IRON A FACTOR IN THE WORLD'S PROGRESS.*

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THE European war, while drawing heavily upon the resources affecting industries of contending nations, also seriously influences conditions in countries throughout the world not engaged in hostilities, threatening lasting effect and possible future changes in many phases of development. For this reason a discussion is offered of the relative positions of the leading countries which produce pig iron or supply the requisite raw materials for its manufacture, and to indicate past as well as present conditions a period of at least four decades has been chosen as covering practically the era of greatest industrial growth.

Prognostications as to future conditions are not attempted, but analyses of the data presented may suggest possibilities for nations now prominent or others wherein the development or utilization of the above commodities is less pronounced, while similar studies of other industrial specialties may indicate even greater changes.

Iron ore and coal hold leading rank among mineral resources whose development has been and is coincident with the world's progress, for countries possessing these abundantly, or utilizing them liberally, are the dominant nations.

The United States produces more coal, more iron ore, and more pig iron than any other nation, and her strongest competitors are the European countries now at war, for they are each an important factor in the supply of some or all of the above, and, together with the United States, are depended upon for

85 per cent. of the iron ore,

96 per cent. of the pig iron supply of the world,

89 per cent. of the coal.

They are also the most active producers of varied forms of iron and steel manufactures, a large proportion of their inhabi-

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* Communicated by the Author.

tants being skilled and efficient in mine, furnace and mill work.

A disturbance as momentous as that produced by the European conflict is far-reaching in its effect upon industrial progress, and its influence may be expected to continue long after peace is declared: for animosities do not cease with the suspension of active hostilities.

Consideration of iron as a factor in the world's progress necessarily is dependent on statistics, but, to relieve the discussion of voluminous tables, charts are presented on which are traced the conditions prevailing since 1870 in iron ore, coal, and pig iron productions of important nations. The quantities recorded are in long tons (2240 pounds), except for countries using the metric system, where the amounts are given in metric tons (2204 pounds).

Iron Ore.

Plate A illustrates the annual production of iron ores in the countries which have been or are prominent in supplying this mineral. The ordinates indicate in tons (the space between two longitudinal lines representing five million tons) the outputs of each country, designated by a particular form of line; the abscissæ show the years. By tracing the "curve" for any country, its production in a given year is found, or its contemporaneous position with other iron ore producing nations is demonstrated. Thus Plate A shows that Great Britain was the largest contributor of iron ore until 1889, when the United States took first place, and since 1895 Germany has exceeded the output of Great Britain. The contemporaneous contributions of the three nations were practically equal in the years 1893 and 1894, subsequent to which time the advance of Germany and of the United States has been more pronounced than that of Great Britain. In late years the iron ore output of France has materially advanced. It will be noted that the maximum annual productions of iron ore were, for the United States 1913, Great Britain 1882, Germany and Luxemburg 1913,¹ France 1912, Spain 1907, Russia 1911 (?), Sweden 1913, Austria-Hungary 1911 (?).²

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¹ The statistics of Luxemburg, which supplies liberal quantities of iron ore and coal, have been officially combined with those of Germany.

² (?) intimates that no authentic records are available subsequent to the date mentioned.

In addition to the countries designated in the graphic representation, the islands of Cuba and Newfoundland are each supply-

PLATE A.

ing about one and a half million tons of iron ore annually, and smaller amounts are mined in Canada, China, Greece, Italy, Algeria, Belgium, Tunis, Australia, India, Japan, Norway,

Mexico, Brazil, Chile and Korea. Iron ore exists in minable quantities in most of the geographical divisions of the earth and in some of these there are known reserves of enormous extent and of excellent quality.

The majority of iron ores obtained in Spain, Sweden, Russia, and the United States average higher percentages of iron than those in Great Britain, Austria-Hungary, Germany and Luxemburg, France, and Belgium. Hence the relative weights of iron ore obtained in the different countries may not be considered as equitably comparative, for two tons of ore containing 60 per cent. iron will produce as much metal as three tons of 40 per cent. ore. The world's output of iron ore approximates 157,000,000 tons, the United States furnishing 36 per cent., and the nations now actively engaged in hostilities in Europe supplying an aggregate of 49 per cent. of the total iron ore product of the world. This resource is a most important factor, and it is asserted by some competent to judge that the control of the iron ore deposits of what was then eastern France and Luxemburg had a potential influence in the Franco-Prussian war of 1870, and is a factor in the present conflict.

Pig Iron.

The graphic statement, Plate B, illustrates by ordinates, each space between horizontal lines representing 1,000,000 tons, the status of various countries as pig-iron producers subsequent to 1869, and indicates by "curves" the annual contribution of each nation in tons.

The diagram shows that England, which had long been pre-eminent in pig-iron manufacture, was outstripped by the United States in 1890, and that in 1903 Germany's product also exceeded that of Great Britain. Plate B, read in connection with Plate A, demonstrates that some important pig-iron producing countries depend to a greater or less extent upon other nations for iron ore, a feature which is later discussed.

Sweden, long celebrated for the excellence of its pig iron produced with charcoal as fuel, is included in Plate B, although its output is below, while those of all other nations shown on the diagram at present exceed 1,000,000 tons of pig iron annually. It will be noted that the maximum production of pig iron in each of the nations discussed was obtained within the past four years.

PLATE B.

Among the countries supplying less than 1,000,000 tons of pig iron per year are: Canada (contributing over a half million tons), Spain, Italy, Japan, China, India, and Mexico.

The production of pig iron indicates that various commercial forms of iron and steel into which it enters are also locally fabricated. The employment of liquid metal from blast furnaces for steel conversion, and of continuous processes of manipulation used in the manufacture of merchantable metal, causes the district which produces pig iron to attain prominence in supplying various forms of iron and steel, thereby advancing it as an important industrial factor.

To obtain pig iron, ores, fuels, fluxes, and air are required; the last named is sufficiently abundant to cause no anxiety, and fluxes represent a minor part of the "charge." But the average ton of pig iron demands for its production the consumption of two tons of ore and a ton or more of satisfactory fuel. Hence the nation having its own supply of iron ore, and ample metallurgical fuel of desirable quality, has an advantage in the race for industrial supremacy. The total quantity of pig iron produced throughout the world is in the neighborhood of 73,000,000 tons. This is exclusive of metal obtained from forges by crude methods in a number of countries. Upon the above basis the United States at present supplies 41 per cent., and the combined output of the European nations in conflict is 55 per cent. of the world's pig-iron product.

Coal.

Plate C, which follows the form of Plates A and B, except that the spaces between horizontal lines represent 20,000,000 tons, illustrates the production of coal by various nations, and when read in connection with Plates A and B shows how different countries compare in the production and utilization of coal and iron ore.

England maintained preëminence in coal output until 1898, but since that date the United States has been in the lead, and in 1913 produced almost as much coal as its nearest competitors, Great Britain, Germany and Luxemburg, combined. The United States supplies more coal than all of continental Europe; in fact, as much as the balance of the world excluding Great Britain—39 per cent.

The coal product of the United States and Great Britain

averages higher grade than that of continental Europe, where large quantities of lignite or brown coal are secured, but the

PLATE C.

statistics given include the production of anthracite, bituminous, and lignite or brown coal.

In Plate C only those countries contributing 20,000,000 long or metric tons annually are indicated, but other countries mine large quantities of coal. Japan, China, India, and Canada each produces between 10,000,000 and 20,000,000 tons annually, and New South Wales, Spain, Transvaal, Natal, New Zealand, Mexico, Holland, and Chile each supplies between 1,000,000 and 10,000,000 tons yearly. About thirty countries produce smaller amounts.

In round numbers the total annual production of coal in the world at the present time is 1,250,000,000 tons, of which the United States contributes between 38 and 39 per cent., and the combined output of the European nations now at war approximates 50 per cent.

As supplementary to the three charts, the following statements are presented to show the position of each nation as a producer of iron ore, pig iron, and coal. To bring the statistics close to the present time, the obtainable records subsequent to the last census are given. The data are not completely contemporaneous, owing to the different periods for which information is available and to delays in making official statistics public.

The charts show that, according to latest official comparable data, the countries mentioned rank in volume of products in the following order:

Iron ore	Pig iron	Coal
United States,	United States,	United States,
Germany,	Germany,	Great Britain,
France,	Great Britain,	Germany,
Great Britain,	France,	Austria-Hungary,
Spain,	Russia,	France,
Sweden,	Austria-Hungary,	Russia,
Russia.	Belgium.	Belgium.

Analyses of these statements and of the three diagrams present some interesting, if not surprising, features.

The relative importance of the nations as producers of coal, iron ore, and pig iron is evident from the statistics presented, but the population of the countries and the relation which this bears to the quantities produced are of interest.

Thus, in per capita production, the nations rank:

As producers of iron ore	As producers of pig iron	As producers of coal
Sweden,	United States,	Great Britain,
United States,	Belgium,	United States,
Germany,	Germany,	Germany,
France,	Great Britain,	Belgium,
Great Britain,	France,	France,
Austria-Hungary,	Sweden,	Austria-Hungary,
Russia.	Austria-Hungary,	Japan,
	Russia.	Russia.

Progress in iron ore and coal mining, and in the manufacture of pig iron, between the years 1870 and 1910, shows as follows for the various countries, the quantities being quoted as per 1000 inhabitants:

In the interval of forty years the population of the United States increased from 38,500,000 to 92,000,000; its coal output rose from 765 to 4869 tons; its iron ores mined from 100 to 620 tons, and its pig iron made from 43 to 297 tons per 1000 inhabitants, the rate of increase being most pronounced in the last twenty years.

In the same period Great Britain's population advanced from 32,000,000 to 45,000,000, and its coal output increased from 3685 to 5994 tons, but its iron ore production decreased from 513 to 342 tons (in the decade ending 1901 to 292 tons). The amount of pig iron manufactured rose from 208 to 214 tons per 1000 inhabitants, reaching 231 tons in 1881.

In Germany and Luxemburg the population was augmented from 41,000,000 in 1871 to 66,000,000 in 1910; its coal output advanced from 922 to 3360 tons, its iron ore production from 106 to 434 tons, and the pig iron manufactured from 38 to 224 tons per 1000 inhabitants.

In forty years the population of France advanced from 36,000,000 to 39,600,000, and contemporaneously its proportionate coal production grew from 438 to 991 tons, its iron ore output from 85 to 404 tons, and pig iron manufactured from 34 to 113 tons per 1000 inhabitants.

In Austria-Hungary the increase in population was from 36,000,000 in 1870 to 49,000,000 in 1910. In the same interval its coal output was augmented from 233 to 989 tons, its iron ore product from 32 to 92 tons, and the amount of pig iron manufactured from 13 to 41 tons per 1000 inhabitants.

From 1870 to 1912 the population of Russia has risen from

85,000,000 to 171,000,000, and in that interval its coal mined advanced from 8 to 179 tons, its iron ore output from 9 to 41 tons, and its pig iron manufactured from 4 to 24 tons per 1000 inhabitants.

Belgium produces but little iron ore, but, while its population advanced from 5,000,000 in 1870 to 7,500,000 in 1910, its proportionate coal output rose from 2692 to 3222 tons, reaching 3505 tons in the year 1900. This nation is a liberal manufacturer of pig iron, of which it produced 111 tons in 1870 and 249 tons in 1910 per 1000 of population.

Sweden differs from Belgium in having but a small coal supply but an abundance of iron ore. In the forty years the population advanced from 4,000,000 to 5,500,000, its iron ore output, much of which is exported, rose from 151 to 1006 tons, and its pig-iron production using charcoal as fuel from 72 to 109 tons per 1000 inhabitants.

To illustrate the position of various nations as producers of coal, iron ore and pig iron, a series of statistical statements has been prepared covering the interval from 1870 to the present time, divided by decades. These show for each nation the total production in a decade, also the mean, maximum and minimum annual productions.

Reference has been made to the interdependence of nations, and, without attempting detailed explanation, this is epitomized in statements from latest data available of the amounts of iron ore, coal and pig iron exported and imported by various countries.

In the *United States* all iron ore produced, except about 1,000,000 tons annually exported to Canada, is smelted in the country, and in addition, in late years, from 2,000,000 to 2,600,000 tons of iron ore are imported, principally from Cuba, Sweden, and Newfoundland.

The imports of pig iron and ferro alloys in late years into the United States range from 130,000 to 237,000 tons and the exports from 60,000 to 275,000 tons, showing that the domestic pig iron is used at home.

From 12,000,000 to 22,000,000 tons of coal are annually exported from and 1,250,000 to 2,000,000 tons imported into the United States.

Germany and Luxemburg smelt their domestic iron ores, and in addition import 11,000,000 to 14,000,000 tons, principally

from Sweden, France, and Spain, and have exported about 2,500,000 tons, chiefly to Belgium and to France.

Germany annually imports 125,000 to 140,000 tons, and exports in the neighborhood of 1,000,000 tons of pig iron.

Thirty-one million to thirty-four million five hundred thousand tons of German coal are exported to Austria-Hungary, Holland, Belgium, France, Sweden, and Russia, and from 17,500,000 to 18,500,000 tons are imported into Germany.

Great Britain, in addition to its domestic iron ore supply, draws 6,000,000 to nearly 8,000,000 tons from foreign mines, two-thirds coming from Spain, although Algeria, Norway, Sweden, Tunis, Greece, and France contribute considerable quantities. No ore is exported.

Great Britain exports from 1,000,000 to 2,000,000 tons of pig iron, but the imports seldom exceed 250,000 tons.

Of its large fuel production, 65,000,000 tons of coal and about 1,000,000 tons of coke are exported to continental European, South American, and other countries. Those receiving more than 5,000,000 tons of British fuel annually are France, Italy, Germany, Sweden, and Norway.

France.—Four million to over eight million tons of French iron ore are annually exported, principally to Belgium and Germany, and from 1,000,000 to 2,000,000 tons of iron ore are imported, mostly from Germany and Spain. France exported from 100,000 to 250,000 tons of pig iron annually, while its imports of this metal are less than half these amounts.

France imports (mostly from England) about 16,000,000 tons of coal and 2,000,000 to 2,750,000 tons of coke, while its fuel exports are from 1,300,000 to 2,000,000 tons.

Russia exports little iron ore, but about 4,000,000 tons of coal and 500,000 or more tons of coke are imported.

Austria-Hungary imports annually from 500,000 to 600,000 tons of iron ore, mainly from Sweden, and exports about 100,000 tons, principally to Germany. From 100,000 to 200,000 tons of pig iron are imported and 28,000 to 60,000 tons exported.

From 9,000,000 to 12,000,000 tons of coal are imported, principally from Germany, and 8,000,000 tons, mostly lignite, are exported chiefly to Germany.

Spain is a large iron ore producer, and exports 7,000,000 to 9,000,000 tons per year, the greater portion going to Great

Britain. It produces 300,000 to 400,000 tons of pig iron, and its imports and exports are small. The domestic production of coal is augmented by importations of 2,000,000 tons annually.

Belgium mines from 125,000 to 250,000 tons of iron ore annually, but imports mostly from France, Germany, and Spain 5,000,000 to 6,000,000 tons, about 500,000 tons of which are reexported to Germany.

Belgium fabricates practically all of its pig-iron product, and also imports about two-thirds of a million tons annually, the larger part from Germany, although Great Britain and France also furnish pig iron. It mines from 22,000,000 to 24,000,000 tons of coal, imports 6,000,000 to 7,500,000 tons, and exports about 5,000,000 tons, principally to France.

Sweden produces an abundance of high-grade iron ore, the greater part of which is exported to Germany, England, Belgium, and the United States. The pig-iron industry depends almost entirely on charcoal, about one-fourth of the production being exported.

The various nations have been discussed independently of any colonies or dependencies, for, as before stated, the pig iron made has not been followed through mills and factories. But the statements presented may indicate how intimate the association has been between nations now combating each other and seeking to cripple their adversaries in every possible manner. These may also suggest the present and prospective status of each country as a contributor to the supply of resources necessary for the world's advancement, and show how changes of boundary lines may enlarge or reduce the independent manufacturing possibilities of the nations now at war.

On preceding pages reference has been made to the necessary interchange of the raw or the manufactured materials between the countries now at conflict, and it is possible that the result of the war may greatly strengthen some or seriously cripple others of the contestants, according to the peace terms which may be agreed upon. The commercial supremacy of each nation is, to a great extent, controlled by its ability to manufacture articles of iron and steel.

The effects of such changes may extend far beyond the limits of the countries contending with each other, and the possession of natural reserves of some nations or colonies and also in the Orient may be more than a mere incident in the European War.

PRODUCTION OF IRON ORE in the Eight Principal Iron-Ore Mining Countries in the World, from 1870 to 1913, by Ten-year Periods.

UNITED STATES—Long Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } ..	44,645,440	4,464,544	1879	5,255,000	1876	3,734,000
1880 } 1889 } ..	95,089,403	9,508,940	1889	14,518,041	1880	7,120,362
1890 } 1899 } ..	163,989,193	16,398,919	1899	24,683,173	1893	11,587,629
1900 } 1909 } ..	383,932,500	38,393,250	1907	51,720,619	1900	27,553,161
1910 } 1913 } ..	218,022,042	54,505,510	1913	61,980,437	1911	43,876,552

GERMANY AND LUXEMBURG—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } ..	51,160,842	5,116,084	1873	6,177,576	1870	3,839,222
1880 } 1889 } ..	89,499,306	8,949,931	1889	11,002,187	1880	7,238,640
1890 } 1899 } ..	133,313,059	13,331,306	1899	17,989,635	1891	10,657,521
1900 } 1909 } ..	224,434,495	22,443,450	1907	27,697,127	1901	16,570,182
1910 } 1913 } ..	128,284,212	32,071,053	1913	35,941,285	1910	28,729,700

GREAT BRITAIN—Long Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } ..	156,173,886	15,617,389	1876	16,841,584	1870	14,370,655
1880 } 1889 } ..	158,823,859	15,882,386	1882	18,031,957	1887	13,098,041
1890 } 1899 } ..	130,184,239	13,018,424	1899	14,461,330	1893	11,203,476
1900 } 1909 } ..	142,877,457	14,287,746	1907	15,731,604	1901	12,275,198
1910 } 1913 } ..	60,533,158	15,133,290	1913	15,997,328	1912	13,790,391

FRANCE—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } ..	25,715,612	2,571,561	1872	3,081,026	1871	2,099,706
1880 } 1889 } ..	28,743,748	2,874,375	1882	3,467,251	1886	2,285,648
1890 } 1899 } ..	40,088,780	4,008,878	1899	4,985,702	1890	3,471,718
1900 } 1909 } ..	76,317,045	7,631,705	1909	11,890,000	1902	5,003,782
1910 } 1912 } ..	49,410,078	16,470,026	1912	18,800,000	1910	14,605,542

PRODUCTION OF IRON ORE in the Eight Principal Iron-Ore Mining Countries in the World, from 1870 to 1913, by Ten-year Periods.—Continued.

SPAIN—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } ..	9,419,302	941,930	1874	423,401	1877	1,578,150
1879 } ..						
1880 } ..	46,444,883	4,644,488	1887	6,796,266	1881	3,502,681
1889 } ..						
1890 } ..	63,292,106	6,329,211	1899	9,397,733	1892	5,041,317
1899 } ..						
1900 } ..	87,235,290	8,723,529	1907	9,896,178	1902	7,904,555
1909 } ..						
1910 } ..	17,440,486	8,720,243	1911	8,773,691	1910	8,666,795
1911 } ..						

RUSSIAN EMPIRE—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } ..	9,166,008	916,601	1875	1,056,545	1871	794,779
1879 } ..						
1880 } ..	11,692,556	1,169,256	1889	1,646,840	1883	998,393
1889 } ..						
1890 } ..	30,468,011	3,046,801	1899	5,788,709	1890	1,802,165
1899 } ..						
1900 } ..	50,621,536	5,062,154	1900	6,122,270	1902	4,004,007
1909 } ..						
1910 } ..	12,750,218	6,375,109	1911	6,985,039	1910	5,765,179
1911 } ..						

SWEDEN—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } ..	7,466,982	746,698	1874	926,825	1870	630,739
1879 } ..	8,883,492	888,349	1889	985,904	1880	775,344
1880 } ..						
1889 } ..	17,402,164	1,740,216	1899	2,435,200	1890	941,241
1890 } ..						
1899 } ..	38,011,618	3,801,162	1908	4,713,160	1900	2,609,500
1900 } ..						
1909 } ..	25,886,414	6,471,604	1913	7,479,393	1910	5,552,678
1910 } ..						
1913 } ..						

AUSTRIA-HUNGARY—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1871 } ..	10,246,331	1,138,481	1873	1,588,058	1877	884,260
1879 } ..	14,632,594	1,463,259	1889	1,780,772	1881	1,084,443
1880 } ..	25,162,976	2,516,298	1899	3,293,004	1892	1,913,831
1889 } ..	37,511,679	3,751,168	1908	4,568,814	1903	3,155,116
1890 } ..	9,245,998	4,622,999	1911	4,712,666	1910	4,533,332
1899 } ..						
1900 } ..						
1909 } ..						
1910 } ..						
1911 } ..						

PRODUCTION OF PIG IRON in the Eight Principal Pig-iron Producing Countries in the World, from 1870 to 1914, by Ten-year Periods.

UNITED STATES—Long Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } 1880 } 1889 }	21,885,266	2,188,527	1879	2,741,853	1870	1,665,179
1890 } 1899 }	51,534,529	5,153,453	1889	7,603,642	1880	3,835,191
1900 } 1909 }	93,538,215	9,353,822	1899	13,620,703	1894	6,657,388
1910 } 1914 }	197,807,609	19,780,761	1909	25,795,471	1900	13,789,242
	134,978,776	26,995,755	1913	30,966,301	1914	23,332,244

GERMANY AND LUXEMBURG—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } 1880 } 1889 }	19,272,726	1,927,273	1873	2,240,575	1870	1,391,124
1890 } 1899 }	36,195,906	3,619,591	1889	4,524,558	1880	2,729,038
1900 } 1909 }	58,777,609	5,877,761	1899	8,143,132	1891	4,641,217
1910 } 1914 }	105,500,005	10,550,001	1907	12,875,159	1901	7,880,087
	81,683,742	16,336,748	1913	19,309,172	1914	14,389,547

GREAT BRITAIN—Long Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } 1880 } 1889 }	63,796,993	6,379,699	1872	6,741,929	1870	5,963,515
1890 } 1899 }	79,127,923	7,912,792	1882	8,586,680	1886	7,009,754
1900 } 1909 }	79,614,624	7,961,462	1899	9,421,435	1892	6,709,255
1910 } 1913 }	91,251,065	9,125,107	1906	10,149,388	1901	7,761,832
	39,306,601	9,826,650	1913	10,481,917	1912	8,889,124

FRANCE—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 } 1880 } 1889 }	13,364,987	1,336,499	1878	1,521,274	1871	859,641
1890 } 1899 }	17,723,834	1,772,383	1883	2,069,430	1886	1,516,574
1900 } 1909 }	21,919,062	2,191,906	1899	2,567,388	1891	1,897,387
1910 } 1913 }	30,278,382	3,027,838	1907	3,590,235	1901	2,388,823
	18,758,948	4,689,737	1913	5,311,316	1910	4,038,297

PRODUCTION OF PIG IRON in the Eight Principal Pig-iron Producing Countries in the World, from 1870 to 1914, by Ten-year Periods.—Continued.

RUSSIA—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } ..	3,805,983	380,598	1879	420,660	1871	339,513
1879 } ..						
1880 } ..	5,278,717	527,872	1889	733,720	1880	427,696
1889 } ..						
1890 } ..	15,113,846	1,511,385	1899	2,677,120	1890	905,460
1899 } ..						
1900 } ..	27,634,376	2,763,438	1904	2,962,283	1903	2,449,701
1901 } ..						
1910 } ..	10,830,846	3,610,282	1912	4,197,635	1910	3,040,047
1912 } ..						

AUSTRIA-HUNGARY—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } ..	4,423,447	442,345	1873	534,508	1877	387,630
1879 }						
1880 } ..	6,838,158	683,816	1889	855,822	1880	464,234
1889 }						
1890 } ..	11,431,258	1,143,126	1899	1,467,664	1891	921,846
1899 }						
1900 } ..	16,119,729	1,611,973	1909	1,995,511	1904	1,375,865
1909 }						
1910 } ..	6,545,212	2,181,737	1912	2,372,660	1910	2,060,975
1912 }						

BELGIUM—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879	5,379,203	537,920	1872	655,565	1879	389,330
1880 } 1889	7,323,421	732,342	1889	832,226	1880	608,084
1890 } 1899	8,631,404	863,140	1899	1,036,185	1891	684,126
1900 } 1909	12,335,766	1,233,577	1909	1,616,370	1901	764,180
1910 } 1913	8,726,830	2,181,708	1913	2,527,070	1910	1,852,090

SWEDEN—Metric Tons.

[illegible]

PRODUCTION OF COAL in the Eight Principal Coal-Mining Countries in the World, from 1870 to 1913, by Ten-year Periods.

UNITED STATES—Long Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	476,566,017	47,656,602	1879	60,808,749	1870	29,496,054
1880 } 1889 }	1,019,753,264	101,975,326	1888	132,701,827	1880	63,822,830
1890 } 1899 }	1,712,331,738	171,233,174	1899	226,554,635	1890	140,866,931
1900 } 1909 }	3,337,185,589	333,718,559	1907	428,895,914	1900	240,789,310
1910 } 1913 }	1,877,082,366	469,270,592	1913	508,971,540	1911	443,054,614

GREAT BRITAIN—Long Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	1,274,494,850	127,449,485	1877	134,179,968	1870	110,431,192
1880 } 1889 }	1,607,990,447	160,799,045	1889	176,916,724	1880	146,969,409
1890 } 1899 }	1,910,785,455	191,078,546	1899	220,094,781	1893	164,325,795
1900 } 1909 }	2,414,416,661	241,441,666	1907	267,830,962	1901	219,046,945
1910 } 1913 }	1,084,171,738	271,042,935	1913	287,430,473	1912	260,416,338

GERMANY—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	456,561,932	45,656,193	1879	53,470,716	1870	34,003,004
1880 } 1889 }	719,117,229	71,911,723	1889	84,973,230	1880	59,118,035
1890 } 1899 }	1,073,735,837	107,373,584	1899	135,824,427	1890	89,051,527
1900 } 1909 }	1,791,128,249	179,112,825	1909	217,445,656	1900	149,788,256
1910 } 1912 }	711,706,424	237,235,475	1912	255,810,094	1910	222,375,076

FRANCE—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	161,713,709	16,171,371	1873	17,479,341	1871	13,258,920
1880 } 1889 }	208,703,065	20,870,307	1889	24,303,509	1881	19,361,564
1890 } 1899 }	286,581,124	28,658,112	1899	32,863,000	1893	25,650,981
1900 } 1909 }	346,903,640	34,690,364	1909	37,840,086	1902	29,997,470
1910 } 1913 }	159,716,914	39,929,229	1912	41,145,178	1910	38,349,942

PRODUCTION OF COAL in the Eight Principal Coal-Mining Countries in the World, from 1870 to 1913 by 10-year periods.

AUSTRIA-HUNGARY—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	121,822,412	12,182,241	1879	14,891,024	1870	8,355,944
1880 } 1889 }	202,430,110	20,243,011	1889	25,328,417	1880	16,128,718
1890 } 1899 }	325,647,572	32,564,757	1899	38,739,000	1890	27,504,032
1900 } 1909 }	439,719,257	43,971,926	1908	49,626,184	1900	39,502,301
1910 } 1912 }	151,031,218	50,343,739	1912	52,521,776	1910	48,649,768

RUSSIA—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	15,555,667	1,555,567	1879	2,874,790	1870	696,673
1880 } 1889 }	43,237,790	4,323,779	1889	6,213,869	1880	3,286,534
1890 } 1899 }	91,966,854	9,196,685	1899	14,311,200	1890	6,085,080
1900 } 1909 }	204,227,251	20,422,725	1909	26,075,086	1900	16,135,600
1910 } 1912 }	83,551,747	27,850,582	1912	30,646,163	1910	24,898,345

BELGIUM—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1870 } 1879 }	146,893,125	14,689,313	1873	15,778,401	1877	13,669,077
1880 } 1889 }	179,771,122	17,977,112	1889	19,869,980	1881	16,873,951
1890 } 1899 }	206,800,233	20,680,023	1898	22,075,093	1893	19,410,519
1900 } 1909 }	231,237,587	23,123,759	1907	23,705,190	1905	21,775,280
1910 } 1912 }	69,942,240	23,314,060	1910	23,916,560	1912	22,972,140

JAPAN—Metric Tons.

Period	Total production	Mean annual production	Year	Maximum	Year	Minimum
1881 } 1889 }	12,808,235	1,423,136	1889	2,388,614	1881	925,198
1890 } 1899 }	45,721,857	4,572,186	1898	6,761,301	1890	2,608,284
1900 } 1909 }	115,283,197	11,528,320	1909	14,973,617	1900	7,429,457
1910 } 1912 }	52,953,789	17,651,263	1912	19,639,755	1910	15,681,324