS.

At the close of 1908 the total number of open-hearth plants which were equipped to make basic steel ingots or castings was 103, of which 78 were active in 1908 and 25 were idle, and the number of plants which were equipped to make acid open-hearth steel was 91, of which 66 were active during 1908 and 25 were idle. A number of these plants are equipped to make and some did make both basic and acid steel in 1908.

On December 31, 1908, the number of open-hearth plants which were being built was 12. In addition there were 3 plants which were partly erected but work on their construction had been temporarily suspended. If completed 12 of these plants will make basic and 3 will make acid steel. A number of open-hearth steel plants were projected on December 31.

#### PRODUCTION OF CRUCIBLE STEEL.

The production of crucible steel in 1908 amounted to 63,631 tons, against 131,234 tons in 1907, a decrease of 67,603 tons, or over 51.5 per cent. Sixty-six works in 12 States made crucible steel in 1908, as compared with 68 works in 13 States in 1907. The direct castings produced in 1908, included above, amounted to 8,271 tons, against 10,233 tons in 1907. Pennsylvania made 36,796 tons of crucible steel ingots and castings in 1908, against 87,556 tons in 1907. New York was the next largest maker in 1908, its production amounting to 8,838 tons. No other State made 8,000 tons in 1908. The total production in 1908 was the smallest since 1896, when 60,689 tons were made. As far back as 1880 we made more crucible steel than we made in 1908, the production in 1880 having amounted to 64,664 tons, or 1,033 tons more than in 1908. The maximum production was reached in 1907. The year of next largest production was 1906.

The following table gives separately by States the production of crucible steel ingots and castings in 1908 in gross tons.

States—Gross tons.	Ingots.	Castings.	Total.
Pennsylvania .....	35,160	1,636	36,796
Mass., Conn., New York, and other States.	20,200	6,635	26,835
Total for 1908.....	55,360	8,271	63,631
Total for 1907.....	121,001	10,233	131,234

Of the active crucible steel works in 1908 there were 27 works in 5 States which made ingots but not castings, 36 works in 10 States which made castings but not ingots, and 3 works in 2 States which made both ingots and castings.

In addition to the States enumerated above New Jersey, Ohio, Indiana, Illinois, Michigan, Wisconsin, Washington, and California made crucible steel ingots or castings in 1908. The total number of completed crucible steel plants in 1908 was 85, of which 66 were active and 19 were idle. On December 31, 1908, one crucible steel plant was being built in Ohio.

The production of crucible steel ingots and castings in the last fifteen years is given in the following table in gross tons.

Years.	Ingots and castings.	Years.	Ingots and castings.	Years.	Ingots and castings.
1894.....	51,702	1899.....	101,213	1904.....	83,391
1895.....	67,666	1900.....	100,562	1905.....	102,233
1896.....	60,689	1901.....	98,513	1906.....	127,513
1897.....	69,959	1902.....	112,772	1907.....	131,234
1898.....	89,747	1903.....	102,434	1908.....	63,631

#### PRODUCTION OF MISCELLANEOUS STEEL.

The production of steel in 1908 by various minor processes amounted to 6,132 tons, against 14,075 tons in 1907, a decrease of 7,943 tons. Eight works in 7 States made steel in 1908 by minor processes, against 11 works in 7 States in 1907. Blister, puddled, electric, and "patented" steel, including patented steel castings, are represented in these figures.

The following table gives the production of all kinds of miscellaneous steel by States in 1908, ingots and bars being separated from castings. Production is in gross tons of 2,240 pounds.

States—Gross tons.	Ingots or bars.	Castings.	Total. Gross tons.
Pennsylvania.....	.....	458	458
Conn., New Jersey, Ohio, and other States...	519	5,155	5,674
Total for 1908.....	519	5,613	6,132
Total for 1907.....	989	13,086	14,075

In addition to the States enumerated above New York, Indiana, and Michigan made steel by minor processes in 1908.

The following table gives the production of steel by minor processes in the last fifteen years in gross tons.

Years. Gross tons.	Ingots, bars, and castings.	Years. Gross tons.	Ingots, bars, and castings.	Years. Gross tons.	Ingots, bars, and castings.
1894.....	4,081	1899.....	4,974	1904.....	9,190
1895.....	858	1900.....	4,862	1905.....	8,963
1896.....	2,394	1901.....	5,471	1906.....	14,380
1897.....	3,012	1902.....	8,386	1907.....	14,075
1898.....	3,801	1903.....	9,804	1908.....	6,132

## PRODUCTION OF ALL KINDS OF STEEL.

In 1908 there were 218 works in 25 States and the District of Columbia which made steel ingots or castings, against 234 works in 24 States and the District of Columbia in 1907. Of the total active works in 1908 there were 76 works in 16 States and the District of Columbia which made steel ingots but not steel castings, against 86 works in 15 States and the District of Columbia in 1907; 116 works in 18 States and the District of Columbia which made steel castings but not steel ingots, against 119 works in 17 States and the District of Columbia in 1907; and 26 works in 9 States which made both steel ingots and castings, against 29 works in 10 States in 1907.

The production of all kinds of steel ingots and castings in 1908 amounted to 14,023,247 tons, against 23,362,594 tons in 1907, a decrease of 9,339,347 tons, or over 39.9 per cent. The production in 1908 was the smallest since 1901, when 13,473,595 tons were made. The maximum production was reached in 1906. The year of next largest production was 1907. The following table gives the production of all kinds of steel ingots and castings by States in 1908 in gross tons of 2,240 pounds.

States—Gross tons.	Bessemer.	Open-hearth.	Crucible and all other.	Total ingots and castings.
Mass., Rhode Island, and Conn.....	837	158,417	3,344	162,598
New York and New Jersey.....	351,794	350,348	19,911	722,053
Pennsylvania.....	2,106,382	5,322,229	37,254	7,465,865
Del., Md., Dist. of Columbia, Va., West Va., Ky., Ga., and Ala.....	375,756	499,096	.....	874,852
Ohio.....	1,955,446	525,171	1,172	2,481,789
Indiana and Illinois.....	1,237,747	650,403	4,736	1,892,886
Mich., Wis., Minn., Missouri, Kan., Colorado, Wash., Oregon, and Cal.	88,793	331,065	3,346	423,204
Total for 1908.....	6,116,755	7,836,729	69,763	14,023,247
Total for 1907.....	11,667,549	11,549,736	145,309	23,362,594

The following table gives the production of all kinds of steel ingots and castings in the last fifteen years in gross tons.

Years. Gross tons.	Ingots and castings.	Years. Gross tons.	Ingots and castings.	Years. Gross tons.	Ingots and castings.
1894.....	4,412,032	1899.....	10,639,857	1904.....	13,859,887
1895.....	6,114,834	1900.....	10,188,329	1905.....	20,023,947
1896.....	5,281,689	1901.....	13,473,595	1906.....	23,398,136
1897.....	7,156,957	1902.....	14,947,250	1907.....	23,362,594
1898.....	8,932,857	1903.....	14,534,978	1908.....	14,023,247

#### PRODUCTION OF ALL KINDS OF STEEL INGOTS.

The total production of all kinds of steel ingots in 1908 amounted to 13,677,027 tons, against 22,559,477 tons in 1907, a decrease of 8,882,450 tons, or over 39.3 per cent. The production in 1908 was the smallest since 1904. The maximum production was reached in 1906. The year of next largest production was 1907. The following table gives the production of steel ingots by States in 1908. All direct castings are omitted. A table giving the production of steel castings alone will be found on page 70.

States—Gross tons.	Bessemer ingots.	Open- hearth ingots.	Crucible and all other.	Total ingots. Gross tons.
Mass., R. I., Conn., N. Y., and N. J....	348,343	455,610	17,246	821,199
Pennsylvania.....	2,102,190	5,208,514	35,160	7,345,864
Md., D. of C., W. Va., Ky., Ga., Ala.	374,471	491,764	.....	866,235
Ohio.....	1,952,001	472,164	.....	2,424,165
Ind., Ill., Colorado, Wash., and Cal.	1,319,191	896,900	3,473	2,219,564
Total for 1908.....	6,096,196	7,524,952	55,879	13,677,027
Total for 1907.....	11,634,276	10,803,211	121,990	22,559,477

There were 102 works in 17 States and the District of Columbia which made steel ingots in 1908, against 115 works in 16 States and the District of Columbia in 1907. Of the total production of steel ingots in 1908 Pennsylvania made over 53.7 per cent., against over 53.1 per cent. in 1907; Ohio over 17.7 per cent. in 1908, against over 19.2 per cent. in 1907; and Illinois over 12.3 per cent. in 1908, against over 11.5 per cent. in 1907. No other State made over 4.5 per cent. in 1908 or over 6.3 per cent. in 1907.

In the following table the production of all kinds of steel ingots is given from 1898. Prior to 1898 steel ingots were not separated from steel castings. Gross tons are used.

Years. Gross tons.	Steel ingots.	Years. Gross tons.	Steel ingots.	Years. Gross tons.	Steel ingots.
1898.....	8,800,920	1902.....	14,556,315	1906.....	22,624,431
1899.....	10,458,745	1903.....	14,104,713	1907.....	22,559,477
1900.....	9,995,526	1904.....	13,529,676	1908.....	13,677,027
1901.....	13,156,025	1905.....	19,463,180	.....	.....

## PRODUCTION OF ALL KINDS OF STEEL CASTINGS.

In 1908 the production of all kinds of steel castings was 346,220 gross tons, against 803,117 tons in 1907, a decrease of 456,897 tons, or over 56.8 per cent. Of the total production in 1908 20,559 tons were made by the Bessemer process or some of its modifications, 311,777 tons by the open-hearth process, 8,271 tons by the crucible process, and 5,613 tons by various minor processes. The production in 1908 was the smallest since 1904, when 330,211 tons were made. The maximum production of steel castings was reached in 1907. The year of next largest production was 1906. One hundred and forty-one works in 20 States and the District of Columbia made steel castings in 1908, against 148 works in 19 States and the District of Columbia in 1907. The following table gives by States the production of all kinds of direct steel castings in 1908 in gross tons.

States—Gross tons.	Bessemer.	Open-hearth.	Crucible and all other.	Total. Gross tons.
Mass., Conn., New York, and N. J.....	4,288	53,155	6,009	63,452
Pennsylvania .....	4,192	113,715	2,094	120,001
Del., Md., Dist. of C., Va., Ala., Ohio.....	4,730	60,339	1,172	66,241
Indiana, Illinois, and Michigan.....	3,440	54,467	2,451	60,358
Wis., Minn., Mo., Kan., Col., Ore., Cal.....	3,909	30,101	2,158	36,168
Total for 1908.....	20,559	311,777	13,884	346,220
Total for 1907.....	33,273	746,525	23,319	803,117

The production of all kinds of steel castings since 1898 is given below. Prior to 1898 castings were not separated from ingots.

Years. Gross tons.	Steel castings.	Years. Gross tons.	Steel castings.	Years. Gross tons.	Steel castings.
1898.....	131,937	1902.....	390,935	1906.....	773,705
1899.....	181,112	1903.....	430,265	1907.....	803,117
1900.....	192,803	1904.....	330,211	1908.....	346,220
1901.....	317,570	1905.....	560,767	.....	.....

## PRODUCTION OF ALL KINDS OF RAILS.

The production of all kinds of rails in the United States in 1908 amounted to 1,921,611 tons, against 3,633,654 tons in 1907, a decrease of 1,712,043 tons, or over 47.1 per cent. The falling off in Pennsylvania amounted to 637,745 tons and in the remainder of the country to 1,074,298 tons. The total production was the smallest since 1897. The maximum production was reached in 1906. The year of next largest production was 1907. Rails rolled from purchased blooms, crop ends, scrap, and "seconds," and rerolled and renewed rails are included. Renewed rails are rails that have been in use and after reheating are rolled down to smaller sections. In the following table the production of all kinds of rails in 1908 is given by States.

States—Gross tons.	Bessemer.	Open-hearth.	Iron.	Total.
Pennsylvania .....	315,563	177,461	.....	493,024
Other States .....	1,038,673	389,843	71	1,428,587
Total for 1908 .....	1,354,236	567,304	71	1,921,611
Total for 1907 .....	3,380,025	252,704	925	3,633,654

Twenty-two works in 11 States rolled or rerolled rails in 1908, as follows: New York, 1; New Jersey, 1; Pennsylvania, 6; Maryland, 2; West Virginia, 1; Alabama, 2; Ohio, 2; Indiana, 1; Illinois, 3; Wisconsin, 1; and Colorado, 2. In 1907 rails were rolled by 26 works in 13 States.

## PRODUCTION OF BESSEMER STEEL RAILS.

The production of Bessemer steel rails in 1908 amounted to 1,354,236 tons, against 3,380,025 tons in 1907, a decrease of 2,025,789 tons, or over 59.9 per cent. The 1908 production was the smallest since 1896, when 1,116,958 tons were rolled. Of the total in 1908 1,272,686 tons were rolled by makers of domestic ingots and 81,550 tons by companies which did not operate Bessemer converters, the latter including a small tonnage of manganese rails rolled from purchased ingots. The following table gives the production of Bessemer steel rails from 1903 to 1908.

Gross tons.	1903.	1904.	1905.	1906.	1907.	1908.
Pennsylvania.....	1,186,284	801,657	1,097,154	1,298,409	1,093,932	315,563
Other States .....	1,760,472	1,336,300	2,095,193	2,493,050	2,286,093	1,038,673
Total .....	2,946,756	2,137,957	3,192,347	3,791,459	3,380,025	1,354,236

In Pennsylvania the decreased production in 1908 as compared with 1907 amounted to 778,369 tons and in the remainder of the country to 1,247,420 tons. In addition to Pennsylvania the States which rolled Bessemer rails in 1908 were New York, New Jersey, Maryland, West Virginia, Ohio, Indiana, Illinois, Wisconsin, and Colorado. For the first time in its history since the Bessemer steel industry was firmly established in this country Illinois rolled more Bessemer rails in 1908 than Pennsylvania.

The production of Bessemer steel rails by the makers of Bessemer steel ingots, included above, amounted to 1,272,686 tons in 1908, against 3,302,009 tons in 1907, a decrease of 2,029,323 tons, or over 61.4 per cent. By non-makers of Bessemer ingots the production in 1908 was 81,550 tons, against 78,016 tons in 1907. In the figures for 1908 a small tonnage of manganese steel rails rolled from purchased Tropenas ingots is included.

The following table gives the total production of all kinds of Bessemer steel rails from 1903 to 1908, the rails rolled by makers of domestic ingots being separated from those rolled by companies which did not operate Bessemer converters. During 1908 about 71,900 tons of renewed or rerolled Bessemer steel rails were produced by the makers of Bessemer ingots.

Gross tons.	1903.	1904.	1905.	1906.	1907.	1908.
By makers.....	2,873,228	2,084,688	3,135,729	3,705,642	3,302,009	1,272,686
By all others...	73,528	53,269	56,618	85,817	78,016	81,550
Total.....	2,946,756	2,137,957	3,192,347	3,791,459	3,380,025	1,354,236

#### PRODUCTION OF OPEN-HEARTH STEEL AND IRON RAILS.

The production of open-hearth steel rails in 1908 was 567,304 tons, against 252,704 tons in 1907. The increase in 1908 over 1907 was 314,600 tons, or more than 124 per cent. Almost all the open-hearth rails in 1908 were rolled from basic steel, and virtually all were rolled by producers of open-hearth ingots. A few thousand tons of basic nickel-steel rails are included in the total for 1908. The maximum production was reached in 1908. Alabama made over 44 per cent. of the open-hearth rails that were rolled in that year, Pennsylvania, Colorado, and New York rolling the remainder in the order named. Ten works rolled open-hearth rails in 1908, against 8 works in 1907.

The production of iron rails in 1908 was 71 tons, all rolled in Illinois, and all weighing less than 45 pounds to the yard.

In 1907 the production was 925 tons and in 1906 it was 15 tons. The maximum production of 808,866 tons was reached in 1872.

#### WEIGHT OF ALL KINDS OF RAILS.

The following table gives the production of all kinds of rails in 1908 according to the weight of the rails per yard, followed by the production in 1907. Street and trolley rails are included.

Kinds of rails—Gross tons.	Under 45 pounds.	45 pounds and less than 85.	85 pounds and over.	Total. Gross tons.
Bessemer rails.....	169,384	456,144	728,708	1,354,236
Open-hearth rails.....	14,414	232,054	320,836	567,304
Iron rails.....	71	.....	.....	71
Total for 1908 .....	183,869	688,198	1,049,544	1,921,611
Total for 1907 .....	295,838	1,569,985	1,767,831	3,633,654

The production of rails weighing under 45 pounds to the yard shows a decrease of 111,969 tons in 1908 as compared with 1907, rails weighing 45 pounds and less than 85 pounds a decrease of 881,787 tons, and rails weighing 85 pounds and over a decrease of 718,287 tons.

In addition to the rails rolled in 1908 we imported 1,719 tons of iron and steel rails in that year. During the same year we exported 196,510 tons. In 1907 our exports of rails amounted to 338,906 tons and our imports to 3,752 tons, virtually all steel.

#### PRODUCTION OF STRUCTURAL SHAPES.

Our statistics of iron and steel structural shapes embrace the production of beams, beam girders, zee bars, tees, channels, angles, and other structural forms, but they do not include plates, girders made from plates, or bars for reinforcing concrete work. Plates are provided for under other classifications, and all plates cut to specifications are included in the general statistics of plates.

The total production of strictly structural shapes in 1908 was 1,083,181 tons, against 1,940,352 tons in 1907, a decrease of 857,171 tons, or over 44.1 per cent. Of the total production in 1908 about 1,080,758 tons were rolled from steel and about 2,423 tons from iron, against about 1,936,379 tons rolled from steel and about 3,973 tons rolled from iron in 1907. The maximum production of structural shapes was reached in 1906. The year of next largest production was 1907. The production of structural shapes in 1907 and 1908 by States was as follows:

States—Gross tons.	1907.	1908.	States—Gross tons.	1907.	1908.
New York and New Jersey ...	181,677	86,044	Indiana, Illinois, Wis., Colorado, and California..	253,094	155,704
Pennsylvania .....	1,458,507	810,146			
Alabama and Ohio .....	47,074	31,287	Total .....	1,940,352	1,083,181

Nine States made structural shapes in 1908, against 10 States in 1907. Pennsylvania made over 74.7 per cent. of the total production in 1908, against over 75.1 per cent. in 1907. Illinois, New York, Indiana, Ohio, Wisconsin, and Alabama were the next largest producers in 1908. In 1908 there were 36 works which rolled structural shapes, against 37 works in 1907.

The following table gives the production of structural shapes from 1892 to 1908. Prior to 1892 structural shapes were not separated from other rolled products in our statistics.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1892.....	453,957	1898.....	702,197	1904.....	949,146
1893.....	387,307	1899.....	850,376	1905.....	1,660,519
1894.....	360,305	1900.....	815,161	1906.....	2,118,772
1895.....	517,920	1901.....	1,013,150	1907.....	1,940,352
1896.....	495,571	1902.....	1,300,326	1908.....	1,083,181
1897.....	583,790	1903.....	1,095,813	.....	.....

#### PRODUCTION OF WIRE RODS.

The total production of iron and steel wire rods in 1908 amounted to 1,816,949 gross tons, against 2,017,583 tons in 1907, a decrease of 200,634 tons, or over 9.9 per cent. Of the total production in 1908 1,816,440 tons were steel rods and 509 tons were iron rods. In 1907 the steel wire rods rolled amounted to 2,016,033 tons and the iron rods to 1,550 tons. The maximum production of wire rods was reached in 1907. The year of next largest production was 1906. In 1908 there were 29 works which rolled wire rods, against the same number of works in 1907. The following table gives the production by States since 1905.

States—Gross tons.	1905.	1906.	1907.	1908.
Mass., Conn., R. I., N. Y., and N. J.	249,835	236,380	233,687	200,113
Penna., Ky., Ga., Ala., and Ohio .....	1,038,212	1,102,365	1,176,278	1,047,243
Indiana, Illinois, and Colorado .....	520,641	532,869	607,618	569,593
Total .....	1,808,688	1,871,614	2,017,583	1,816,949

In 1908 Pennsylvania rolled over 32.4 per cent. of the total for the whole country. The following table gives the production of iron and steel wire rods from 1889 to 1908 in gross tons.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1889....	363,851	1894....	673,402	1899....	1,036,398	1904....	1,699,028
1890....	457,099	1895....	791,130	1900....	846,291	1905....	1,808,688
1891....	536,607	1896....	623,986	1901....	1,365,934	1906....	1,871,614
1892....	627,829	1897....	970,736	1902....	1,574,293	1907....	2,017,583
1893....	537,272	1898....	1,071,683	1903....	1,503,455	1908....	1,816,949

#### TOTAL PRODUCTION OF FINISHED ROLLED IRON AND STEEL.

The total production of iron and steel rails, plates, sheets, wire rods, structural shapes, nail plate, bars, and all other finished rolled products from 1887 to 1907 is given below. Rolled forging blooms and forging billets are included from 1905. Prior to 1892 structural shapes were included with bars, hoops, etc. Complete finished rolled statistics for 1908 have not yet been compiled.

Years.	Iron and steel rails.	Plates and sheets, except nail plate.	Wire rods.	Structural shapes, not including plates.	Nail plate. Gross tons.	Bars, hoops, and all other forms.	Total. Gross tons.
1887...	2,139,640	603,355	.....	.....	308,432	2,184,279	5,235,706
1888...	1,403,700	609,827	279,769	.....	289,891	2,034,162	4,617,349
1889...	1,522,204	716,496	363,851	.....	259,409	2,374,968	5,236,928
1890...	1,885,307	809,981	457,099	.....	251,828	2,618,660	6,022,875
1891...	1,307,176	678,927	536,607	.....	223,312	2,644,941	5,390,963
1892...	1,551,844	751,460	627,829	453,957	201,242	2,579,482	6,165,814
1893...	1,136,458	674,345	537,272	387,307	136,113	2,104,190	4,975,685
1894...	1,021,772	682,900	673,402	360,305	108,262	1,795,570	4,642,211
1895...	1,306,135	991,459	791,130	517,920	95,085	2,487,845	6,189,574
1896...	1,122,010	965,776	623,986	495,571	72,137	2,236,361	5,515,841
1897...	1,647,892	1,207,286	970,736	583,790	94,054	2,497,970	7,001,728
1898...	1,981,241	1,448,301	1,071,683	702,197	70,188	3,239,760	8,513,370
1899...	2,272,700	1,903,505	1,036,398	850,376	85,015	4,146,425	10,294,419
1900...	2,385,682	1,794,528	846,291	815,161	70,245	3,575,536	9,487,443
1901...	2,874,639	2,254,425	1,365,934	1,013,150	68,850	4,772,329	12,349,327
1902...	2,947,933	2,665,409	1,574,293	1,300,326	72,936	5,383,219	13,944,116
1903...	2,992,477	2,599,665	1,503,455	1,095,813	64,102	4,952,185	13,207,697
1904...	2,284,711	2,421,398	1,699,028	949,146	61,601	4,597,497	12,013,381
1905...	3,375,929	3,532,230	1,808,688	1,660,519	64,542	6,398,107	16,840,015
1906...	3,977,887	4,182,156	1,871,614	2,118,772	54,211	7,383,828	19,588,468
1907...	3,633,654	4,248,832	2,017,583	1,940,352	52,027	7,972,374	19,864,822

#### IRON AND STEEL SHIPBUILDING.

We have received from the Hon. Eugene T. Chamberlain, Commissioner of Navigation, the following table, which shows the

number and gross tonnage of iron and steel vessels launched and officially numbered in the United States during the calendar year 1908. Vessels for the United States Navy are not included.

Ports. Calendar year 1908.	Sailing.		Steam.		Barges.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Boston, Mass.....	...	.....	5	8,663	...	.....	5	8,663
New York, N. Y.....	...	.....	10	2,315	1	99	11	2,414
Philadelphia, Pa.....	3	2,802	6	17,580	1	518	10	20,900
Wilmington, Del.....	...	.....	4	1,860	...	.....	4	1,860
Baltimore, Md.....	...	.....	2	724	...	.....	2	724
Newport News, Va....	...	.....	5	13,523	...	.....	5	13,523
New Orleans, La.....	...	.....	1	46	...	.....	1	46
St. Louis, Mo.....	...	.....	3	30	...	.....	3	30
Evansville, Ind....	...	.....	1	49	...	.....	1	49
Pittsburgh, Pa.....	...	.....	1	91	...	.....	1	91
Buffalo, N. Y.....	...	.....	10	3,983	...	.....	10	3,983
Cleveland, Ohio.....	...	.....	10	49,749	1	596	11	50,345
Toledo, Ohio.....	...	.....	2	12,383	...	.....	2	12,383
Detroit, Mich.....	...	.....	11	51,709	...	.....	11	51,709
Port Huron, Mich....	...	.....	5	29,764	1	160	6	29,924
Marquette, Mich.....	...	.....	2	9,588	...	.....	2	9,588
Grand Haven, Mich..	...	.....	2	101	1	356	3	457
Chicago, Ill.....	...	.....	1	98	...	.....	1	98
Milwaukee, Wis.....	...	.....	1	442	...	.....	1	442
San Francisco, Cal....	...	.....	3	7,802	...	.....	3	7,802
Seattle, Wash.....	...	.....	6	6,679	...	.....	6	6,679
Total.....	3	2,802	91	217,179	5	1,729	99	221,710

All the vessels enumerated above were built of steel. No iron vessels were built in 1908. Five yachts of 774 tons are included in the 91 steam vessels. Of the 99 sailing and steam vessels and barges launched in 1908 44 steam vessels and 3 barges were built at ports on the Great Lakes, their total tonnage amounting to 158,929 tons. In 1907 the number of iron and steel vessels built was 157 and the total gross tonnage was 436,183 tons, a falling off in 1908 of 58 in the vessels built and of 214,473 tons in the tonnage. The tonnage of vessels built in 1908 is incorrectly given on pages 20 and 24 as 221,541 tons.

The Commissioner also gives us the following details for the first three months of the present year, ended on March 31, 1909: Number of steel steam vessels built, 10, with a tonnage of 22,982 tons; number of steel sailing vessels built, 5, with a tonnage of 4,670 tons; number of steel barges built, including one composite barge, 9, with a tonnage of 3,552 tons: total number of metal vessels built, 24; total tonnage, 31,204 tons.

## STATISTICS OF IMMIGRATION IN THE LAST SIX YEARS.

The following table gives the total number of immigrants who have arrived in the United States in the calendar years 1903 to 1908. Citizens of Canada and Newfoundland coming direct from British North America and citizens of Mexico coming direct from Mexico, are not included in the table prior to July 1, 1907. Since that date, however, citizens of these countries are included. From March 3, 1903, until June 30, 1907, a tax of \$2 per head has been collected on all immigrants who have arrived since the former date, with the exception of citizens of Mexico, Canada, Cuba, and Newfoundland. By act of Congress this tax was increased to \$4 per head after June 30, 1907. There was a decrease of 923,847 in the total immigration in 1908 as compared with 1907, the arrivals in the former year having been smaller than in any year since 1899, when they aggregated 361,318. Immigrants from Russian Poland are included with Russia, Austrian Poland with Austria-Hungary, and German Poland with Germany.

Countries.	1903.	1904.	1905.	1906.	1907.	1908.
United Kingdom.....	88,614	123,563	101,821	107,096	122,002	62,808
Germany.....	49,222	42,848	36,943	38,838	39,948	22,524
France.....	9,385	9,999	9,463	8,903	10,766	6,210
Austria-Hungary.....	233,454	165,815	284,967	296,208	352,983	66,074
Russia and Finland....	148,587	161,649	177,860	263,269	254,527	71,791
Sweden and Norway...	69,657	47,971	48,072	44,374	40,688	16,490
Denmark.....	7,922	9,193	7,996	7,654	7,076	3,530
Netherlands.....	5,025	4,766	4,840	5,315	8,135	3,820
Italy.....	232,528	156,794	267,541	292,221	277,827	56,096
Switzerland.....	5,331	4,461	3,980	3,655	4,169	2,367
Belgium.....	4,295	4,292	4,709	5,922	6,703	2,508
Bulg., Serv., and Mont.	2,157	1,252	2,595	5,879	18,918	893
Greece.....	13,598	9,617	15,150	28,126	39,173	5,701
Turkey in Europe.....	3,316	3,101	6,833	13,158	24,290	2,049
China.....	3,759	3,019	1,716	994	1,117	1,733
Japan.....	17,120	12,225	9,603	20,961	28,286	8,160
Turkey in Asia.....	5,043	5,731	6,892	5,936	12,383	4,731
British North America.	2,502	2,584	1,199	15,150	32,214	39,978
Mexico.....	670	1,924	2,548	1,650	3,821	9,241
West Indies.....	10,286	13,594	15,016	14,953	15,298	10,444
All other countries....	24,900	23,859	*44,698	*34,574	33,842	13,171
Total.....	937,371	808,257	1,054,442	1,214,836	1,334,166	410,319

\* Includes 20,758 immigrants in 1905 and 12,139 immigrants in 1906 who gave their country of last permanent residence as the United States.

For the above information we are indebted to Hon. Daniel J. Keefe, Commissioner-General of Immigration and Naturalization.

## SUMMARY OF STATISTICS FOR 1907 AND 1908.

Subjects—Calendar years.	1907.	1908.
Production of Iron Ore, gross tons.....	51,720,619	.....
Imports of Iron Ore, gross tons.....	1,229,168	776,898
Production of Bituminous Coal, gross tons.....	352,463,493	.....
Production of Pennsylvania Anthracite, gross tons....	76,432,421	.....
Production of all kinds of Coal, gross tons.....	428,895,914	.....
Shipments of Pennsylvania Anthracite, gross tons...	67,109,393	64,665,014
Imports of Coal, gross tons.....	2,126,018	1,504,299
Domestic Exports of Coal, gross tons.....	13,152,749	11,853,177
Production of Coke, net tons.....	40,779,564	.....
Production of Pig Iron, gross tons.....	25,781,361	15,936,018
Production of Spiegeleisen and Ferro-manganese, included in Pig Iron, gross tons.....	339,348	152,018
Production of Bessemer Steel, gross tons.....	11,667,549	6,116,755
Production of Open Hearth Steel, gross tons.....	11,549,736	7,836,729
Production of Crucible Steel, gross tons.....	131,234	63,631
Production of Blister and Patented Steel, gross tons..	14,075	6,132
Production of all kinds of Steel, gross tons.....	23,362,594	14,023,247
Production of Open Hearth Steel Castings, gross tons.	746,525	311,777
Production of all kinds of Steel Castings, gross tons.	803,117	346,220
Production of Bessemer Steel Rails, gross tons.....	3,380,025	1,354,236
Production of Open Hearth Steel Rails, gross tons...	252,704	567,304
Production of Iron Rails, gross tons.....	925	71
Production of all kinds of Rails, gross tons.....	3,633,654	1,921,611
Production of Structural Shapes, gross tons.....	1,940,352	1,083,181
Production of Iron and Steel Wire Rods, gross tons.	2,017,583	1,816,949
Production of Plate and Sheet Iron and Steel, ex- cept Nail Plate, gross tons.....	4,248,832	.....
Production of Nail Plate, gross tons.....	52,027	.....
Production of Bar, Bolt, Hoop, Skelp, Rolled Axles, Forging Blooms and Billets, etc., gross tons.....	7,972,374	.....
Production of all Rolled Iron and Steel, including both Nail Plate and Rails, gross tons.....	19,864,822	.....
Production of Iron and Steel Cut Nails and Cut Spikes, kegs of 100 pounds.....	1,109,138	.....
Production of Steel Wire Nails, kegs of 100 pounds.	11,731,044	.....
Production of Tinsplates and Terne Plates, gross tons.	514,775	.....
Production of Charcoal Blooms, Slabs, Bars, etc., for Sale or for Consumption of Makers, gross tons...	84,623	.....
Imports of Iron and Steel, foreign value.....	\$38,789,851	\$19,957,261
Exports of Iron and Steel, home value.....	\$197,066,781	\$151,113,114
Miles of Steam Railroad in operation on Dec. 31....	228,128	.....
Miles of New Steam Railroad built.....	5,499	3,214
Tonnage of Iron and Steel Vessels built, cal. year...	436,183	221,710
Immigrants landed in the year ended December 31.	1,334,166	410,319

# PRODUCTION OF ALL KINDS OF PIG IRON IN THE UNITED STATES IN 1904, 1905, 1906, 1907, AND 1908, BY STATES.

*The following statistics, giving the total production of pig iron in the United States for the past five years, have been collected directly from the manufacturers by the American Iron and Steel Association. Production in previous years will be found in the Annual Reports of the Association.*

## TOTAL PRODUCTION OF PIG IRON FROM 1904 TO 1908.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1904.	1905.	1906.	1907.	1908.
Massachusetts.....	3,149	} 15,987	20,239	19,119	13,794
Connecticut.....	8,922				
New York.....	605,709	1,198,068	1,552,659	1,659,752	1,019,495
New Jersey.....	262,294	311,039	379,390	373,189	225,372
Pennsylvania.....	7,644,321	10,579,127	11,247,869	11,348,549	6,987,191
Maryland.....	293,441	332,096	386,709	411,833	183,502
Virginia.....	310,526	510,210	483,525	478,771	320,458
Georgia.....	} 75,686	38,699	92,599	55,825	24,345
Texas.....					
Alabama.....	1,453,513	1,604,062	1,674,848	1,686,674	1,397,014
West Virginia.....	270,945	298,179	304,534	291,066	65,551
Kentucky.....	37,106	63,735	98,127	127,946	45,096
Tennessee.....	302,096	372,692	426,874	393,106	290,826
Ohio.....	2,977,929	4,586,110	5,327,133	5,250,687	2,861,325
Illinois.....	1,655,991	2,034,483	2,156,866	2,457,768	1,691,944
Indiana.....	} 233,225	288,704	369,456	436,507	348,096
Michigan.....					
Wisconsin.....	} 210,404	351,415	373,323	322,083	148,938
Minnesota.....					
Missouri.....	} 151,776	407,774	413,040	468,486	313,071
Colorado.....					
Washington.....	}				
California.....					
Total.....	16,497,033	22,992,380	25,307,191	25,781,361	15,936,018

## PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND BITUMINOUS PIG IRON FROM 1904 TO 1908.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1904.	1905.	1906.	1907.	1908.
New York.....	} 134,762	{ 85,179	47,458	117,288	355,009
New Jersey.....					
Pennsylvania.....	1,091,641	1,485,092	1,387,345	1,254,266	.....
Maryland.....	1,737	.....	.....	.....	
Total.....	1,228,140	1,674,515	1,560,686	1,371,554	355,009

# PRODUCTION OF ALL KINDS OF PIG IRON IN THE UNITED STATES.—CONTINUED.

## PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON FROM 1904 TO 1908.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1904.	1905.	1906.	1907.	1908.
New York .....	547,184	1,111,885	1,505,201	1,659,752	1,018,795
New Jersey .....	156,153	206,795	253,507	255,901	192,352
Pennsylvania .....	6,550,087	9,090,741	9,857,861	10,091,994	6,662,723
Maryland.....	290,905	331,870	385,300	411,833	183,502
Virginia, Ga., and Tex.	351,498	528,036	550,327	517,095	326,465
Alabama.....	1,423,021	1,578,514	1,649,018	1,651,533	1,373,199
West Virginia.....	270,945	298,179	304,534	291,066	65,551
Kentucky .....	37,106	63,381	95,945	125,984	43,172
Tennessee.....	299,446	370,217	424,341	390,606	288,316
Ohio .....	2,976,941	4,581,935	5,321,683	5,248,262	2,858,925
Illinois .....	1,655,991	2,034,483	2,156,866	2,457,768	1,691,944
Ind., Mich., and Wis...	218,342	332,057	354,391	358,268	* 315,985
Minn., Mo., Col., and Washington .....	153,745	436,844	454,524	512,348	310,934
Total.....	14,931,364	20,964,937	23,313,498	23,972,410	*15,331,863

\* Includes a small quantity of iron made experimentally with manufactured gas.

## PRODUCTION OF CHARCOAL PIG IRON FROM 1904 TO 1908.

States. Calendar years.	Production—Gross tons of 2,240 pounds.				
	1904.	1905.	1906.	1907.	1908.
Massachusetts.....	3,149	16,991	20,239	19,119	* 14,494
Connecticut.....	8,922				
New York.....	29,904				
Pennsylvania .....	2,593	3,294	2,663	2,289	2,479
Maryland and Virginia	5,335	2,071	4,903	1,444	3,298
Alabama .....	30,492	25,548	25,830	35,141	23,815
Georgia .....	24,648	21,857	* 27,018	20,519	19,474
Texas .....	8,180				
Kentucky .....					
Tennessee.....					
Ohio .....	988	4,175	5,450	2,425	2,400
Michigan .....	171,519	210,573	281,368	294,922	143,492
Wisconsin, Missouri, Wash., and California	51,799	68,419	65,536	* 61,538	* 39,694
Total.....	337,529	352,928	* 433,007	* 437,397	* 249,146

\* Includes about 500 tons [made with mixed charcoal and coke in Georgia in 1906; also a small quantity made by California in 1907 and 1908 and by New York in 1908 with charcoal and electricity.

# STATISTICS OF THE FOREIGN IRON TRADE FOR 1908.

FULL statistics of the production of iron and steel in foreign countries in 1908 are not available. We give below such details for that year as have been received from statistical sources at the time this Report goes to press. Canadian statistics we have ourselves compiled from returns made to us by the manufacturers. Some belated statistics from foreign countries for 1907 are also given. In nearly every instance official figures are quoted.

## CANADA.

*Coal.*—The total production of coal in Canada in 1908 is given by John McLeish, statistician of the Division of Mineral Resources, as amounting to 9,736,130 gross tons, against 9,385,202 tons in 1907 and 8,716,608 tons in 1906.

*Iron Ore.*—The shipments of iron ore from the mines in Canada amounted to 181,687 gross tons in 1908, as compared with 279,014 tons in 1907, a decrease of 97,327 tons. In 1906 the shipments were 222,171 tons. Canada is a large ore importer.

*Pig Iron.*—The total production of all kinds of pig iron in Canada in 1908 amounted to 563,672 tons, against 581,146 tons in 1907, a decrease of 17,474 tons, or over 3 per cent. In the first half of 1908 the pig iron production amounted to 307,074 tons and in the second half to 256,598 tons, a decrease of 50,476 tons. The production of basic pig iron in 1908 amounted to 335,410 tons, against 341,257 tons in 1907, and the production of Bessemer pig iron to 112,811 tons, against 154,910 tons in 1907. The basic and Bessemer pig iron were made with coke. Of the total production in 1908 556,671 tons were made with coke and 7,001 tons with charcoal and electricity. The production of pig iron in Canada in the last fifteen years is given below. Spiegeleisen and ferro-manganese are included.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1894.....	44,791	1898.....	68,755	1902.....	319,557	1906.....	541,957
1895.....	37,829	1899.....	94,077	1903.....	265,418	1907.....	581,146
1896.....	60,030	1900.....	86,090	1904.....	270,942	1908.....	563,672
1897.....	53,796	1901.....	244,976	1905.....	468,003	.....	.....

On December 31, 1908, Canada had 16 completed furnaces, of which 10 were in blast and 6 were idle. One of the idle furnaces was being rebuilt. Of the total 13 usually use coke and 3 use charcoal. One coke furnace was projected and 2 coke furnaces upon which work had been suspended were partly erected.

*Steel Ingots and Castings.*—The production of all kinds of steel ingots and castings in Canada in 1908 amounted to 509,957 tons, against 646,754 tons in 1907, a decrease of 136,797 tons, or over 21.1 per cent. Bessemer and open-hearth steel ingots and castings were made in both 1907 and 1908, the production of Bessemer steel amounting to 108,433 tons in 1908, against 202,268 tons in 1907, a decrease of 93,835 tons, and the production of open-hearth steel amounting to 401,119 tons in 1908, against 440,936 tons in 1907, a decrease of 39,817 tons. Almost all the Bessemer steel made in these two years was in the form of ingots and all was produced by the acid process. Of the total production of open-hearth steel in 1908 about 392,135 tons were ingots and 8,984 tons were castings, against 427,250 tons of ingots and 13,686 tons of castings in 1907. In both years all the ingots were made by the basic process but the castings were made by both the acid and the basic processes. Small quantities of steel castings were made in 1907 and 1908 by minor processes. The total production of all kinds of steel castings in 1908 was 9,657 tons, against 17,728 tons in 1907.

The following table gives the production of all kinds of steel ingots and castings in Canada from 1894 to 1908 in gross tons.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894.....	25,685	1899.....	22,000	1904.....	148,784
1895.....	17,000	1900.....	23,577	1905.....	403,449
1896.....	16,000	1901.....	26,084	1906.....	570,889
1897.....	18,400	1902.....	182,037	1907.....	646,754
1898.....	21,540	1903.....	181,514	1908.....	509,957

*Finished Rolled Iron and Steel.*—The production of finished rolled iron and steel in Canada in 1908 amounted to about 496,517 tons, as compared with about 600,179 tons in 1907, a decrease of 103,662 tons, or over 17.2 per cent. Of the total production in 1908 about 65,505 tons were iron and about 431,012 tons were steel, against about 81,093 tons of iron and about 519,086 tons of steel in 1907.

The following table gives the production of leading articles of finished rolled iron and steel in Canada in the last five years.

Products—Gross tons.	1904.	1905.	1906.	1907.	1908.
Rails.....	36,216	178,885	312,877	311,461	268,692
Structural shapes and wire rods	11,195	48,850	48,351	65,541	41,520
Plates and sheets.....	3,102	4,944	15,202	18,493	11,656
Nail plate.....	5,030	4,110	2,183	1,720	2,126
All other finished rolled forms	124,495	149,037	193,129	202,964	172,523
Total.....	180,038	385,826	571,742	600,179	496,517

The following table gives the production of all kinds of finished rolled iron and steel in Canada from 1895 to 1908 in gross tons.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1895.....	66,402	1900.....	100,690	1905.....	385,826
1896.....	75,043	1901.....	112,007	1906.....	571,742
1897.....	77,021	1902.....	161,485	1907.....	600,179
1898.....	90,303	1903.....	129,516	1908.....	496,517
1899.....	110,642	1904.....	180,038	.....	.....

*Forged Iron and Steel.*—The total production of forged iron and steel by rolling mills and steel works in Canada in 1908 amounted to about 14,738 tons, of which about 2,300 tons were iron and about 12,438 tons were steel.

*Cut Nails and Wire Nails.*—In 1908 the rolling mills and steel works in Canada which operated cut nail or wire nail factories produced about 298,000 kegs of steel cut nails and steel wire nails of 100 pounds each, as compared with about 313,200 kegs in 1907 and about 347,000 kegs in 1906.

*Active Rolling Mills and Steel Works.*—In 1908 there were 25 works in 5 Provinces which made steel ingots or castings or rolled iron or steel into finished forms, against 22 works in 5 Provinces in 1907, a gain of 3 works. Of the total in 1908 there were 19 works which rolled iron or steel into finished forms and 6 works which made steel ingots or castings but not finished forms of rolled iron or steel, while in 1907 the number of works which rolled iron or steel into finished forms was 16 and the number of works which did not produce finished rolled forms was 6. There were 2 idle rolling mills and steel works in Canada in 1908.

Of the 25 rolling mills and steel works in Canada which were active in 1908 5 were located in Nova Scotia, 6 in Quebec, 12 in Ontario, 1 in New Brunswick, and 1 in Manitoba.

#### NEWFOUNDLAND.

*Iron Ore.*—The production of iron ore in Newfoundland in 1908 amounted to 935,154 gross tons, as compared with 864,195

tons in 1907, an increase of 70,959 tons. All the ore was mined on Belle Island, in Conception Bay. The following table, for which we are indebted to Mr. James P. Howley, Director of the Newfoundland Geological Survey, gives the iron ore production of Newfoundland during the last nine years. All the iron ore mined in Newfoundland is exported, principally to Nova Scotia and the United States. It is not of Bessemer quality. Newfoundland is now a larger producer of iron ore than Cuba.

Years.	Tons.	Years.	Tons.	Years.	Tons.
1900.....	317,216	1903.....	588,795	1906.....	884,986
1901.....	738,206	1904.....	589,739	1907.....	864,195
1902.....	721,867	1905.....	689,970	1908.....	935,154

#### GREAT BRITAIN.

*Coal.*—The production of coal in Great Britain in 1907 amounted to 267,830,962 tons, the largest production ever recorded. In 1906 the production was 251,067,628 tons.

*Iron Ore.*—The production of iron ore in Great Britain in 1907 amounted to 15,731,604 tons and the imports to 7,641,934 tons. Nearly 75 per cent. of the imports came from Spain.

*Manganese Ore.*—The production of manganese ore in Great Britain in 1907 was 16,098 tons, against 22,762 tons in 1906. In 1907 Great Britain imported 505,635 tons of manganese ore.

*Pig Iron.*—The official Government statistics of the production of pig iron in Great Britain in 1907 show that the output in that year amounted to 10,114,281 tons, to produce which 25,123,759 tons of iron ore were used and 21,119,547 tons of coal were consumed, chiefly as coke. The production of pig iron in the first half of 1908 was 4,633,353 tons, against an output of 5,194,712 tons in the first half of 1907 and 4,905,424 tons in the first half of 1906. Production in the first half of 1908 was 561,359 tons less than the output in the first half of 1907 and 272,071 tons less than the output in the first half of 1906. The half-yearly statistics have been compiled by Mr. C. J. Fairfax Scott, Secretary of the British Iron Trade Association.

*Steel.*—Mr. Scott also reports that the output of Bessemer ingots in Great Britain in the first half of 1908 shows a total of 738,170 tons, as compared with 1,068,972 tons in the first half of 1907. The production of Bessemer steel rails in the first half of 1908 amounted to 319,606 tons, as compared with 452,774 tons in the first half of 1907 and 487,184 tons in the first half of 1906.

## GERMANY AND LUXEMBURG.

The Verein Deutscher Eisen und Stahlindustrieller has issued detailed statistics of the production of coal, iron ore, pig iron, and steel ingots and castings in Germany and Luxemburg in 1908.

*Coal.*—The production of stone coal and brown coal in Germany and Luxemburg in 1908 was 215,283,474 metric tons, against 205,732,362 tons in 1907, an increase of 9,551,112 tons. In 1908 the production of stone coal amounted to 148,537,417 tons, as compared with 143,185,691 tons in 1907, an increase of 5,351,726 tons. The production of brown coal in 1908 was 66,746,057 tons, against 62,546,671 tons in 1907, an increase of 4,199,386 tons.

*Iron Ore.*—The production of iron ore in Germany and Luxemburg in 1908 amounted to 24,224,762 metric tons, as compared with 27,697,128 tons in 1907, a decrease of 3,472,366 tons. The imports of iron ore in 1908 amounted to 7,732,949 tons and the exports to 3,577,454 tons.

*Manganese Ore.*—The production of manganese ore in Germany and Luxemburg in 1907 amounted to 73,105 metric tons, against 52,485 tons in 1906. In 1908 the imports of manganese ore into Germany and Luxemburg amounted to 334,133 tons, against 393,327 tons in 1907.

*Pig Iron.*—The total production of pig iron in Germany and Luxemburg in 1908, including charcoal pig iron and broken and washed iron, amounted to 11,805,321 metric tons, against 12,875,159 tons in 1907, a decrease of 1,069,838 tons. Spiegeleisen, ferro-manganese, ferro-silicon, etc., are included. Of the total production in 1907 about 6,935 tons were made with charcoal.

*Steel Ingots and Castings.*—The following table gives the production of steel ingots and castings in Germany and Luxemburg in 1907 and 1908, all in metric tons. There was a loss in production in 1908 as compared with 1907 of 877,253 tons.

Products—Metric tons.	Acid.	Basic.	Total for 1908.	Total for 1907.
Bessemer ingots.....	374,100	6,510,754	6,884,854	7,599,574
Open-hearth ingots.....	146,768	3,854,155	4,000,923	4,252,560
Steel castings.....	77,443	115,440	192,883	211,498
Crucible steel.....	.....	.....	88,183	.....
Electric steel.....	.....	.....	19,536	.....
Total for 1908.....	598,311	10,480,349	11,186,379	.....
Total for 1907.....	685,161	11,378,471	.....	12,063,632

*Iron and Steel Rails.*—The total production of iron and steel rails in Germany and Luxemburg in 1907 amounted to 1,413,042 metric tons, of which 3,127 tons were iron and 1,409,915 tons were steel. In 1908 the exports of all kinds of rails from Germany amounted to 331,323 metric tons, as compared with 417,963 tons in 1907. In 1908 the imports of rails amounted to only 307 metric tons, against 361 metric tons in 1907.

#### FRANCE.

We are indebted to the *Journal Officiel* and to the General Secretary of the Comité des Forges de France for the following statistics for France for 1907 and 1908. The figures given for 1908 are chiefly provisional.

*Coal.*—The production of coal and lignite in France in 1908 was 37,622,556 metric tons, against 36,753,627 tons in 1907.

*Iron Ore.*—The production of iron ore in France in 1907 was 10,008,478 metric tons, against 8,481,423 tons in 1906. Statistics for 1908 are not yet available.

*Pig Iron.*—The production of pig iron in France in 1908 is said to have amounted to 3,412,393 metric tons, against 3,590,235 tons in 1907. Of the total production in 1907 there were 3,571,888 tons made with coke, 2,607 tons with charcoal, and 15,740 tons with electricity. Similar details for 1908 are not at hand.

*Steel.*—The total production of steel ingots and castings in France in 1908 was 2,756,862 tons, against 2,826,184 tons in 1907. Of the steel ingot production in 1908 1,709,877 tons were Bessemer, (77,581 tons acid and 1,632,296 tons basic,) 1,002,789 tons were open-hearth, 12,662 tons were crucible, and 2,289 tons were electric. In 1908 the production of steel castings amounted to 29,245 tons, against 59,411 tons in 1907.

*Steel Rails.*—The production of steel rails in France in 1908 amounted to 322,241 metric tons, against 344,513 tons in 1907.

#### ALGERIA.

*Iron Ore.*—The production of iron ore in Algeria in 1907 amounted to 973,445 metric tons, against 779,826 tons in 1906. These figures are official. Statistics for 1908 are not available.

#### AUSTRIA.

*Coal.*—The total production of coal in Austria in 1908 was 40,760,868 metric tons, against 40,112,529 tons in 1907. Of the production in 1908 26,669,708 tons were brown coal and 14,091,160 tons were stone coal.

*Iron Ore.*—The production of iron ore in Austria in 1907 was 2,540,118 metric tons, against 2,253,662 tons in 1906. In 1907 Austria imported 799,890 tons of iron ore.

*Manganese Ore.*—The production of manganese ore in Austria in 1907 was 16,756 metric tons, against 13,402 tons in 1906.

*Pig Iron.*—The production of pig iron in Austria in 1907, including castings, was 1,383,524 metric tons, against 1,222,230 tons in 1906. In 1907 Austria imported 134,660 tons of pig iron, against 56,429 tons in 1906, and in 1907 Austria exported 41,887 tons of pig iron, against 55,966 tons in 1906. In 1907 there were 61 furnaces in Austria, of which 42 were active and 19 were idle.

#### HUNGARY.

*Coal.*—The total production of brown and bituminous coal in Hungary in 1907 was 7,447,141 metric tons, against a total production in 1906 of 7,333,241 tons. In 1907 the production of bituminous coal amounted to 1,038,819 tons and of brown coal to 6,408,322 tons.

*Iron Ore.*—The production of iron ore in Hungary in 1907 was 1,666,020 metric tons, against 1,698,291 tons in 1906. In 1907 Hungary exported 623,518 tons of iron ore.

*Pig Iron.*—The production of pig iron in Hungary in 1907 amounted to 440,237 metric tons, against 419,691 tons in 1906.

#### BOSNIA AND HERZEGOVINA.

*Coal.*—The production of brown coal in Bosnia and Herzegovina in 1907 amounted to 621,179 metric tons, against 594,172 tons in 1906 and 540,236 tons in 1905.

*Iron Ore.*—The production of iron ore in 1907 in Bosnia and Herzegovina amounted to 164,893 metric tons, against 136,513 tons in 1906 and 122,539 tons in 1905.

*Pig Iron.*—The production of pig iron in Bosnia and Herzegovina in 1907 amounted to 48,923 metric tons, against 45,660 tons in 1906 and 43,074 tons in 1905.

*Steel.*—The production of steel ingots and castings in Bosnia and Herzegovina in 1907 amounted to 31,180 metric tons, against 30,263 tons in 1906 and 22,223 tons in 1905.

#### AUSTRIA-HUNGARY.

The output of coal, iron ore, and pig iron in Austria, Hungary, and Bosnia and Herzegovina in 1906 and 1907 follows:

*Coal.*—Production in 1907, 48,180,849 metric tons, against 45,568,434 tons in 1906.

*Iron Ore.*—Production in 1907, 4,371,031 metric tons, against 4,088,466 tons in 1906.

*Pig Iron.*—Production in 1907, 1,872,684, metric tons, against 1,687,581 tons in 1906. Blast furnace castings are included.

*Steel.*—Statistics of the production of steel ingots and castings in Austria and Hungary are not annually collected.

#### SPAIN.

*Iron Ore.*—The production of iron ore in Spain in 1907 was 10,072,709 metric tons, against 9,448,533 tons in 1906.

*Exports.*—Spain exported 7,252,958 metric tons of iron ore in 1908, 25,446 tons of manganese ore, and 11,287 tons of pig iron.

#### BELGIUM.

*Coal.*—The production of coal in Belgium in 1907 was 23,705,190 metric tons, as compared with 23,569,860 tons in 1906, an increase of 135,330 tons. In 1907 the average daily wages of the coal miners was 96 cents, as compared with an average in 1906 of 87 cents. Belgium imported 5,381,165 tons of coal in 1908, against 5,285,921 tons in 1907. The exports of coal from Belgium in 1908 amounted to 4,756,048 tons.

*Iron Ore.*—The production of iron ore in Belgium in 1907 amounted to 316,250 metric tons, against 232,570 tons in 1906. Belgium is a heavy importer of iron ore, the consumption of foreign ore in 1907 in the manufacture of pig iron alone having amounted to 3,699,750 tons, while the consumption of domestic ore amounted to only 129,170 tons.

*Pig Iron.*—The production of pig iron in Belgium in 1908, chiefly basic, amounted to 1,206,440 metric tons, against 1,406,980 tons in 1907, a decrease of 200,540 tons. Belgium also produces annually small quantities of spiegeleisen and ferro-manganese. At the end of 1908 the total number of completed blast furnaces in Belgium was 42, of which 31 were in operation. Belgium imported 397,184 tons of pig iron in 1908 and exported 14,014 tons.

*Steel Ingots and Castings.*—The production of Bessemer and open-hearth steel ingots and castings in Belgium amounted in 1907 to 1,521,610 metric tons, against 1,440,860 tons in 1906. Of the total production in 1907 1,289,750 tons were Bessemer ingots, chiefly basic, and 176,960 tons were open-hearth ingots. The production of steel castings in 1907 was 54,900 tons.

*Steel Rails and Sleepers.*—The production of steel rails and sleepers in Belgium in 1907 amounted to 314,760 metric tons, against 274,920 tons in 1906.

*Imports and Exports.*—In 1908 the total imports of iron and steel into Belgium amounted to 751,387 metric tons, against 957,326 tons in 1907, a decrease of 205,939 tons. The exports of iron and steel from Belgium in 1908 amounted to 1,064,468 tons, against 1,128,828 tons in 1907 and 1,131,093 tons in 1906.

#### ITALY.

*Coal.*—The production of all kinds of coal in Italy in 1907 amounted to 453,137 tons, against 473,293 tons in 1906. In 1907 447,256 tons and in 1906 467,125 tons were lignite. In 1907 the district of Florence mined 322,014 tons and in 1906 it mined 313,152 tons. All these are metric tons.

*Iron Ore.*—The total production of iron ore in Italy in 1907 amounted to 517,952 metric tons, of which 488,474 tons were mined in the district of Florence, which includes the Island of Elba, 22,114 tons in the district of Milan, and the remainder, 7,364 tons, in three other districts. In 1906 the total production of iron ore was 384,217 tons. The increase in the iron ore production in 1907 over 1906 amounted to 133,735 tons.

*Manganese Ore.*—The production of manganese ore in Italy in 1907 amounted to 3,654 tons, against 3,060 tons in 1906.

*Pig Iron.*—The production of all kinds of pig iron and castings direct from the blast furnace in Italy in 1907 amounted to 112,232 metric tons, of which 106,900 tons were made in the district of Florence. In 1906 the production was 135,296 tons. In 1907 there were 8 active blast furnaces in Italy.

*Steel Ingots and Castings.*—The production of steel ingots and castings in Italy in 1907 amounted to 430,000 tons, of which 7,490 tons were castings. In 1906 the production was 390,740 tons. In 1907 there were 42 open-hearth steel furnaces and 2 Robert-Bessemer steel converters in operation and one 30-ton open-hearth furnace was being built.

*Steel Rails.*—The production of steel rails in Italy in 1907 amounted to 75,000 metric tons, against 52,750 tons in 1906.

*Tinplates.*—The production of tinplates in Italy in 1906 amounted to 16,350 metric tons. In the same year the imports amounted to 13,360 tons and the exports to 9,000 tons.

*Imports.*—The imports of pig iron into Italy in 1908 amounted to 254,238 metric tons, against 231,041 tons in 1907; scrap iron and scrap steel, 326,119 tons, against 362,567 tons in 1907; bars and rods, 130,908 tons, against 147,331 tons in 1907; and rails, 31,262 tons, against 31,267 tons in 1907.

## SWEDEN.

The production of pig iron in Sweden in 1908 is said to have amounted to 563,300 metric tons; charcoal blooms, 148,500 tons; Bessemer steel ingots and castings, 79,500 tons; and open-hearth ingots and castings, 347,600 tons. These figures are not official.

We are indebted to Director Richard Åkerman, of Stockholm, for official Swedish iron and steel statistics for 1906 and 1907.

Products—Metric tons.	1906.	1907.
Iron ore.....	4,502,597	4,480,070
Coal.....	296,980	305,338
Pig iron.....	604,789	615,778
Charcoal blooms from pig iron.....	178,298	174,405
Bessemer ingots and castings.....	84,633	77,036
Open-hearth ingots and castings.....	311,435	341,893
Crucible ingots and castings.....	1,457	1,287
Blister steel.....	522	416
Total steel.....	398,047	420,632
Bar iron and steel.....	206,124	198,533
Nail and wire rods and bands.....	125,051	139,240
Other shaped iron and steel bars.....	11,965	15,025
Plates, not including sheets.....	21,063	21,246
Tube blocks, hollow blooms, and billets.....	28,880	44,975

The average number of furnaces in blast in 1907 was 130, against 128 in 1906, and the average daily production of pig iron per furnace was 16.91 metric tons in 1907, as compared with 16.28 tons in 1906.

*Exports.*—Sweden exports annually over one-sixth of the total pig iron made, the exports in 1908 amounting to about 107,100 metric tons and in 1907 to about 129,800 tons. Large quantities of merchant bars are also exported, the exports in 1908 amounting to 122,200 tons, against 154,200 tons in 1907. The exports of iron ore from Sweden in 1908 amounted to 3,654,270 metric tons, against 3,513,803 metric tons in 1907.

## RUSSIA.

*Coal.*—The production of coal in Russia in 1907 amounted to 26,023,344 metric tons, against 20,664,411 tons in 1906, 18,683,800 tons in 1905, and 19,624,700 tons in 1904. The increase in 1907 over 1904 amounted to 6,398,644 tons.

*Iron Ore.*—The production of iron ore in Russia in 1907, exclusive of the manganese ore exported from Poti, amounted to

4,227,419 metric tons. In 1906 the production was 3,873,356 tons, in 1905 it was 4,942,182 tons, and in 1904 it was 5,160,990 tons. The exports of manganese ore from Poti amounted in 1907 to 881,322 tons, against 464,016 tons in 1906.

*Pig Iron.*—The production of pig iron in Russia in 1907 amounted to 2,820,604 metric tons, as compared with 2,691,606 tons in 1906, 2,713,674 tons in 1905, and 2,950,651 tons in 1904. Furnace castings are included.

*Steel Ingots and Castings.*—The total production of steel ingots and castings in Russia in 1907 amounted to 2,823,028 metric tons, of which 524,786 tons were made by the Bessemer and Thomas processes, 2,129,503 tons by the Martin process, and 168,739 tons by the crucible and other processes. In 1906 the total output amounted to 2,643,027 tons, of which 402,268 tons were made by the Bessemer and Thomas processes, 2,046,935 tons by the Martin process, and 193,824 tons by the crucible and other processes.

*Steel Rails.*—The production of steel rails in Russia in 1907 amounted to 311,806 metric tons, against 271,739 tons in 1906, 358,499 tons in 1905, and 401,668 tons in 1904.

#### JAPAN.

*Coal.*—The production of coal in Japan is said by the *Japan Financial and Economic Monthly* to have amounted to 13,255,972 metric tons in 1906, against 11,593,292 tons in 1905. The production in 1907 is said by an English journal to have amounted to 13,716,488 gross tons.

*Iron Ore.*—The *Economic Monthly* also says that the production of iron ore in Japan in 1906 amounted to 15,299,767 kwans, against 14,189,913 kwans in 1905. A kwan equals 8.26 pounds.

*Manganese Ore.*—The production of manganese ore in Japan in 1906 amounted to 12,841 metric tons, against 14,017 tons in 1905.

*Imports.*—Japan is said to have imported 135,941 net tons of iron ore in 1907 and 111,152 net tons of pig iron.

#### FOREIGN STATISTICAL NOTES.

A correspondent of the *Iron Trade Review* says that in 1907 the Monterey Iron and Steel Company, of Monterey, Mexico, produced 17,875 tons of Bessemer steel ingots and approximately 35,000 tons of open-hearth steel. Practically the entire open-hearth steel output was consumed by the plate mill, the tonnage of plates aggregating 33,000 tons. The foundry showed a production of 2,400 tons. The company mined 11,800 tons of coal. The National Railway Company had closed a contract with the

Monterey Iron and Steel Company for 20,000 tons of steel rails to be used for extensions and replacements.

The mineral statistics for Peru show that in 1907 the output of coal was 185,000 metric tons, against 79,969 tons in 1906. Of the 1907 total 161,000 tons were bituminous and 13,500 tons were anthracite, the remainder being lignite.

The production of iron ore in Norway in late years was as follows, according to the *Teknisk Ugeblad*: 1907, 130,000 metric tons; 1906, 99,000 tons; 1905, 61,500 tons; and 1904, 45,350 tons. According to the same authority the exports of iron ore were: 1907, 137,600 tons; 1906, 81,400 tons; 1905, 60,550 tons; and 1904, 45,400 tons.

The production of iron ore in Greece in 1907 amounted to 768,860 metric tons, against 680,600 tons in 1906; manganese ore, 11,140 tons in 1907, against 10,040 tons in 1906; manganiferous iron ore, 92,980 tons in 1907, against 96,380 tons in 1906; chrome ore, 11,730 tons in 1907, against 11,530 tons in 1906; and lignite, 11,720 tons in 1907, against 11,580 tons in 1906.

The production of coal in India in the calendar year 1907 is officially stated by the chief inspector of mines to have amounted to 11,147,339 gross tons, as compared with 9,783,250 tons in 1906 and 8,417,739 tons in 1905. The same authority says that the production of manganese ore in 1907 was 898,345 tons, against 495,730 tons in 1906 and 253,896 tons in 1905. The production of iron ore in 1907 amounted to 67,667 tons, against 74,120 tons in 1906 and 102,535 tons in 1905.

The production of coal in New Zealand in 1907, as officially reported, amounted to 1,831,009 gross tons, as compared with 1,729,536 tons in 1906. Of the total production in 1907 128,950 tons were exported, including coal used by home steamers.

The production of coal in New South Wales in 1907 was 8,657,924 tons, an increase of 1,031,562 tons over 1906. The production in 1908 amounted to 9,147,025 tons. The production of coal in Queensland, Victoria, and Western Australia in 1907 aggregated 964,229 tons.

The production of coal in Natal in 1907 amounted to 1,530,043 gross tons, against 1,238,713 tons in 1906; in the Transvaal to 3,012,692 tons in 1908, as compared with 2,883,342 tons in 1907; in Cape Colony to 144,040 net tons in 1907, as compared with 142,877 tons in 1906; and in the Orange River Colony to 499,590 gross tons in the fiscal year ended June 30, 1907, against 263,232 tons in the fiscal year 1906.



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