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American Iron and Steel
Association.
Statistics of the American
and foreign iron trades ...
Annual statistical report o

STATISTICS
OF THE
AMERICAN AND FOREIGN IRON TRADES
FOR 1902.

ANNUAL STATISTICAL REPORT
OF THE
AMERICAN
IRON AND STEEL ASSOCIATION,

CONTAINING
COMPLETE STATISTICS OF THE IRON AND STEEL INDUSTRIES OF THE UNITED STATES FOR 1902 AND IMMEDIATELY PRECEDING YEARS; ALSO STATISTICS OF THE COAL, COKE, AND SHIPBUILDING INDUSTRIES OF THE UNITED STATES; ALSO STATISTICS OF THE IRON AND STEEL INDUSTRIES OF CANADA AND OF OTHER FOREIGN COUNTRIES.

PRESENTED TO THE MEMBERS, JUNE 25, 1903.

PHILADELPHIA:
THE AMERICAN IRON AND STEEL ASSOCIATION,
No. 261 SOUTH FOURTH STREET.
1903.

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LETTER TO THE PRESIDENT.

HON. B. F. JONES,

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

DEAR SIR: I submit herewith the Annual Statistical Report of the American Iron and Steel Association for 1902. This is the thirty-first Annual Report which has been issued since my first Report appeared in November, 1873. The present Report, in addition to giving full details of the progress of our iron and steel industries in 1902, contains details of the progress of the iron and steel industries of Canada in 1902; also summary statements of the progress of the iron and steel and related industries of all countries in 1901 or in 1900, as the case may be, trustworthy statistics for 1901 not being in every case available. These statements are accompanied by comprehensive and exhaustive tables which give the production of pig iron, steel, iron ore, and coal in the United States, Great Britain, Germany, France, and Belgium in each year prior to 1902 as far back as authentic statistics go. These tables uniformly end with 1901, the first year of the Twentieth Century.

The work of the American Iron and Steel Association during the past year has been along the same general lines that have been observed in former years. Soon after the Annual Report of last year appeared our midsummer pig iron statistics were published in the Bulletin. Other statistics for the whole of the year 1902 have since appeared in the Bulletin, all with usual promptness. In the latter part of 1902 the compilation of information for a Supplement to our Directory for 1901 was undertaken, and this volume, embracing 196 pages, uniform with the Directory, was published in April last and sent to all our members. In February last a pocket manual of pig iron, steel, iron ore, and coal statistics for the United States and other leading countries for 1901 and previous years was published and also sent to our members. The Bulletin has appeared regularly and our miscellaneous correspondence has been promptly attended to.

I regret to say that in the autumn months of 1902 President Roosevelt, in at least one public address, gave encouragement to the thought that the Dingley tariff might be in need of revision. If it was to be revised the President expressed his preference for revision by a tariff commission. At that time there was no general demand for tariff revision. The country was very prosperous under the Dingley tariff. But the President's remarks greatly encouraged free trade sentiment everywhere, and in the ranks of protectionists, even in quarters where it was least expected, there was also developed a disposition to submit the whole question of tariff revision to a tariff commission, as tentatively recommended by the President. In the Annual Message of the President, submitted to Congress on December 2, additional encourage-

ment was given to free traders in specific recommendations favoring pending reciprocity treaties, but, the Message said, "wherever the tariff conditions are such that a needed change can not with advantage be made by the application of the reciprocity idea then it can be made outright by a lowering of duties on a given product. If possible such change should be made only after the fullest consideration by practical experts," that is, by a tariff commission. Happily Congress adjourned on March 4 without favorable action on any of the reciprocity treaties except the treaty with Cuba, which treaty was ratified by the Senate but must yet receive the approval of the House of Representatives before it can take effect. Congress gave no consideration to the suggestion of a tariff commission. But in January both houses passed a bill placing bituminous coal in the free list for one year and making all anthracite coal permanently free of duty. It is not now probable that any serious attempt will be made to further amend the Dingley tariff until after the Presidential election next year. Then it may be looked for.

A powerful influence in preventing the consideration by Congress last winter of reciprocity treaties and of the project of a tariff commission, or commission of "practical experts," was furnished by the late Hon. Thomas B. Reed, ex-Speaker of the National House of Representatives, in a paper which he contributed to the *North American Review* for December, 1902, entitled "What Shall we Do with the Tariff?" This paper was widely read and greatly aided in clearing the atmosphere concerning the question of tariff revision. Its answer to the question which formed its caption is summed up in the following words: "We ought to let the tariff alone; we ought to defend it against all comers for the good of the nation. We are doing more than well and need not hunt for disaster. That will come in due time." In a few days after this remarkably able paper was published Mr. Reed died. It was his farewell message to the American people.

The financial condition of the Association during the year 1902 is shown by the following abstract of the statement of our Treasurer, Mr. Andrew Wheeler, on December 31, 1902: On January 1, 1902, for reasons which were explained in my last Annual Report, there was no balance in the hands of the Treasurer; the receipts from members and from advertisements in the *Bulletin* during the year 1902 were \$16,640; the expenditures during the year were \$12,832.73; leaving a balance in the treasury on December 31, 1902, of \$3,807.27. The above figures do not include the receipts from the sale of our *Directory* and *Annual Report* to brokers and others who are not members of the Association, nor the payments from the fund thus derived in defraying in large part the cost of printing the publications of the Association.

In the collection of the statistics for this Report I have again had the assistance of Mr. William G. Gray. I also take pleasure in acknowledging the industry and fidelity of my other assistants, four in number, in all the work of this office. Very Truly Yours,

JAMES M. SWANK, *General Manager*.

No. 261 SOUTH FOURTH STREET, PHILADELPHIA, May 16, 1903.

DEATH OF HON. B. F. JONES.

THE Hon. B. F. Jones, President of the American Iron and Steel Association for eighteen years, from 1885 to 1903, died suddenly at his home in Allegheny City, Pennsylvania, on May 19, in his 79th year. No eulogy can do full justice to the sterling qualities of head and heart of this enterprising and successful man of affairs, public-spirited citizen, and courtly gentleman. In his death the American iron trade has lost a leader who had earned and long enjoyed the honor of being easily the first among the old-time ironmasters, but one who had also kept abreast of the marvelous improvements in the last thirty years in the manufacture of iron and steel. Pittsburgh, the centre of his business and social activities for exactly sixty years, has lost its First Citizen.

Benjamin Franklin Jones was born at Claysville, on the National Road, in Washington county, Pennsylvania, on August 8, 1824. On his father's side Mr. Jones was of Welsh descent and his mother was of mingled Alsatian and Scotch ancestry. His paternal great-great-grandfather emigrated from London to Philadelphia in 1682. His father, Jacob A. Jones, moved to Washington county at an early day. When B. F. Jones was 14 years old his father moved again, this time to New Brighton, in Beaver county, Pennsylvania. At New Brighton he attended the public schools and the local academy.

In 1843, when 18 years old, Mr. Jones went to Pittsburgh, to make his own way in the world. He found employment, but at first without salary, as receiving clerk in the warehouse of the Mechanics' Line of boats on the Pennsylvania Canal, of which line Samuel M. Kier was the principal owner. In 1847 Mr. Jones became Mr. Kier's partner, the new firm taking the name of Kier & Jones. This partnership lasted until 1854, when the completion of the Pennsylvania Railroad to Pittsburgh virtually put an end to business on the canal.

In 1850 Bernard Lauth, a skilled ironworker, in association with others, began the erection on a small scale of the American Iron Works, in Birmingham, on the south bank of the Monongahela river, now within the city limits of Pittsburgh, the product to be bar iron. Although not one of the projectors of this enterprise Mr. Jones soon became pecuniarily interested in it, and in 1851 he became Mr. Lauth's partner, the firm name being Jones & Lauth. In 1852 the works were in full operation, Mr. Jones having charge of the business of the firm. In 1854 James Laughlin, a successful Pittsburgh merchant, became a member of the firm of Jones & Lauth, and in 1860 Mr. Lauth retired. In August, 1861, the name of the firm was changed to Jones & Laughlins, other partners being admitted, which name was again changed in 1883 to Jones & Laughlins, Limited, and in 1902 to the Jones and Laughlin Steel Company, the present title.

In 1860 the subsidiary firm of Laughlin & Co., afterwards Laughlin & Co., Limited, was organized to build two blast furnaces on the north side of the Monongahela river, in Pittsburgh, opposite the American Iron Works. This new firm was composed of B. F. Jones, James Laughlin, and Richard Hays, each owning one-third. The erection of two furnaces was at once undertaken and in 1861 they were completed. They were named the Eliza Furnaces. They were the first furnaces built in Allegheny county expressly to use Connellsville coke. Mr. Hays superintended the operation of the Eliza Furnaces for a number of years, when his interest was sold to his partners, the firm name being continued. In 1887 a third Eliza Furnace was built. In 1900 the firms of Jones & Laughlins, Limited, and Laughlin & Co., Limited, were merged, the latter name disappearing. Mr. Laughlin died on December 18, 1882.

During the whole of Mr. Jones's more than fifty years of active connection with the iron trade he was also active in all movements that had for their object the advancement of the business interests of Pittsburgh. Especially was he active in all plans for the improvement of Pittsburgh's transportation facilities. He was one of the early directors of the Pittsburgh and Connellsville Railroad Company; also of the Cleveland and Pittsburgh Railroad Company, the Allegheny Valley Railway Company, and the Pittsburgh, Virginia, and Charleston Railway Company. Of the last mentioned road he was one of the original promoters and was its first president.

When the civil war commenced and all through the war Mr. Jones was one of the most active men in Pittsburgh in promoting enlistments and in raising funds for the support of soldiers and their families. A Pittsburgh paper says that "the Pittsburgh Subsistence Committee, which gained such an enviable reputation during the war, was largely indebted to him for its early impetus and much of its success." He used his pen vigorously in the columns of Pittsburgh newspapers and in letters to members of Congress in support of all the war measures of the Government, including its legal tender policy.

In 1884, because of his prominence in the counsels of the Republican party, Mr. Jones was selected as the Pennsylvania member of the Republican National Committee, and at the special request of Mr. Blaine, the Republican nominee in that year for the Presidency and a lifelong friend of Mr. Jones, he was made the chairman of the committee, retaining this position until 1888.

Mr. Jones had a statesman's grasp of political and economic problems. His name was often mentioned in connection with elective offices. In 1899 he received 89 votes for United States Senator in the caucus of the Republican members of the Pennsylvania Legislature.

In 1885 Mr. Jones was elected President of the American Iron and Steel Association, and this position he filled worthily and acceptably to the day of his death. He always kept in close touch with the work of the Association. He helped to shape its policies on all public questions affecting the iron trade, and in emergencies his services were freely given for the promotion of these policies.

J. M. S.

IRON AND STEEL NECROLOGY.

FROM JUNE, 1902, TO JUNE, 1903.

(1902.) William Swindell, president of the corporation of William Swindell & Brothers, of Pittsburgh, died on June 19. Mr. Swindell was born in Allegheny City in 1834.—Alexander W. Adair, vice president of the Shenango Furnace Company, was almost instantly killed on the 4th of July by the explosion of a bomb at Sewickley, Pa.—H. H. Scoville, at Chicago, July 5. He went to Chicago in 1839 from Syracuse, N. Y., and in 1847 established the Scoville Iron Works, which were the first in Chicago, on the site of the present Union depot. The firm built the first locomotive that ever ran out of Chicago.—Edward A. Muench, chief purchasing agent of the American Bridge Company, July 5, at Overbrook, a suburb of Philadelphia. Mr. Muench was born at Millersburg, Pa., and was about 30 years of age.—Colonel George C. Tichenor, a member of the Board of United States General Appraisers, at East Orange, N. J., on July 11, from locomotor ataxia, aged 68 years. Colonel Tichenor was a veteran of the civil war and one of the leading tariff experts in the country. He was born at Shelbyville, Ky., in 1834. In 1878 he was appointed a special agent of the Treasury Department and for many years he was a special agent of the State and Treasury Departments in Europe. In March, 1889, President Harrison appointed him First Assistant Secretary of the Treasury Department, and in 1890 the same wise President appointed him a member of the new Board of General Appraisers.—Professor Van Buren Denslow, at New York, July 17, aged 69 years. Years ago Professor Denslow was active in the practice of law in Chicago. He was the head of the Chicago Union School of Law for some years before it was divided between the Chicago University and the Northwestern University. At one time he was the tariff editor of the Chicago *Inter Ocean*. He was the author of a valuable work on the principles of economic philosophy.—Captain E. A. C. Lohmann, a steel expert, at Bethlehem, Pa., July 21. He was a native of New Haven, Conn.—Matthew Graff, July 22, at New Kensington, Pa., aged 90. He was born in Westmoreland county, Pa., and removed to Pittsburgh in 1852, where he established one of the first stove foundries in that city.—On August 9, at Chicago, Walter A. Scott, president of the Illinois Wire Company, was stabbed to death in his office in the Monadnock Building by a civil and consulting engineer, with offices in the same building.—Senator James McMillan, of Michigan, August 10, at Manchester-by-the-Sea, Mass. Mr. McMillan was a member of the United States Senate from March 4, 1889, until the time of his death. He was born at Hamilton, Ontario, May 12, 1838. In company with several others he organized the Michigan Car Company in 1864 and was afterwards identified with

similar enterprises elsewhere. He was largely interested in lake transportation and in Michigan railroads.—Edward Roberts, Jr., widely known in financial circles in Philadelphia and New York, at Rosemont, Pa., August 12, in his 70th year. He was vice president of the East Broad Top Railroad Company and of the Rockhill Iron and Coal Company and was interested in several coal, iron, and land companies.—Charles W. Wharton, a well-known business man and philanthropist, of Philadelphia, August 16, at Braecleugh, near Newport, R. I. Mr. Wharton was nearly 79 years old. In his early life he was a silk importer. He was president of the Schuylkill Navigation Company, which passed into the hands of the Philadelphia and Reading Railroad Company.—W. Hasell Wilson, president of the companies composing the Belvidere Division of the Pennsylvania Railroad, and formerly president of the Philadelphia and Erie Railroad Company, August 17, at Philadelphia, in his 91st year. Mr. Wilson's railroad career spans the period of railroad construction in this country. In 1828 he assisted in making the surveys for the Philadelphia and Columbia Railroad, which is now a part of the Pennsylvania system.—George Alfred Bell, treasurer of the Marion Malleable Iron Works, of Marion, Ind., August 26. He was born at Brooklyn, N. Y., on September 6, 1851. In 1886 he became auditor of the Troy Steel and Iron Company, at Troy, N. Y. Upon the organization of the Troy Steel Company he became its vice president and general manager, which position he held until August, 1900.—Major J. Wesley Powell, Director of the Bureau of American Ethnology and for fourteen years Director of the United States Geological Survey, September 23, at Haven, Maine. Major Powell was born at Mount Morris, N. Y., on March 24, 1834.—J. B. Lequear, successor to the late William E. S. Baker as secretary of the Duncannon Iron Company, at Germantown, Philadelphia, September 20. Mr. Lequear had been in the service of the Duncannon Iron Company for many years. He is succeeded as secretary by W. L. Coover.—Thomas Chalmers Clarkson, of the firm of Zug & Co., of Pittsburgh, and a son-in-law of the late Christopher Zug, September 28. He was in his 54th year.—Jacob R. Dodge, statistician of the Department of Agriculture, at Washington, D. C., for about thirty years, and one of the last of the old writers on protection whose work has made this country prosperous, October 1, at Woburn, Mass. He was born at New Boston, N. H., on September 28, 1823. Mr. Dodge's connection with the Department began on September 4, 1863, and ended with his resignation on March 31, 1893.—Henry Tod, Jr., assistant superintendent of the Brier Hill Iron and Coal Company, of Youngstown, Ohio, was killed on October 8 by being thrown from his automobile, which was struck by an Erie Railroad passenger train at a grade crossing. He was 25 years old.—Howard M. Jenkins, of Philadelphia, a historical writer of national reputation, was drowned on Saturday, October 11, while on a visit in Monroe county, Pa. He was 60 years old.—Robert C. Schenck, president of the First National Bank and the Dayton Malleable Iron Company, of Dayton, Ohio, in a hospital at Utica, N. Y., on October 15.—Hon.

James A. Logan, solicitor general of the Pennsylvania Railroad Company, at Bala, near Philadelphia, October 29. Judge Logan was born in Westmoreland county, Pa., on December 3, 1839.—Charles Lukens, at Conshohocken, Pa., October 30, in his 66th year. Mr. Lukens was a member of the Alan Wood Company.—Alan Wood, Jr., October 31, at Philadelphia, in his 69th year, having been born in Philadelphia on July 6, 1834. Mr. Wood was identified with the manufacture of iron all his life and since 1858 with the Schuylkill Iron Works, at Conshohocken, Montgomery county, Pa., owned by the Alan Wood Company. In 1876 Mr. Wood was elected a Republican member of the 44th Congress.—Joseph H. Outhwaite, of Cleveland, Ohio, at New York, November 15. Mr. Outhwaite was the principal member of the old firm of J. H. Outhwaite & Co., which operated extensive ore mines in the Lake Superior region. He was born at Cleveland on December 5, 1841.—George Harding, one of the oldest and most widely known patent attorneys of the United States, at New York, November 17, aged 76 years.—John A. Grier, at Chicago, November 18, aged about 69 years. Mr. Grier was a native of Chester county, Pa., and was a descendant of a Revolutionary family. During the civil war he was a chief engineer in the Navy and subsequently was chief engineer of the United States Mint, at Philadelphia. He was widely known as an economic writer.—Friedrich Alfred Krupp, the owner of the most extensive steel works in Europe, employing, with associated enterprises, about 45,000 workmen, and noted chiefly for the manufacture of the celebrated Krupp guns, of apoplexy, at his country seat near Essen, in Prussia, November 22, aged almost 49 years. He was born on February 17, 1854.—James E. A. Gibbs, the inventor of the Wilcox & Gibbs sewing machine and other devices, at his home at Raphine, Rockbridge county, Va., November 25, aged 73 years.—Charles B. Houston, of Chester, Pa., at the German Hospital in Philadelphia, November 28, from injuries received by being struck by a locomotive at his coal mines in West Virginia. He was 70 years old, having been born at Belfast, Ireland, on December 16, 1832. Mr. Houston was prominently identified with the iron trade at Chester and with the coal industry of West Virginia.—Hon. Thomas Brackett Reed, Representative in Congress from 1877 to 1899, and Speaker of the House of Representatives from 1889 to 1891 and again from 1895 to 1899. He was born at Portland, Maine, October 18, 1839, and died at Washington, D. C., December 7, 1902.—George W. Prescott, one of the principal stockholders of the Union Iron Works, of San Francisco, and for several years the president of the company, December 13.—Charles T. Neale, president and general manager of the Kittanning Iron and Steel Manufacturing Company, of Kittanning, Pa., at Pittsburgh, December 20. He was born at Kittanning 70 years ago.—William McKee Lorenz, of Pittsburgh, at Mt. Clemens, Mich., December 23. Mr. Lorenz was the principal owner and manager of the *American Manufacturer*, published at Pittsburgh.—William Perkins Tyler, president of the Tyler Tube and Pipe Company, of Washington, Pa., December 27, at New York, aged 53 years. He was born at Bos-

ton.—Charles Wessell, a metallurgist of national reputation, suddenly, on an elevated street car, in New York, December 30, aged 67 years.

(1903.) General Samuel Thomas, the well-known railroad man and financier, died on January 11, at New York. General Thomas was born at Southpoint, Lawrence county, Ohio, on September 27, 1840. At the outbreak of the civil war he entered the Union army. After the war he devoted himself to the development of the coal and iron interests of the Hocking Valley and to various railroad enterprises. In 1901 he was president of the United States Cast Iron Pipe and Foundry Company.—C. A. Godcharles, manager of the F. A. Godcharles Company, manufacturers of muck bar and cut nails, at Milton, Pa., January 17. He was born at Farrandville, Pa., on December 8, 1843.—Hon. Abram Stevens Hewitt, prominent as an iron and steel manufacturer for more than 50 years, and during the greater part of this time as a politician and statesman, at his home in New York, January 18. He was born at Haverstraw, N. Y., on July 31, 1822, and was consequently in his 81st year at the time of his death. Mr. Hewitt was a vice president of the American Iron and Steel Association from 1864 to the end of his career, a period of thirty-nine years.—Robert Packer Linderman, former president of the Bethlehem Steel Company, January 21, at Bethlehem, Pa. He was born at Mauch Chunk, Pa., on July 26, 1863, his father being the late Garrett Brodhead Linderman.—Ferdinand Protzman, Sr., at Allegheny City, Pa., January 21, aged 63 years. He was born at Waynesboro, Franklin county, Pa., January 1, 1840. He went to Pittsburgh about 1865 and began the publication of the *Iron World*, which was afterwards merged with the *American Manufacturer*.—Florian Grosjean, president of the Lalance and Grosjean Manufacturing Company, at Brooklyn, N. Y., January 24. Mr. Grosjean was born in Saule, Switzerland, on January 12, 1824.—Colonel Ira Ayer, one of the oldest and most valued of the special agents of the Treasury Department, at Brooklyn, N. Y., February 3, aged 67 years.—William Coleman Freeman, of Cornwall, Lebanon county, Pa., February 7, at Lebanon, Pa. Mr. Freeman was 62 years old. For many years he had been chairman of the Robeson Iron Company, at Robeson, Pa.—George R. Taylor, manager of the Robeson Iron Company, at Robeson, Pa., and one of the well-known ironmasters of Eastern Pennsylvania, February 16. He was 58 years old.—William Johnston Taylor, February 17, at Bound Brook, N. J. Mr. Taylor was born at High Bridge, N. J., in 1836. He was long connected with the Taylor Iron and Steel Company, of High Bridge, and was prominent in many other enterprises.—Lewis Sylvester Hough, educator, lawyer, author of numerous protective tariff and financial essays, and a Union soldier, at Media, Pa., February 17, at the age of 82 years. He was born at Martinsburg, N. Y.—William R. Trigg, founder and president of the William R. Trigg Company, of Richmond, Va., February 17, at Richmond, aged 54 years. He was a native of Richmond. He was the founder of the Richmond Locomotive Works.—Charles M. Day, a director of the Portland Iron and Steel Company, of Portland, Maine, Feb-

ruary 21, aged 43 years.—John M. Stetson, manager of the Bridgewater Foundry, Machine, and Rolling Mill Company, at Bridgewater, Mass., February 25, aged about 50 years.—Dr. R. J. Gatling, inventor of the Gatling gun, at New York, February 26. Dr. Gatling was born in North Carolina. In 1862 he invented the revolving gun which bears his name. He was 84 years old.—A. L. Murphy, secretary of the Longmead Iron Company and superintendent of its tube mills, at Conshohocken, Pa., and a director of the company, February 27. He was president of the National Tube Makers' Association and was the patentee of a tube-welding machine.—George L. Raymond, one of the sales agents of the Gautier Department of the Cambria Steel Company, at Cincinnati, February 28.—Mrs. Roebling, wife of Colonel Washington A. Roebling, engineer of the Brooklyn Bridge, at Trenton, N. J., February 28. Mrs. Roebling achieved great prominence through the part she took in directing the details of construction of the Brooklyn Bridge after her husband had been incapacitated in 1872 by caisson fever. The bridge was completed on May 27, 1883, and Mrs. Roebling was the first woman to cross it.—Jacob Schoenhof, United States Consul at Tunstall, England, during President Cleveland's first Administration and Assistant Appraiser at the port of New York in his second, in February. Mr. Schoenhof was an active free trader. He helped to frame the Wilson bill.—Palmer C. Goble, head of the Chicago sales department of the Jones and Laughlin Steel Company, at Chicago, March 2, aged 63 years. He was a native of Michigan, having been born at Monroe on September 18, 1839.—Robert S. Jamison, Sr., of Greensburg, Pa., president of the Jamison Coal and Coke Company, at Redlands, Cal., March 14. Mr. Jamison was born in Westmoreland county, Pa., in 1835.—Oliver P. Scaife, Sr., one of the most prominent business men of Allegheny county, Pa., March 14, at Allegheny City, in his 67th year. He was interested in the tank works of the Oliver P. Scaife Company, Limited, and in the Scaife Foundry and Machine Company, Limited.—Anson O. Kittredge, editor of *The Metal Worker* for a number of years prior to 1893, at Boston, March 24. He was 55 years old.—Mrs. Mattie F. Weeks, widow of Joseph D. Weeks, editor of the *American Manufacturer*, of Pittsburgh, at the home of her brother, C. C. Fowler, in Burlington, Iowa, March 26, aged 60 years.—George Singer, Jr., one of the last surviving members of the famous steel firm of Singer, Nimick & Co., of Pittsburgh, at his home in that city, March 27. He was a son of John F. Singer, the founder of Singer, Nimick & Co., and was 71 years old. He was born at Greensburg, Pa., on January 16, 1832.—Wm. Chisholm Stubbs, treasurer of the Struthers Furnace Company, at Cleveland, March 31, of pneumonia. Mr. Stubbs was 31 years old and leaves a widow and three children. He was born in Chicago.—Philip H. Sternbergh, at Kansas City, Mo., April 2, of pneumonia. Mr. Sternbergh was the oldest son of J. H. Sternbergh, of Reading, Pa., and had been the vice president and treasurer of the Kansas City Bolt and Nut Company from 1897 to the time of his death. He was born in 1865 and was unmarried.—W. W. Card,

president of the Pittsburgh Screw and Bolt Company and first vice president of the Westinghouse Air Brake Company, was killed on April 4 by a trolley car in front of his home in the East End. Mr. Card was 72 years old. He was born at Nelson, Madison county, N. Y., on September 6, 1831.—George Johnson, proprietor of the Catasauqua Steel Works, at Catasauqua, Pa., April 4. Mr. Johnson was a native of Derbyshire, England, where he was born on March 11, 1851.—Richard Percy Heckscher, son of the late Richard Heckscher, April 22, at Lakewood, N. J., aged 43 years. He was a partner with his father and brothers in anthracite coal operations and in the iron business in connection with the Swede blast furnaces.—Theodore Dehon Rand, April 24, at his home in Radnor, Delaware county, Pa. Mr. Rand was born in Philadelphia 67 years ago. He was admitted to the bar in June, 1858. He was treasurer of the American Institute of Mining Engineers from May, 1874, to the time of his death.—Irving M. Scott, for many years vice president and general manager of the Union Iron Works, of San Francisco, which built the battleship *Oregon*, at his home in that city, April 28. Mr. Scott's death is a distinct loss to his State and the nation. He was born at Hebron Mills, Md., on December 25, 1837.—Jonathan Rowland, April 30, at Holmesburg, Philadelphia. Mr. Rowland was a member of an old Philadelphia family that has long been engaged in the iron business. He was born at Holmesburg on March 27, 1856.—Captain John B. Ford, the pioneer manufacturer of plate glass in the United States, May 1, at his home at Creighton, Allegheny county, Pa. He was in his 92d year.—James M. Bailey, a prominent iron manufacturer of Pittsburgh, May 6, aged nearly 70 years. He was a member of the firm of Phillips, Nimick & Co., which operated the Sligo Rolling Mills, at Pittsburgh, for many years.—Edmund Parsons Dwight, president of the Chester Steel Castings Company, of Chester, Pa., suddenly at his home at Chestnut Hill, Philadelphia, May 24. He was born of New England parentage on November 23, 1815.—Fletcher Haight Knight, assistant general manager of the Thomas Iron Company, at Rochester, N. Y., May 31.—Henry G. Morse, president of the New York Shipbuilding Company, at New York, June 2, after an attack of apoplexy. Mr. Morse was 53 years old. He was born at Poland, Ohio, in 1850.—Professor J. Peter Lesley, the eminent geologist and first secretary of the American Iron Association, from 1855 to 1859, at Milton, Mass., June 2, in his 84th year. He was born at Philadelphia on September 17, 1819.—General William Patton, at Columbia, Pa., June 5, in his 87th year. For many years General Patton was president and general manager of the Susquehanna Iron Company, at Columbia.—David H. Mason, the well-known writer on tariff and other economic subjects, of pneumonia, at Chicago, June 17, in his 75th year. Mr. Mason was born at Philadelphia on January 8, 1829. He was almost the last of the "old guard" of protectionist writers in this country.—Colonel George Church, president of the Richmond Iron Company, at Great Barrington, Mass., June 27. He was born at Canaan, Conn., July 20, 1826.

STATISTICS OF THE AMERICAN IRON TRADE FOR 1902.

GENERAL REVIEW OF THE AMERICAN IRON TRADE.

IN our last Annual Report, which was printed in June, 1902, the opinion was expressed that, "while a reaction from the great prosperity that now prevails is certain to come some day, from causes which no prophet can now foretell, it seems reasonably certain that the year 1902 will close under as favorable industrial conditions as signalized its opening and that they will be continued far into 1903 and perhaps longer." The reasons for this hopeful opinion were given in detail, particularly those which related to the iron trade. It is a pleasure to be able to say that the extraordinary prosperity which prevailed a year ago has continued to the present time, and that it bids fair to continue for some time to come without serious interruption. A decline in the stock market does not mean an end to this prosperity. At the same time a wise man will not neglect to observe the signs of overtrading or overproduction or be unprepared for a business reaction when it comes. Our Annual Reports during the past thirty years have chronicled many financial panics and visitations of hard times. Prosperous as this country is to-day and has been for several years it is not so prosperous that it can digest all the speculative schemes that are continually being offered to the credulous and unthinking. Nor is there room or excuse for business enterprises, otherwise meritorious, that are projected far in advance of the wants of the present generation.

The interruptions to the general prosperity in 1902 included a general strike in the anthracite coal region and the inability of many leading railroads to promptly handle all the freight that was offered to them. No other strike of the year was either general or of far-reaching effect. The anthracite strike, which virtually closed all the anthracite coal mines of Pennsylvania, began on May 12, 1902, and lasted until October 23 of the same year, when there was a general resumption of work. During these twenty-three weeks little anthracite coal was mined and about 140,000 workmen were idle. The workmen lost about \$25,000,000 in wages, the operators lost about \$46,000,000 in

sales, and the railroads lost about \$28,000,000 in freight charges. These were serious losses. The shipments of anthracite coal in 1902 were 22,367,711 gross tons less than in 1901. The scarcity of anthracite coal from May to October greatly restricted the operations of Eastern iron and steel manufacturers.

The railroad trouble mentioned was also of a serious character. Soon after the present boom in the iron trade got fairly under way at the beginning of 1899 it became manifest that the railroads which haul most of the raw materials and finished products of iron and steel were lacking in car and locomotive equipment, so that much of the freight to and from our iron and steel works could not be promptly shipped and delivered. Notwithstanding the efforts of railroad managers to meet this difficulty by ordering new rolling stock, the car and locomotive shortage continued and manufacturers' troubles increased. In 1902, with thousands of new cars and locomotives in service, a fresh difficulty presented itself, or, rather, a complication that had previously existed assumed an acute stage—there were not enough tracks and yard facilities to accommodate the increased rolling stock. Throughout the greater part of the year and until March of the present year the congestion of freight on many lines of railroad, especially those which run into Pittsburgh or which tap the Connellsville coke region, was a matter of daily occurrence. These lines had absolutely broken down! As one result of the inability of the railroads to promptly move coke, iron ore, pig iron, and other products many consumers of iron and steel were compelled to send abroad orders that could otherwise have been filled at home. Another result was, of course, a smaller production of some forms of iron and steel in 1902 than would have been possible under more favorable conditions. Blast furnaces were often banked for many days at a time because a sufficient supply of coke or iron ore could not be obtained, and the mills were often operated on short time because they could not obtain a sufficient supply of pig iron or billets. From this condition there was but little relief until the spring of 1903. The extraordinary efforts of railroad managers to meet in every way the increased demand upon their roads have at last resulted in the virtual ending of the congestion we have described. Other industries were also affected by this congestion, but in a less degree.

In May and June, 1902, so general was the opinion that the railroad managers would be able thereafter to supply the wants of the mills and furnaces, and thus enable our manufacturers to

meet with promptness the extraordinary home demand for their products, that a further advance in prices, which had previously been of moderate proportions, was not generally expected. But stable conditions did not continue because the railroad problem was not solved. Prices for some products rose during the remainder of the year, but there was no sensational advance except for both coal and coke, for some shipments of which raw materials fabulous prices were paid. The present price of coke is \$3 a net ton, which is somewhat higher than a year ago. The prices of iron ore for 1903 range from 15 cents to \$1 a ton higher than in 1902. But the tendency has been toward lower figures since the close of 1902 for some iron and steel products, notably pig iron, because, through improved railroad facilities and a steadily increasing capacity of production, orders can now be more promptly filled than a few months ago.

As already mentioned, there was an increased demand in 1902 for foreign iron and steel products to meet a deficiency in the home supply. There was also a further decline in that year in our exports of these products. With an active home demand and higher prices this decline in our exports was inevitable. The increase in our imports of iron and steel had indeed commenced in 1899 and the decrease in our exports in 1901, but the increase in imports became more marked in 1902 as the months passed. In the years immediately preceding 1899 our imports of iron and steel had greatly declined and until 1901 our exports had greatly increased; now the conditions were reversed. The foreign value of our imports of iron and steel in 1902 exceeded that of any year since 1891. In 1902 we imported 625,383 tons of pig iron, spiegeleisen, and ferro-manganese, 109,510 tons of scrap iron and scrap steel, 63,522 tons of rails, and 289,318 tons of steel billets, bars, structural steel, etc. At the present moment the indications are that in 1903 the imports of iron and steel will greatly decline as compared with 1902, but there is slight probability that our exports will increase. The home demand still taxes the capacity of our iron and steel works in all lines.

Although, as has been explained, there was much interruption in 1902 to the continuous operation of our iron and steel works, the year's production of iron and steel was not only larger than that of any preceding year but it was very much larger, as was also the production of iron ore and coke. The shipments of Lake Superior iron ore in 1902 amounted to 27,571,121 gross tons, as compared with 20,593,537 tons in 1901, and the shipments of

Connellsville coke amounted to 14,138,740 net tons, against 12,609,949 tons in 1901. The production of pig iron in 1902 amounted to 17,821,307 gross tons, against 15,878,354 tons in 1901; of Bessemer steel to 9,138,363 tons, against 8,713,302 tons; and of open-hearth steel to 5,687,729 tons, against 4,656,309 tons. It will not be many years, probably only a very few years, until this country will make one-half of all the pig iron and one-half of all the steel that the world produces.

Labor in the iron and steel industries appears to be contented with its rewards. In the iron trade, in the mining of coal, in the manufacture of coke, and in railroad transportation there have been material advances in wages in the last year.

GENERAL STATISTICAL SUMMARY.

The following table gives the shipments of Lake Superior iron ore, the shipments of Connellsville and Pocahontas coke, the shipments of anthracite coal, the production of leading articles of iron and steel, the imports and exports of iron ore and iron and steel, and the miles of new railroad built in 1901 and 1902.

Articles—Gross tons, except for coke and nails.	1901.	1902.
Shipments of iron ore from Lake Superior.....	20,593,537	27,571,121
Total production of iron ore.....	28,887,479	.....
Shipments of Pennsylvania anthracite coal.....	53,568,601	31,200,890
Total production of all kinds of coal.....	261,873,675	.....
Total production of coke, in net tons.....	21,795,883	.....
Shipments of Connellsville coke, in net tons.....	12,609,949	14,138,740
Shipments of Pocahontas Flat Top coke, in net tons	1,279,949	1,191,436
Production of pig iron, including spiegel and ferro.	15,878,354	17,821,307
Production of spiegeleisen and ferro-manganese.....	291,461	212,981
Production of Bessemer steel ingots and castings.....	8,713,302	9,138,363
Production of open-hearth steel ingots and castings..	4,656,309	5,687,729
Production of all kinds of steel.....	13,473,595	14,947,250
Production of structural shapes, not including plates	1,013,150	1,300,326
Production of plates and sheets, except nail plate....	2,254,425	2,665,409
Production of all rolled iron and steel, except rails..	9,474,688	10,996,183
Production of Bessemer steel rails.....	2,870,816	2,935,392
Production of all kinds of rails.....	2,874,639	2,947,933
Production of iron and steel wire rods.....	1,365,934	1,574,293
Production of all rolled iron and steel, including rails	12,349,327	13,944,116
Production of iron and steel cut nails, in kegs.....	1,542,240	1,633,762
Production of iron and steel wire nails, in kegs.....	9,803,822	10,982,246
Imports of iron ore.....	966,950	1,165,470
Exports of iron ore.....	64,703	88,445
Imports of iron and steel, value.....	\$20,395,015	\$41,468,826
Exports of iron and steel, value.....	\$102,534,575	\$97,892,036
Miles of new railroad built .....(estimate for 1902.)	4,906	6,000

The shipments of Lake Superior iron ore in 1902 increased 6,977,584 gross tons over 1901 and the shipments of Connellsville coke increased 1,528,791 net tons. The production of all kinds of pig iron increased 1,942,953 gross tons, but the production of spiegeleisen and ferro-manganese decreased 78,480 tons. The production of Bessemer steel increased 425,061 tons; open-hearth steel, 1,031,420 tons; all kinds of steel, 1,473,655 tons; structural shapes, 287,176 tons; plates and sheets, 410,984 tons; Bessemer steel rails, 64,576 tons; all kinds of rails, 73,294 tons; iron and steel wire rods, 208,359 tons; iron and steel cut nails, 91,522 kegs; iron and steel wire nails, 1,178,424 kegs; and all kinds of rolled iron and steel, 1,594,789 tons. The shipments of Pennsylvania anthracite coal declined from 53,568,601 gross tons in 1901 to 31,200,890 tons in 1902, a decrease of 22,367,711 tons. The shipments of Pocahontas Flat Top coke declined from 1,279,949 net tons to 1,191,436 tons. The increase in the mileage of new railroads was approximately 1,100 miles.

IMPORTS OF IRON AND STEEL.

The following table, which we have compiled from the reports of the Bureau of Statistics of the Treasury Department, gives the quantities of various leading articles of iron and steel and of iron ore and manganese ore imported into the United States in the calendar years 1899, 1900, 1901, and 1902.

Imports—Gross tons.	1899.	1900.	1901.	1902.
Pig iron, spiegel, ferro-mang., and ferro-sil..	40,393	52,565	62,930	625,383
Scrap iron and scrap steel	10,925	34,431	20,130	109,510
Bar iron	19,791	19,685	20,792	28,844
Iron and steel rails	2,134	1,448	1,905	63,522
Hoop, band, or scroll iron and steel	663	165	2,974	3,362
Steel ingots, billets, structural steel, etc...	12,601	12,709	8,163	289,318
Sheet, plate, and taggers' iron and steel...	7,043	5,143	5,621	7,156
Tinplates	58,915	60,386	77,395	60,115
Wire rods, iron and steel	17,964	21,092	16,804	21,382
Wire, and articles made from wire	2,363	1,848	4,129	3,468
Anvils	240	223	251	203
Chains	188	260	198	576
Total of above iron and steel	173,220	209,955	221,292	1,212,839
Iron ore	674,082	897,831	966,950	1,165,470
Manganese ore	188,349	256,252	165,722	235,576

Our total imports of iron and steel, including machinery, cutlery, firearms, etc., for which weights are not obtainable, amounted in

foreign value to \$41,468,826 in the calendar year 1902, against \$20,395,015 in 1901, \$20,443,911 in 1900, and \$15,800,579 in 1899, showing an increase in 1902 as compared with 1901 of \$21,073,811, or over 100 per cent.

Our imports of pig iron increased from 62,930 tons in 1901 to 625,383 tons in 1902, of scrap iron and steel from 20,130 tons to 109,510 tons, of rails from 1,905 tons to 63,522 tons, and of billets, structural steel, etc., from 8,163 tons to 289,318 tons. While these heavy importations in 1902 were due mainly to the difficulty in having orders promptly filled at home, they undoubtedly show how easy it is for foreigners to send their iron and steel products to our markets whenever our prices are materially expanded beyond those which rule abroad; in other words, our existing tariff on iron and steel is not a serious impediment to importations of these articles.

Of the pig iron imported in recent years a large part was spiegeleisen and ferro-manganese, but in 1902 there was a great increase in the importations of both foundry and Bessemer pig iron.

EXPORTS OF IRON AND STEEL.

The following table, also compiled from the reports of the Bureau of Statistics of the Treasury Department, gives our exports of leading articles of iron and steel and of iron ore and locomotives in the calendar years 1899, 1900, 1901, and 1902.

Exports—Gross tons.	1899.	1900.	1901.	1902.
Pig iron.....	228,678	286,687	81,211	27,487
Scrap and old, for remanufacture...	76,663	49,328	14,199	9,411
Bar iron.....	10,898	13,299	17,708	22,249
Band, hoop, or scroll iron and steel.	2,869	2,976	1,561	1,674
Bars or rods of steel not wire rods	30,429	81,366	27,397	9,300
Steel wire rods.....	16,992	10,652	8,165	24,613
Billets, ingots, and blooms.....	25,487	107,385	28,614	2,409
Cut nails and spikes.....	9,974	11,163	9,302	7,170
Wire nails.....	33,517	27,404	18,773	26,580
All other nails, including tacks....	2,076	1,812	1,896	2,244
Iron plates and sheets.....	6,196	9,331	6,909	3,434
Steel plates and sheets.....	50,635	45,534	23,923	14,866
Iron rails.....	6,442	5,374	901	211
Steel rails.....	271,272	356,245	318,055	67,455
Structural iron and steel.....	54,244	67,714	54,005	53,859
Wire.....	116,317	78,014	88,238	97,843
Total of the above iron and steel	942,689	1,154,284	700,857	370,805
Iron ore.....	40,665	51,460	64,703	88,445
Locomotives.....Number..	484	436	448	368

Our total exports of iron and steel, which include locomotives, car wheels, machinery, castings, hardware, saws and tools, sewing machines, stoves, printing presses, boilers, etc., amounted in the calendar year 1902 to \$97,892,036, against \$102,534,575 in 1901, \$129,633,480 in 1900, \$105,690,047 in 1899, \$82,771,550 in 1898, and \$62,737,250 in 1897. Our exports of iron and steel more than doubled in value from 1897 to 1900, but there was a shrinkage in 1901 as compared with 1900 of \$27,098,905, or over 20 per cent. In 1902 there was a further shrinkage, but it was not so pronounced as in 1901, owing largely to the advance in prices. The decline in our exports of iron and steel in 1902 as compared with 1901 was partly due to the active demand for these products at home and partly to lower prices abroad.

EXPORTS OF AGRICULTURAL IMPLEMENTS.

Our exports of agricultural implements, which are not included above, amounted in the calendar year 1902 to \$17,981,597, against \$16,714,308 in 1901, \$15,979,909 in 1900, \$13,594,524 in 1899, \$9,073,384 in 1898, and \$5,302,807 in 1897.

IMPORTS OF IRON ORE.

The following table, for which we are indebted to the Bureau of Statistics of the Treasury Department, gives the quantities and values of iron ore imported into the United States during the calendar years 1900, 1901, and 1902, by customs districts. The imports of manganese ore are given on the following page.

Customs districts.	1900.		1901.		1902.	
	Gross tons.	Values.	Gross tons.	Values.	Gross tons.	Values.
Baltimore.....	448,660	\$629,507	484,035	\$733,071	600,711	\$1,401,326
New York.....	25,878	63,540	15,865	45,863	14,546	39,800
Philadelphia..	414,064	589,749	298,255	459,698	338,848	597,895
Puget Sound..	.....	.....	2,875	4,313	5,661	9,312
Vermont.....	257	454	48	186	18	72
All other.....	8,972	19,946	165,872	416,142	205,686	534,672
Total	897,831	\$1,303,196	966,950	\$1,659,273	1,165,470	\$2,583,077

The imports of iron ore in 1902 included 209,485 tons from Canada, valued at \$519,023, received chiefly at Lake Erie ports. In addition there were imported in 1902 from Newfoundland into the customs district of Philadelphia 11,000 tons of iron ore, valued at \$11,000. We are indebted to Josiah Monroe, secretary and treasurer of the Juragua Iron Company Limited, for the following report of the shipments of Cuban iron ore in 1902.

The following companies shipped iron ore to the United States in 1902: The Juragua Iron Company Limited, 221,039 gross tons; the Spanish-American Iron Company, 455,105 tons; the Cuban Steel Ore Company, 23,590 tons: total shipments, 699,734 tons. The Cuban Steel Ore Company went out of business at the end of the year and its mines are closed. No iron ore was shipped from Cuba in 1902 to any other country than the United States.

Mr. Monroe also furnishes us with statistics of the total shipments of iron ore from Cuba to all countries from the beginning of shipments in 1884 to the close of 1902 as follows: By the Juragua Iron Company Limited, 3,911,795 gross tons; by the Sigua Iron Company, 20,438 tons; by the Spanish-American Iron Company, 1,777,118 tons; and by the Cuban Steel Ore Company, 41,241 tons: total, 5,750,592 tons.

IMPORTS OF IRON ORE SINCE 1879.

The following table gives the imports of iron ore into the United States in the calendar years from January 1, 1879, to December 31, 1902. 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.

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

IMPORTS OF MANGANESE ORE SINCE 1889.

The following table, for which we are indebted to the Bureau of Statistics of the Treasury Department, gives the imports of manganese ore into the United States from 1889 to 1902.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1889.....	4,286	1894.....	44,655	1899.....	188,349
1890.....	34,154	1895.....	86,111	1900.....	256,252
1891.....	28,825	1896.....	31,489	1901.....	165,722
1892.....	58,572	1897.....	119,961	1902.....	235,576
1893.....	68,113	1898.....	114,885		

IRON AND STEEL IMPORTS AND EXPORTS SINCE 1871.

The following table, compiled from the reports of the Bureau of Statistics of the Treasury Department, shows the foreign value of our imports of iron and steel and manufactures thereof in the calendar years from 1871 to 1902, including tinplates; also the value of our exports of iron and steel and manufactures thereof, not including agricultural implements, in the same years.

Calendar years.	Imports—Values.	Exports—Values.	Calendar years.	Imports—Values.	Exports—Values.
1871.....	\$57,866,299	\$14,185,359	1887.....	\$56,420,607	\$16,235,922
1872.....	75,617,677	12,595,539	1888.....	42,311,689	19,578,489
1873.....	60,005,538	14,173,772	1889.....	42,027,742	23,712,814
1874.....	37,652,192	17,312,239	1890.....	44,540,413	27,000,134
1875.....	27,363,101	17,976,833	1891.....	41,983,626	30,736,507
1876.....	20,016,603	13,647,764	1892.....	33,882,447	27,900,862
1877.....	19,874,399	18,549,922	1893.....	29,656,539	30,159,363
1878.....	18,013,010	15,101,899	1894.....	20,843,576	29,943,729
1879.....	33,331,569	14,223,646	1895.....	25,772,136	35,071,563
1880.....	80,443,362	15,156,703	1896.....	19,506,587	48,670,218
1881.....	61,555,077	18,216,121	1897.....	13,835,950	62,737,250
1882.....	67,075,125	22,348,834	1898.....	12,474,572	82,771,550
1883.....	47,506,306	22,716,040	1899.....	15,800,579	105,690,047
1884.....	37,078,122	19,290,895	1900.....	20,443,911	129,633,480
1885.....	31,144,552	16,622,511	1901.....	20,395,015	102,534,575
1886.....	41,630,779	14,865,087	1902.....	41,468,826	97,892,036

IMPORTS OF TINPLATES SINCE 1871.

The following table gives the quantities and foreign values of our imports of tinplates in the calendar years 1871 to 1902.

Years.	Gross tons.	Values.	Years.	Gross tons.	Values.
1871.....	82,969	\$9,946,373	1887.....	283,836	\$18,699,145
1872.....	85,629	13,893,450	1888.....	298,238	19,762,961
1873.....	97,177	14,240,868	1889.....	331,311	21,726,707
1874.....	79,778	13,057,658	1890.....	329,435	23,670,158
1875.....	91,054	12,098,885	1891.....	327,882	25,900,305
1876.....	89,946	9,416,816	1892.....	268,472	17,102,487
1877.....	112,479	10,679,028	1893.....	253,155	15,559,423
1878.....	107,864	9,069,967	1894.....	215,068	12,053,167
1879.....	154,250	13,227,659	1895.....	219,545	11,482,380
1880.....	158,049	16,478,110	1896.....	119,171	6,140,161
1881.....	183,005	14,886,907	1897.....	83,851	4,366,828
1882.....	213,987	17,975,161	1898.....	66,775	3,311,658
1883.....	221,233	18,156,773	1899.....	58,915	3,738,567
1884.....	216,181	16,858,650	1900.....	60,386	4,617,813
1885.....	228,596	15,991,152	1901.....	77,395	5,294,789
1886.....	257,822	17,504,976	1902.....	60,115	4,023,421

IMPORTS AND EXPORTS OF COAL AND COKE.

Our exports of anthracite coal in the calendar year 1899 amounted to 1,707,796 gross tons, in 1900 to 1,654,610 tons, in 1901 to 1,993,307 tons, and in 1902 to 907,977 tons. Our exports of bituminous coal in 1899 amounted to 4,044,354 gross tons, in 1900 to 6,262,909 tons, in 1901 to 5,390,086 tons, and in 1902 to 5,218,969 tons. Our imports of anthracite coal in 1899 amounted to 61 tons, in 1900 to 118 tons, in 1901 to 286 tons, and in 1902 to 73,006 tons. Our imports of bituminous coal in 1899 amounted to 1,400,461 tons, in 1900 to 1,909,258 tons, in 1901 to 1,919,962 tons, and in 1902 to 2,478,375 tons. Our exports of coke in 1899 amounted to 280,196 tons, in 1900 to 376,999 tons, in 1901 to 384,330 tons, and in 1902 to 392,491 tons. Our imports of coke in 1899 amounted to 37,788 tons, in 1900 to 86,565 tons, in 1901 to 72,820 tons, and in 1902 to 126,671 tons. These figures are from the reports of the Bureau of Statistics of the Treasury Department.

PRODUCTION AND SHIPMENTS OF COAL AND COKE.

We are indebted to H. P. Snyder, the editor of the *Connellsville Courier*, for the following information: The total shipments of Connellsville coke in 1902, including the shipments from the Lower Connellsville region, amounted to 14,138,740 net tons of 2,000 pounds, against 12,609,949 tons in 1901, 10,166,234 tons in 1900, and 10,129,764 tons in 1899. Mr. Snyder says that the shipments from the Connellsville region proper in 1902 were practically the same as in the previous year. Of the shipments for 1902 over 2,000,000 tons came from the Lower Connellsville region. Coke shipments must not be confounded with production. The increased shipments of coke from the entire Connellsville region in 1902 over 1901 amounted to 1,528,791 tons. The shipments in 1902 would have been still further increased if transportation facilities had been equal to the demand for coke. Over 200,000 tons of coke were in stock piles at the end of the year awaiting shipment.

Concerning the prices paid for Connellsville coke during 1902 the *Courier* says that a careful estimate of the average price places it at \$2.37 per ton, at which rate the gross revenue of the region in that year was \$33,508,814. It adds: "The price of coke during the greater part of the year was almost anything the operators chose to ask for it. Their contracts, of course, were filled at the contract prices. It would be impossible to give the monthly range of prices. Quotations were practically withdrawn

the latter part of the year. Orders went begging. Furnacemen with empty coke bins offered as much as \$15 per ton for a few cars of quick-delivery coke. During the month of January there were actual sales as low as \$1.75 per ton, but these were on contract. The transient price was in the neighborhood of \$2.50. During February and March it rose to \$3 and during April and May it went back to \$2.50. After that time, as stated above, it commanded almost any price. During the last quarter of the year there were a number of sales at \$7.50 to \$11 per ton."

The shipments of anthracite coal from the Pennsylvania mines in 1902 amounted to 31,200,890 gross tons, against 53,568,601 tons in 1901, 45,107,484 tons in 1900, 47,665,204 tons in 1899, and 41,899,751 tons in 1898. These figures are furnished us by Mr. W. W. Ruley, the anthracite coal statistician.

The shipments of Pocahontas Flat Top coke in 1902, for which we are indebted to Mr. A. J. Hemphill, secretary of the Norfolk and Western Railway Company, amounted to 1,191,436 net tons, against 1,279,949 tons in 1901, 1,341,444 tons in 1900, and 1,317,246 tons in 1899.

The shipments of Cumberland coal from the mines of Western Maryland and West Virginia in 1902 amounted to 6,288,867 gross tons, against 6,139,329 tons in 1901, 5,171,916 tons in 1900, 6,131,461 tons in 1899, and 5,533,636 tons in 1898.

LAKE SUPERIOR IRON ORE SHIPMENTS.

The *Iron Trade Review* gives full details of the shipments of iron ore from the Lake Superior region in 1902 and in preceding years. Its figures show that the total shipments by water and by all-rail routes in 1902 amounted to 27,571,121 gross tons, against 20,593,537 tons in 1901, an increase of 6,977,584 tons, or 33.8 per cent. The shipments in 1902 from the Helen mine on the Canadian side to Canada and the United States, 298,420 tons, are not included. In 1902 there were shipped from this side to Canadian ports 88,241 tons of iron ore.

The *Review* says that 123 mines on the five Lake Superior ranges shipped iron ore last year, against 104 mines in 1901. The distribution is as follows: Marquette, 19; Menominee, 34; Gogebic, 27; Vermilion, 5; Mesabi, 48. The great gain was on the Mesabi range, where 17 new active mines appear. Strictly speaking, says the *Review*, more than 133 mines shipped iron ore last year, as the Cleveland-Cliffs Iron Company's mines are considered as one mine. There are other similar cases.

In the following tables the shipments of Lake Superior iron ore in the last four years are given by ranges and by ports and all-rail. Shipments to local furnaces are included.

Ranges—Gross tons.	1899.	1900.	1901.	1902.
Marquette Range.....	3,757,010	3,457,522	3,240,699	3,853,010
Menominee Range.....	3,301,052	3,261,221	3,623,730	4,627,524
Gogebic Range.....	2,795,856	2,875,295	2,938,155	3,663,484
Vermilion Range.....	1,771,502	1,655,820	1,786,063	2,084,263
Mesabi Range.....	6,626,384	7,809,535	9,004,890	13,342,840
Total.....	18,251,804	19,059,393	20,593,537	27,571,121

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.

Ports—Gross tons.	1899.	1900.	1901.	1902.
Escanaba.....	3,720,218	3,436,734	4,022,668	5,413,704
Marquette.....	2,733,596	2,661,861	2,354,284	2,595,010
Ashland.....	2,703,447	2,633,687	2,886,252	3,553,919
Two Harbors.....	3,973,733	4,007,294	5,018,197	5,605,185
Gladstone.....	381,457	418,854	117,089	92,375
Superior.....	878,942	1,522,899	2,321,077	4,180,568
Duluth.....	3,509,965	3,888,986	3,437,955	5,598,408
All-rail.....	350,446	489,078	436,015	531,952
Total.....	18,251,804	19,059,393	20,593,537	27,571,121

The shipments from the United States Steel Corporation's mines in 1902 amounted to 16,174,473 tons, or 58.6 per cent. of the whole. This is apart from 325,440 tons shipped by the Corporation from the Pewabic mine, in which the Carnegie Company has a one-half interest, but it includes the 6,882 tons shipped from the Iron Ridge mine of the Illinois Steel Company in Wisconsin. This mine is remote from the Lake Superior ranges and has never been included in Lake Superior statistics. The total shipments from the Pewabic mine were 530,291 tons.

LARGEST SHIPPERS OF LAKE SUPERIOR IRON ORE.

The Lake Superior mines which shipped the largest quantities of iron ore in 1902 were the following: the Norrie, in the Gogebic range, 1,080,032 tons; Tilden, in the Gogebic range, 468,672 tons; Aurora, in the Gogebic range, 402,981 tons; Chandler, in the Vermilion range, 645,786 tons; Savoy, in the Vermilion range, 322,241 tons; Minnesota, in the Vermilion range, 275,168 tons; Pioneer, in the Vermilion range, 673,863 tons; Aragon, in the

Menominee range, 646,203 tons; Chapin, in the Menominee range, 956,812 tons; Pewabic, in the Menominee range, 530,291 tons; Lake Angeline, in the Marquette range, 304,125 tons; Queen, in the Marquette range, 418,044 tons; Lake Superior, in the Marquette range, 832,796 tons; Cleveland-Cliffs, in the Marquette range, 1,104,864 tons; Mountain Iron, in the Mesabi range, 1,421,456 tons; Fayal, in the Mesabi range, 1,919,172 tons; Mahoning, in the Mesabi range, 1,038,645 tons; Adams, in the Mesabi range, 1,242,923 tons; and Stevenson, in the Mesabi range, 1,434,681 tons.

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, and Conneaut; also the quantity left on the docks at the close of navigation. From these statistics we compile the following statement from 1889 to 1902.

Years.	Receipts. Gross tons.	On dock. Gross tons.	Years.	Receipts. Gross tons.	On dock. Gross tons.
1889.....	5,856,344	2,607,106	1896.....	8,026,432	4,954,984
1890.....	6,874,664	3,893,487	1897.....	10,120,906	5,923,755
1891.....	4,939,684	3,508,489	1898.....	11,028,321	5,136,407
1892.....	6,660,734	4,149,451	1899.....	15,222,187	5,530,283
1893.....	5,333,061	4,070,710	1900.....	15,797,787	5,904,670
1894.....	6,350,825	4,834,247	1901.....	17,014,076	5,859,663
1895.....	8,112,228	4,415,712	1902.....	22,649,424	7,074,254

The receipts of Lake Superior iron ore at the ports of Buffalo, (including Tonawanda,) Erie, and Conneaut in the last seven years are given by the *Review* as follows, in gross tons.

Ports.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Buffalo....	545,101	797,446	1,075,975	1,530,016	1,616,919	1,475,386	2,256,798
Erie.....	847,849	1,311,526	1,092,364	1,309,961	1,240,715	1,379,377	1,717,268
Conneaut	327,623	495,327	1,404,169	2,320,696	2,556,631	3,181,019	4,300,301
Total.	1,720,573	2,604,299	3,572,508	5,160,673	5,414,265	6,035,782	8,274,367

PRODUCTION AND IMPORTS OF MANGANESE ORE.

The United States produces annually only a few thousand tons of manganese ore—9,935 tons in 1899, 11,771 tons in 1900, and 11,995 tons in 1901. Our supply of manganese ore is therefore mainly derived from foreign sources. As will be seen by reference to page 24 the imports of manganese ore have greatly

increased in the last few years. In 1897 the United States imported 119,961 gross tons of manganese ore; in 1898, 114,885 tons; in 1899, 188,349 tons; in 1900, 256,252 tons; in 1901, 165,722 tons; and in 1902, 235,576 tons. Some of the iron ores of the United States contain varying percentages of manganese, and these enter more or less into the production of the domestic supply of spiegeleisen. In 1901 Colorado produced 62,385 gross tons of manganiferous iron ore, containing from 16 to 30 per cent. of manganese; the Lake Superior region produced 512,084 tons, containing from 1 to 10 per cent. of manganese; and North Carolina produced 20 tons, but the percentage of manganese is not stated. In 1901 there were also used in the production of spiegeleisen 52,311 tons of combined iron and manganese, obtained in extracting zinc from the franklinite ores of New Jersey.

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.	1900. Gross tons.	1901. Gross tons.	1902. Gross tons.
Lake Superior mines of Michigan and Wis...	9,594,038	9,802,584	12,144,018
Vermilion and Mesabi mines of Minnesota....	9,465,355	10,790,953	15,427,103
Missouri mines.....	88,475	94,374	65,645
Cornwall mines, Pennsylvania.....	558,713	747,012	594,177
New Jersey mines.....	339,914	419,762	399,984
Chateaugay mines, on Lake Champlain.....	87,592	70,025	83,688
Port Henry mines.....	140,767	167,642	365,437
Salisbury region, Connecticut.....	22,792	19,472	23,276
Alleghany county, Virginia.....	137,031	143,530	144,637
Cranberry mines, North Carolina.....	20,479	180	30,810
Tennessee Coal, Iron, and Railroad Company's Inman mines in Tennessee.....	31,586	26,304	4,948
The same company's mines in Alabama.....	1,376,522	1,415,723	1,276,969
Calhoun, Etowah, and Shelby counties, Ala..	154,849	202,095	422,745
Total of the above districts.....	22,018,113	23,899,656	30,983,437

PRICES OF LAKE SUPERIOR IRON ORE.

We give below the prices at which Lake Superior iron ore has been sold upon season contracts in 1901 and 1902, per gross ton, delivered at lower ports on Lake Erie; also the prices at which sales were made in the spring of 1903 for season delivery. The star used in connection with 1903 prices refers to base ores. These prices have been furnished to us by Mr. A. I. Findley, the editor of the *Iron Trade Review*.

Grades.	1901.	1902.	1903.
Mesabi Bessemer.....	\$2.75 @ \$3.00	\$3.00 @ \$3.25	\$4.00*
Mesabi non-Bessemer.....	2.35 @ 2.65	2.60 @ 2.85	3.20*
Marquette specular No. 1 Bessemer.	4.66 @ 4.92	4.65 @ 5.00	\$4.85 @ \$5.15
Marquette specular No. 1 non-Bes...	3.65 @ 3.85	3.80 @ 4.00	4.00 @ 4.25
Chapin.....	3.78	3.91	.....
Soft hematites, No. 1 non-Bessemer..	2.85 @ 3.15	3.00 @ 3.25	3.60*
Gogebic, Marquette, and Menominee No. 1 Bessemer hematites..	4.25 @ 4.65	4.25 @ 4.65	4.50*
Vermilion No. 1 hard non-Bessemer	4.08	4.07	.....
Chandler No. 1 Bessemer.....	4.62	4.50	.....
Marquette extra low-phos. Bessemer	5.65 @ 5.75	5.40	.....

We have omitted quotations for 1903 for Chapin, Vermilion No. 1 hard non-Bessemer, Chandler No. 1 Bessemer, and Marquette extra low-phosphorus Bessemer ores because none of these are now on the market, these ores being mined for their own use by the United States Steel Corporation and other companies which own the mines from which they are obtained.

The base price for 1903 of "old range" Bessemer ores from the Marquette, Menominee, Gogebic, and Vermilion ranges has been fixed at \$4.50 per ton, which is 25 cents higher than in 1901 and 1902. The base adopted, says Mr. Findley, has been in use for the past six or seven years, and is a supposititious ore containing 63 per cent. of metallic iron, 0.045 per cent. of phosphorus, and 10 per cent. of moisture. This is very close to the analysis of the well-known Norrie ore of the Gogebic range, which is sometimes spoken of as the base ore. On "old range" non-Bessemer ores the basis for 1903 is \$3.60 per ton for an ore containing 60 per cent. of metallic iron and 12 per cent. of moisture. Mesabi ores for 1903 delivery have sold on a basis of \$4 per ton for a Bessemer ore of the analysis mentioned above as the "old range" Bessemer base, and on a basis of \$3.20 for a non-Bessemer ore of the analysis mentioned above.

AVERAGE MONTHLY PRICES OF IRON AND STEEL.

Prices of nearly all forms of iron and steel all through 1902 were lower than they were in the last few months of 1899 and the first few months of 1900, but as a rule are now higher than they were at any time in 1901 and do not differ materially from prices at the corresponding period of 1902.

In the following table we give the average monthly prices of leading articles of iron and steel in Pennsylvania in 1900, 1901, and 1902, and in the first five months of 1903. The prices named

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 mills.

Months.	Old iron T rails, at Philadelphia.	No. 1 foundry pig iron, at Philadelphia.	Gray forge pig iron, at Philadelphia.	Gray forge pig iron, Lake ore, at Pittsburgh.	Bessemer pig iron, at Pittsburgh.	Steel rails, at mills, in Pennsylvania.	Steel billets, at mills, at Pittsburgh.	Best refined bar iron, at Philadelphia.	Best refined bar iron, at mills, at Pittsburgh.	Bar steel, at mills, at Pittsburgh.
January, 1900	\$26.20	\$25.00	\$20.35	\$21.00	\$24.97	\$35.00	\$34.50	\$2.50	\$2.50	\$2.25
February	26.00	24.50	20.19	21.25	25.00	34.20	33.10	2.35	2.50	2.25
March	25.25	23.62	19.19	20.90	24.90	35.00	33.00	2.35	2.50	2.25
April	24.00	23.19	18.50	20.50	24.90	35.00	32.00	2.25	2.45	2.12
May	21.40	22.60	17.80	19.12	24.90	35.00	28.90	2.12	2.34	1.94
June	17.00	20.00	16.50	17.80	21.16	35.00	27.25	1.90	2.20	1.79
July	15.25	17.75	14.56	15.50	17.00	35.00	21.00	1.80	2.00	1.24
August	13.80	17.20	14.45	14.00	16.07	35.00	18.20	1.60	2.00	1.05
September	14.87	17.00	14.12	13.37	14.19	30.25	17.06	1.60	2.00	1.12
October	15.75	16.00	13.55	13.00	13.37	26.00	16.80	1.60	1.81	1.15
November	17.00	16.40	14.12	13.03	13.70	26.00	19.19	1.75	1.73	1.18
December	17.62	16.50	14.50	13.32	13.75	26.00	19.75	1.75	1.75	1.20
January, 1901	18.00	16.05	14.50	13.25	13.43	26.00	19.75	1.75	1.75	1.20
February	18.25	16.00	14.19	13.56	14.60	26.00	20.31	1.75	1.82	1.27
March	18.37	16.00	14.00	14.62	16.87	26.00	22.87	1.75	1.90	1.44
April	19.50	16.00	14.37	14.56	16.94	26.00	24.00	1.85	1.90	1.50
May	19.50	16.00	14.30	14.62	16.70	28.00	24.00	1.85	1.90	1.50
June	19.12	16.00	14.06	14.15	16.00	28.00	24.37	1.85	1.86	1.50
July	19.00	15.87	13.87	14.00	16.00	28.00	24.00	1.85	1.75	1.52
August	19.00	15.50	13.75	13.87	16.00	28.00	24.20	1.85	1.75	1.50
September	18.50	15.50	13.75	13.81	16.00	28.00	24.87	1.85	1.75	1.50
October	19.90	15.50	13.75	14.10	16.00	28.00	26.70	1.90	1.75	1.52
November	21.25	15.75	13.94	14.69	16.31	28.00	27.00	1.90	1.75	1.60
December	21.50	16.25	14.44	15.12	16.37	28.00	27.50	1.90	1.75	1.60
January, 1902	21.30	17.55	15.65	16.00	16.70	28.00	27.60	1.90	1.87	1.58
February	21.25	18.37	16.62	16.37	16.94	28.00	29.37	2.00	1.90	1.50
March	23.00	19.44	17.75	17.44	17.37	28.00	31.25	2.10	1.90	1.50
April	25.25	20.37	18.19	18.56	18.75	28.00	31.50	2.10	1.95	1.67
May	25.00	21.00	18.35	19.75	20.75	28.00	32.20	2.10	2.02	1.80
June	24.50	22.87	19.44	20.06	21.56	28.00	32.37	2.20	2.10	1.80
July	24.70	24.20	20.80	21.00	21.60	28.00	31.75	2.20	1.86	1.72
August	24.00	24.50	21.00	20.69	22.19	28.00	31.75	2.20	1.95	1.75
September	24.25	24.50	20.50	20.81	22.50	28.00	31.00	2.20	2.00	1.75
October	24.80	24.45	20.25	21.60	23.00	28.00	30.40	2.20	1.92	1.69
November	24.25	24.87	20.94	21.06	23.81	28.00	28.50	2.20	1.85	1.60
December	23.62	24.20	20.90	20.55	22.92	28.00	29.20	2.20	2.00	1.68
January, 1903	23.50	24.00	20.50	20.50	22.85	28.00	29.60	2.20	2.00	1.64
February	23.75	23.75	20.00	20.50	21.91	28.00	30.00	2.20	2.00	1.60
March	24.50	23.50	19.50	20.87	21.85	28.00	30.62	2.20	2.00	1.60
April	24.90	22.70	19.10	20.45	21.28	28.00	30.20	2.20	2.00	1.60
May	24.50	21.37	18.62	19.87	20.01	28.00	30.25	2.16	2.00	1.60

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 1895, as reported to us by the Duncannon Iron Company.

Months.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
January.....	\$1.00	\$2.30	\$1.60	\$1.35	\$1.40	\$2.80	\$2.25	\$2.30
February....	1.00	2.30	1.55	1.35	1.65	2.80	2.27	2.20
March.....	.95	2.45	1.55	1.30	1.75	2.80	2.27	2.25
April.....	.90	2.45	1.50	1.30	1.95	2.62	2.30	2.30
May.....	1.00	2.45	1.45	1.30	1.95	2.45	2.30	2.30
June.....	1.50	2.53	1.45	1.30	2.20	2.42	2.30	2.30
July.....	1.50	2.53	1.40	1.30	2.30	2.30	2.30	2.30
August.....	1.75	2.53	1.40	1.30	2.35	2.30	2.30	2.30
September..	2.20	2.53	1.45	1.30	2.60	2.25	2.35	2.30
October.....	2.30	2.53	1.45	1.30	2.75	2.28	2.30	2.30
November..	2.30	2.00	1.40	1.30	2.80	2.30	2.30	2.30
December...	2.30	*1.70	1.40	1.30	2.80	2.25	2.30	2.30
Average..	\$1.56	\$2.36	\$1.47	\$1.31	\$2.21	\$2.46	\$2.29	\$2.29

* Early in 1893 the base price and schedule of extras of cut nails were changed to correspond with the wire nail schedule, and in December, 1896, the schedule of extras was again changed to correspond with the wire nail schedule referred to below.

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 1895 to 1902 inclusive.

Months.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
January.....	\$0.95	\$2.42	\$1.50	\$1.55	\$1.59	\$3.53	\$2.35	\$2.16
February....	.95	2.42	1.45	1.57	1.73	3.53	2.45	2.20
March.....	1.00	2.57	1.50	1.55	2.09	3.53	2.45	2.20
April.....	.95	2.55	1.45	1.47	2.25	3.28	2.45	2.20
May.....	1.10	2.70	1.42	1.45	2.35	2.53	2.45	2.20
June.....	1.50	2.70	1.42	1.43	2.60	2.48	2.45	2.20
July.....	1.95	2.70	1.35	1.36	2.70	2.43	2.45	2.20
August.....	2.20	2.70	1.37	1.36	2.80	2.43	2.45	2.20
September..	2.40	2.70	1.50	1.45	3.10	2.35	2.45	2.15
October.....	2.40	2.70	1.52	1.47	3.20	2.35	2.42	2.05
November..	2.42	2.70	1.50	1.40	3.28	2.35	2.35	2.00
December...	2.42	*1.60	1.50	1.37	3.53	2.35	2.25	2.00
Average..	\$1.69	\$2.54	\$1.46	\$1.45	\$2.60	\$2.76	\$2.41	\$2.15

* A new nail card was adopted in December, 1896. The average price given for wire nails in December, 1896, on the new card, \$1.60 per keg, would be equivalent to \$1.10 per keg on the old card, showing a very great decrease in prices.

AVERAGE MONTHLY PRICES OF STEEL BARS AT PITTSBURGH.

The following table, compiled from weekly quotations in the *American Manufacturer*, gives the average monthly prices of steel bars, per 100 pounds, at mills in Pittsburgh from 1896 to 1902.

Months.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
January....	\$1.20	\$1.07	\$1.00	\$1.07	\$2.25	\$1.20	\$1.58
February..	1.20	1.05	1.00	1.09	2.25	1.27	1.50
March.....	1.16	1.00	.99	1.48	2.25	1.44	1.50
April.....	1.15	.95	.95	1.75	2.12	1.50	1.67
May.....	1.15	.92	.95	1.71	1.94	1.50	1.80
June.....	1.15	.90	.95	2.05	1.79	1.50	1.80
July.....	1.15	.90	.95	2.00	1.24	1.52	1.72
August.....	1.14	.90	.96	2.21	1.05	1.50	1.75
September	1.07	1.00	.99	2.50	1.12	1.56	1.75
October.....	1.05	1.00	1.00	2.60	1.15	1.52	1.69
November.	1.07	1.00	1.01	2.46	1.18	1.60	1.60
December..	1.10	1.00	1.00	2.25	1.20	1.60	1.68
Average.	\$1.13	\$0.97	\$0.98	\$1.93	\$1.63	\$1.47	\$1.67

The lowest quoted price at which steel bars were sold at Pittsburgh within the last seven years was 90 cents per 100 pounds, this price prevailing in June, July, and August, 1897.

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 1898 to 1902. These prices are obtained by averaging monthly quotations, and these have in turn been averaged from weekly quotations. The prices given 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.	1898.	1899.	1900.	1901.	1902.
Old iron T rails, at Philadelphia.....	\$12.39	\$20.36	\$19.51	\$19.32	\$23.83
No. 1 foundry pig iron, at Philadelphia	11.66	19.36	19.98	15.87	22.19
Gray forge pig iron, at Philadelphia..	10.23	16.60	16.49	14.08	19.20
Gray forge pig iron, at Pittsburgh.....	9.18	16.72	16.90	14.20	19.49
Bessemer pig iron, at Pittsburgh.....	10.33	19.03	19.49	15.93	20.67
Steel rails, at mills, in Pennsylvania..	17.62	28.12	32.29	27.33	28.00
Steel billets, at mills, at Pittsburgh..	15.31	31.12	25.06	24.13	30.57
Best bar iron, from store, at Philada...	1.28	2.07	1.96	1.84	2.13
Best bar iron, at mills, at Pittsburgh.	1.07	1.95	2.15	1.80	1.94
Steel bars, at mills, at Pittsburgh.....	.98	1.93	1.63	1.47	1.67
Cut nails, from store, at Philadelphia..	1.31	2.21	2.46	2.29	2.29
Wire nails, base price, at Chicago.....	1.45	2.60	2.76	2.41	2.15

AVERAGE WHOLESALE MONTHLY PRICES OF TINPLATES.

In late years foreign tinplates have not been an important factor in supplying the home market. The prices of foreign tinplates will not be found in the following table, which gives the average monthly prices of American Bessemer tinplates, I. C., 14 by 20, per box of 100 pounds, at mills in Pennsylvania, from January, 1899, to December, 1902, and which has been compiled for this Report by W. P. Beaver, of the American Tin Plate Company.

Months.	Price.	Months.	Price.	Months.	Price.	Months.	Price.
Jan., 1899...	\$3.00	Jan., 1900...	\$4.65	Jan., 1901...	\$4.00	Jan., 1902...	\$4.00
February...	3.38	February...	4.65	February....	4.00	February...	4.00
March.....	3.75	March.....	4.65	March.....	4.00	March.....	4.00
April.....	3.87	April.....	4.65	April.....	4.00	April.....	4.00
May.....	3.87	May.....	4.65	May.....	4.00	May.....	4.00
June.....	3.87	June.....	4.65	June.....	4.00	June.....	4.00
July.....	4.12	July.....	4.65	July.....	4.00	July.....	4.00
August.....	4.23	August.....	4.65	August.....	4.00	August.....	4.00
September...	4.65	September..	4.50	September..	4.00	September..	4.00
October.....	4.65	October.....	4.00	October.....	4.00	October.....	4.00
November...	4.65	November....	4.00	November....	4.00	November....	3.60
December...	4.65	December....	4.00	December...	4.00	December...	3.60
Average...	\$4.06	Average..	\$4.47	Average..	\$4.00	Average..	\$3.93

On March 2, 1903, the price of tinplates was advanced to \$3.80 per box, owing to the increased cost of pig tin and coal.

Foreign tinplates are imported chiefly by the oil and canning interests that the benefit of the drawback system may be secured in the export trade. The drawback system should be repealed.

TOTAL PRODUCTION OF PIG IRON.

Twenty-two States made pig iron in 1902, against 21 in 1899 and 1900 and 20 in 1901. The total production of pig iron in 1902 was 17,821,307 gross tons, against 15,878,354 tons in 1901, 13,789,242 tons in 1900, 13,620,703 tons in 1899, 11,773,934 tons in 1898, and 9,652,680 tons in 1897. The production in 1902 was 1,942,953 tons more than in 1901. The following table gives the half-yearly production in the last six years.

Periods.	1897. Gross tons.	1898. Gross tons.	1899. Gross tons.	1900. Gross tons.	1901. Gross tons.	1902. Gross tons.
First half...	4,403,476	5,869,703	6,289,167	7,642,569	7,674,613	8,808,574
Second half.	5,249,204	5,904,231	7,331,536	6,146,673	8,203,741	9,012,733
Total...	9,652,680	11,773,934	13,620,703	13,789,242	15,878,354	17,821,307

The following table gives the half-yearly production of pig iron by States in 1902, arranged according to geographical position.

States—Gross tons.	First half, 1902.	Second half, 1902.	States—Gross tons.	First half, 1902.	Second half, 1902.
Massachusetts.....	1,716	1,644	Kentucky.....	51,089	59,636
Connecticut.....	5,278	6,808	Tennessee.....	187,359	205,419
New York.....	186,523	214,846	Ohio.....	1,775,496	1,855,892
New Jersey.....	105,295	86,085	Illinois.....	879,800	850,420
Pennsylvania.....	4,045,965	4,071,835	Michigan.....	85,661	69,552
Maryland.....	148,619	154,610	Wisconsin.....	131,531	142,456
Virginia.....	263,233	273,983	Minnesota.....		
North Carolina... }	12,401	19,914	Missouri, Col'ado and Washingt'n }	133,237	136,693
Georgia.....			.....	
Alabama.....	700,546	771,665	.....	.....	.....
Texas.....	1,528	1,567			
West Virginia.....	93,297	89,708	Total.....	8,808,574	9,012,733

The following table gives the production of pig iron by States in 1901 and 1902, in the order of their prominence in 1902.

States—Gross tons.	1901.	1902.	States—Gross tons.	1901.	1902.
Pennsylvania.....	7,343,257	8,117,800	New Jersey.....	155,746	191,380
Ohio.....	3,326,425	3,631,388	West Virginia...	166,597	183,005
Illinois.....	1,596,850	1,730,220	Michigan.....	170,762	155,213
Alabama.....	1,225,212	1,472,211	Kentucky.....	68,462	110,725
Virginia.....	448,662	537,216	North Carolina and Georgia... }	27,333	32,315
New York.....	283,662	401,369	Connecticut.....		12,086
Tennessee.....	337,139	392,778	Massachusetts...	3,386	3,360
Maryland.....	303,186	303,229	Texas.....	2,273	3,095
Wis. and Minn.... }	207,551	273,987			
Missouri, Colorado and Washingt'n }			Total.....	15,878,354	17,821,307

All the above States, with the exception of Massachusetts and Michigan, made more pig iron in 1902 than in 1901.

PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

The production of pig iron in 1902, classified according to the fuel used, was as follows, compared with the four preceding years.

Fuel used—Gross tons.	1898.	1899.	1900.	1901.	1902.
Bituminous, chiefly coke	10,273,911	11,736,385	11,727,712	13,782,386	16,315,891
Anthracite and coke.....	1,180,999	1,558,521	1,636,366	1,668,808	1,096,040
Anthracite alone.....	22,274	41,031	40,682	43,719	19,207
Charcoal.....	296,750	284,766	339,874	360,147	378,504
Charcoal and coke.....	.....	.....	44,608	23,294	11,665
Total.....	11,773,934	13,620,703	13,789,242	15,878,354	17,821,307

The following table gives the production of bituminous pig iron by States in 1901 and 1902, according to their prominence in 1902.

States—Gross tons.	1901.	1902.	States—Gross tons.	1901.	1902.
Pennsylvania.....	5,819,961	7,193,795	Wisconsin.....	172,278	233,286
Ohio.....	3,316,358	3,620,590	Colorado.....	155,664	210,147
Illinois.....	1,596,850	1,730,220	West Virginia....	166,597	183,005
Alabama.....	1,172,202	1,411,677	Kentucky.....	68,462	110,725
Virginia.....	446,188	535,174	New Jersey.....		54,451
North Carolina....			Minnesota and Missouri.....	33,523	44,786
Tennessee.....	310,928	377,915			
New York.....	225,549	308,619			
Maryland.....	297,826	301,501	Total.....	13,782,386	16,815,891

The table below gives the production of anthracite and mixed anthracite and coke pig iron by States from 1897 to 1902.

States. Gross tons.	1897.	1898.	1899.	1900.	1901.	1902.
Pennsylvania	837,081	1,102,592	1,420,618	1,440,139	1,518,535	919,775
New Jersey...	95,696	100,681	163,853	168,762	155,746	136,929
New York.....				50,859	35,508	58,543
Maryland.....			15,081	17,288	2,738	.....
Total.....	932,777	1,203,273	1,599,552	1,677,048	1,712,527	1,115,247

The following table gives the production of charcoal pig iron by States in 1901 and 1902, according to their prominence in 1902.

States—Gross tons.	1901.	1902.	States—Gross tons.	1901.	1902.
Michigan.....	170,762	155,213	Ohio.....	10,067	10,798
Alabama.....	53,010	60,534	Tennessee.....	5,190	6,293
Wisconsin.....	49,495	55,698	Texas.....		
Missouri.....			Md. and Va.....	5,096	4,400
Washington.....			Pennsylvania....	4,761	4,230
New York.....	22,605	34,207	Massachusetts...	3,386	3,360
Georgia.....	27,333	31,685			
Connecticut.....	8,442	12,086	Total.....	360,147	378,504

There were also produced in 1902 in Tennessee 11,665 tons of pig iron with mixed charcoal and coke, against 23,294 tons in 1901.

PRODUCTION OF BESSEMER PIG IRON.

The following table gives the production of Bessemer pig iron by States in each year from 1897 to 1902, in gross tons. Bessemer pig iron made with charcoal is included. Low-phosphorus pig iron is included in the statistics for 1901 and 1902.

States—Gross tons.	1897.	1898.	1899.	1900.	1901.	1902.
Pennsylvania.....	3,434,930	4,040,965	4,473,493	4,242,397	4,885,877	5,130,022
Ohio.....	1,027,897	1,570,535	1,852,965	1,898,663	2,637,091	2,927,605
Illinois.....	1,017,991	1,210,124	1,330,169	1,178,241	1,394,430	1,495,298
Maryland.....	151,105	186,563	210,670	260,688	297,149	296,971
West Virginia...	132,907	192,699	187,858	169,802	166,597	182,937
North Carolina.....						
Colorado.....	6,582	88,701	96,364	118,146	147,216	201,580
Missouri.....	5,000	30,238				
Ky. and Tenn.....			22,756	13,430		9,746
Wisconsin.....	15,699	14,620	14,519	21,785	39,941	82,328
Michigan.....	3,473	2,939				
Minnesota.....			13,984	40,300	28,492	66,681
New Jersey.....						
New York.....						
Total.....	5,795,584	7,337,384	8,202,778	7,943,452	9,596,793	10,393,168

Of the total production of Bessemer pig iron in Pennsylvania in 1902 the Lehigh Valley made 115,615 tons; the Schuylkill Valley, 54,220 tons; the Upper Susquehanna Valley, 3,147 tons; the Lower Susquehanna Valley and the Juniata Valley, 404,656 tons; Allegheny County, 3,123,632 tons; the Shenango Valley, 891,776 tons; and the remainder of the State, 536,976 tons: total, 5,130,022 tons.

In Ohio in 1902 the Mahoning Valley produced 1,093,242 tons of Bessemer pig iron; the Hanging Rock bituminous district, 112,603 tons; the Lake Counties, 819,107 tons; and the remainder of the State, 902,653 tons: total, 2,927,605 tons.

PRODUCTION OF BASIC PIG IRON.

The production of basic pig iron in 1896 with coke or mixed anthracite and coke as fuel was 336,403 tons; in 1897 it was 556,391 tons; in 1898 it was 785,444 tons; in 1899 it was 985,033 tons; in 1900 it was 1,072,376 tons; in 1901 it was 1,448,850 tons; and in 1902 it was 2,038,590 tons. Basic charcoal iron is not included. The production of basic pig iron by States since 1898 is given in the following table, in gross tons.

States—Gross tons.	1898.	1899.	1900.	1901.	1902.
New York and New Jersey...	645	.....	4,929	34,320	90,736
Pennsylvania—Allegheny Co..	378,156	470,848	446,543	568,516	932,532
Pennsylvania—other counties..	204,547	267,760	344,065	442,744	596,216
Md., Va., Tenn., and Alabama..	154,829	166,093	179,717	301,444	295,191
Ohio, Ill., Wis., and Missouri..	47,267	80,332	97,122	101,826	123,915
Total.....	785,444	985,033	1,072,376	1,448,850	2,038,590

Maryland, Tennessee, Illinois, and Wisconsin did not make basic pig iron in 1901 or 1902, as in some previous years. The production of basic pig iron made rapid progress in 1901 and 1902.

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

The production of spiegeleisen and ferro-manganese in 1902 included in the total production of pig iron, was 212,981 tons, against 291,461 tons in 1901, 255,977 tons in 1900, 219,768 tons in 1899, 213,769 tons in 1898, 173,695 tons in 1897, 131,940 tons in 1896, 171,724 tons in 1895, 120,180 tons in 1894, and 81,118 tons in 1893. The spiegeleisen and ferro-manganese produced in 1902 were made in New Jersey, Pennsylvania, Alabama, Illinois, and Colorado. Included in the total production for 1902 is a small quantity of ferro-phosphorus, made in Alabama.

PRODUCTION OF PIG IRON IN PENNSYLVANIA BY DISTRICTS.

The production of pig iron in Pennsylvania by districts in 1902 was as follows: Lehigh Valley, 517,950 tons; Schuylkill Valley, 520,597 tons; Upper Susquehanna Valley, 3,147 tons; Lower Susquehanna Valley, 527,794 tons; Juniata Valley, 198,571 tons; Allegheny County, 4,260,769 tons; Shenango Valley, 1,254,933 tons; Western Pennsylvania, except Allegheny County and the Shenango Valley, 829,809 tons; charcoal, (whole State,) 4,230 tons: total, 8,117,800 tons. In 1902 only three charcoal furnaces in Pennsylvania were in operation.

In 1901 Pennsylvania made 46.2 per cent. of the country's total production of pig iron, and in 1902 it made 45.5 per cent.

In 1902 the Shenango Valley increased its production 275,058 tons over 1901; Allegheny County increased its production 570,758 tons, almost identically the same increase that it made in 1901 over 1900, which was 571,250 tons; Western Pennsylvania, outside of Allegheny County and the Shenango Valley, gained 41,950 tons; the Lehigh Valley gained 26,676 tons; the Schuylkill Valley gained 16,528 tons; the Upper Susquehanna Valley lost 77,095 tons; the Lower Susquehanna Valley lost 125,683 tons; the Juniata Valley gained 46,882 tons; charcoal lost 531 tons.

Allegheny County produced more than one-half the pig iron made in Pennsylvania in 1897 and 1898 and more than one-fourth of the country's production in each year, but in 1899 it made slightly less than one-half the production of Pennsylvania in that year, and considerably less than one-fourth the country's production. In 1900 it again made less than one-half the pro-

duction of Pennsylvania and less than one-fourth the country's total production. In 1901 and again in 1902 Allegheny County made more than one-half the production of Pennsylvania but less than one-fourth the country's total production.

PRODUCTION OF PIG IRON IN OHIO BY DISTRICTS.

The production of pig iron in Ohio in 1902 by districts was as follows: Mahoning Valley, including the Leetonia furnaces, 1,438,087 tons; Hocking Valley, 36,194 tons; Lake Counties, 860,371 tons; miscellaneous bituminous, 969,372 tons; Hanging Rock bituminous, 316,566 tons; Hanging Rock charcoal, 10,798 tons: total, 3,631,388 tons.

The increase in production in the Mahoning Valley, including the Leetonia furnaces, in 1902 over 1901 was 33,230 tons; in the Lake Counties the increase was 76,881 tons; in the miscellaneous bituminous district the increase was 175,662 tons; in the Hanging Rock bituminous district the increase was 17,265 tons; in the Hanging Rock charcoal district the increase was 731 tons; and in the Hocking Valley the increase was 1,194 tons.

PRODUCTION IN THE SHENANGO AND MAHONING VALLEYS.

The production of pig iron in the Mahoning Valley in Ohio, including the Leetonia furnaces, and in the Shenango Valley in Pennsylvania in 1898 was almost exactly the same, the former producing 769,334 tons and the latter 769,677 tons. In 1899 the Mahoning Valley made 932,165 tons and the Shenango Valley made 937,215 tons. In 1900 the Mahoning Valley went away ahead of its rival, making 1,002,362 tons, against 800,214 tons in the Shenango Valley. In 1901 the Mahoning Valley further increased its lead, producing 1,404,857 tons, against 979,875 tons in the Shenango Valley. In 1902 the Mahoning Valley, while still in the lead, increased its production over 1901 only 33,230 tons, while the Shenango Valley increased its production 275,058 tons, showing a comparative gain of 241,828 tons in favor of the Shenango Valley in 1902.

STOCKS OF UNSOLD PIG IRON.

Our statistics of stocks of unsold pig iron do not include pig iron made by the owners of rolling mills or steel works for their own use, but only pig iron made for sale and which has not been sold. The stocks of pig iron which were unsold in the hands of manufacturers or which were under their control at the close of 1902, and were not intended for their own con-

sumption, amounted to 49,951 tons, against 70,647 tons at the close of 1901 and 442,370 tons at the close of 1900. The American Pig Iron Storage Warrant Company held no pig iron whatever in any of its yards on December 31, 1902. This is the first time since its organization in 1889 that the company has not held at least a small quantity of pig iron in its yards on December 31. At the end of 1901 the company had 3,000 tons in its yards, and at the end of 1900 it had 16,400 tons.

NUMBER OF FURNACES IN BLAST.

The whole number of furnaces which were in blast at the close of 1902 was 307, against 266 at the close of 1901 and 232 at the close of 1900. The following classified table shows the number of furnaces in blast at the close of each year since 1897.

Fuel used.	1897.	1898.	1899.	1900.	1901.	1902.
Bituminous coal and coke.....	146	152	191	155	188	222
Anthracite and anth. and coke...	29	30	68	45	54	52
Charcoal and charcoal and coke.	16	20	30	32	24	33
Total.....	191	202	289	232	266	307

The number of furnaces out of blast at the close of 1902 was 105. Many of these furnaces were only temporarily banked because of the inability of their owners to obtain a supply of fuel. At the close of 1901 there were 140 furnaces out of blast.

ANNUAL CONSUMPTION OF PIG IRON.

Our consumption of pig iron in the last five years is approximately shown in the following table. The comparatively small quantity of foreign pig iron held in bonded warehouses has not been considered. Warrant stocks are included in unsold stocks.

Pig iron—Gross tons.	1898.	1899.	1900.	1901.	1902.
Domestic production.....	11,773,934	13,620,703	13,789,242	15,878,354	17,821,307
Imported	25,152	40,393	52,565	62,930	625,383
Stocks unsold January 1...	874,978	415,333	68,309	446,020	73,647
Total supply.....	12,674,064	14,076,429	13,910,116	16,387,304	18,520,337
Deduct stocks Dec. 31.....	415,333	68,309	446,020	73,647	49,951
Also exports.....	253,057	228,678	286,687	81,211	27,487
Approximate consumption	12,005,674	13,779,442	13,177,409	16,232,446	18,442,899

It will be observed that, while the increased production of pig iron in 1902 over 1901 was 1,942,953 tons, the increased con-

sumption was 2,210,453 tons. The increased consumption of pig iron in 1901 over 1900 was 3,055,037 tons, but the consumption in 1900 was 602,033 tons less than in 1899.

LIMESTONE CONSUMED IN MAKING PIG IRON.

The limestone consumed for fluxing purposes by the blast furnaces of the United States in the production of 17,821,307 tons of pig iron in 1902 amounted to 9,490,090 tons. The average consumption of limestone per ton of all kinds of pig iron produced was 1,192.8 pounds in 1902, against 1,186.5 pounds in 1901 and 1,205.6 pounds in 1900. The consumption by the anthracite and bituminous furnaces was 1,207.7 pounds per ton of pig iron made and by the charcoal and mixed charcoal and coke furnaces it was 527.9 pounds. Oyster shells are regularly used by Muirkirk (charcoal) Furnace, at Muirkirk, in Maryland, for fluxing purposes, to the entire exclusion of limestone.

PRODUCTION OF PIG IRON BY GRADES.

In the Annual Report for 1901 we gave for the first time a series of tables showing the production by States of all kinds of pig iron by grades in 1900 and 1901, including spiegeleisen and ferro-manganese. Similar details for 1902 will be found in the tables which follow. A few thousand tons of castings made direct from blast furnaces are included.

The Bessemer figures for 1901 and 1902 include low-phosphorus pig iron. The basic figures are confined strictly to pig iron made with mineral fuel, and do not include the small quantity of basic pig iron that is made with charcoal, practically all of which is used in the manufacture of steel castings. High silicon pig iron is included in the foundry figures.

The following table gives by grades the total production of pig iron in the United States in 1901 and 1902, in gross tons.

Grades—Gross tons.	1901.	1902.
Bessemer and low-phosphorus pig iron.....	9,596,793	10,393,168
Basic pig iron made with mineral fuel.....	1,448,850	2,038,590
Forge pig iron	639,454	833,093
Foundry pig iron.....	3,548,718	3,851,276
Malleable Bessemer pig iron.....	256,532	311,458
White and mottled and miscellaneous grades....	87,964	172,085
Spiegeleisen.....	231,822	168,408
Ferro-manganese.....	59,639	44,573
Direct castings	8,582	8,656
Total.....	15,878,354	17,821,307

Of the total production of pig iron in 1902 over 58 per cent. was Bessemer and low-phosphorus, as compared with over 60 per cent. in 1901; 21.6 per cent. was foundry, against 22.3 per cent. in 1901; over 11 per cent. was basic, against 9 per cent. in 1901; 4.6 per cent. was forge, against over 4 per cent. in 1901; 1.19 per cent. was spiegeleisen and ferro-manganese, against 1.8 per cent. in 1901; and 1.7 per cent. was malleable Bessemer, against 1.6 per cent. in 1901. The production of white and mottled and of miscellaneous grades of pig iron amounted to less than 1 per cent. in both years. Castings made direct from the furnace did not amount to one-tenth of one per cent. in either year.

In 1902 the production of low-phosphorus pig iron, which is chiefly used by manufacturers of acid open-hearth steel, was for the first time definitely ascertained. It amounted to 164,246 gross tons, and was made by four States, namely, New York, New Jersey, Pennsylvania, and Tennessee.

The following table gives the production by States of Bessemer and low-phosphorus, basic, and forge pig iron in 1901 and 1902. As heretofore stated the small quantity of pig iron made with charcoal as fuel is not included in the basic figures for either year.

States—Gross tons.	Bess. and low-phos.		Basic.		Forge.	
	1901.	1902.	1901.	1902.	1901.	1902.
New York.....	16,239	60,818	4,014	15,766	12,596	45,887
New Jersey.....	12,253	5,863	30,306	74,970	31,548	32,234
Pennsylvania.....	4,885,877	5,130,022	1,011,260	1,528,748	314,010	399,962
Maryland.....	297,149	296,971	.....	.....	1,280	1,939
Virginia.....	.....	.....	80,945	95,776	34,121	59,402
West Virginia..	166,597	182,937	.....	.....	.....	.....
Kentucky.....	.....	.....	.....	.....	1,987	15,381
Tennessee.....	.....	9,746	.....	.....	9,638	41,137
North Carolina.	.....	.....	.....	.....	.....	71
Alabama.....	.....	.....	220,499	199,415	131,040	170,784
Ohio.....	2,637,091	2,927,605	79,477	101,457	91,922	52,418
Illinois.....	1,394,430	1,495,298	.....	.....	.....	2,649
Michigan.....	4,365	926	.....	.....	.....	.....
Wisconsin.....	35,576	70,303	.....	.....	638	.....
Minnesota.....	.....	11,099	.....	.....	.....	.....
Missouri.....	.....	.....	22,349	22,458	10,674	11,229
Colorado.....	147,216	201,580	.....	.....	.....	.....
Total.....	9,596,793	10,393,168	1,448,850	2,038,590	639,454	833,093

The following table gives the production by States of foundry, malleable Bessemer, and white and mottled and miscellaneous grades of pig iron in 1901 and 1902.

States—Gross tons.	Foundry.		Malleable Bessemer.		White and mottled and miscellaneous.	
	1901.	1902.	1901.	1902.	1901.	1902.
Massachusetts.....	3,386	3,360				
Connecticut.....	8,442	12,086				
New York.....	237,440	272,633	10,705		2,668	5,874
New Jersey.....	50,898	59,015		2,748	1,952	2,368
Pennsylvania.....	849,610	845,472	61,073	7,693	24,732	57,396
Maryland.....	4,757	3,789				530
Virginia.....	331,269	348,771		500	2,252	32,714
West Virginia.....		68				
Kentucky.....	66,475	93,699				1,645
Tennessee.....	324,057	328,975			3,354	12,849
North Carolina.....		544				15
Georgia.....	26,433	30,762			900	923
Texas.....	2,273	3,095				
Alabama.....	818,765	1,044,874			49,501	53,410
Ohio.....	448,219	403,880	69,480	144,629	236	1,384
Illinois.....	81,327	67,627	60,614	118,805		40
Michigan.....	166,337	154,234				
Wisconsin.....	114,808	152,965	54,660	37,083	1,869	2,537
Mo. and Wash.....	14,222	25,427			500	400
Total.....	3,548,718	3,851,276	256,532	311,458	87,964	172,085

The following table gives the production by States in 1901 and 1902 of spiegeleisen and ferro-manganese and of castings made direct from the furnace. Gross tons are used.

States—Gross tons.	Spiegeleisen.		Ferro-manganese.		Direct castings.	
	1901.	1902.	1901.	1902.	1901.	1902.
New York.....						391
New Jersey.....	28,789	14,182				
Pennsylvania ..	133,986	99,383	57,408	44,453	5,301	4,671
Virginia.....					75	53
Tennessee.....					90	71
Alabama.....	302	475	2,049	120	3,056	3,133
Ohio.....						15
Illinois.....	60,297	45,801	182			
Michigan.....					60	53
Mo. and Col.....	8,448	8,567				269
Total.....	231,822	168,408	59,639	44,573	8,582	8,656

The figures given for ferro-manganese for 1902 include the production in that year of a small quantity of ferro-phosphorus by one of the Southern States. In 1901 ferro-phosphorus, if made, was not separated from other pig iron.

IMPORTS FOR CONSUMPTION OF FERRO-MANGANESE, SPIEGELEISEN, AND FERRO-SILICON.

We are indebted to the Bureau of Statistics of the Treasury Department for the following statistics of the imports of ferro-manganese, spiegeleisen, and ferro-silicon which were entered for consumption in the calendar years 1900, 1901, and 1902. These imports are included in the statistics of imports of pig iron, spiegeleisen, ferro-manganese, and ferro-silicon given on page 21.

Articles.	1900.		1901.		1902.	
	Gross tons.	Values.	Gross tons.	Values.	Gross tons.	Values.
Ferro-manganese.	8,122	\$467,592	20,751	\$870,828	40,386	\$1,818,036
Spiegeleisen.....	14,184	619,949	26,827	677,246	62,813	1,473,853
Ferro-silicon.....	2,165	81,442	822	21,224	15,945	362,110

Prior to 1900 available statistics combine the imports of spiegeleisen and ferro-manganese as follows: Of spiegeleisen and ferro-manganese there were entered for consumption 101,167 gross tons in 1890, 41,449 tons in 1891, 47,310 tons in 1892, 37,199 tons in 1893, 9,722 tons in 1894, 39,582 tons in 1895, 39,311 tons in 1896, 17,163 tons in 1897, 17,203 tons in 1898, and 19,006 tons in 1899. There were also entered for consumption 158 tons of ferro-silicon in 1892, 154 tons in 1893, 228½ tons in 1894, 1,544 tons in 1895, 941 tons in 1896, 1,254 tons in 1897, 1,038 tons in 1898, and 3,613 tons in 1899. All these are official figures from the Bureau of Statistics of the Treasury Department.

PRODUCTION OF BESSEMER STEEL.

The total production of Bessemer steel ingots and castings in the United States in 1902 was 9,138,363 gross tons, against 8,713,302 tons in 1901, an increase of 425,061 tons, or 4.8 per cent. The increase in 1901 over 1900 amounted to 2,028,532 tons, or over 30 per cent. The following table gives the production of Bessemer steel ingots and castings in the last five years, by States. Of the production last year 12,548 tons were steel castings, against a similar production of 6,764 tons in 1901.

States—Gross tons.	1898.	1899.	1900.	1901.	1902.
Pennsylvania.....	3,402,254	3,968,779	3,488,731	4,293,439	4,209,326
Ohio.....	1,489,115	1,679,237	1,388,124	2,154,846	2,528,802
Illinois.....	1,105,040	1,211,246	1,115,571	1,324,217	1,443,614
Other States.....	612,608	727,092	692,344	940,800	956,621
Total.....	6,609,017	7,586,354	6,684,770	8,713,302	9,138,363

There were no Clapp-Griffiths works in operation in 1902 and only two Robert-Bessemer plants were active. Five Tropenas plants were at work, as compared with 7 in 1901. In addition one Bookwalter converter was running. All these works that were active were engaged in the production of steel castings only.

Neither the production of Bessemer ingots nor the production of Bessemer rails kept pace in 1902 with the marvelous growth in that year of our iron and steel industries taken as a whole, which condition was owing entirely to the fact that the Lackawanna Iron and Steel Company dismantled its Bessemer plants and its rail mills, as well as its remaining blast furnace, at Scranton, early in the year, preparatory to the erection at Buffalo by the Lackawanna Steel Company of new and more extensive works, which are not yet entirely completed. The North Works of the company at Scranton made their last ingots in June, 1900, and their last rails on January 16, 1902, and the South Works made their last ingots and their last rails on February 26, 1902. The new works of the company at Buffalo will contain four 10-gross-ton Bessemer converters, one of which was completed and three were in course of erection on December 31, 1902. The production of Bessemer steel rails will be found on page 50.

In July, 1902, at South Chicago, Illinois, the International Harvester Company commenced the erection of two 10-gross-ton acid Bessemer converters. These converters will not be completed and ready for work until about the middle of July, 1903.

PRODUCTION OF OPEN-HEARTH STEEL.

The total production of open-hearth steel ingots and direct castings in the United States in 1902 was 5,687,729 gross tons, against 4,656,309 tons in 1901, an increase of 1,031,420 tons, or over 22 per cent. As compared with 1898, four years ago, there was an increase in 1902 of 3,457,437 tons, or over 155 per cent. The following table gives the production of open-hearth steel ingots and direct castings by States since 1897, in gross tons.

States—Gross tons.	1897.	1898.	1899.	1900.	1901.	1902.
New England	51,402	47,381	57,124	74,522	170,876	179,923
N. Y. and N. J.....	39,521	47,957	61,461	67,361	82,985	92,763
Pennsylvania.....	1,271,751	1,817,521	2,393,811	2,699,502	3,594,763	4,375,364
Ohio	78,357	79,886	117,458	130,191	184,943	278,854
Illinois.....	120,609	183,103	246,183	285,551	398,522	435,461
Other States.....	47,031	54,444	71,279	141,008	224,220	325,364
Total.....	1,608,671	2,230,292	2,947,316	3,398,135	4,656,309	5,687,729

The open-hearth steel made in 1902 was produced by 98 works in 16 States—Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, Tennessee, Alabama, Ohio, Indiana, Illinois, Michigan, Wisconsin, and Missouri. Ninety works in 14 States made open-hearth steel in 1901. The States which have open-hearth furnaces, but which did not produce steel by this process in 1902, were Kentucky and Minnesota. The erection of a large open-hearth steel plant was commenced in Colorado in 1901, but open-hearth steel had not been made down to the close of 1902. This State will, however, probably make open-hearth steel during the year 1903. Maryland and Michigan again made open-hearth steel in 1902.

In 1901 the production of open-hearth steel by the basic process amounted to 3,618,993 tons and by the acid process to 1,037,316 tons, while in 1902 the production by the basic process amounted to 4,496,533 tons and by the acid process to 1,191,196 tons. In the following table the production by States of both acid and basic open-hearth steel in 1902 is given in gross tons.

States—Gross tons.	Basic open-hearth steel.	Acid open-hearth steel.	Total. Gross tons.
New England.....	110,961	68,962	179,923
New York and New Jersey	54,296	38,467	92,763
Pennsylvania	3,459,702	915,662	4,375,364
Ohio	195,700	83,154	278,854
Illinois.....	384,951	50,510	435,461
Other States.....	290,923	34,441	325,364
Total.....	4,496,533	1,191,196	5,687,729

The increase in the production of acid open-hearth steel in 1902 as compared with 1901 was 153,880 tons, or almost 15 per cent., while the increase in the production of basic open-hearth steel was 877,540 tons, or over 24 per cent.

PRODUCTION OF OPEN-HEARTH STEEL CASTINGS.

The total production of open-hearth steel castings in 1902, included above, amounted to 367,879 gross tons, of which 112,404 tons were made by the basic process and 255,475 tons were made by the acid process. In 1901 the production of open-hearth steel castings amounted to 301,622 tons, of which 94,941 tons were made by the basic process and 206,681 tons by the acid process. The following table gives the production of open-hearth steel castings by the acid and basic processes in 1902, by States.

States—Gross tons.	Acid castings.	Basic castings.	Total. Gross tons.
New England, New York, and New Jersey.	33,158	3,883	37,041
Pennsylvania.....	141,385	11,014	152,399
Ohio, Indiana, Illinois, and other States....	80,932	97,507	178,439
Total.....	255,475	112,404	367,879

PRODUCTION OF CRUCIBLE STEEL.

The production of crucible steel in the United States in 1902 amounted to 112,772 gross tons, against 98,513 tons in 1901, 100,562 tons in 1900, 101,213 tons in 1899, 89,747 tons in 1898, 69,959 tons in 1897, 60,689 tons in 1896, 67,666 tons in 1895, 51,702 tons in 1894, and 63,613 tons in 1893. Ten States made crucible steel in 1902, namely, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Tennessee, Ohio, Indiana, Illinois, and Wisconsin. The direct castings produced in 1902, included above, amounted to 4,955 tons. Pennsylvania made a little over three-fourths of the total crucible steel production in 1902.

PRODUCTION OF MISCELLANEOUS STEEL.

The production of steel in the United States in 1902 by various minor processes amounted to 8,386 gross tons, almost two-thirds of which was in the form of direct castings, against 5,471 tons in 1901, 4,862 tons in 1900, 4,974 tons in 1899, 3,801 tons in 1898, 3,012 tons in 1897, 2,394 tons in 1896, and 858 tons in 1895.

PRODUCTION OF ALL KINDS OF STEEL.

The production of all kinds of steel ingots and castings by States in 1902 is given in the following table, in gross tons. Of the total production 390,935 tons were direct steel castings. The increase in the production of all kinds of steel in 1902 as compared with 1901 was 1,473,655 tons, or 10.9 per cent.

States—Gross tons.	Bessemer.	Open-hearth.	Crucible and miscellaneous.	Total. Ingots and castings.
Mass., Rhode Island, and Conn.....		179,923	2,105	182,028
New York and New Jersey.....	2,082	92,763	25,430	120,275
Pennsylvania.....	4,209,326	4,375,364	88,866	8,673,556
Del., Md., W. Va., Ky., Tenn., and Ala.	743,042	252,041	20	995,103
Ohio.....	2,528,802	278,854	125	2,807,781
Indiana and Illinois.....	1,443,614	476,514	2,865	1,922,993
Mich., Wis., Minn., Mo., Col., and Cal.	211,497	32,270	1,747	245,514
Total.....	9,138,363	5,687,729	121,158	14,947,250

The total production of all kinds of steel ingots and castings in the United States in the thirteen years from 1890 to 1902 is given in detail in the following table, in gross tons.

Years—Gross tons.	Bessemer.	Open-hearth.	Crucible.	Miscellaneous.	Total. Ingots and castings.
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

PRODUCTION OF ALL KINDS OF STEEL CASTINGS.

In 1902 the production of all kinds of steel castings amounted to 390,935 gross tons, against 317,570 tons in 1901, 192,803 tons in 1900, and 181,112 tons in 1899. The increase in 1902 over 1901 was 73,365 tons, or over 23 per cent., but over 1899 it was 209,823 tons, or over 115 per cent. The following table gives by States the production of Bessemer, open-hearth, crucible, and other steel castings in 1902, in gross tons.

States—Gross tons.	Bessemer.	Open-hearth.	Crucible and miscellaneous.	Total. Gross tons.
Mass., Conn., New York, and N. J.	2,082	37,041	6,138	45,261
Pennsylvania	1,270	152,399	1,283	154,952
Tennessee, Alabama, and Ohio	1,000	33,617	75	34,692
Indiana, Illinois, and Michigan	6,078	117,552	1,265	124,895
Wis., Minn., Mo., Col., and California	2,118	27,270	1,747	31,135
Total	12,548	367,879	10,508	390,935

Of the total production of steel castings in 1902 Pennsylvania made over 39 per cent., against almost 35 per cent. in 1901; Illinois over 25 per cent., against over 32 per cent. in 1901; Ohio over 8 per cent. in each year; and Indiana almost 6 per cent., against over 4 per cent. in 1901. No other State made over 5.2 per cent. in either year.

PRODUCTION OF ALL KINDS OF RAILS.

The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1902 was 2,876,293 gross tons, against a similar production in 1901 of 2,836,273 tons, in 1900 of 2,361,921 tons, and in 1899 of 2,240,767 tons. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1902, but the increase in that year over 1901 amounted to only 40,020 tons, or 1.4 per cent. As compared with 1887, fifteen years ago, the increase in 1902 in the production of Bessemer rails amounted to only 831,474 tons, or 40 per cent., while during the same period the increase in the production of Bessemer ingots amounted to 6,202,330 tons, or almost 211 per cent. The following table shows the production by States of Bessemer steel rails by the producers of Bessemer steel ingots in the last six years, not including a small quantity of rails made each year from purchased blooms or from rerolled steel rails.

States—Gross tons.	1897.	1898.	1899.	1900.	1901.	1902.
Pennsylvania.....	1,024,386	1,052,771	1,224,807	1,195,255	1,406,008	1,148,425
Other States.....	590,013	902,656	1,015,960	1,166,666	1,430,265	1,727,868
Total	1,614,399	1,955,427	2,240,767	2,361,921	2,836,273	2,876,293

With the exception of the Lackawanna plant at Scranton, which was dismantled in 1902, all our Bessemer rail mills were operated nearly to their full capacity in that year, the demand for steel rails being greater than the supply all through the year. Some interruption to the utmost possible activity of the Bessemer rail mills in 1902 was also caused by the inability of the railroads to promptly deliver raw materials to the blast furnaces.

To the above total for 1902 must be added 59,099 tons of Bessemer rails made in the same year from purchased blooms and from rerolled and renewed Bessemer steel rails, making a grand total for 1902 of 2,935,392 tons of Bessemer steel rails. Twenty plants rolled or renewed Bessemer steel rails in 1902, of which 6 were located in Pennsylvania, 3 in Maryland, 5 in Ohio, and 2 in Illinois, and 1 was located in each of the States of New York, Wisconsin, Colorado, and Wyoming.

The production of open-hearth steel rails in the United States in 1902 was 6,029 tons, against 2,093 tons in 1901 and 1,333 tons in 1900. The maximum production of open-hearth rails was reached in 1881, when 22,515 tons were made. The rails rolled in 1902 were made in Pennsylvania and Alabama, the latter

producing over five-sixths of the total quantity made. The production of iron rails in 1902 was 6,512 tons, all made in Pennsylvania, Alabama, Ohio, and California, and all weighing less than 45 pounds to the yard. In 1901 the production of iron rails was 1,730 gross tons, against 695 tons in 1900, 1,592 tons in 1899, and 3,319 tons in 1898. Adding the open-hearth and iron rails produced in 1902 to the Bessemer steel rails made in that year gives a grand total for 1902 of 2,947,933 tons of all kinds of rails, the largest production ever attained in one year, against a total production of 2,874,639 tons in 1901, 2,385,682 tons in 1900, 2,272,700 tons in 1899, and 1,981,241 tons in 1898.

In addition to our large production of rails we imported in 1902 63,522 tons of iron and steel rails, but to balance this importation we exported 67,666 tons of iron and steel rails. In 1901 we exported 318,956 tons of rails and imported only 1,905 tons. Virtually all our imports and exports of rails are steel rails.

WEIGHT OF ALL KINDS OF RAILS.

The following table gives the production of all kinds of rails in 1902 according to the weight of the rails per yard. Street rails are included in the total production of rails, but the quantity made in each year can no longer be given separately.

Kinds of rails—Gross tons.	Under 45 pounds.	45 pounds and less than 85.	85 pounds and over.	Total. Gross tons.
Bessemer steel rails.....	253,167	2,037,063	645,162	2,935,392
Open-hearth steel rails.....	2,208	3,821	.....	6,029
Iron rails.....	6,512	.....	.....	6,512
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 increase in the production of rails weighing under 45 pounds to the yard from 1897 to 1902 was 172,991 gross tons, in rails weighing 45 and less than 85 pounds, 817,449 tons, and in rails weighing over 85 pounds, 309,601 tons.

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 in the general statistics of plates are included all plates cut to specifications. Practically all the structural shapes and plates used for structural purposes are made of steel. The total production of strictly structural shapes in 1902 was 1,300,326 tons and in 1901 it was 1,013,150 tons. The production of structural shapes in 1901 and 1902 by States was as follows.

States—Gross tons.	1901.	1902.	States—Gross tons.	1901.	1902.
Maine, New York, and New Jersey	51,002	52,554	Illinois, Colora- do, and Cali- fornia.....	5,700	18,762
Pennsylvania.....	925,940	1,178,760			
Delaware, Ala., and Ohio.....	30,508	50,250	Total.....	1,013,150	1,300,326

The increased production of structural shapes in 1902 as compared with 1901 amounted to 287,176 gross tons, or over 28 per cent. Pennsylvania made over 90 per cent. of the total production in 1902, against over 91 per cent. in 1901; Ohio over 3.7 per cent., against almost 3 per cent. in 1901; and New Jersey almost 3 per cent., against over 3 per cent. in 1901. No other State made 1.5 per cent. of the total production in either year. In 1900 the production of structural shapes amounted to 815,161 tons, against 850,376 tons in 1899, 702,197 tons in 1898, 583,790 tons in 1897, 495,571 tons in 1896, and 517,920 tons in 1895.

PRODUCTION OF WIRE RODS.

The production of iron and steel wire rods in the United States in 1902 amounted to 1,574,293 gross tons, against 1,365,934 tons in 1901, 846,291 tons in 1900, and 1,036,398 tons in 1899, showing an increase of 208,359 tons in 1902 as compared with 1901. Of the total production in 1902, 1,574,087 tons were steel rods and 206 tons were iron rods. The following table gives the production by States in the last four years in gross tons.

States—Gross tons.	1899.	1900.	1901.	1902.
Mass., Conn., R. I., N. Y., and N. J.	139,945	134,502	176,101	201,653
Pennsylvania.....	319,058	240,533	386,037	509,802
Kentucky, Alabama, and Ohio.....	312,620	244,731	422,679	440,458
Indiana and Illinois.....	264,775	226,525	381,117	422,380
Total.....	1,036,398	846,291	1,365,934	1,574,293

Pennsylvania made the largest quantity of wire rods in 1902, with Illinois second, Ohio third, and Massachusetts fourth. Seven

other States, Kentucky, Indiana, Alabama, New Jersey, New York, Rhode Island, and Connecticut, also rolled wire rods in 1902 in the order named. All the States named rolled rods in 1901.

PRODUCTION OF WIRE NAILS.

The production of wire nails in the United States in 1902 amounted to 10,982,246 kegs of 100 pounds, as compared with 9,803,822 kegs in 1901, an increase of 1,178,424 kegs, or over 12 per cent. In 1900 the production amounted to 7,233,979 kegs, in 1899 to 7,618,130 kegs, in 1898 to 7,418,475 kegs, in 1897 to 8,997,245 kegs, in 1896 to 4,719,860 kegs, and in 1895 to 5,841,403 kegs. The wire nails produced in 1902, nearly all made of steel, were made by 62 works, as compared with 61 in 1901, 56 in 1900, and 59 in 1899.

The following table gives the production of wire nails in 1900, 1901, and 1902, in kegs of 100 pounds.

States—Kegs of 100 pounds.	1900.	1901.	1902.
N. H., Mass., R. I., and Conn.....	212,584	71,553	309,651
New York.....	63,466	136,118	132,854
Pennsylvania.....	2,158,399	3,118,508	4,219,604
Md., West Virginia, Ky., Ala., and Ohio..	2,516,391	3,633,894	3,251,918
Indiana and Illinois.....	2,195,672	2,716,748	2,902,006
Michigan, Wisconsin, and California.....	87,467	127,001	166,213
Total	7,233,979	9,803,822	10,982,246

PRODUCTION OF CUT NAILS.

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

The total production of cut nails in 1902 was 1,633,762 kegs of 100 pounds each, against 1,542,240 kegs in 1901, an increase of 91,522 kegs, or almost 6 per cent. In 1886 the maximum production of 8,160,973 kegs was reached. In 1902 the production of wire nails exceeded that of cut nails by 9,348,484 kegs, in 1901 by 8,261,582 kegs, in 1900 by 5,660,485 kegs, in 1899 by 5,713,790 kegs, in 1898 by 5,846,254 kegs, and in 1897 by 6,890,446 kegs.

Eleven States made cut nails in 1902, the same number as in 1901. The following table shows the production of iron and steel cut nails by States from 1897 to 1902, in kegs of 100

pounds. The wire nail production is added to the table. Both Pennsylvania and Ohio decreased their production of cut nails in 1902 as compared with 1901, but substantial increases were made in West Virginia, Kentucky, Indiana, and Illinois.

States—Kegs.	1897.	1898.	1899.	1900.	1901.	1902.
Pennsylvania.....	1,057,964	768,171	920,133	777,611	833,469	752,729
Ohio.....	411,396	392,003	386,215	261,216	123,788	99,938
West Virginia.....	290,203	184,942	178,006	168,469	150,222	271,362
Indiana.....						
Massachusetts and N. Jersey	142,021	127,706	149,700	155,968	179,474	167,963
Illinois.....	34,000	87,399	255,286	193,230	240,657	304,990
Maryland, Vir- ginia, and Ky.	164,465					
Mo., Wis., Col., Wyo., and Cal.	6,750	12,000	15,000	17,000	14,630	36,780
Total cut nails..	2,106,799	1,572,221	1,904,340	1,573,494	1,542,240	1,633,762
Total wire nails.	8,997,245	7,418,475	7,618,130	7,233,979	9,803,822	10,982,246
Grand total.	11,104,044	8,990,696	9,522,470	8,807,473	11,346,062	12,616,008

PRODUCTION OF PLATES AND SHEETS.

The production of plate and sheet iron and steel in the United States in 1902, excluding nail plate, amounted to 2,665,409 gross tons, against 2,254,425 tons in 1901, an increase of 410,984 tons, or over 18 per cent. Skelp iron and steel are not included in our statistics of plates and sheets but are classed with bars, hoops, etc. The following table gives the production by States of all kinds of plates and sheets in 1901 and 1902, in gross tons.

States—Gross tons.	1901.	1902.
New England.....	416	4,394
New York and New Jersey	6,512	4,846
Pennsylvania.....	1,572,500	1,808,207
Delaware and Maryland.....	29,484	34,282
West Virginia.....	31,928	67,072
Kentucky and Alabama.....	47,503	56,823
Ohio.....	294,266	404,902
Indiana, Ill., Mich., Mo., Wis., Col., and California....	271,816	284,883
Total	2,254,425	2,665,409

The production of "black plates for tinning" alone in 1902, which is included above, was 365,743 gross tons, against 398,026 tons in 1901, a decrease of 32,283 tons, or over 8 per cent. Of the production in 1902 Pennsylvania made over 48 per cent.,

against over 49 per cent. in 1901. Ohio, Indiana, West Virginia, Maryland, Illinois, Michigan, and Missouri also made black plates for tinning in 1902 in the order named.

PRODUCTION OF TINPLATES AND TERNE PLATES.

The duty on tinplates and terne plates provided for in the tariff act of 1890 went into effect on July 1, 1891. From that date until the close of the fiscal year ending on June 30, 1897, the statistics of our production of tinplates and terne plates were regularly collected for the Treasury Department by the late Col. Ira Ayer, special agent. From the data thus obtained and from other sources of information we have prepared the following table of our production of tinplates and terne plates in the calendar years 1891 to 1901. We have added an estimate of the production in 1902, but in a short time we hope to have definite figures for that year. The production of tin dipping plants is included in all the figures that are given.

Calendar years.	Gross tons.	Calendar years.	Gross tons.
1891 (last-six months) ..	999	1897.....	256,598
1892.....	18,803	1898.....	326,915
1893.....	55,182	1899.....	360,875
1894.....	74,260	1900.....	302,665
1895.....	113,666	1901.....	399,291
1896.....	160,362	1902 (estimate).....	366,000

PRODUCTION OF ALL ROLLED IRON AND STEEL.

By the phrase rolled iron and steel we include all iron and steel rolled into finished forms, as follows: (1) all sizes of iron and steel rails; (2) plate and sheet iron and steel; (3) iron and steel plates for cut nails and cut spikes; (4) wire rods; (5) iron and steel structural shapes; (6) bar, bolt, hoop, skelp, rolled axles, fish plates, rolled armor plate, and other rolled products. Forged armor plate, hammered axles, and other forgings are not included, nor such intermediate rolled forms as muck bars, billets, and tinplate and sheet bars.

The production of all iron and steel rolled into finished forms in the United States in 1902 was 13,944,116 gross tons, against 12,349,327 tons in 1901, an increase of 1,594,789 tons, or almost 13 per cent. Twenty-six States rolled either iron or steel or both iron and steel in 1902, the same number as in 1901. The following table gives the total production by States of rolled iron and steel in 1901 and 1902, in gross tons.

States. Gross tons.	1901.	1902.	States. Gross tons.	1901.	1902.
Me. and Mass...	165,100	173,463	Ohio.....	1,566,996	2,019,952
R. I. and Conn..	48,043	95,200	Indiana.....	399,707	415,049
New York.....	182,948	181,443	Illinois.....	1,442,165	1,636,806
New Jersey.....	143,367	139,310	Michigan.....	103,063	89,297
Pennsylvania....	6,962,668	7,642,636	Wisconsin.....	181,867	232,752
Delaware.....	58,242	61,409	Missouri.....	37,182	64,741
Maryland.....	301,446	339,773	Col. and Wy...	197,980	200,771
Virginia.....	29,026	41,329	Wash., Ore., and Cal.....	32,152	35,357
West Virginia..	201,264	247,812	.....	.....	.....
Kentucky.....	156,506	170,320	Total.....	12,349,327	13,944,116
Tenn. and Ga...	30,214	25,398			
Alabama.....	109,391	131,298			

Pennsylvania made almost 55 per cent. of the total production of rolled iron and steel in 1902, against over 56 per cent. in 1901; Ohio over 14 per cent., against over 12 per cent. in 1901; Illinois over 11 per cent. in each year; and Indiana almost 3 per cent., against over 3 per cent. in 1901. No other State made 2.5 per cent. in either year. Minnesota and Kansas, both of which States have rolling mills, did not produce any rolled iron or steel in 1901 or 1902, but Minnesota made a small quantity of direct steel castings in both years.

TOTAL PRODUCTION OF ROLLED IRON AND STEEL.

The total production of all kinds of iron and steel rolled into finished forms in the United States from 1887 to 1902 is given below.

Years. Gross tons.	Iron and steel rails.	Bars, hoops, skelp, and shapes.	Wire rods.	Plates and sheets, except nail plate.	Cut nails. Gross tons.	Total. Gross tons.
1887.....	2,139,640	2,184,279	.....	603,355	308,432	5,235,706
1888.....	1,403,700	2,034,162	279,769	609,827	289,891	4,617,349
1889.....	1,522,204	2,374,968	363,851	716,496	259,409	5,236,928
1890.....	1,885,307	2,618,660	457,099	809,981	251,828	6,022,875
1891.....	1,307,176	2,644,941	536,607	678,927	223,312	5,390,963
1892.....	1,551,844	3,033,439	627,829	751,460	201,242	6,165,814
1893.....	1,136,458	2,491,497	537,272	674,345	136,113	4,975,685
1894.....	1,021,772	2,155,875	673,402	682,900	108,262	4,642,211
1895.....	1,306,135	3,005,765	791,130	991,459	95,085	6,189,574
1896.....	1,122,010	2,731,932	623,986	965,776	72,137	5,515,841
1897.....	1,647,892	3,081,760	970,736	1,207,286	94,054	7,001,728
1898.....	1,981,241	3,941,957	1,071,683	1,448,301	70,188	8,513,370
1899.....	2,272,700	4,996,801	1,036,398	1,903,505	85,015	10,294,419
1900.....	2,385,682	4,390,697	846,291	1,794,528	70,245	9,487,443
1901.....	2,874,639	5,785,479	1,365,934	2,254,425	68,850	12,349,327
1902.....	2,947,933	6,683,545	1,574,293	2,665,409	72,936	13,944,116

PRODUCTION OF IRON BLOOMS AND BILLETS.

In 1902 there were no forges in operation in the United States for the manufacture of blooms and billets directly from the ore. In 1901 the blooms and billets so made amounted to 2,310 gross tons, against 4,292 tons in 1900, 3,142 tons in 1899, 1,767 tons in 1898, 1,455 tons in 1897, 1,346 tons in 1896, 40 tons in 1895, 40 tons in 1894, 864 tons in 1893, and 2,182 tons in 1892. All the ore blooms produced since 1897 were made by the Chateaugay Ore and Iron Company, of Plattsburgh, New York, at its Standish Iron Works, which were, however, idle in 1902.

The iron blooms produced in forges from pig and scrap iron in 1902, and which were for sale and not intended for the consumption of the makers, amounted to 12,002 gross tons, against 8,237 tons in 1901, 8,655 tons in 1900, 9,932 tons in 1899, 6,345 tons in 1898, 7,159 tons in 1897, 6,494 tons in 1896, 7,185 tons in 1895, 3,221 tons in 1894, and 6,605 tons in 1893. All the pig and scrap blooms made in forges from 1895 to 1902, and intended to be for sale, were made in Pennsylvania and Maryland.

PRODUCTION OF ALLEGHENY COUNTY, PENNSYLVANIA.

The following table gives the number of built and building blast furnaces and completed rolling mills and steel works, and the production in gross tons of pig iron and crude steel and of iron and steel rails and iron and steel structural shapes in Allegheny county, Pennsylvania, in the last four years.

Details—Gross tons.	1899.	1900.	1901.	1902.
Furnaces built and building....No.	34	34	37	40
Production of pig iron.....	3,255,678	3,118,761	3,690,011	4,260,769
Rolling mills and steel works..No.	63	61	63	66
Production of Bessemer steel.....	2,606,220	2,318,871	2,883,595	3,094,175
Production of open-hearth steel....	1,470,271	1,680,249	2,199,191	2,503,245
Production of crucible and other steel.....	58,426	52,188	56,053	62,888
Total production of steel.....	4,134,917	4,051,308	5,138,839	5,660,308
Production of all kinds of rails....	606,017	631,467	711,031	712,286
Production of structural shapes....	529,979	475,572	617,308	773,144

Allegheny county produced in 1902 almost 24 per cent. of the total production of pig iron in the United States, against over 23 per cent. in 1901; almost 34 per cent. of the total production of Bessemer steel ingots and castings, against over 33 per cent. in 1901; over 44 per cent. of the total production of open-hearth steel ingots and castings, against over 47 per cent. in 1901; over

53 per cent. of the total production of crucible steel, against almost 57 per cent. in 1901; almost 38 per cent. of the total production of all kinds of steel, against over 38 per cent. in 1901; over 24 per cent. of the total production of all kinds of rails, against 24.7 per cent. in 1901; over 59 per cent. of the total production of structural shapes; against over 60 per cent. in 1901; and over 32 per cent. of the total production of all kinds of rolled products, against over 32.3 per cent. in 1901.

MILES OF IRON AND STEEL RAILS IN THE UNITED STATES.

The following table from *Poor's Manual* gives the number of miles of steam railroad track in the United States from 1880 to the end of 1901 which had been laid with steel rails or iron rails. In the figures given all tracks of steam railroads are included, but tracks of elevated city passenger railways are excluded.

Years.	Miles of steel rails.	Miles of iron rails.	Total miles.	Percentage of steel rails.
1880.....	33,680	81,967	115,647	29.1
1881.....	48,984	81,471	130,455	37.5
1882.....	66,611	74,267	140,878	47.3
1883.....	78,411	70,690	149,101	52.6
1884.....	90,162	66,252	156,414	57.6
1885.....	98,013	62,493	160,506	61.0
1886.....	105,630	62,322	167,952	62.9
1887.....	125,349	59,586	184,935	67.8
1888.....	138,395	52,981	191,376	72.3
1889.....	151,578	50,510	202,088	75.0
1890.....	167,458	40,694	208,152	80.4
1891.....	174,775	39,754	214,529	81.5
1892.....	182,711	38,918	221,629	82.4
1893.....	190,718	37,135	227,853	83.7
1894.....	197,491	35,264	232,755	84.8
1895.....	206,381	28,650	235,031	87.8
1896.....	210,290	28,440	238,730	88.1
1897.....	215,658	26,043	241,701	89.2
1898.....	220,804	24,435	245,239	90.0
1899.....	228,976	21,387	250,363	91.5
1900.....	238,464	19,389	257,853	92.4
1901.....	246,811	19,181	265,992	92.7

IRON AND STEEL SHIPBUILDING.

In the fiscal year ended on June 30, 1900, there were built in the United States 90 steel vessels, and in the fiscal year 1901 there were built 119 steel vessels and one iron vessel. The gross tonnage of the vessels built in the fiscal year 1900 was 196,851 tons, and the gross tonnage of the vessels built in the fiscal year

1901 was 262,699 tons. In the fiscal year 1902 there were built 106 steel vessels and one iron vessel, with a gross tonnage of 280,362 tons. The iron vessel was built at Wilmington and was of 193 tons' capacity. Vessels for the United States Navy are not included in the figures given below, which have been furnished by the Hon. Eugene T. Chamberlain, Commissioner of Navigation of the Treasury Department. The following table, received from the Commissioner, shows the number and gross tonnage of the vessels launched and officially numbered during the fiscal year 1902.

Ports—Fiscal year 1902.	Sailing.		Steam.		Barges.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Bath, Me.....	2	6,755	.....	.....	.....	.....	2	6,755
New York, N. Y.....	7	1,976	2	1,024	9	3,000
Newark, N. J.....	3	662	.....	.....	3	662
Philadelphia, Pa.....	1	1,651	14	33,300	.....	.....	15	34,951
Wilmington, Del.....	12	14,949	.....	.....	12	14,949
Baltimore, Md.....	4	19,997	.....	.....	4	19,997
Richmond, Va.....	2	1,710	.....	.....	2	1,710
Newport News, Va.....	4	25,119	.....	.....	4	25,119
New Orleans, La.....	2	399	.....	.....	2	399
Rock Island, Ill.....	1	8	.....	.....	1	8
Wheeling, W. Va.....	1	33	.....	.....	1	33
Pittsburgh, Pa.....	1	142	.....	.....	1	142
Buffalo, N. Y.....	5	7,565	.....	.....	5	7,565
Cleveland, Ohio.....	14	61,585	.....	.....	14	61,585
Toledo, Ohio.....	6	6,759	.....	.....	6	6,759
Detroit, Mich.....	7	21,115	.....	.....	7	21,115
Port Huron, Mich.....	5	21,133	.....	.....	5	21,133
Marquette, Mich.....	4	16,002	.....	.....	4	16,002
Grand Haven, Mich.....	1	44	.....	.....	1	44
Chicago, Ill.....	7	27,727	.....	.....	7	27,727
San Francisco, Cal.....	2	10,707	.....	.....	2	10,707
Total.....	3	8,406	102	270,932	2	1,024	107	280,362

Of the 107 vessels built in the fiscal year above referred to 49 were built at ports on the Great Lakes, their tonnage amounting to 161,930 gross tons out of a total tonnage of 280,362 tons.

The Commissioner also furnishes us with the following details of steel vessels built in the United States in the first nine months of the present fiscal year, which nine months ended on March 31, 1903: Number of sailing vessels built, 3, with a total tonnage of 7,731 tons; number of steam vessels built, 62, with a total tonnage of 140,319 tons: total number of steel vessels built in the nine months, 65: total tonnage, 148,050 tons. These figures and

those given previously show satisfactory progress in the last few years in the building of steel vessels in this country, not including, as already mentioned, the large number of vessels built and building for the United States Navy. On January 1, 1903, there were 72 yards which were equipped for the construction of iron and steel vessels and 4 yards were being built.

STATISTICS OF IMMIGRATION.

The following official statistics, for which we are indebted to the Commissioner General of Immigration, Hon. F. P. Sargent, give the total number of immigrants who arrived in the United States in the calendar years 1897 to 1902, except those coming from the British North American Possessions and Mexico, for which countries statistics are not collected. Immigrants to the United States who come by vessels entering Canadian ports, and who are inspected by officers of our Government at these ports, are, however, included in the figures below, and have been included in previous statistics since September 15, 1893.

Countries.	1897.	1898.	1899.	1900.	1901.	1902.
United Kingdom.....	39,771	39,444	45,844	49,532	45,475	51,338
Germany	18,785	16,351	17,989	20,768	22,159	32,736
France	2,104	1,671	1,761	2,971	2,684	3,391
Austria-Hungary.....	31,320	50,332	84,837	108,701	133,805	185,659
Russia, including Poland	26,813	39,640	76,114	92,486	87,384	123,882
Sweden and Norway	18,692	17,365	21,970	31,844	38,295	59,172
Denmark	1,872	2,090	2,895	3,213	4,168	6,318
Netherlands.....	768	855	1,219	1,890	2,315	2,484
Italy	58,787	69,890	82,297	111,088	143,131	201,269
Switzerland	1,417	1,202	1,107	1,710	2,257	2,623
All other countries	22,070	16,060	25,285	47,923	40,900	70,417
Total	222,399	254,900	361,318	472,126	522,573	739,289

There was an increase of 216,716 in the total immigration of 1902 over that of 1901. Of the large number of immigrants who arrived in 1902 there was a continued increase in the arrivals from both Austria-Hungary and Italy. These two countries unitedly sent us in 1902 a total of 386,928 immigrants, or more than one-half of the year's immigration from all countries. Next to Austria-Hungary and Italy Russia sends us the largest number of immigrants, and they are nearly all Polish and other Jews. Immigrants from Finland are included with Russia for the last four years. The increase in the total immigration, from 222,399 persons in 1897 to 739,289 persons in 1902, is worthy of more attention than it has received or is likely to receive.

SUMMARY OF STATISTICS FOR 1901 AND 1902.

Subjects.	1901.	1902.
Production of Pig Iron, gross tons.....	15,878,354	17,821,307
Production of Spiegeleisen and Ferro-manganese, included in Pig Iron, gross tons.....	291,461	212,981
Production of Iron and Steel Structural Shapes, gross tons.....	1,013,150	1,300,326
Production of Iron and Steel Wire Rods, gross tons.	1,365,934	1,574,293
Production of Plate and Sheet Iron and Steel, except Nail Plate, gross tons.....	2,254,425	2,665,409
Production of Iron and Steel Cut Nails and Cut Spikes, kegs of 100 pounds.....	1,542,240	1,633,762
Production of Iron and Steel Wire Nails, kegs of 100 pounds.....	9,803,822	10,982,246
Production of Bar, Bolt, Hoop, Skelp, Rolled Axles, Rolled Armor Plate, etc., gross tons.....	4,772,329	5,383,219
Production of all Rolled Iron and Steel, including Cut Nails and excluding Rails, gross tons.....	9,474,688	10,996,183
Production of all Rolled Iron and Steel, including both Cut Nails and Rails, gross tons.....	12,349,327	13,944,116
Production of Bessemer Steel Rails, gross tons.....	2,870,816	2,935,392
Production of Open-hearth Steel Rails, gross tons....	2,093	6,029
Production of Iron Rails, gross tons.....	1,730	6,512
Production of all kinds of Rails, gross tons.....	2,874,639	2,947,933
Production of Bessemer Steel, gross tons.....	8,713,302	9,138,363
Production of Open-hearth Steel, gross tons.....	4,656,309	5,687,729
Production of Crucible Steel, gross tons.....	98,513	112,772
Production of Blister and Patented Steel, gross tons...	5,471	8,386
Production of all kinds of Steel, gross tons.....	13,473,595	14,947,250
Production of Open-hearth Steel Castings, gross tons.	301,622	367,879
Production of all kinds of Steel Castings, gross tons.	317,570	390,935
Production of Ore, Pig, and Scrap Blooms for sale, gross tons.....	10,547	12,002
Production of Tinplates and Terne Plates, gross tons.	399,291	366,000
Value of Imports of Iron and Steel.....	\$20,395,015	\$41,468,826
Value of Exports of Iron and Steel.....	\$102,534,575	\$97,892,036
Production of Iron Ore, gross tons.....	28,887,479	.....
Imports of Iron Ore, gross tons.....	966,950	1,165,470
Production of all kinds of Coal, gross tons.....	261,873,675	.....
Production of Coke, net tons.....	21,795,883	.....
Production of Pennsylvania Anthracite, gross tons...	60,242,560	.....
Shipments of Pennsylvania Anthracite, gross tons...	53,568,601	31,200,890
Imports of Coal, gross tons.....	1,920,248	2,551,381
Exports of Coal, gross tons.....	7,383,393	6,126,946
Miles of New Railroad built (estimate for 1902).....	4,906	6,000
Immigrants in the year ended December 31.....	522,573	739,289

PRODUCTION OF ALL KINDS OF PIG IRON IN THE UNITED STATES IN 1898, 1899, 1900, 1901, AND 1902, 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.

TOTAL PRODUCTION OF PIG IRON FROM 1898 TO 1902.

States.	Gross tons of 2,240 pounds.				
	1898.	1899.	1900.	1901.	1902.
Massachusetts.....	3,661	2,476	3,310	3,386	3,360
Connecticut.....	6,336	10,129	10,233	8,442	12,086
New York.....	228,011	264,346	292,827	283,662	401,369
New Jersey.....	100,681	127,598	170,262	155,746	191,380
Pennsylvania.....	5,537,832	6,558,878	6,365,935	7,343,257	8,117,800
Maryland.....	190,974	234,477	290,073	303,186	303,229
Virginia.....	283,274	365,491	490,617	448,662	537,216
North Carolina.....	.....	17,835	28,984	27,333	32,315
Georgia.....	13,762				
Alabama.....	1,033,676	1,083,905	1,184,337	1,225,212	1,472,211
Texas.....	5,178	5,803	10,150	2,273	3,095
West Virginia.....	192,699	187,858	166,758	166,597	183,005
Kentucky.....	100,724	119,019	71,562	68,462	110,725
Tennessee.....	263,439	346,166	362,190	337,139	392,778
Ohio.....	1,986,358	2,378,212	2,470,911	3,326,425	3,631,388
Illinois.....	1,365,898	1,442,012	1,363,383	1,596,850	1,730,220
Michigan.....	147,640	134,443	163,712	170,762	155,213
Wisconsin.....	172,781	203,175	184,794	207,551	273,987
Minnesota.....	.....			
Missouri.....	141,010	138,880	159,204	203,409	269,930
Colorado.....					
Washington.....					
Total.....	11,773,934	13,620,703	13,789,242	15,878,354	17,821,307

PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND BITUMINOUS PIG IRON FROM 1898 TO 1902.

States.	Gross tons of 2,240 pounds.				
	1898.	1899.	1900.	1901.	1902.
New York.....	.....	163,853	{ 50,859	191,254	195,472
New Jersey.....	100,681		{ 168,762		
Pennsylvania.....	1,102,592	1,420,618	1,440,139	1,518,535	919,775
Maryland.....	.....	15,081	17,288	2,738	.....
Total.....	1,203,273	1,599,552	1,677,048	1,712,527	1,115,247

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

PRODUCTION OF CHARCOAL PIG IRON FROM 1898 TO 1902.

States.	Gross tons of 2,240 pounds.				
	1898.	1899.	1900.	1901.	1902.
Massachusetts.....	3,661	2,476	3,310	3,386	3,360
Connecticut.....	6,336	10,129	10,233	8,442	12,086
New York.....	6,600	7,120	7,920	22,605	34,207
Pennsylvania.....	3,191	3,731	3,422	4,761	4,230
Maryland.....	2,106	1,708	5,975	5,096	4,400
Virginia.....					
Georgia.....	13,762	.....	22,879	27,333	31,685
Alabama.....	36,734	41,669	57,632	53,010	60,534
Texas.....	5,178	5,803	10,150	2,273	6,293
Tennessee.....	17,498	29,037	3,119	2,917	
Ohio.....	6,351	6,476	7,737	10,067	10,798
Michigan.....	147,640	134,443	163,712	170,762	155,213
Wisconsin.....	47,693	42,174	43,785	49,495	55,698
Missouri.....					
Washington.....					
Total.....	296,750	284,766	339,874	360,147	378,504

In addition to the pig iron above noted there were produced in 1902 in Tennessee 11,665 tons of pig iron with mixed charcoal and coke, against 23,294 tons in 1901.

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON FROM 1898 TO 1902.

States.	Gross tons of 2,240 pounds.				
	1898.	1899.	1900.	1901.	1902.
New York	221,411	220,971	} 235,548	225,549	{ 308,619 54,451
New Jersey					
Pennsylvania	4,432,049	5,134,529	4,922,374	5,819,961	7,193,795
Maryland.....	188,868	219,236	269,589	297,826	301,501
Virginia.....	283,274	363,943	487,838	446,188	} 535,174
North Carolina		} 17,835	4,825	.....
Georgia					
Alabama.....	996,942	1,042,236	1,126,705	1,172,202	1,411,677
West Virginia.....	192,699	187,858	166,758	166,597	183,005
Kentucky	100,724	119,019	71,562	68,462	110,725
Tennessee.....	245,941	317,129	315,743	310,928	377,915
Ohio	1,980,007	2,371,736	2,463,174	3,316,358	3,620,590
Illinois.....	1,365,898	1,442,012	1,363,383	1,596,850	1,730,220
Wisconsin.....	134,558	161,471	131,354	172,278	233,286
Minnesota.....		} 37,857	47,704	} 189,187	254,933
Missouri.....	40,318				
Colorado.....	91,222				
Total.....	10,273,911	11,736,385	11,727,712	13,782,386	16,315,891

STOCKS OF ALL KINDS OF PIG IRON UNSOLD AT THE
CLOSE OF 1899, 1900, 1901, AND 1902.

These statistics represent only unsold stocks in the hands of makers or their agents, including stocks controlled by the manufacturers in warrant yards, and do not include other warrant stocks, or stocks in the hands of consumers, or pig iron made for the use of the makers, or foreign pig iron held in bond.

States and Districts.	Gross tons of 2,240 pounds.			
	1899.	1900.	1901.	1902.
New England.....	1,199	2,791	684	229
New York	13,229	34,260	4,907	2,661
New Jersey	350	11,500	648	700
Lehigh Valley.....	372	41,664	3,783	150
Schuylkill Valley.....	3,851	21,895	4,756	400
Upper Susquehanna Valley.....	285	21,102	1,409	2,256
Lower Susquehanna Valley	8,731			
Juniata Valley.....	3,538	4,815	600	1,598
Allegheny County.....	.....	1,082	.....	.....
Shenango Valley.....	.....	22,742	4,017	.....
Miscellaneous bituminous.....	1,287	18,003	3,139	.....
Charcoal	4,026	3,692	3,046	718
Total for Pennsylvania.....	22,090	134,995	20,750	5,122
Maryland .....	.....	24,513	8,477	6,791
Virginia.....	6,979			
North Carolina, Georgia, and Texas.....	179	8,741	1,066	.....
Alabama.....	7,262	49,394	4,393	22,404
Kentucky and West Virginia.....	1,302	6,673	3,156	1,125
Tennessee.....	3,259	15,174	1,361	3,554
Mahoning Valley.....	1,712	80,792	8,343	2,503
Hocking Valley and miscellaneous.	933	9,450	.....	.....
Lake Counties.....	.....	10,761	1,671	.....
Hanging Rock bit. and charcoal...	1,983	20,618	8,285	1,954
Total for Ohio.....	4,628	121,621	18,299	4,457
Indiana, Michigan, and Minnesota.....	2,952	32,708	6,906	2,908
Illinois and Wisconsin.....				
Missouri and Colorado.....				
Pacific States.....				
Grand total.....	63,429	442,370	70,647	49,951

STOCKS ACCORDING TO FUEL USED.

Bituminous.....	28,217	261,407	42,426	38,645
Anthracite and anth. and coke mixed..	23,419	110,127	12,007	4,080
Charcoal.....	11,793	62,578	15,950	7,226
Mixed charcoal and coke.....	.....	8,258	264	.....
Total.....	63,429	442,370	70,647	49,951

STATISTICS OF THE UNITED STATES STEEL CORPORATION.

WITH the single exception of iron ore the statistics presented below have been carefully compiled from the returns of production made to the American Iron and Steel Association for the whole of the calendar year 1901 by all the constituent companies of the United States Steel Corporation, including the period prior to its organization, and by all other iron and steel manufacturing companies. The statistics of iron ore shipments and production in 1901 have been obtained from the Corporation itself and from authentic data contained in our Annual Statistical Report for 1901.

Iron ore shipments and production in the calendar year 1901.		By U. S. Steel Corporation.	By independent companies.	Total shipments and production.	Percentage of U. S. Steel Corporation.
Gross tons.					
Shipments of iron ore from the Lake Superior region in 1901.....		12,692,213	7,897,024	20,589,237	61.6
Total production of iron ore in 1901.....		12,692,213	16,195,266	28,887,479	43.9
Iron and steel actually produced in the calendar year 1901.		Production by U. S. Steel Corporation.	Production by independent companies.	Total production. Gross tons.	Percentage of U. S. Steel Corporation.
Gross tons.					
Bessemer and basic pig iron.....		6,460,847	4,584,796	11,045,643	58.5
Spiegeleisen and ferro-manganese.....		190,485	100,976	291,461	65.4
Forge, foundry, and all other kinds of pig iron not included above.....		152,656	4,388,594	4,541,250	3.4
Total pig iron, including spiegeleisen and ferro-manganese.....		6,803,988	9,074,366	15,878,354	42.9
Bessemer steel ingots and castings.....		6,113,588	2,599,714	8,713,302	70.2
Open-hearth steel ingots and castings.....		2,746,996	1,909,313	4,656,309	59.0
Total Bessemer and open-hearth steel ingots and castings.....		8,860,584	4,509,027	13,369,611	66.3
Bessemer steel rails.....		1,719,076	1,151,740	2,870,816	59.9
Structural shapes.....		629,733	383,417	1,013,150	62.2
Plates and sheets, including black plates for tinning.....		1,456,897	737,528	2,254,425	64.6
Wire rods.....		1,059,859	306,075	1,365,934	77.6
All other rolled products, including bars, skip, cut nails, open-hearth steel rails, iron rails, etc.....		1,324,393	3,520,609	4,845,002	27.3
Total of all rolled products.....		6,189,958	6,159,369	12,349,327	50.1
Wire nails..... kegs of 100 pounds.		6,446,938	3,356,884	9,803,822	65.8

STATISTICS OF THE CANADIAN IRON TRADE FOR 1902.

PRODUCTION OF PIG IRON IN CANADA.

The American Iron and Steel Association has received from the manufacturers the statistics of the production of pig iron in Canada in 1902. They show an increase of 74,581 gross tons, or over 30 per cent., as compared with the production in 1901.

The total production in 1902 amounted to 319,557 gross tons, against 244,976 tons in 1901 and 86,090 tons in 1900. In the first half of 1902 the production was 157,804 tons and in the second half it was 161,753 tons, a gain of only 3,949 tons. Of the total production in 1902, 302,712 tons were made with coke and 16,845 tons with charcoal. A little over one-third of the total production was basic pig iron, namely, 107,315 tons. The Bessemer pig iron made amounted to about 9,000 tons. Spiegel-eisen and ferro-manganese have not been made since 1899.

The following table gives the total production of all kinds of pig iron in Canada from 1894 to 1902, the statistics for each year having been received directly from the manufacturers. Prior to 1894 the statistics of the production of pig iron in the Dominion of Canada were not collected by this Association.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894.....	44,791	1897.....	53,796	1900.....	86,090
1895.....	37,829	1898.....	68,755	1901.....	244,976
1896.....	60,030	1899.....	94,077	1902.....	319,557

On December 31, 1902, the unsold stocks of pig iron in Canada amounted to about 20,000 gross tons, as compared with 59,472 tons at the close of 1901 and 12,465 tons at the close of 1900. Of the unsold pig iron on hand on December 31, 1902, over 19,000 tons were coke pig iron.

On December 31, 1902, Canada had 14 completed blast furnaces, of which 7 were in blast and 7 were idle. Of this total 9 were equipped to use coke for fuel, 4 to use charcoal, and 1 to use mixed charcoal and coke. In addition 1 charcoal and 5 coke furnaces were being built or were partly erected on December 31, but work on some of the coke furnaces was suspended.

The Algoma Steel Company, Limited, of Sault Ste. Marie, Ontario, one of the constituent companies of the Consolidated Lake Superior Company, commenced the erection of two charcoal and two coke furnaces at Sault Ste. Marie in 1901. The charcoal furnaces were to be 70 by 14 feet and the coke furnaces 90 by 21 feet. Subsequently work on the coke furnaces was suspended and one of the building charcoal furnaces was converted into a coke furnace, the size being changed from 70 by 14 feet to 80 by 15½ feet. The company now expects to have its charcoal furnace ready for blast in June and its coke furnace in July.

The Cramp Steel Company, Limited, has put in the foundations for a blast furnace at Collingwood, Simcoe county, Ontario. The company expects to have the furnace ready for operation in the fall of 1903. Coke from the United States will be used for fuel and Bessemer pig iron will be made. The daily capacity of the furnace will be about 250 gross tons.

The Nova Scotia Steel and Coal Company, Limited, of New Glasgow, Nova Scotia, broke ground in June, 1902, for a new furnace at Sydney Mines, Cape Breton, Nova Scotia. The furnace will be 85 by 17 feet and will have a daily capacity of about 200 tons of basic and foundry pig iron. Coke will be used and red and brown hematite ore will be obtained from Nova Scotia and Newfoundland. It is expected that the furnace will be ready for blast in September, 1903. The company now has a furnace at Ferrona, with an annual capacity of 33,000 tons.

The Londonderry Iron and Mining Company, Limited, of Londonderry, Nova Scotia, is the successor to the Londonderry Iron Company, Limited. It is rebuilding Furnace A, at Acadia Iron Mines, and expects to blow it in in July, 1903. The furnace will be 75 by 17 feet and will have an annual capacity of 48,000 tons of foundry iron. The company does not contemplate blowing in Furnace B in the near future, but may rebuild it later on.

PRODUCTION OF STEEL IN CANADA.

The total production of steel ingots and castings in Canada in 1902 was 182,037 gross tons, against 26,084 tons in 1901, an increase of 155,953 tons. Bessemer and open-hearth steel ingots and castings were made in each year. Almost all of the open-hearth steel reported in 1902 was made by the basic process. The direct castings made in 1902 amounted to 5,288 tons.

The following table gives the production of all kinds of steel ingots and castings in Canada from 1894 to 1902, in gross tons.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894.....	25,685	1897.....	18,400	1900.....	23,577
1895.....	17,000	1898.....	21,540	1901.....	26,084
1896.....	16,000	1899.....	22,000	1902.....	182,037

The large increase in the production of steel in Canada in 1902 over 1901 was caused by the starting up of the new open-hearth steel plant of the Dominion Iron and Steel Company, Limited, at Sydney, Cape Breton, Nova Scotia, which first produced steel on December 31, 1901, and of the new Bessemer plant of the Algoma Steel Company, Limited, at Sault Ste. Marie, Ontario, at which steel was first made on February 18, 1902. The latter company has two 6-gross-ton Bessemer converters, which were operated for a few months in 1902, producing in all 44,537 gross tons of ingots. The company also has a rail mill which first made Bessemer steel rails on May 5, 1902, and which also ran for a few months in that year, producing 32,878 tons. In addition this company produced 1,558 tons of other rolled products in 1902. The Dominion Iron and Steel Company made 99,377 tons of basic open-hearth steel ingots, 48 tons of steel castings, and 86,424 tons of blooms, billets, and slabs. It did not make steel rails. It has ten 50-gross-ton open-hearth furnaces.

PRODUCTION OF ROLLED IRON AND STEEL IN CANADA.

The production of Bessemer and open-hearth steel rails in 1902 amounted to 33,950 gross tons, against 891 tons of open-hearth rails in 1901; structural shapes, 423 tons, against 4,388 tons in 1901; cut nails made by rolling mills and steel works having cut-nail factories connected with their plants, 114,685 kegs of 100 pounds, against 126,891 kegs in 1901; plates and sheets, 2,191 tons, against 2,857 tons in 1901; all other rolled products, excluding muck and scrap bars, blooms, billets, sheet bars, etc., 119,801 tons, against 98,206 tons in 1901. Changing the cut-nail production to gross tons, the total quantity of all kinds of iron and steel rolled into finished forms in Canada in 1902 amounted to 161,485 tons, against 112,007 tons in 1901.

The following table gives the production of all kinds of iron and steel rolled into finished forms in Canada from 1895 to 1902.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1895.....	66,402	1898.....	90,303	1901.....	112,007
1896.....	75,043	1899.....	110,642	1902.....	161,485
1897.....	77,021	1900.....	100,690	.....	.....

On December 31, 1902, there were 19 completed rolling mills and steel works in Canada and 1 plant was being erected. Of the completed plants 2 were equipped for the manufacture of steel castings only, 4 for the manufacture of Bessemer or open-hearth steel ingots and rolled products, and 13 for the manufacture of rolled products only. The plant in course of construction was being equipped for the manufacture of Bessemer and open-hearth ingots and finished rolled products.

The Canada Switch and Spring Company, Limited, of Montreal, has changed its name to the Montreal Steel Works, Limited, and has practically discontinued the manufacture of steel castings by the Bessemer process and will hereafter make steel castings by the open-hearth process only. Its Bessemer castings were produced in a 3,000-pound modified acid converter, which was first put in operation in 1897. In 1901 the company erected and put in operation one 15-gross-ton acid open-hearth furnace, and in 1903 it built another 15-ton acid furnace. Nearly all the steel castings made by the company in 1902 were produced by the open-hearth process.

The Page-Hersey Iron and Tube Company, Limited, is erecting a plant at Guelph, Ontario, for the manufacture of wrought-iron pipe. It is the intention of the company to add in the near future a number of puddling and busheling furnaces and 2 trains of rolls (one 12 and one 16-inch) and to manufacture skelp for use in its pipe mill. Small quantities of bar iron may also be made. The plant will have an annual capacity of about 17,000 gross tons of finished rolled material and 15,000 tons of wrought-iron pipe.

The Cramp Steel Company, Limited, expects to have two 18-gross-ton basic open-hearth steel furnaces and 2 trains of rolls (one 10 and one 18-inch) in operation at its new plant at Collingwood, Ontario, late in the spring of 1903. When completed the works will make steel rails, beams, plates, merchant bar iron, rods, shafting, etc.

The rolling mill formerly located at Guelph, Ontario, and operated by the Guelph Iron and Steel Company, Limited, was removed to London, Ontario, in the fall of 1902, and is now being operated at the latter place by the London Rolling Mill Company, Limited. A 14-inch roughing mill has been added, and the plant can now turn out annually about 15,000 gross tons of merchant bar iron and steel and 6,000 tons of bolts, nuts, and hinges. Operations at London were commenced in March, 1903.

PRODUCTION OF COAL, IRON ORE, PIG IRON, AND STEEL IN LEADING COUNTRIES.

STATISTICS TO THE CLOSE OF THE FIRST YEAR OF THE TWENTIETH CENTURY.

WE present herewith complete statistics of the production of pig iron, steel, iron ore, and coal in the United States, Great Britain, Germany, France, and Belgium to the close of 1901, and also of the production of iron ore in Algeria, beginning in most cases as far back as authentic statistics are available. We also add for the United States statistics of the production of coke to the close of 1901 and of the shipments of Connellsville and Pocahontas Flat Top coke; also statistics of the shipments of Lake Superior and of Cuban iron ore and of the production of Cornwall iron ore to the same date; also complete statistics of the imports of iron ore into the United States to the close of 1901; also tables of the average prices of pig iron and steel rails in the United States for a long series of years, ending with 1901.

PRODUCTION OF IRON ORE IN THE UNITED STATES.

Previous to 1870 no iron ore statistics for the United States are complete. The figures for 1870 and 1880 are for census years ending on May 31 of those years. For 1889 (census year) and subsequent years they are for calendar years. Since 1889 the statistics have been compiled by Mr. John Birkinbine for the Division of Mineral Resources of the United States Geological Survey.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1870.....	3,031,891	1892.....	16,296,666	1897.....	17,518,046
1880.....	7,120,362	1893.....	11,587,629	1898.....	19,433,716
1889.....	14,518,041	1894.....	11,879,679	1899.....	24,683,173
1890.....	16,036,043	1895.....	15,957,614	1900.....	27,553,161
1891.....	14,591,178	1896.....	16,005,449	1901.....	28,887,479

PRODUCTION OF CORNWALL IRON ORE.

The following table gives the production of iron ore by the Cornwall mines in Pennsylvania from 1740 to 1901. The production from 1740 to February, 1864, amounted to 2,524,908 tons. The figures for 1864 are for 11 months only.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1740 to 1864..	2,524,908	1876.....	137,902	1889.....	769,020
1864 (11 mos.)	165,915	1877.....	171,589	1890.....	686,302
1865.....	114,803	1878.....	179,299	1891.....	663,755
1866.....	216,660	1879.....	268,488	1892.....	634,714
1867.....	202,755	1880.....	231,173	1893.....	439,705
1868.....	165,843	1881.....	249,050	1894.....	371,710
1869.....	173,429	1882.....	309,681	1895.....	614,598
1870.....	174,408	1883.....	363,143	1896.....	463,059
1871.....	176,055	1884.....	412,320	1897.....	419,878
1872.....	193,317	1885.....	508,864	1898.....	584,342
1873.....	166,782	1886.....	688,054	1899.....	763,152
1874.....	112,429	1887.....	667,210	1900.....	558,713
1875.....	98,925	1888.....	722,917	1901.....	747,012

SHIPMENTS OF LAKE SUPERIOR IRON ORE.

Three States, Michigan, Wisconsin, and Minnesota, now comprise the Lake Superior iron-ore region, which was originally confined to Michigan alone. Minnesota now leads her sister States in production. The following table gives the shipments of iron ore from the Lake Superior region from 1854 to 1901. The word "shipments" is not synonymous with production in this table.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1854.....	3,000	1870.....	830,940	1886.....	3,568,022
1855.....	1,449	1871.....	779,607	1887.....	4,762,107
1856.....	36,343	1872.....	900,901	1888.....	5,063,877
1857.....	25,646	1873.....	1,162,458	1889.....	7,292,643
1858.....	15,876	1874.....	919,557	1890.....	9,003,725
1859.....	68,832	1875.....	891,257	1891.....	7,071,053
1860.....	114,401	1876.....	992,764	1892.....	9,072,241
1861.....	49,909	1877.....	1,015,087	1893.....	6,065,716
1862.....	124,169	1878.....	1,111,110	1894.....	7,748,312
1863.....	203,055	1879.....	1,375,691	1895.....	10,429,037
1864.....	243,127	1880.....	1,908,745	1896.....	9,934,828
1865.....	236,208	1881.....	2,306,505	1897.....	12,464,574
1866.....	278,796	1882.....	2,965,412	1898.....	14,024,673
1867.....	473,567	1883.....	2,353,288	1899.....	18,251,804
1868.....	491,449	1884.....	2,518,692	1900.....	19,059,393
1869.....	617,444	1885.....	2,466,372	1901.....	20,593,537

SHIPMENTS OF IRON ORE FROM CUBA.

The first shipment of iron ore from the Province of Santiago, Cuba, was made by the Juragua Iron Company to the United States in August, 1884. In October, 1892, the Sigua Iron Company first commenced to ship iron ore to the United States, and

in 1895 the Spanish-American Iron Company also first commenced shipping iron ore to the United States. The Cuban Steel Ore Company for the first time commenced to ship iron ore in 1901. For the following complete details of the shipments of iron ore from Cuba we are indebted to Mr. Josiah Monroe, the secretary of the Juragua Iron Company. The figures given include a few cargoes of iron ore which were lost at sea, approximating 16,000 tons. They embrace all shipments since 1884.

Years. Gross tons.	Juragua Iron Company.		Sigua Iron Company.*	Spanish-American Iron Company.		Total. Gross tons.
	Shipments to the United States.	Shipments to other countries.	Shipments to the United States.	Shipments to the United States.	Shipments to other countries.	
1884.....	25,295	.....	.....	.....	.....	25,295
1885.....	80,716	.....	.....	.....	.....	80,716
1886.....	112,074	.....	.....	.....	.....	112,074
1887.....	94,240	.....	.....	.....	.....	94,240
1888.....	206,061	.....	.....	.....	.....	206,061
1889.....	260,291	.....	.....	.....	.....	260,291
1890.....	363,842	.....	.....	.....	.....	363,842
1891.....	264,262	.....	.....	.....	.....	264,262
1892.....	335,236	.....	6,418	.....	.....	341,654
1893.....	337,155	.....	14,020	.....	.....	351,175
1894.....	156,826	.....	.....	.....	.....	156,826
1895.....	307,503	.....	.....	74,991	.....	382,494
1896.....	298,885	.....	.....	114,110	.....	412,995
1897.....	242,324	5,932	.....	154,492	51,537	454,285
1898.....	83,696	.....	.....	84,643	.....	168,339
1899.....	161,783	.....	.....	215,406	.....	377,189
1900.....	154,871	.....	.....	292,001	.....	446,872
1901.....	199,764	.....	.....	322,142	12,691	†552,248
Total	3,684,824	5,932	20,438	1,257,785	64,228	5,050,858
Total shipments to the United States.....						4,980,698
Total shipments to other countries.....						70,160

*This company met with financial disaster and the mines that it operated in 1892 and 1893 are now idle.

†Including 17,651 tons shipped to the United States in 1901 by the Cuban Steel Ore Company, which has quit business, iron ore not being found in quantities.

TOTAL IMPORTS OF IRON ORE INTO THE UNITED STATES.

The following table gives the total imports of iron ore into the United States in the fiscal years from June 30, 1871, to June 30, 1879, and the imports in the calendar years from January 1, 1879, to December 31, 1901. In 1879 this country for the first

time imported iron ore largely from Europe. Prior to that year such iron ore as was imported into this country came chiefly from Canada, more than one-half of the total imports coming from that country in the calendar years 1873, 1874, and 1875. Our imports of iron ore now come chiefly from Cuba.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1872.....	23,733	1882.....	589,655	1893.....	526,951
1873.....	45,981	1883.....	490,875	1894.....	168,541
1874.....	57,987	1884.....	487,820	1895.....	524,153
1875.....	56,655	1885.....	390,786	1896.....	682,806
1876.....	17,284	1886.....	1,039,433	1897.....	489,970
1877.....	30,669	1887.....	1,194,301	1898.....	187,093
1878.....	28,212	1888.....	587,470	1899.....	674,082
1879*.....	150,197	1889.....	853,573	1900.....	897,831
1879†.....	284,141	1890.....	1,246,830	1901.....	966,950
1880.....	493,408	1891.....	912,856	.....	.....
1881.....	782,887	1892.....	806,585	.....	.....

* Fiscal years end. † Calendar years begin.

PRODUCTION OF COKE IN THE UNITED STATES.

The following table, compiled from the reports of the United States Geological Survey, gives the total production of coke in the United States from 1880 to 1901, in net tons of 2,000 pounds.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1880.....	3,338,300	1888.....	8,540,030	1896.....	11,788,773
1881.....	4,113,760	1889.....	10,258,022	1897.....	13,288,984
1882.....	4,793,321	1890.....	11,508,021	1898.....	16,047,209
1883.....	5,464,721	1891.....	10,352,688	1899.....	19,668,569
1884.....	4,873,805	1892.....	12,010,829	1900.....	20,533,348
1885.....	5,106,696	1893.....	9,477,580	1901.....	21,795,883
1886.....	6,845,369	1894.....	9,203,632	.....	.....
1887.....	7,611,705	1895.....	13,333,714	.....	.....

SHIPMENTS OF POCAHONTAS FLAT TOP COKE.

The following table gives the shipments of Pocahontas Flat Top coke from 1883 to 1901, in net tons of 2,000 pounds.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1883.....	23,762	1890.....	499,148	1897.....	855,756
1884.....	56,360	1891.....	466,016	1898.....	1,276,172
1885.....	48,571	1892.....	499,777	1899.....	1,317,246
1886.....	59,021	1893.....	539,548	1900.....	1,341,444
1887.....	151,171	1894.....	865,684	1901.....	1,279,949
1888.....	202,808	1895.....	707,697	.....	.....
1889.....	310,504	1896.....	999,567	.....	.....

SHIPMENTS OF CONNELLSVILLE COKE.

The following table, compiled from statistics furnished by Mr. H. P. Snyder, editor of the *Connellsville Courier*, gives the shipments of coke from the Connellsville region in Pennsylvania from 1880 to 1901, in net tons. Statistics for earlier years are not available. Shipments must not be confounded with production.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1880.....	2,205,946	1888.....	4,955,553	1896.....	5,411,602
1881.....	2,639,002	1889.....	5,930,428	1897.....	6,915,052
1882.....	3,043,394	1890.....	6,464,156	1898.....	8,460,112
1883.....	3,552,402	1891.....	4,760,665	1899.....	10,129,764
1884.....	3,192,105	1892.....	6,329,452	1900.....	10,166,234
1885.....	3,096,012	1893.....	4,805,623	1901.....	12,609,949
1886.....	4,180,521	1894.....	5,454,451	.....	.....
1887.....	4,146,989	1895.....	8,244,438	.....	.....

PRODUCTION OF COAL IN THE UNITED STATES.

The following table gives the production of all kinds of coal in the United States in gross tons from 1870 to 1901. Authentic statistics for earlier years than 1870 are not available.

Years—Gross tons.	Pennsylvania anthracite.	Bituminous and all other.	Total. Gross tons.
Census year 1870.....	13,973,460	15,369,120	29,342,580
Census year 1880.....	25,572,160	38,250,670	63,822,830
Calendar year 1881.....	28,500,016	48,365,341	76,865,357
Calendar year 1882.....	31,358,264	60,861,190	92,219,454
Calendar year 1883.....	34,336,469	68,531,500	102,867,969
Calendar year 1884.....	33,175,756	73,730,539	106,906,295
Calendar year 1885.....	34,228,548	64,840,668	99,069,216
Calendar year 1886.....	34,853,077	66,646,947	101,500,024
Calendar year 1887.....	37,578,747	79,073,227	116,651,974
Calendar year 1888.....	41,624,611	91,107,002	132,731,613
Census year 1889.....	40,665,152	85,432,717	126,097,869
Calendar year 1890.....	41,489,858	99,377,073	140,866,931
Calendar year 1891.....	45,236,992	105,268,962	150,505,954
Calendar year 1892.....	46,850,450	113,264,792	160,115,242
Calendar year 1893.....	48,185,306	114,629,671	162,814,977
Calendar year 1894.....	46,358,144	106,089,647	152,447,791
Calendar year 1895.....	51,785,122	120,641,244	172,426,366
Calendar year 1896.....	48,523,287	122,893,103	171,416,390
Calendar year 1897.....	46,974,714	131,794,630	178,769,344
Calendar year 1898.....	47,663,075	148,742,878	196,405,953
Calendar year 1899.....	53,944,647	172,608,917	226,553,564
Calendar year 1900.....	51,221,353	189,566,885	240,788,238
Calendar year 1901.....	60,242,560	201,631,115	261,873,675

The statistics above given are for the census years 1870 and 1880, ending on the 31st day of May of each year; for the census year 1889, ending on the 31st day of December of that year; and for the calendar years from 1881 to 1888 and from 1890 to 1901. Credit is due to the Census Bureau for the statistics for census years and to the Division of Mining and Mineral Resources of the United States Geological Survey, Department of the Interior, for the statistics for other years.

PRODUCTION OF PIG IRON IN THE UNITED STATES.

The total production of pig iron in the United States in the past ninety-two years is shown in the following table. Prior to 1854 the statistics given were compiled by various Government and other statistical agencies. For 1854 and all succeeding years the statistics were gathered by the American Iron Association and its successor, the American Iron and Steel Association. The statistics for 1810, 1840, and 1850 are census figures. The figures for 1820 and 1830 are estimates made by early statisticians: census statistics for these years are wanting.

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

PRICES OF PIG IRON IN THE UNITED STATES.

The following table gives the average yearly prices of leading grades of pig iron in the United States from 1844 to 1901.

Years.	No. 1 fdy., at Phila- delphia.	Years.	No. 1 fdy., at Phila- delphia.	Gray forge, at Phila- delphia.	Gray forge, at Pitts- burgh.	Bessemer, at Pitts- burgh.
1844.....	\$25.75	1873.....	\$42.75	.....	\$35.80	.....
1845.....	29.25	1874.....	30.25	.....	27.16	.....
1846.....	27.88	1875.....	25.50	.....	23.67	.....
1847.....	30.25	1876.....	22.25	.....	21.74	.....
1848.....	26.50	1877.....	18.88	.....	20.60	.....
1849.....	22.75	1878.....	17.63	.....	18.09	.....
1850.....	20.88	1879.....	21.50	.....	22.15	.....
1851.....	21.38	1880.....	28.50	.....	27.98	.....
1852.....	22.63	1881.....	25.12	.....	22.94	.....
1853.....	36.12	1882.....	25.75	\$22.60	23.84	.....
1854.....	36.88	1883.....	22.38	19.33	19.04	.....
1855.....	27.75	1884.....	19.88	17.71	17.17	.....
1856.....	27.12	1885.....	18.00	15.58	15.27	.....
1857.....	26.38	1886.....	18.71	16.40	16.58	\$18.96
1858.....	22.25	1887.....	20.92	17.79	19.02	21.37
1859.....	23.38	1888.....	18.88	16.21	15.99	17.38
1860.....	22.75	1889.....	17.75	15.48	15.37	18.00
1861.....	20.25	1890.....	18.40	15.82	15.78	18.85
1862.....	23.88	1891.....	17.52	14.52	14.06	15.95
1863.....	35.25	1892.....	15.75	13.54	12.81	14.37
1864.....	59.25	1893.....	14.52	12.73	11.77	12.87
1865.....	46.12	1894.....	12.66	10.73	9.75	11.38
1866.....	46.88	1895.....	13.10	11.49	10.94	12.72
1867.....	44.12	1896.....	12.95	11.09	10.39	12.14
1868.....	39.25	1897.....	12.10	10.48	9.03	10.13
1869.....	40.63	1898.....	11.66	10.23	9.18	10.33
1870.....	33.25	1899.....	19.36	16.60	16.72	19.03
1871.....	35.12	1900.....	19.98	16.49	16.90	19.49
1872.....	48.88	1901.....	15.87	14.08	14.20	15.93

PRODUCTION OF BESSEMER STEEL IN THE UNITED STATES.

The following table gives the production of Bessemer steel in-
gots and castings in the United States from 1867 to 1901.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1867.....	2,679	1879.....	829,439	1891.....	3,247,417
1868.....	7,589	1880.....	1,074,262	1892.....	4,168,435
1869.....	10,714	1881.....	1,374,247	1893.....	3,215,686
1870.....	37,500	1882.....	1,514,687	1894.....	3,571,313
1871.....	40,179	1883.....	1,477,345	1895.....	4,909,128
1872.....	107,239	1884.....	1,375,531	1896.....	3,919,906
1873.....	152,368	1885.....	1,519,430	1897.....	5,475,315
1874.....	171,369	1886.....	2,269,190	1898.....	6,609,017
1875.....	335,283	1887.....	2,936,033	1899.....	7,586,354
1876.....	469,639	1888.....	2,511,161	1900.....	6,684,770
1877.....	500,524	1889.....	2,930,204	1901.....	8,713,302
1878.....	653,773	1890.....	3,688,871	.....	.....

PRODUCTION OF OPEN-HEARTH STEEL IN THE UNITED STATES.

The following table gives the production of open-hearth steel ingots and castings in the United States from 1869 to 1901.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1869.....	893	1880.....	100,851	1891.....	579,753
1870.....	1,339	1881.....	131,202	1892.....	669,889
1871.....	1,785	1882.....	143,341	1893.....	737,890
1872.....	2,679	1883.....	119,356	1894.....	784,936
1873.....	3,125	1884.....	117,515	1895.....	1,137,182
1874.....	6,250	1885.....	133,376	1896.....	1,298,700
1875.....	8,080	1886.....	218,973	1897.....	1,608,671
1876.....	19,187	1887.....	322,069	1898.....	2,230,292
1877.....	22,349	1888.....	314,318	1899.....	2,947,316
1878.....	32,255	1889.....	374,543	1900.....	3,398,135
1879.....	50,259	1890.....	513,232	1901.....	4,656,309

TOTAL PRODUCTION OF STEEL IN THE UNITED STATES.

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 statistics are of record until 1863, when the production fell to 8,075 tons. From 1867 until 1901 the production of all kinds of crude steel, including all kinds of steel castings, and crucible, blister, and other kinds of steel, is given below. In 1901 the production of steel castings amounted to 317,570 gross tons.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1867.....	19,643	1879.....	935,273	1891.....	3,904,240
1868.....	26,786	1880.....	1,247,335	1892.....	4,927,581
1869.....	31,250	1881.....	1,588,314	1893.....	4,019,995
1870.....	68,750	1882.....	1,736,692	1894.....	4,412,032
1871.....	73,214	1883.....	1,673,535	1895.....	6,114,834
1872.....	142,954	1884.....	1,550,879	1896.....	5,281,689
1873.....	198,796	1885.....	1,711,920	1897.....	7,156,957
1874.....	215,727	1886.....	2,562,503	1898.....	8,932,857
1875.....	389,799	1887.....	3,339,071	1899.....	10,639,857
1876.....	533,191	1888.....	2,899,440	1900.....	10,188,329
1877.....	569,618	1889.....	3,385,732	1901.....	13,473,595
1878.....	731,977	1890.....	4,277,071	.....	.....

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

The following table gives the annual production in gross tons of Bessemer steel rails in the United States from 1867 to 1901,

together with their average annual price at the works in Pennsylvania and the rates of duty imposed by our Government at various periods on foreign steel rails. Prices are given 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	158.50	
1869.....	8,616	132.25	
1870.....	30,357	106.75	
1871.....	34,152	102.50	
1872.....	83,991	112.00	\$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	120.50	
1874.....	129,414	94.25	
1875.....	259,699	68.75	
1876.....	368,269	59.25	
1877.....	385,865	45.50	
1878.....	491,427	42.25	
1879.....	610,682	48.25	
1880.....	852,196	67.50	
1881.....	1,187,770	61.13	
1882.....	1,284,067	48.50	\$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	28.50	
1886.....	1,574,703	34.50	
1887.....	2,101,904	37.08	\$13.44 per ton from October 6, 1890, to August 28, 1894.
1888.....	1,386,277	29.83	
1889.....	1,510,057	29.25	
1890.....	1,867,837	31.75	
1891.....	1,293,053	29.92	
1892.....	1,537,588	30.00	\$7.84 per ton from August 28, 1894.
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	
1901.....	2,870,816	27.33	

PRODUCTION OF COAL IN GREAT BRITAIN.

Great Britain has not been dependent upon any other country at any time in her history for any part of her supply of mineral fuel; she is, indeed, an exporter of coal in large quantities. The following table, compiled from the reports of His Majesty's inspectors of mines, gives the official statistics of the production of coal in Great Britain from 1854 to 1901, in gross tons. The maximum production was attained in 1900.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1854.....	64,661,401	1870.....	110,431,192	1886.....	157,518,482
1855.....	64,453,070	1871.....	117,352,028	1887.....	162,119,812
1856.....	66,645,450	1872.....	123,497,316	1888.....	169,935,219
1857.....	65,394,707	1873.....	128,680,131	1889.....	176,916,724
1858.....	65,008,649	1874.....	126,590,108	1890.....	181,614,288
1859.....	71,979,765	1875.....	133,306,485	1891.....	185,479,126
1860.....	80,042,698	1876.....	134,125,166	1892.....	181,786,871
1861.....	83,635,214	1877.....	134,179,968	1893.....	164,325,795
1862.....	81,638,338	1878.....	132,612,063	1894.....	188,277,525
1863.....	86,292,215	1879.....	133,720,393	1895.....	189,661,362
1864.....	92,787,873	1880.....	146,969,409	1896.....	195,361,260
1865.....	98,150,587	1881.....	154,184,300	1897.....	202,129,931
1866.....	101,630,544	1882.....	156,499,977	1898.....	202,054,516
1867.....	104,500,480	1883.....	163,737,327	1899.....	220,094,781
1868.....	103,141,157	1884.....	160,757,779	1900.....	225,181,300
1869.....	107,427,557	1885.....	159,351,418	1901.....	219,046,945

PRODUCTION OF IRON ORE IN GREAT BRITAIN.

The following table of the production of iron ore in the United Kingdom from 1855 to 1901 has been compiled from Mr. Richard Meade's "Coal and Iron Industries of the United Kingdom," published at London in 1882, and since 1880 from the "Mineral Statistics" of His Majesty's inspectors of mines. The United Kingdom is a large importer of iron ore, chiefly from Spain.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1855.....	9,553,741	1871.....	16,334,888	1887.....	13,098,041
1856.....	10,483,309	1872.....	15,584,357	1888.....	14,590,713
1857.....	9,573,281	1873.....	15,577,499	1889.....	14,546,105
1858.....	8,040,959	1874.....	14,844,936	1890.....	13,780,767
1859.....	7,880,316	1875.....	15,821,060	1891.....	12,777,689
1860.....	8,024,205	1876.....	16,841,584	1892.....	11,312,675
1861.....	7,215,518	1877.....	16,692,802	1893.....	11,203,476
1862.....	7,562,240	1878.....	15,726,370	1894.....	12,367,308
1863.....	9,088,960	1879.....	14,379,735	1895.....	12,615,414
1864.....	10,064,890	1880.....	18,026,050	1896.....	13,700,764
1865.....	9,910,045	1881.....	17,446,065	1897.....	13,787,878
1866.....	9,965,012	1882.....	18,031,957	1898.....	14,176,938
1867.....	10,021,058	1883.....	17,383,046	1899.....	14,461,330
1868.....	10,169,231	1884.....	16,137,887	1900.....	14,028,208
1869.....	11,508,525	1885.....	15,417,982	1901.....	12,275,198
1870.....	14,370,655	1886.....	14,110,013	.....	.....

PRODUCTION OF PIG IRON IN GREAT BRITAIN.

The following table gives the official Government statistics of the production of pig iron in the United Kingdom from 1740 to

1901. As there has been no noteworthy iron industry in Ireland since about 1740 the figures given in the table relate to the production of pig iron by England, Scotland, and Wales. Ireland possesses some iron ore but its fuel resources are not extensive.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1740.....	17,350	1856.....	3,586,377	1879.....	5,995,337
1788.....	68,300	1857.....	3,659,447	1880.....	7,749,233
1796.....	125,079	1858.....	3,456,064	1881.....	8,144,449
1806.....	243,851	1859.....	3,712,904	1882.....	8,586,680
1818.....	325,000	1860.....	3,826,752	1883.....	8,529,300
1820.....	400,000	1861.....	3,712,390	1884.....	7,811,727
1823.....	455,166	1862.....	3,943,469	1885.....	7,415,469
1825.....	581,367	1863.....	4,510,040	1886.....	7,009,754
1827.....	690,000	1864.....	4,767,951	1887.....	7,559,518
1828.....	703,184	1865.....	4,825,254	1888.....	7,998,969
1830.....	677,417	1866.....	4,523,897	1889.....	8,322,824
1833.....	700,000	1867.....	4,761,023	1890.....	7,904,214
1836.....	1,000,000	1868.....	4,970,206	1891.....	7,406,064
1839.....	1,248,781	1869.....	5,445,757	1892.....	6,709,255
1840.....	1,396,400	1870.....	5,963,515	1893.....	6,976,990
1842.....	1,099,138	1871.....	6,627,179	1894.....	7,427,342
1843.....	1,215,350	1872.....	6,741,929	1895.....	7,703,459
1844.....	1,999,608	1873.....	6,566,451	1896.....	8,659,681
1845.....	1,512,500	1874.....	5,991,408	1897.....	8,796,465
1847.....	1,999,508	1875.....	6,365,462	1898.....	8,609,719
1852.....	2,701,000	1876.....	6,555,997	1899.....	9,421,435
1854.....	3,069,838	1877.....	6,608,664	1900.....	8,959,691
1855.....	3,218,154	1878.....	6,381,051	1901.....	7,928,647

PRODUCTION OF BESSEMER STEEL INGOTS IN GREAT BRITAIN.

The production of Bessemer steel ingots from 1868 to 1901 has been as follows, in gross tons. Steel castings are not included. There are no trustworthy statistics for earlier years.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1868.....	110,000	1880.....	1,044,382	1892.....	1,500,810
1869.....	160,000	1881.....	1,441,719	1893.....	1,493,454
1870.....	215,000	1882.....	1,673,649	1894.....	1,535,384
1871.....	329,000	1883.....	1,553,380	1895.....	1,535,225
1872.....	410,000	1884.....	1,299,676	1896.....	1,815,842
1873.....	496,000	1885.....	1,304,127	1897.....	1,884,155
1874.....	540,000	1886.....	1,570,520	1898.....	1,759,386
1875.....	620,000	1887.....	2,089,403	1899.....	1,825,074
1876.....	700,000	1888.....	2,032,794	1900.....	1,745,004
1877.....	750,000	1889.....	2,140,791	1901.....	1,606,253
1878.....	807,527	1890.....	2,014,843	.....	.....
1879.....	834,511	1891.....	1,642,005	.....	.....

PRODUCTION OF OPEN-HEARTH STEEL INGOTS IN GREAT BRITAIN.

The production of open-hearth steel ingots in Great Britain has been as follows from 1873 to 1901. Steel castings are not included. Statistics for earlier years are wanting. In 1894 the production of open-hearth steel first exceeded that of Bessemer steel.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1873.....	77,500	1883.....	455,500	1893.....	1,456,309
1874.....	90,500	1884.....	475,250	1894.....	1,575,318
1875.....	88,000	1885.....	583,918	1895.....	1,754,737
1876.....	128,000	1886.....	694,150	1896.....	2,317,555
1877.....	137,000	1887.....	981,104	1897.....	2,601,806
1878.....	175,500	1888.....	1,292,742	1898.....	2,806,600
1879.....	175,000	1889.....	1,429,169	1899.....	3,030,251
1880.....	251,000	1890.....	1,564,200	1900.....	3,156,050
1881.....	338,000	1891.....	1,514,538	1901.....	3,297,791
1882.....	436,000	1892.....	1,418,830	.....	.....

The statistics of the production of Bessemer and open-hearth steel ingots in Great Britain have been collected by Mr. J. S. Jeans, secretary of the British Iron Trade Association.

TOTAL PRODUCTION OF STEEL IN GREAT BRITAIN.

The following table, compiled from statistics published by the British Iron Trade Association, gives the production of all kinds of crude steel in Great Britain from 1873 to 1901. We have added to the production of Bessemer and open-hearth steel ingots an estimated annual production of crucible steel and of all other kinds of steel. Steel castings are not included in the table.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1873.....	653,500	1883.....	2,088,880	1893.....	3,049,763
1874.....	710,500	1884.....	1,854,926	1894.....	3,210,702
1875.....	788,000	1885.....	1,968,045	1895.....	3,389,962
1876.....	908,000	1886.....	2,344,670	1896.....	4,233,397
1877.....	967,000	1887.....	3,150,507	1897.....	4,585,961
1878.....	1,063,027	1888.....	3,405,536	1898.....	4,665,986
1879.....	1,089,511	1889.....	3,669,960	1899.....	4,955,325
1880.....	1,375,382	1890.....	3,679,043	1900.....	5,001,054
1881.....	1,859,719	1891.....	3,256,543	1901.....	5,000,000
1882.....	2,189,649	1892.....	3,019,640	.....	.....

PRODUCTION OF COAL AND LIGNITE IN GERMANY.

The following table, for the details of which we are indebted for the earlier years to Dr. Hermann Wedding and for later

years to Dr. H. Rentzsch, gives the total production of coal and lignite in Germany and Luxemburg from 1848 to 1901, in metric tons. About one-fourth of the annual production of coal in Germany and Luxemburg is brown coal, or lignite.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1848.....	5,800,985	1872.....	42,324,467	1887.....	76,232,618
1853.....	10,714,556	1873.....	46,145,194	1888.....	81,960,083
1857.....	14,867,121	1874.....	46,658,145	1889.....	84,973,230
1860.....	16,730,492	1875.....	47,804,054	1890.....	89,290,834
1861.....	18,755,361	1876.....	49,550,461	1891.....	94,252,278
1862.....	20,660,677	1877.....	48,229,882	1892.....	92,544,030
1863.....	22,366,203	1878.....	50,519,899	1893.....	95,426,153
1864.....	25,612,899	1879.....	53,470,716	1894.....	98,805,702
1865.....	28,552,762	1880.....	59,118,035	1895.....	103,957,639
1866.....	28,162,805	1881.....	61,540,485	1896.....	112,471,106
1867.....	30,802,889	1882.....	65,378,211	1897.....	120,474,485
1868.....	32,879,123	1883.....	70,442,648	1898.....	127,958,550
1869.....	34,343,913	1884.....	72,113,820	1899.....	135,844,419
1870.....	34,003,004	1885.....	73,675,515	1900.....	149,788,256
1871.....	37,856,110	1886.....	73,682,584	1901.....	152,628,931

Of the total production of coal and lignite in Germany and Luxemburg in 1900 there were 40,498,019 metric tons of brown coal, or lignite, and of the total production in 1901 there were 44,211,902 tons of brown coal. Germany exports considerable quantities of coal to Austria, Holland, and Belgium.

PRODUCTION OF IRON ORE IN GERMANY.

The production of iron ore in Germany and Luxemburg from 1869 to 1901 is given by Dr. Rentzsch as follows, in metric tons. Germany imports and exports iron ore in considerable quantities.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1869.....	4,083,807	1880.....	7,238,640	1891.....	10,657,521
1870.....	3,839,222	1881.....	7,573,772	1892.....	11,539,133
1871.....	4,368,025	1882.....	8,263,254	1893.....	11,457,533
1872.....	5,895,674	1883.....	8,756,617	1894.....	12,392,065
1873.....	6,177,576	1884.....	9,005,796	1895.....	12,349,600
1874.....	5,137,468	1885.....	9,157,869	1896.....	14,162,335
1875.....	4,730,352	1886.....	8,485,758	1897.....	15,465,979
1876.....	4,711,982	1887.....	9,351,106	1898.....	15,901,263
1877.....	4,980,048	1888.....	10,664,307	1899.....	17,989,635
1878.....	5,462,055	1889.....	11,002,187	1900.....	18,964,294
1879.....	5,859,439	1890.....	11,406,132	1901.....	16,570,258

In his admirable and invaluable volume on "Coal and Iron in All Countries," prepared for the Paris Universal Exposition of

1878, Johann Pechar gives the production of iron ore in Germany and the Grand Duchy of Luxemburg at various periods prior to 1869 as follows: 1848, 693,725 metric tons; 1853, 903,236 tons; 1857, 1,962,054 tons; 1862, 2,216,023 tons; 1866, 2,996,148 tons; 1867, 3,264,464 tons; and 1868, 3,634,302 tons.

PRODUCTION OF PIG IRON IN GERMANY.

The production of pig iron in Germany and Luxemburg in 1844 is said by Dr. Wedding to have amounted to only 171,000 metric tons, and Herr Pechar says that in 1848 it amounted to 205,342 tons. It was not until 1866 that the production reached 1,000,000 tons, in which year it is said by Dr. Wedding to have amounted to 1,046,954 tons. Since 1869 it has been as follows, in metric tons, according to Dr. Rentzsch, of Dresden-Blasewitz, the statistician of the *Verein Deutscher Eisen und Stahl Industrieller*, who has verified for us the figures in the following table.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1869.....	1,409,429	1880.....	2,729,038	1891.....	4,641,217
1870.....	1,391,124	1881.....	2,914,009	1892.....	4,937,461
1871.....	1,563,682	1882.....	3,380,806	1893.....	4,986,003
1872.....	1,988,395	1883.....	3,469,719	1894.....	5,380,039
1873.....	2,240,575	1884.....	3,600,612	1895.....	5,464,501
1874.....	1,906,263	1885.....	3,687,434	1896.....	6,372,575
1875.....	2,029,389	1886.....	3,528,657	1897.....	6,881,466
1876.....	1,846,345	1887.....	4,023,953	1898.....	7,312,766
1877.....	1,781,989	1888.....	4,337,121	1899.....	8,143,132
1878.....	2,147,641	1889.....	4,524,558	1900.....	8,520,541
1879.....	2,226,587	1890.....	4,658,450	1901.....	7,860,893

Adding the production of pig iron by Great Britain in 1901 to that of Germany and Luxemburg, and reducing metric tons of 2,204 pounds in the above table to gross tons of 2,240 pounds, gives us a total production of pig iron by both countries in 1901 of 15,665,310 gross tons, or 213,044 tons less than the production of 15,878,354 tons of pig iron by the United States in that year.

PRODUCTION OF FINISHED STEEL IN GERMANY.

The following table gives the production of all kinds of finished steel in Germany and Luxemburg from 1866 to 1901, in metric tons. We are indebted to Dr. Rentzsch for a verification of this table. Statistics of Bessemer and open-hearth steel ingots for early years are not available, but for 1901 they will be found on the following page. The production of steel castings in 1901, included in the ingot statistics, amounted to 107,210 tons.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1866.....	83,737	1878.....	483,503	1890.....	1,613,783
1867.....	88,589	1879.....	478,344	1891.....	1,841,063
1868.....	92,696	1880.....	624,418	1892.....	1,976,735
1869.....	109,753	1881.....	840,224	1893.....	2,231,873
1870.....	125,814	1882.....	1,003,406	1894.....	2,608,713
1871.....	143,305	1883.....	859,814	1895.....	2,831,318
1872.....	285,582	1884.....	862,529	1896.....	3,462,736
1873.....	310,425	1885.....	893,742	1897.....	3,863,469
1874.....	361,947	1886.....	954,586	1898.....	4,352,831
1875.....	347,337	1887.....	1,163,884	1899.....	4,820,275
1876.....	377,910	1888.....	1,298,574	1900.....	4,825,587
1877.....	402,643	1889.....	1,425,439	1901.....	4,552,952

The production of Bessemer and open-hearth steel ingots and castings in Germany and Luxemburg in 1901 was 6,394,222 metric tons. Assuming that the production of crucible steel in Great Britain in 1901 amounted to 95,956 gross tons, that country's total production of crude steel in that year would be exactly 5,000,000 tons. Adding Great Britain's production to that of Germany and Luxemburg gives us for both countries a total production in 1901 of 11,293,170 gross tons, or 2,180,425 tons less than the output of 13,473,595 tons by the United States in 1901.

PRODUCTION OF COAL AND LIGNITE IN FRANCE.

The production of coal and lignite in France from 1787 to 1901 has been as follows, in metric tons, about one ton in fifty being lignite. France is a large importer of coal from Great Britain, Belgium, and Germany. It also imports coke.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1787.....	215,000	1872.....	15,802,515	1887.....	21,287,589
1802.....	844,180	1873.....	17,479,341	1888.....	22,602,894
1812.....	835,523	1874.....	16,907,913	1889.....	24,303,509
1820.....	1,093,658	1875.....	16,956,840	1890.....	26,083,118
1830.....	1,862,665	1876.....	17,101,448	1891.....	26,024,893
1840.....	3,003,382	1877.....	16,804,529	1892.....	26,178,701
1850.....	4,433,567	1878.....	16,960,916	1893.....	25,650,981
1860.....	8,303,682	1879.....	17,110,979	1894.....	27,416,905
1865.....	11,600,404	1880.....	19,361,564	1895.....	28,019,893
1866.....	12,260,085	1881.....	19,765,983	1896.....	29,189,900
1867.....	12,738,686	1882.....	20,603,704	1897.....	30,797,629
1868.....	13,253,876	1883.....	21,333,884	1898.....	32,356,104
1869.....	13,464,205	1884.....	20,023,514	1899.....	32,862,712
1870.....	13,330,308	1885.....	19,510,530	1900.....	33,404,298
1871.....	13,258,921	1886.....	19,909,894	1901.....	32,325,302

PRODUCTION OF IRON ORE IN FRANCE.

All the statistical tables for this country which we present have been compiled in part from statistics furnished by M. Pinget, of Paris, secretary of the Comité des Forges de France, and in part from official government statistics. The production of iron ore in France from 1860 to 1901 (not including Algeria) has been as follows, in metric tons. Algeria appears below.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1860.....	3,604,638	1877.....	2,426,278	1890.....	3,471,718
1865.....	3,658,464	1878.....	2,469,953	1891.....	3,579,286
1866.....	3,790,168	1879.....	2,271,173	1892.....	3,706,748
1867.....	3,279,395	1880.....	2,874,263	1893.....	3,517,438
1868.....	3,005,094	1881.....	3,032,070	1894.....	3,772,101
1869.....	3,461,672	1882.....	3,467,251	1895.....	3,679,767
1870.....	2,899,593	1883.....	3,297,853	1896.....	4,062,390
1871.....	2,099,706	1884.....	2,976,948	1897.....	4,582,236
1872.....	3,081,026	1885.....	2,318,104	1898.....	4,731,394
1873.....	3,051,124	1886.....	2,285,648	1899.....	4,985,702
1874.....	2,516,548	1887.....	2,579,465	1900.....	5,447,694
1875.....	2,505,870	1888.....	2,841,757	1901.....	4,790,732
1876.....	2,393,340	1889.....	3,070,389	.....	.....

PRODUCTION OF IRON ORE IN ALGERIA.

The production of iron ore in Algeria, which is now regarded as a part of the French Republic, was as follows from 1873 to 1901, in metric tons. All the iron ore mined in Algeria is exported. The figures given below are not included in the production of iron ore in France, given in the preceding table.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1873.....	444,718	1883.....	556,980	1893.....	393,921
1874.....	534,524	1884.....	492,936	1894.....	343,830
1875.....	557,285	1885.....	419,174	1895.....	318,416
1876.....	511,569	1886.....	432,761	1896.....	374,476
1877.....	454,236	1887.....	437,643	1897.....	441,467
1878.....	375,838	1888.....	383,958	1898.....	473,569
1879.....	417,853	1889.....	351,800	1899.....	550,941
1880.....	614,146	1890.....	474,632	1900.....	601,788
1881.....	656,646	1891.....	404,964	1901.....	514,473
1882.....	567,119	1892.....	452,603	.....	.....

PRODUCTION OF PIG IRON IN FRANCE.

The production of pig iron in France in the eighty-three years from 1819 to 1901 has been as follows, in metric tons.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1819.....	112,500	1870.....	1,178,114	1886.....	1,516,574
1830.....	266,861	1871.....	859,641	1887.....	1,567,622
1840.....	347,774	1872.....	1,217,838	1888.....	1,683,349
1850.....	405,653	1873.....	1,381,626	1889.....	1,733,964
1855.....	849,296	1874.....	1,415,897	1890.....	1,962,196
1859.....	864,399	1875.....	1,448,272	1891.....	1,897,387
1860.....	898,353	1876.....	1,435,212	1892.....	2,057,258
1861.....	966,895	1877.....	1,506,827	1893.....	2,003,096
1862.....	1,090,838	1878.....	1,521,274	1894.....	2,069,714
1863.....	1,156,875	1879.....	1,400,286	1895.....	2,003,868
1864.....	1,212,751	1880.....	1,725,293	1896.....	2,339,537
1865.....	1,203,711	1881.....	1,886,350	1897.....	2,484,191
1866.....	1,260,348	1882.....	2,039,067	1898.....	2,525,075
1867.....	1,229,044	1883.....	2,069,430	1899.....	2,578,401
1868.....	1,235,308	1884.....	1,871,537	1900.....	2,714,298
1869.....	1,380,965	1885.....	1,630,648	1901.....	2,388,823

PRODUCTION OF FINISHED STEEL IN FRANCE.

M. Pinget informs us that complete statistics of the production of Bessemer, open-hearth, and other steel in the form of ingots are not of record for the early years of this table, and that only the statistics of finished steel, including castings, are obtainable for those years. The following table gives the production of all kinds of finished steel in France from 1860 to 1901, in metric tons.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1860.....	29,848	1874.....	208,787	1888.....	517,294
1861.....	37,777	1875.....	256,393	1889.....	529,302
1862.....	47,096	1876.....	241,842	1890.....	581,998
1863.....	37,483	1877.....	269,181	1891.....	638,530
1864.....	41,559	1878.....	312,921	1892.....	682,527
1865.....	40,574	1879.....	333,265	1893.....	664,032
1866.....	37,764	1880.....	388,894	1894.....	674,190
1867.....	46,477	1881.....	422,416	1895.....	714,523
1868.....	80,564	1882.....	458,238	1896.....	916,817
1869.....	110,224	1883.....	521,820	1897.....	994,891
1870.....	94,387	1884.....	502,908	1898.....	1,174,075
1871.....	86,126	1885.....	553,839	1899.....	1,239,660
1872.....	141,705	1886.....	454,000	1900.....	1,226,537
1873.....	150,529	1887.....	493,294	1901.....	1,175,454

In 1901 the production in France of puddled, cemented, and crucible steel in finished forms, and of steel made from scrap, amounted to 22,464 metric tons, divided as follows: Puddled steel, 5,196 tons; cemented steel, 1,084 tons; crucible steel, 12,919 tons; and steel made from scrap, 3,265 tons.

PRODUCTION OF BESSEMER AND OPEN-HEARTH STEEL IN FRANCE.

The production of Bessemer and open-hearth steel ingots in France from 1888 to 1901 is given in the following table, in metric tons. Direct steel castings are not included, but about 10,000 metric tons of Bessemer and 10,000 metric tons of open-hearth steel castings are annually made in France.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1888.....	591,807	1893.....	789,852	1898.....	1,433,717
1889.....	626,232	1894.....	818,200	1899.....	1,499,026
1890.....	633,358	1895.....	875,974	1900.....	1,565,164
1891.....	744,484	1896.....	1,180,743	1901.....	1,425,351
1892.....	825,486	1897.....	1,325,213	.....	.....

PRODUCTION OF IRON ORE IN BELGIUM.

The statistics of the mining and metallurgical industries of Belgium which we shall present are official Government statistics. The production of iron ore from 1840 to 1901 is given in the following table, in metric tons. The production of ore in Belgium has greatly declined since 1865, when 1,018,231 tons were mined. Belgium is a large importer of iron ore, the imports in 1901, chiefly from Luxemburg, amounting to 1,768,956 tons.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1840.....	191,812	1874.....	527,050	1888.....	185,542
1845.....	394,544	1875.....	365,044	1889.....	181,526
1850.....	299,272	1876.....	269,206	1890.....	172,291
1855.....	852,134	1877.....	234,127	1891.....	202,204
1860.....	809,176	1878.....	207,157	1892.....	209,943
1865.....	1,018,231	1879.....	195,212	1893.....	238,783
1866.....	886,641	1880.....	253,499	1894.....	311,222
1867.....	602,829	1881.....	223,412	1895.....	312,637
1868.....	519,740	1882.....	208,867	1896.....	307,031
1869.....	628,046	1883.....	215,670	1897.....	240,774
1870.....	654,332	1884.....	176,005	1898.....	217,370
1871.....	697,272	1885.....	187,118	1899.....	201,445
1872.....	749,781	1886.....	152,508	1900.....	247,890
1873.....	503,565	1887.....	172,436	1901.....	218,780

PRODUCTION OF COAL IN BELGIUM.

Belgium is a large producer and exporter of coal. Its exports of coal and coke aggregate about 6,000,000 tons annually.

The following table gives the production of coal in Belgium, not including lignite, in metric tons, from 1830 to 1901. The production of coal in Belgium has not greatly increased in late years.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1830.....	2,568,054	1873.....	15,778,401	1888.....	19,218,481
1835.....	2,638,731	1874.....	14,669,029	1889.....	19,869,980
1840.....	3,929,962	1875.....	15,011,331	1890.....	20,365,960
1845.....	4,919,156	1876.....	14,329,578	1891.....	19,675,644
1850.....	5,820,588	1877.....	13,669,077	1892.....	19,583,173
1855.....	8,409,330	1878.....	14,899,175	1893.....	19,410,519
1860.....	9,610,895	1879.....	15,447,292	1894.....	20,534,501
1865.....	11,840,703	1880.....	16,886,698	1895.....	20,450,604
1866.....	12,774,662	1881.....	16,873,951	1896.....	21,252,370
1867.....	12,755,822	1882.....	17,590,989	1897.....	21,492,446
1868.....	12,298,589	1883.....	18,177,754	1898.....	22,088,335
1869.....	12,943,994	1884.....	18,051,499	1899.....	22,072,068
1870.....	13,697,118	1885.....	17,437,603	1900.....	23,462,817
1871.....	13,733,176	1886.....	17,285,543	1901.....	22,213,410
1872.....	15,658,948	1887.....	18,378,624	.....	.....

PRODUCTION OF PIG IRON IN BELGIUM.

The production of pig iron in Belgium in the fifty-seven years from 1845 to 1901 has been as follows, in metric tons. Belgium imports pig iron in considerable quantities, the imports in 1900 amounting to 305,668 metric tons and in 1901 to 165,781 tons.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1845.....	134,563	1872.....	655,565	1887.....	755,781
1850.....	144,452	1873.....	607,373	1888.....	826,850
1855.....	294,270	1874.....	532,790	1889.....	832,226
1860.....	319,943	1875.....	541,805	1890.....	787,836
1861.....	311,838	1876.....	490,508	1891.....	684,126
1862.....	356,550	1877.....	470,488	1892.....	753,268
1863.....	392,078	1878.....	518,646	1893.....	745,264
1864.....	449,875	1879.....	389,330	1894.....	818,597
1865.....	470,767	1880.....	608,084	1895.....	829,234
1866.....	482,404	1881.....	624,736	1896.....	948,023
1867.....	423,069	1882.....	726,946	1897.....	1,035,037
1868.....	435,754	1883.....	783,433	1898.....	979,755
1869.....	534,319	1884.....	750,812	1899.....	1,024,576
1870.....	563,468	1885.....	712,876	1900.....	1,018,561
1871.....	609,230	1886.....	701,677	1901.....	764,180

PRODUCTION OF STEEL INGOTS IN BELGIUM.

The production of all kinds of steel ingots in Belgium from 1865 to 1901 is given in the following table, in metric tons. The manufacture of Bessemer steel was introduced into Belgium in 1864, that of Martin steel in 1872, and that of Thomas steel in 1879. Prior to the introduction of these processes Belgium produced annually from 1,500 to 3,000 tons of puddled steel.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1865.....	650	1886.....	155,169	1895.....	407,634
1870.....	4,321	1887.....	216,186	1896.....	598,974
1875.....	54,420	1888.....	231,847	1897.....	616,604
1880.....	132,052	1889.....	254,397	1898.....	653,130
1881.....	141,640	1890.....	221,296	1899.....	731,249
1882.....	182,627	1891.....	221,913	1900.....	655,199
1883.....	179,489	1892.....	260,037	1901.....	515,780
1884.....	185,916	1893.....	273,113	.....	.....
1885.....	155,012	1894.....	405,661	.....	.....

PRODUCTION OF FINISHED STEEL IN BELGIUM.

The following table gives the production of finished steel in Belgium, including steel rails, from 1865 to 1901, in metric tons.

Years.	Metric tons.	Years.	Metric tons.	Years.	Metric tons.
1865.....	545	1878.....	102,259	1891.....	206,305
1866.....	930	1879.....	88,952	1892.....	208,281
1867.....	1,420	1880.....	102,772	1893.....	224,922
1868.....	1,857	1881.....	119,237	1894.....	341,318
1869.....	2,826	1882.....	151,291	1895.....	367,947
1870.....	4,062	1883.....	156,301	1896.....	519,311
1871.....	6,622	1884.....	153,999	1897.....	527,617
1872.....	12,389	1885.....	125,461	1898.....	567,728
1873.....	18,533	1886.....	137,771	1899.....	633,950
1874.....	30,932	1887.....	191,445	1900.....	568,539
1875.....	45,536	1888.....	185,417	1901.....	489,640
1876.....	64,543	1889.....	214,561	.....	.....
1877.....	90,646	1890.....	201,817	.....	.....

Belgium is a large exporter of steel rails and of iron and steel structural shapes and plates and sheets. In 1901 the steel rails exported amounted to 114,751 tons; the structural shapes to 23,134 tons, of which 14,380 tons were steel and 8,754 tons were iron; and the plates and sheets to 70,683 tons, of which 13,090 tons were steel and 57,593 tons were iron.

NOTE.

This series of statistical tables, showing the development from year to year of the iron and steel industries and the iron ore and coal industries of leading producing countries from the earliest years for which statistics are available, should be continued in future Annual Reports of the American Iron and Steel Association. The subject has received as full treatment in the present Report as time and opportunity have permitted. J. M. S.

THE WORLD'S IRON TRADE IN 1901.

THE WORLD'S PRODUCTION OF IRON ORE AND COAL.

THE following table gives the production of iron ore and coal in all countries in 1901, except in three instances, when figures for 1900 are given. Tons of 2,240 pounds are used in giving the production of the United States, Great Britain, Canada, Cuba, India, Natal, South African Republic, 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.

Countries.	Iron ore.			Coal and lignite.		
	Years.	Production. Tons.	Per- centage.	Years.	Production. Tons.	Per- centage.
United States.....	1901	28,887,479	33.25	1901	261,873,675	33.43
Great Britain	1901	12,275,198	14.13	1901	219,046,945	27.97
Germany and Luxem..	1901	16,570,258	19.08	1901	152,628,931	19.49
France.....	1901	4,790,732	5.51	1901	32,325,302	4.13
Belgium.....	1901	218,780	.25	1901	22,213,410	2.84
Austria-Hungary*.....	1901	3,643,115	4.19	1901	41,202,902	5.26
Russia and Finland....	1901	†5,663,000	6.52	1901	16,269,800	2.08
Sweden.....	1901	2,795,160	3.22	1901	271,509	.03
Spain.....	1901	7,906,517	9.10	1901	2,747,724	.35
Italy.....	1901	232,299	.27	1901	425,614	.05
Canada.....	1901	280,041	.32	1901	5,560,135	.71
Cuba.....	1901	552,248	.64	.....	.....	.....
South African Republic	.....	.....	.....	1901	752,162	.09
Natal.....	.....	.....	.....	1901	569,200	.07
India.....	1900	63,073	.07	1901	6,635,727	.85
Greece.....	1901	474,798	.55	1901	9,726	.00
New South Wales.....	.....	.....	.....	1901	5,968,426	.76
New Zealand.....	.....	.....	.....	1901	1,227,638	.16
Other Australasia.....	.....	.....	.....	1901	921,239	.12
Japan.....	1900	23,682	.03	1900	7,429,457	.95
Algeria.....	1901	514,473	.59	1901	213	.00
Other countries (about)	1901	1,977,147	2.28	1901	5,170,265	.66
Total.....	.....	86,868,000	100.00	.....	783,250,000	100.00

* Includes Bosnia and Herzegovina. † Unofficial. ‡ Lignite not included.

The iron ore figures for "other countries" include 738,206 gross tons which were produced by Newfoundland in 1901.

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 1901, except in three cases, when figures for 1900 are given. 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, and Canada embrace ingots and in some cases direct castings, but for Italy complete ingot statistics are not available and the statistics for finished steel have been used.

Countries.	Pig iron.			Steel.		
	Years.	Production. Tons.	Per- centage.	Years.	Production. Tons.	Per- centage.
United States.....	1901	15,878,354	39.34	1901	13,473,595	43.92
Great Britain.....	1901	7,928,647	19.65	1901	5,000,000	16.30
Germany and Luxem..	1901	7,860,893	19.48	1901	6,394,222	20.84
France.....	1901	2,388,823	5.92	1901	1,467,815	4.78
Belgium.....	1901	764,180	1.89	1901	515,780	1.68
Austria-Hungary*.....	1900	1,496,347	3.71	1900	1,157,215	3.77
Russia and Finland....	1901	2,831,680	7.02	1901	2,077,889	6.77
Sweden	1901	528,375	1.31	1901	269,897	.88
Spain.....	1901	296,858	.73	1900	150,634	.49
Italy.....	1901	15,819	.04	1901	123,310	.40
Canada.....	1901	244,976	.61	1901	26,084	.09
Other countries (about)	1901	121,048	.30	1901	23,559	.08
Total .....	.....	40,356,000	100.00	.....	30,680,000	100.00

*Includes Bosnia and Herzegovina.

In tables that have appeared in previous issues of our Annual Report we have given the world's probable 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; and now we estimate the total production in 1901 as amounting to 40,356,000 tons.

Nearly twenty-five 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. The figures given in the above table show that the production had increased in 1901 to 30,680,000 tons.

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