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SUMMARIZED DATA OF COPPER PRODUCTION

Economic Paper 1

DEPARTMENT OF COMMERCE
WILLIAM F. WHITING, Secretary
BUREAU OF MINES
SCOTT TURNER, DIRECTOR

SUMMARIZED DATA OF COPPER PRODUCTION

BY

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AND
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INTRODUCTION

This publication is the first of a proposed series of economic papers It presents a careful compilation of the records of copper production since the year 1800. Similar analyses of past production of other metals, such as lead, zinc, iron, chromium, manganese, nickel, aluminum, tin, gold, and silver, will follow. Another group of papers on resources is in contemplation, and eventually the bureau hopes to present papers dealing with distribution or industrial flow and ultimate consumption. Economic papers discussing the opportunities for American citizens or corporations to exploit foreign mineral deposits will also be prepared.

This paper shows that the world's production of copper during 127 years, since the beginning of the nineteenth century, amounts to more than 40,000,000 tons. In comparison, all previous production since the beginning of man's utilization of copper—estimated by some as less than a million tons—is relatively insignificant. Of the output since 1800, about 1¼ per cent was produced in the 25-year period between 1801 and 1825; 2½ per cent between 1826 and 1850; 5¾ per cent between 1851 and 1875; 18¾ per cent between 1876 and 1900; and 63½ per cent between 1901 and 1925. About 8¼ per cent was produced during the years 1926 and 1927. This progressively increasing production is indicated graphically in Figure 1.

Compared with the first decade of the nineteenth century, world production of copper for the first decade of the twentieth century had increased fortyfold, and sixty-sevenfold for the succeeding 10 years. (See fig. 2, page 4.) For more than 100 years there has been an average increase of 53 per cent per decade in the rate of production. Only in the period 1919 to 1925 do we find acceleration of world production interrupted.

The past 127 years have witnessed a geographical shift in the production of copper. During the first half of the nineteenth century Europe produced 63 per cent of the world's output; South America furnished 17 per cent, Asia 13 per cent, and North America 5 per cent. During the next 50 years the North American output was 37 per cent of the world total; European production amounted to less than 30 per cent, South American 21 per cent, and the remainder was produced by Australasia, Asia, and Africa. In the first 25 years of the present century North America produced 66

per cent; South America 11 per cent; Europe 10 per cent; and Africa, Asia, and Australasia the remainder. Statistics for 1926–27 indicate that North America still retains first place in world copper

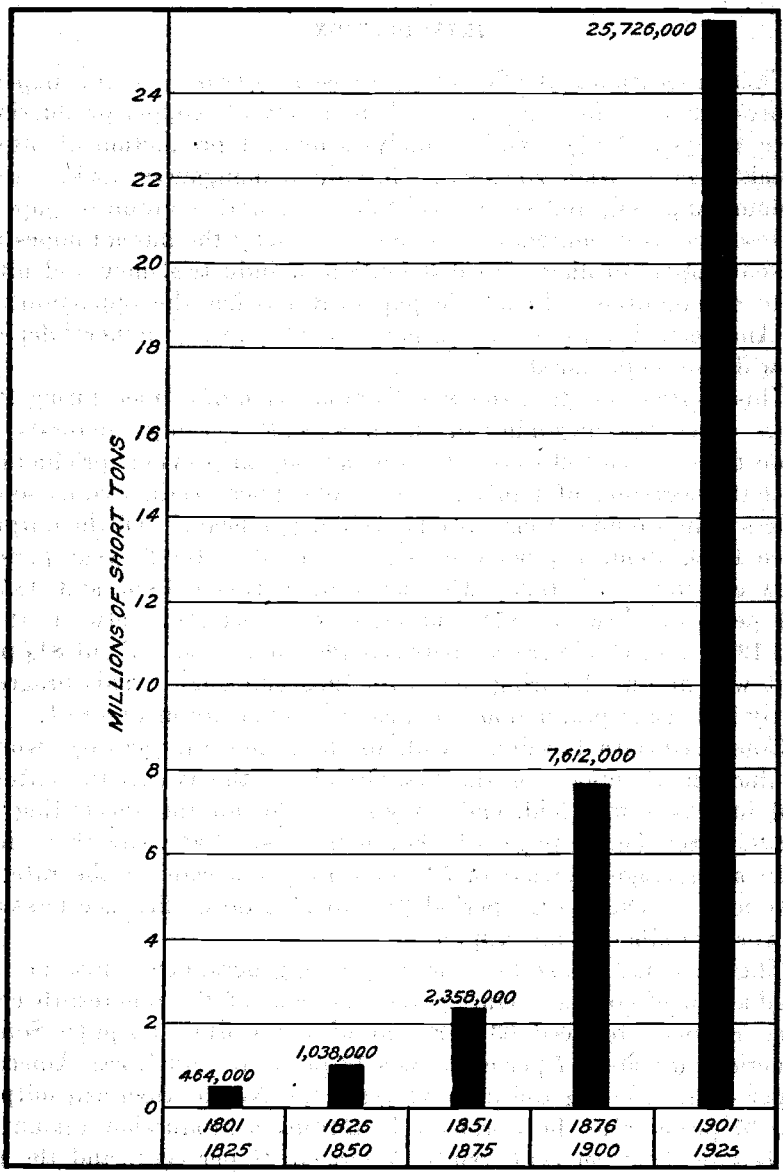

FIGURE 1.—World production of copper, by quarter centuries, 1801–1925

production with 61 per cent, South America second with 18 per cent, Europe third with 8 per cent, Africa fourth with 7 per cent, and Asia fifth with 5 per cent. The increasingly important part played by

the United States in supplying the world with copper is interesting and significant.

The United States has produced more than 19,500,000 tons of copper, or 48 per cent of the world's output since 1800, although the production of this country was negligible prior to 1850. The increase in rate of United States production from 1845 to 1917 was even greater than the increase in world production during the same period.

It is believed that studies of this description by the Bureau of Mines will be appreciated by those engaged in the production or distribution of metals.

SCOTT TURNER, *Director.*

WASHINGTON, *July 9, 1928.*

SUMMARIZED DATA OF COPPER PRODUCTION

By C. E. JULIHN and the staff of the COMMON METALS DIVISION

SOURCES AND SIGNIFICANCE OF PRODUCTION DATA

Because the facts of production illuminate so many aspects of metal economics they are sought by many people studying a great variety of problems. Mine accountants and managers, company presidents and stockholders, commercial and governmental agencies, technical and trade journals, associations of producers, and various professional and scientific societies demand sundry reports of production at brief intervals. At the end of each year estimates of the quantities of metals produced are made promptly, and corrected figures follow a few months later. The fact that such importance is attached to current production data might indicate that the long-time record of production would be studied also. This, however, is not the case.

For such studies the facts of production from at least the early years of the nineteenth century are desirable, as they serve to link the steadily expanding production of that century with the relatively small production of all previous centuries; but for most of the metals no such record is available. Details of world production of most metals previous to the middle of the last century are decidedly sketchy, and even subsequent to that time the record leaves much to be desired.

In 1883 the first volume of Mineral Resources of the United States, covering our domestic production for 1882, was published. Since 1882 records on the production of metals by the United States have been carefully compiled in Mineral Resources, but foreign production has been given less attention. For some years the compilation of copper production issued by Henry R. Merton & Co. (Ltd.), of London, was accepted for all foreign countries by Mineral Resources, and until 1914 the Merton figures were adopted with only slight changes.

Likewise, the Metallgesellschaft and the Metallurgische Gesellschaft, of Frankfort, began compiling statistics only in the latter part of the last century and for some years used the Merton figures for copper.

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The Imperial Mineral Resources Bureau of London and the American Bureau of Metal Statistics of New York were established even more recently.

The first Copper Handbook, issued by Horace Stevens in 1900, contains some very interesting observations on world production of copper. They are based upon data, compiled by R. Gervase Elwas, that appeared in the London Financial News of January, 1900.

About the same time, A Century of Copper, by Nicol Brown and Charles C. Turnbull, was published in London. This valuable compilation has been used in this report as the source of "Production by decades" previous to the year 1881.

Study of the long-time aspects of metal production is rendered especially difficult by the resemblance of the record to a mosaic, the fragments of which are characterized by the different units of weight used. Consequently, the facts often can not be obtained without spending more effort in the conversion of figures from one unit to another than would be practicable.

The present paper does not attempt to discover and publish data that have lain hidden in musty records. Changes that might be made in the production record through such research would be of slight practical importance. The service undertaken here merely includes: (1) A systematic review of recognized sources of information; (2) the selection of data that appear to be acceptable and reasonably accurate; (3) the conversion of figures, when necessary, from long tons, pounds, or metric tons to a single unit, the short ton—the short ton is the only unit of weight used throughout this paper; (4) orderly arrangement of the information obtained; and (5) illustration of the information by suitable diagrams and a few brief comments.

ACKNOWLEDGMENTS

The senior author acknowledges the extensive assistance rendered in the preparation of this paper by Elmer W. Pehrson, mineral economist, and Lewis A. Smith, associate mineral economist, and the cordial cooperation of all other members of the common metals division.

To Scott Turner, director of the Bureau of Mines, and C. P. White, chief of the economics branch, thanks are due for suggestions, assistance, and appreciation of the importance of the task of bringing together the fundamental data of mineral production.

WORLD PRODUCTION—TOTAL AMOUNTS AND RATES OF INCREASE

A general summary of copper production suitable for study from many viewpoints can be combined in a single table. (See Table 26, p. 32.) The several aspects of such a subject, however, are difficult to fully grasp at one time. Accordingly, the data have been selected

for presentation in a number of separate tables, each of which shows some single aspect of copper production. Table 1 shows world production of copper by decades.

TABLE 1.—*World production of copper, by decades, 1801–1920 (short tons)*

[The short ton is the only unit of weight used in this paper]

Period	Production	Annual average	Increase in annual average	
			Quantity (tons)	Per cent
1801–1810	182,000	18,200		
1811–1820	188,496	18,850	650	3.6
1821–1830	273,504	27,350	8,500	45.1
1831–1840	364,448	36,445	9,095	33.3
1841–1850	493,808	49,381	12,936	35.5
1801–1850	1,502,256			
1851–1860	759,079	75,908	26,527	53.7
1861–1870	1,149,344	114,934	39,026	51.4
1871–1880	1,423,744	142,374	27,440	23.9
1881–1890	2,488,591	248,859	106,485	74.8
1891–1900	4,149,353	414,935	166,076	66.7
1851–1900	9,970,111			
1801–1900	11,472,367			
1901–1910	7,628,334	762,833	347,898	83.8
1911–1920	12,187,341	1,218,734	455,901	59.8

52.8 per cent average increase per decade for 100 years

Table 1 shows a constantly expanding ratio of production for more than a century. The increase in the rate of production averaged nearly 53 per cent each decade through the 100 years ending with 1920.

The table shows that during the first half of the nineteenth century nearly three (2.7) times as much copper was produced in the fifth decade as in the first. Yet the production of the second half of the century was more than six (6.65) times that of the first half.

During the first decade of the present century, however, the production was two-thirds as great as that of the entire nineteenth century, and the production of the second decade exceeded the total production of the previous century by nearly a million tons. In the latter decade the production was sixty-five times as great as that of the second decade of the nineteenth century. As shown by Figure 2, the increase in production followed a geometric curve.

Table 2 shows world production of copper by five-year periods.

TABLE 2.—*World production of copper, by five-year periods, 1881–1925 (short tons)*

5-year period	Production	Annual average	Increase in annual average	
			Quantity (tons)	Per cent
1881–1885	1,105,809	221,162		
1886–1890	1,382,782	276,556	55,394	25.0
1891–1895	1,726,305	345,261	68,705	24.8
1896–1900	2,423,048	484,610	139,349	40.4
1901–1905	3,357,378	671,476	186,866	38.6
1906–1910	4,270,956	854,191	182,715	27.2
1911–1915	5,366,397	1,073,279	219,088	25.6
1916–1920	6,820,944	1,364,189	290,910	27.1
1921–1925	5,916,731	1,182,146	−182,043	−13.3

29.8 per cent average increase per 5-year period

The outstanding feature of Table 2 is the appearance of a five-year period (1921–1925) during which there was a recession in the amount of production. During each of seven equal periods preceding it the average increase in production had amounted to about 30 per cent

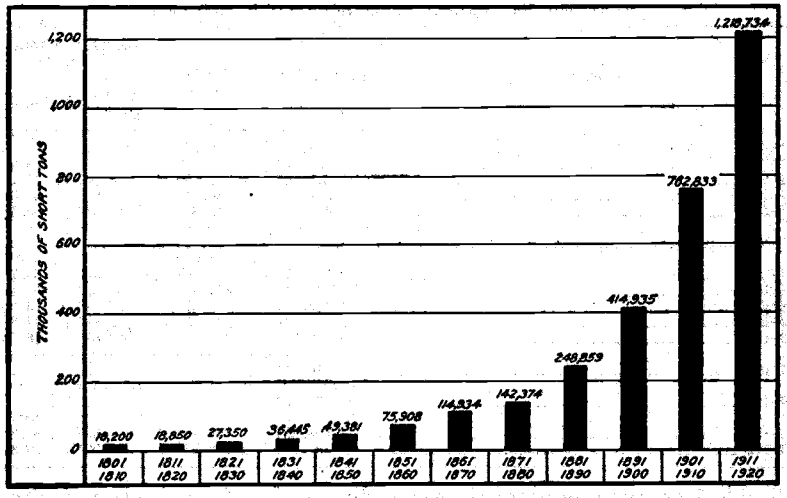


FIGURE 2.—Average annual world production of copper, by decades, 1801–1920

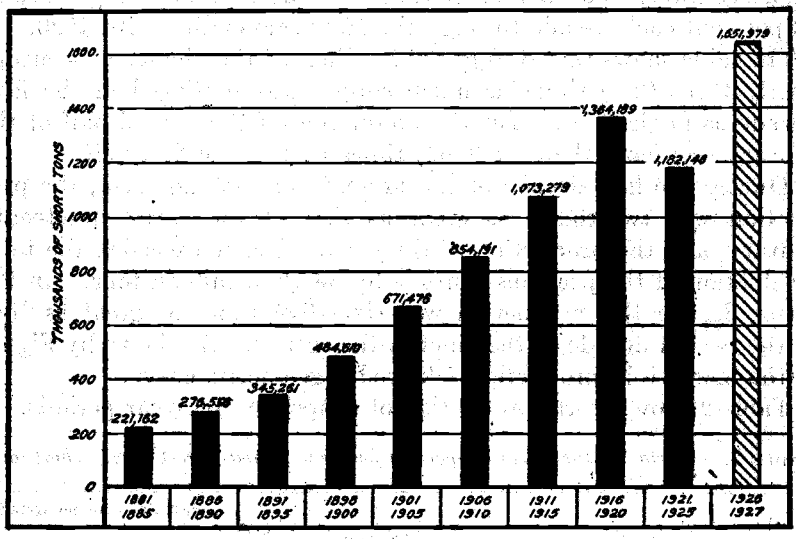


FIGURE 3.—Average annual world production of copper, by five-year periods, 1881–1925, and that of 1926–27

(29.8), but for all of the five-year periods shown (1881–1925) the average increase per five-year period was 24.4 per cent.

Figure 3 covers the average production of 1926–27, indicating unmistakably a resumption of production increase at something like its former rate.

Table 3, presenting the total amount of world production by years, shows that the increase was remarkably steady until it was disturbed by the World War. A decided rise in the amount of production during 1916, 1917, and 1918 was followed by an even more decided reaction. Recovery from the latter was relatively slow, and the prewar trend was resumed only in 1926 after 11 years of disturbance.

TABLE 3.—*World production of copper, by years, 1881–1927 (short tons)*

Year	Production	Year	Production	Year	Production	Year	Production
1881	181,342	1893	334,928	1905	778,841	1917	1,575,281
1882	202,036	1894	353,493	1906	797,777	1918	1,574,256
1883	224,306	1895	368,963	1907	794,704	1919	1,095,617
1884	245,005	1896	422,838	1908	820,104	1920	1,057,168
1885	253,120	1897	454,531	1909	912,241	1921	614,636
1886	241,089	1898	480,904	1910	946,130	1922	934,927
1887	250,538	1899	519,336	1911	980,761	1923	1,354,796
1888	294,803	1900	545,439	1912	1,102,569	1924	1,479,377
1889	291,018	1901	580,011	1913	1,090,629	1925	1,526,995
1890	305,334	1902	615,052	1914	1,027,051	1926	1,629,140
1891	316,672	1903	656,482	1915	1,165,447	1927 [1]	1,674,818
1892	352,249	1904	726,992	1916	1,518,622		

[1] American Bureau of Metal Statistics, 1927.

Figure 4 shows annual world production by years, with a trend line, *a–b*, based on a moving average of five years, to the year 1913, after which its dotted projection, *b–c*, is merely extended to meet the production curve at 1926. Apparently the course of this projection might suggest the minimum expectancy of copper production during the next few years. If this were so, production would exceed 1,800,000 short tons a year by 1930. It should not be assumed, however, that the existing rate of increase in copper production can persist for many more years. Since 1800 the increase in copper production has averaged 180 per cent each quarter century, amounting finally to 25,726,000 tons for the quarter 1901–1925. Such a rate of increase, if continued, would require a production of 72,000,000 tons for 1926–1950, 200,000,000 tons for 1951–1975, and 565,000,000 tons for 1976–2000, a total of 862,000,000 tons for the twentieth century in contrast to less than 12,000,000 tons for the nineteenth. Of course, the known world resources of copper would be inadequate to meet any such demand.

Table 4 gives the monthly production and the average daily rate of production, by months, during the last three years, as reported by a responsible commercial agency. This is the most prompt estimate of world production of copper that becomes available to the public.

The average annual increase for the brief period shown amounts to 58,735 tons, which is less than the average yearly increase for any five-year period since 1890 with the exception of the period 1921–1925, when production actually decreased. This suggests that the rapid geometrical rate of increase in production is now tending to diminish.

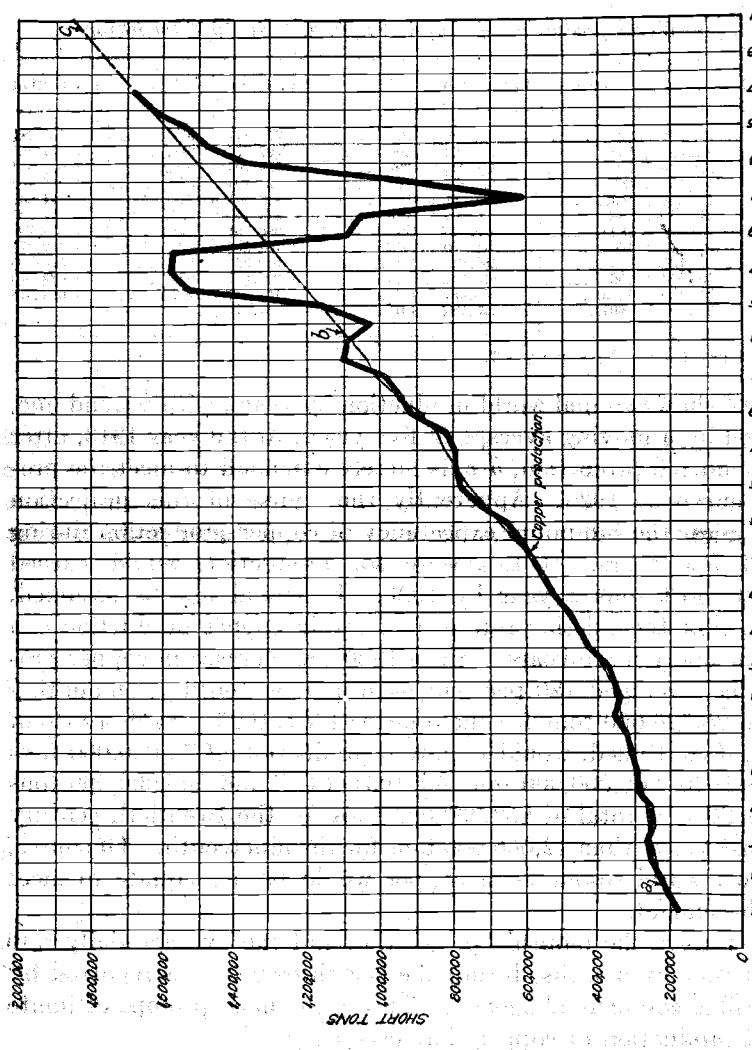


FIGURE 4.—World production of copper, by years, 1881–1927, with a trend line of five-year moving average (1881–1913) extended to meet production curve at 1926

TABLE 4.—*Reported* [1] *production of copper, by months, with average daily rates for 1925, 1926, and 1927* [2] *(short tons)*

Month	1925		1926		1927	
	Monthly production	Daily rate	Monthly production	Daily rate	Monthly production	Daily rate
January	130,310	4,204	129,518	4,178	143,337	4,624
February	122,975	4,392	136,455	4,516	132,870	4,745
March	135,359	4,366	134,727	4,346	136,347	4,398
April	124,510	4,130	136,938	4,565	135,729	4,524
May	126,236	4,072	136,468	4,402	139,114	4,488
June	125,685	4,189	124,100	4,137	134,243	4,475
July	124,926	4,030	124,483	4,016	132,186	4,264
August	122,618	3,955	128,568	4,147	135,015	4,355
September	125,206	4,174	132,013	4,400	133,291	4,443
October	138,234	4,459	136,600	4,406	145,278	4,686
November	133,007	4,434	148,321	4,944	141,975	4,733
December	131,809	4,252	142,300	4,590	148,961	4,805
Total	1,540,875		1,600,491		1,[illegible]16	
Monthly average	128,406	4,222	133,374	4,385	138,[illegible]90	4,543

[1] Reports cover all but about 3,000 tons a month.
[2] American Bureau of Metal Statistics, Jan. 17, 1928.

WORLD PRODUCTION BY CONTINENTS AND COUNTRIES

Table 5 shows that world production of copper for the 127 years 1801–1927, inclusive, was over 40,000,000 tons, nearly 23,000,000 tons or 56 per cent of which were derived from North America. Europe produced nearly 7,000,000 tons, about 17 per cent; South America nearly 6,000,000 tons, or more than 14 per cent; Asia nearly 2,500,000 tons, about 6 per cent; Australasia nearly 1,500,000 tons, about 3.5 per cent; and Africa over 1,200,000 tons, or nearly 3 per cent.

TABLE 5.—*Total world production of copper, 1801–1927 (short tons)*

Country	Quantity	Per cent of total	Country	Quantity	Per cent of total
North America:			Europe—Continued.		
United States	19,615,965	48.431	Other European countries	298,810	0.738
Mexico	1,584,066	3.911	Total, Europe	6,837,979	16.883
Canada	1,101,753	2.720			
Newfoundland	81,205	.200	Asia:		
Cuba	339,250	.838	Japan	2,442,226	6.030
Total, North America	22,722,239	56.100	Turkey	16,093	.040
South America:			China	7,529	.019
Chile	4,545,827	11.224	India	21,299	.052
Peru	872,033	2.153	Cyprus	3,367	.008
Bolivia	220,752	.545	Total, Asia	2,490,507	6.149
Argentina	24,404	.060			
Venezuela	145,951	.360	Africa:		
Total, South America	5,808,967	14.342	Southern Africa	474,620	1.172
Europe:			Belgian Congo	689,485	1.702
Spain and Portugal	2,824,169	6.973	Rhodesia	39,185	.097
England	977,981	2.415	Algeria	7,620	.019
Germany	1,316,138	3.250	Total, Africa	1,210,910	2.990
Russia	879,828	2.172			
Finland	5,848	.014	Australasia	1,427,720	3.525
Sweden	176,649	.436			
Norway	208,690	.515	Other countries (1927)	4,409	.011
Italy	142,348	.351			
France	7,518	.019	World total	40,498,322	100.000

Considering the production of individual countries, it is of interest that the United States produced nearly half (48.4 per cent) of the total; that Chile with about 11 per cent, Spain–Portugal with 7 per cent, and Japan with 6 per cent furnished nearly a quarter (24.2 per cent) of the total; and that four other countries—Mexico with 3.9 per cent; Germany, 3.2 per cent; Canada, 2.7 per cent; and England,

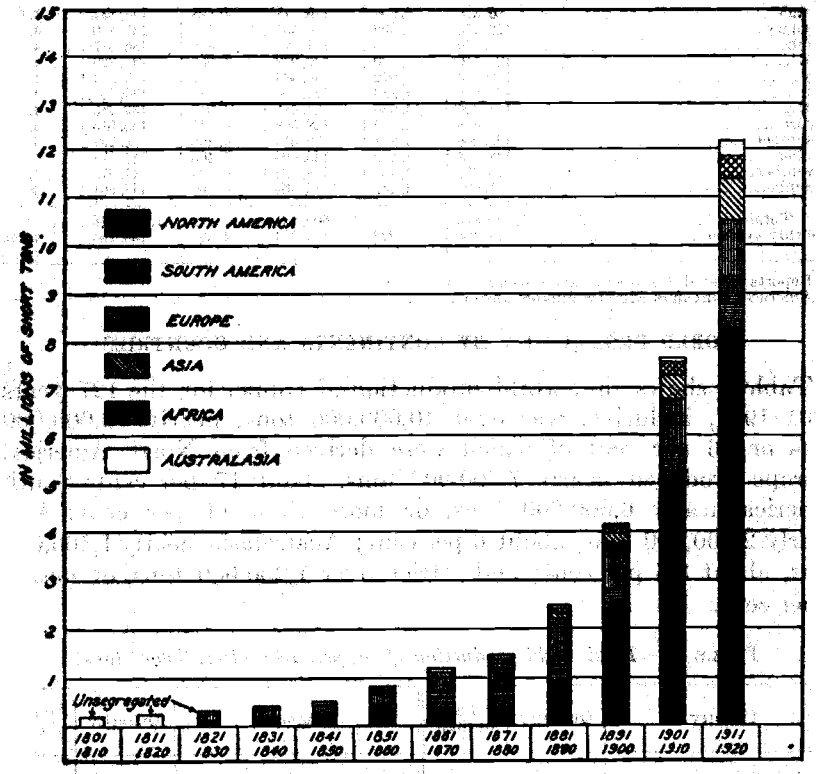


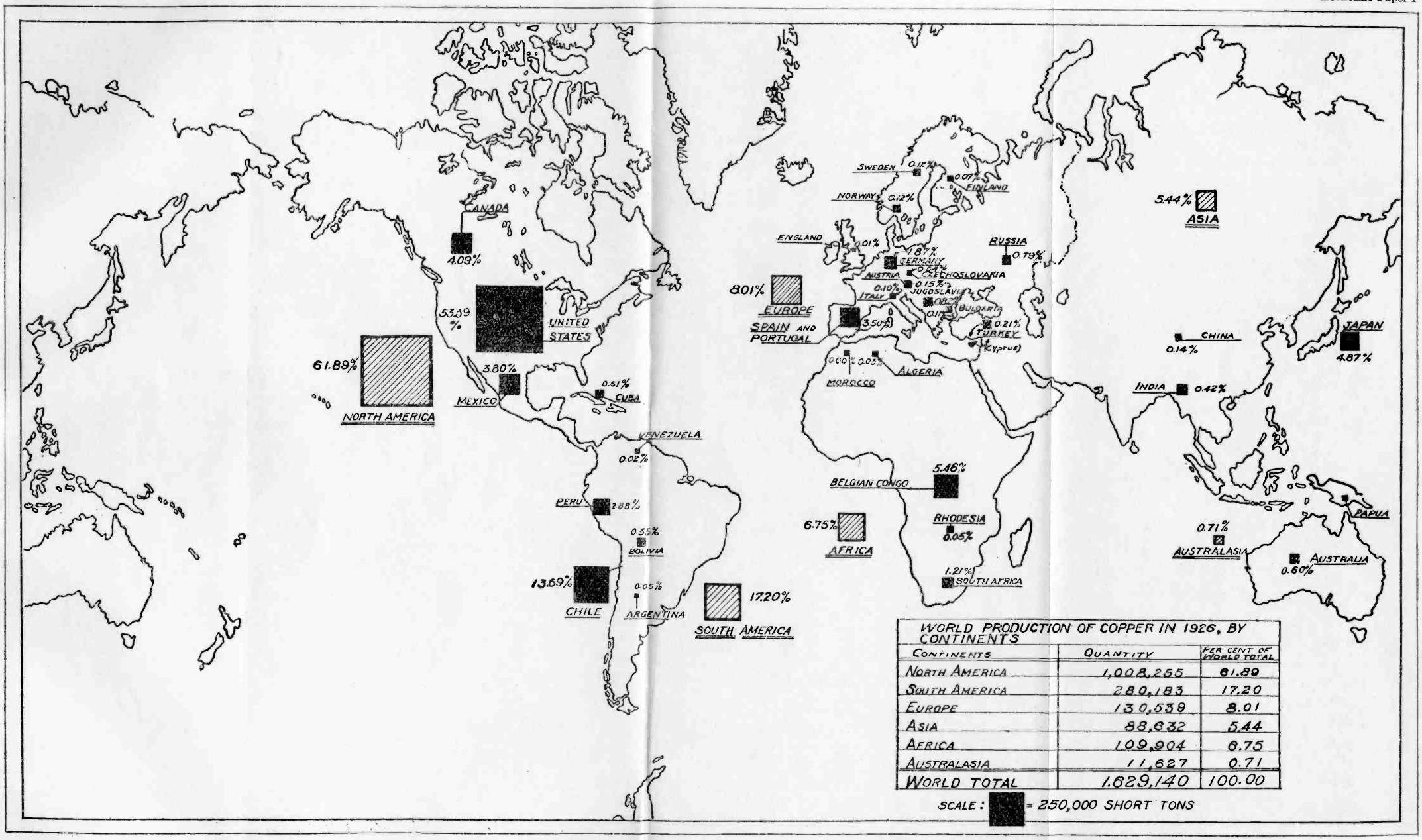
FIGURE 5.—Production of copper, by continents, 1801–1920

2.4 per cent—produced an additional 12 per cent in all, so that only 15 per cent was derived from the rest of the world.

The change in relative importance of the continents in copper production is shown in Table 6, in which various periods are compared, and in Figure 5, which shows production of continents by decades from 1801 to 1920. (See also Table 26.)

TABLE 6.—*Production of continents compared for various periods*

Period	Number of years	World (quantity)	North America		South America		Europe	
			Quantity	Per cent	Quantity	Per cent	Quantity	Per cent
1801–1850	50	1,502,256	77,482	5.16	260,512	17.34	949,559	63.21
1851–1900	50	9,976,111	3,718,376	37.29	2,097,791	21.04	2,961,006	29.70
1901–1925	25	25,726,406	16,920,711	65.77	2,845,801	11.07	2,658,096	10.33
1926–1927	2	3,299,549	2,005,670	60.79	604,368	18.33	269,318	8.16
1801–1927	127	40,498,322	22,722,239	56.10	5,808,967	14.34	6,837,979	16.88



WORLD PRODUCTION OF COPPER IN 1926, BY CONTINENTS

CONTINENTS	QUANTITY	PER CENT OF WORLD TOTAL
NORTH AMERICA	1,008,255	61.89
SOUTH AMERICA	280,183	17.20
EUROPE	130,539	8.01
ASIA	88,632	5.44
AFRICA	109,904	6.75
AUSTRALASIA	11,627	0.71
WORLD TOTAL	1.629,140	100.00

SCALE: ■ = 250,000 SHORT TONS

FIGURE 6.—Map showing world production of copper, by continents and countries, 1926. Hatched area represents continental production; black area represents production by countries

TABLE 6.—*Production of continents compared for various periods*—Continued

Period	Asia		Africa		Australasia	
	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent
1801–1850	197, 120	13. 12			17, 584	1. 17
1851–1900	487, 441	4. 89	200, 623	2. 01	504, 873	5. 06
1901–1925	1, 641, 342	6. 38	779, 620	3. 03	880, 836	3. 42
1926–1927	164, 604	4. 99	230, 667	6. 99	24, 427	0. 74
1801–1927	2, 490, 507	6. 15	1, 210, 910	2. 99	1, 427, 720	3. 52

From 1801 to 1850 Europe ranked first, producing 63.21 per cent of the world total; South America, second, with 17.34 per cent; Asia, third, with 13 per cent; and North America, fourth, with 5 per cent. Production from Australasia and Africa was still relatively insignificant. While Europe, South America, and Asia were continuous and steadily increasing producers, North America began production only in the third decade and Australasia showed no production until the fifth decade.

During the second 50-year period North and South America showed increases in production, while Europe showed a less rapid increase. North America produced 37.29 per cent of the world total; Europe, 29.70 per cent; and South America, 21.04 per cent. Australasia, Asia, and Africa produced 5.06, 4.89, and 2.01 per cent, respectively. Near the end of the nineteenth century Africa showed a substantial production for the first time.

For the first quarter of the present century North America attained a position comparable to that of Europe during the first half of the nineteenth century by producing 65.77 per cent of the world total. South America gained the second position, producing 11.07 per cent of the world total, while Europe dropped to 10.33 per cent. Africa and Asia increased their proportions of the world total, while Australasia dropped in production.

The 1926–27 figures show that North America declined slightly in production to 60.79 per cent, while South America materially strengthened its hold on the second position with 18.33 per cent of the world total. Europe, with a production of 8.16 per cent, held third position but was almost equalled by Africa with 6.99 per cent of the world total. Asia, with 4.99 per cent, continued to hold fifth position, and Australasia declined to relative insignificance with 0.7 per cent of the total.

Figure 6 shows the distribution of production for the year 1926.

Table 7 contrasts the production made by continents and countries during the whole of the nineteenth century with that made during the first quarter of the twentieth century. (See also figs. 7 and 8.) It also compares the average annual production of continents and countries during the latter period with the production of 1926. (See also figs. 9 and 10.)

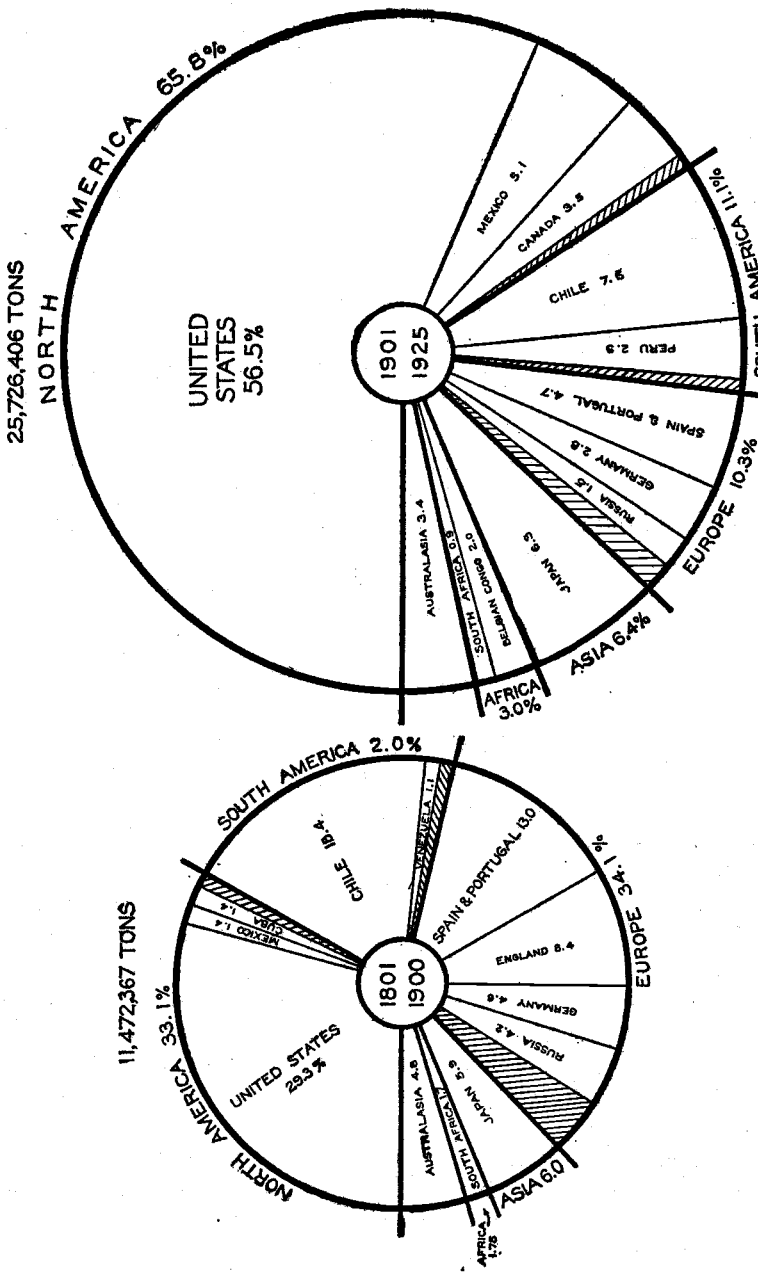


FIGURE 7.—Distribution of world production of copper for the nineteenth century contrasted with that of the first quarter of the twentieth century. Miscellaneous production of continents is shown by hatching.

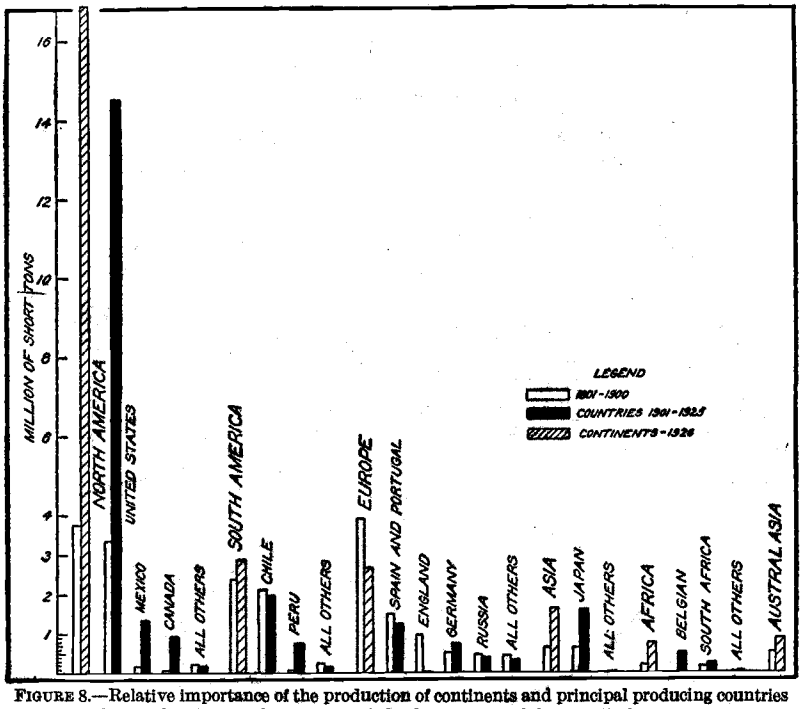


FIGURE 8.—Relative importance of the production of continents and principal producing countries during the nineteenth century and the first quarter of the twentieth century

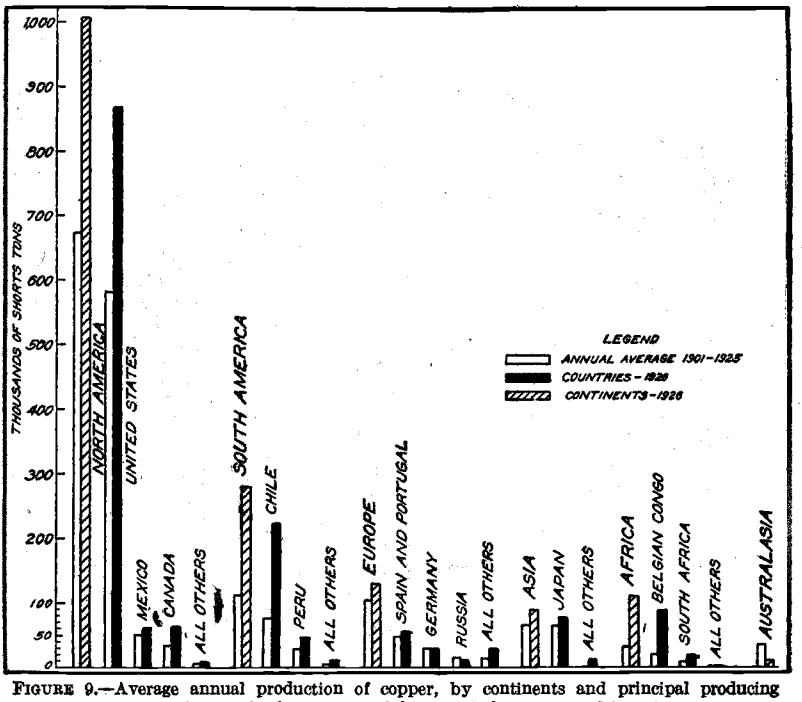


FIGURE 9.—Average annual production of copper, by continents and principal producing countries, for the first quarter of the twentieth century and for 1926

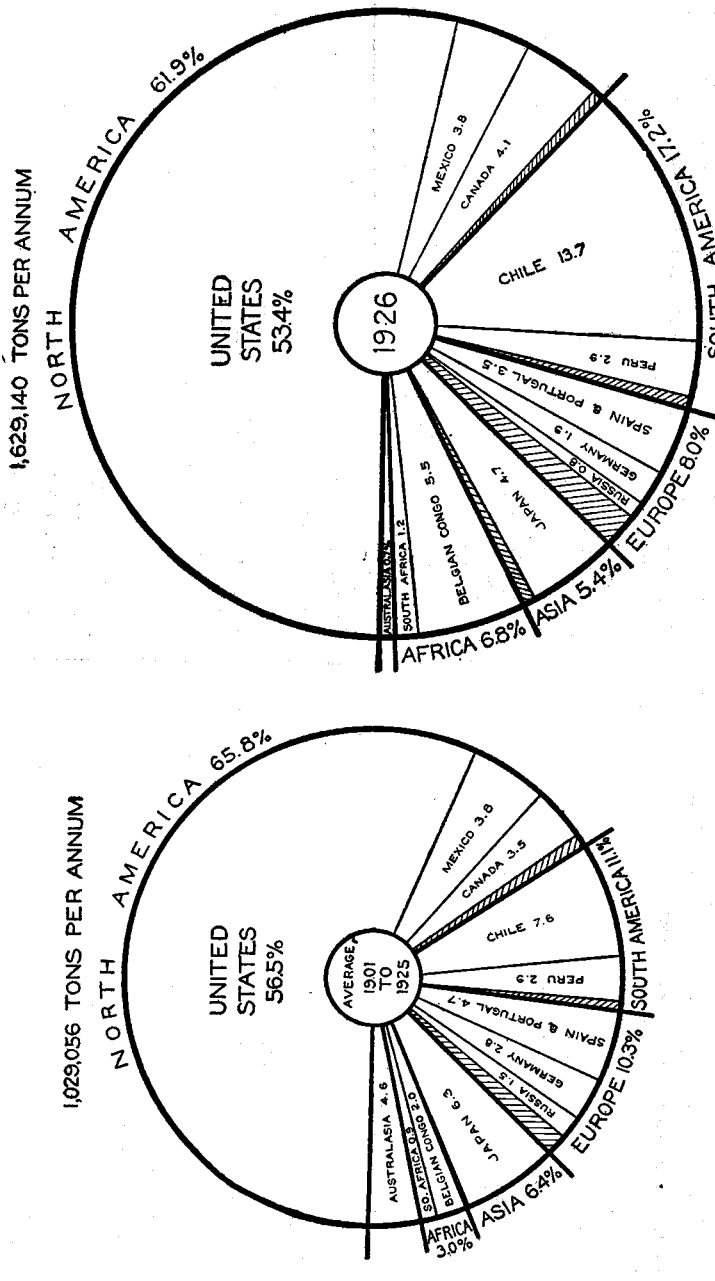


FIGURE 10.—Contrast by continents and countries of the average annual production of the first quarter of the twentieth century and of 1926. Miscellaneous production of continents is shown by hatching

TABLE 7.—*World production by continents and countries for the nineteenth century, first quarter of twentieth century, 1926, and 1927 (short tons)*

Country	Nineteenth century, 1801–1900, inclusive		First quarter of twentieth century, 1901–1925, inclusive			1926		1927	
	Quantity	Per cent of total	Quantity	Average per annum	Per cent of total	Quantity [1]	Per cent of total	Quantity [1]	Per cent of total
North America:									
United States	3,356,472	29.26	14,542,269	581,691	56.53	869,805	53.39		
Mexico	159,918	1.39	1,298,438	51,938	5.05	61,950	3.80		
Canada	69,805	.61	894,702	35,788	3.48	66,548	4.09		
Newfoundland	52,997	.46	28,208	1,128	.11				
Cuba	156,666	1.37	157,094	6,284	.61	9,952	.61		
Total, North America	3,795,858	33.09	16,920,711	676,828	65.77	1,008,255	61.89	[2] 997,415	59.71
South America:									
Chile	2,112,773	18.42	1,945,797	77,832	7.56	[2] 223,015	13.69		
Peru	38,232	.33	734,503	29,380	2.86	46,860	2.88		
Bolivia	60,730	.53	143,195	5,728	.56	8,977	.55		
Argentina	18,981	.17	5,092	204	.02	[2] 331	.02		
Venezuela	127,587	1.11	17,214	689	.07	1,000	.06		
Total, South America	2,358,303	20.56	2,845,801	113,832	11.07	280,183	17.20	[2] 324,680	19.44
Europe:									
Spain and Portugal	1,488,768	12.98	1,218,032	48,721	4.73	57,018	3.50		
England	968,587	8.44	9,273	371	.04	121	.01		
Germany	529,232	4.61	725,080	29,003	2.82	30,520	1.87		
Russia	477,141	4.16	376,633	15,065	1.46	12,827	.79		
Finland			4,756	190	.02	1,092	.07		
Sweden	119,341	1.04	55,381	2,215	.22	1,927	.12		
Norway	115,931	1.01	72,690	2,908	.28	6,842	.42		
Italy	88,729	.77	51,975	2,079	.20	1,644	.10		
France			5,038	202	.02				
Austria-Hungary	122,836	1.07	57,956	2,318	.23	[3] 2,467	.15		
Serbia			35,825	1,433	.14	[4]			
Jugoslavia			39,406	1,576	.15	13,338	.82		
Bulgaria			5,289	212	.02	1,874	.11		
Czechoslovakia						661	.04		
Rumania			762	30	.01	208	.01		
Total, Europe	3,910,565	34.08	2,658,096	106,324	10.33	130,539	8.01	[2] 138,779	8.31
Asia:									
Japan	681,331	5.94	1,614,873	64,595	6.28	76,150	4.67		
Turkey	3,230	.03	12,863	515	.05	[5] 3,369	.21		
China			5,241	210	.02	2,279	.14		
India			8,365	335	.03	6,834	.42		
Total, Asia	684,561	5.97	1,641,342	65,654	6.38	88,632	5.44	[2] 75,972	4.55
Africa:									
South Africa	196,978	1.72	236,448	9,458	.92	19,626	1.21		
Algeria	3,645	.03	2,844	114	.01	539	.03		
Belgian Congo			502,923	20,117	1.96	88,889	5.46		
Rhodesia			37,405	1,496	.15	800	.05		
Morocco						50	.00		
Total, Africa	200,623	1.75	779,620	31,185	3.03	109,904	6.75	[2] 120,763	7.22
Total, Australasia	522,457	4.55	880,836	35,233	3.42	11,627	.71	[2] 12,800	.77
World total	11,472,367	100.00	25,726,406	1,029,056	100.00	1,629,140	100.00	[2]1,670,409	100.00

[1] All figures from Mineral Resources, mine production, except for the United States where smelter production is used.
[2] American Bureau of Metal Statistics, 1927 Yearbook.
[3] Austria only.
[4] Serbia now included in Yugoslavia.
[5] Cyprus.

PRINCIPAL COPPER-PRODUCING COUNTRIES

The following brief resumé of production from each of the principal copper-producing countries concludes the present treatment of copper production. A subsequent paper on sources and resources of copper will contain an account of the principal copper-producing districts and mines.

UNITED STATES

The increase in copper production in the United States during the latter part of the nineteenth century and the first part of the twentieth century was even more remarkable than the large increase in world production. During the six decades ending with 1920 the average increase per decade in world production was 60.1 per cent. During the same period the average increase in the United States production was 145.8 per cent.

The United States began to produce copper in the decade ending with 1850; the quantity produced was less than 1 per cent of the world total. Following that decade, however, the increase was rapid up to the end of the nineteenth century, during the last decade of which the United States produced about 52 per cent of the world total. Since then the relation of the United States production to that of the world has remained fairly constant. The United States production is 48.4 per cent of the total world production from 1801 to 1927, inclusive.

United States production by decades, by five-year periods, and by years is shown in Tables 8, 9, and 10 and Figures 11 and 12.

TABLE 8.—*Smelter production of copper in the United States by decades (short tons)*

Period	Production	Annual average	Increase in annual average	
			Amount, tons	Per cent [1]
1845–1850	2,688	448		
1851–1860	41,496	4,150	3,702	826.3
1861–1870	109,252	10,925	6,775	163.3
1871–1880	210,560	21,056	10,131	92.7
1881–1890	820,404	82,040	60,984	289.6
1891–1900	2,174,356	217,436	135,396	165.0
1901–1910	4,281,715	428,172	210,736	96.9
1911–1920	7,160,559	716,056	287,884	67.2

[1] Average annual increase per decade for the last six decades is 145.8 per cent.

TABLE 9.—*Smelter production of copper in the United States by five-year periods, 1846–1925*

Period	Total, short tons	Annual average, short tons	Period	Total, short tons	Annual average, short tons
1846–1850	2,576	515	1886–1890	526,067	105,213
1851–1855	10,360	2,072	1891–1895	846,638	169,328
1856–1860	31,136	6,227	1896–1900	1,327,718	265,544
1861–1865	46,980	9,396	1901–1905	1,830,473	366,095
1866–1870	62,272	12,454	1906–1910	2,451,242	490,248
1871–1875	85,680	17,136	1911–1915	3,051,566	610,313
1876–1880	124,880	24,976	1916–1920	4,108,993	821,799
1881–1885	294,337	58,867	1921–1925	3,099,996	619,999

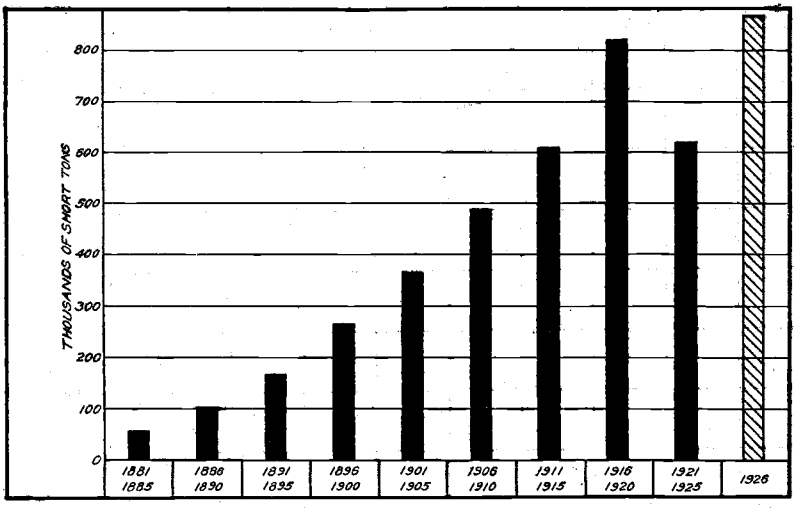


FIGURE 11.—Average annual production of copper in the United States, by five-year periods, 1881–1926

TABLE 10.—*Annual smelter production of copper in the United States, 1845–1927*

Year	Quantity, short tons	Year	Quantity, short tons	Year	Quantity, short tons	Year	Quantity, short tons
1845	112	1866	9,968	1887	90,734	1908	471,285
1846	168	1867	11,200	1888	113,181	1909	546,476
1847	336	1868	12,992	1889	113,388	1910	540,080
1848	560	1869	14,000	1890	129,882	1911	548,616
1849	784	1870	14,112	1891	142,061	1912	621,634
1850	728	1871	14,560	1892	172,499	1913	612,242
1851	1,008	1872	14,000	1893	164,677	1914	575,069
1852	1,232	1873	17,360	1894	177,094	1915	694,005
1853	2,240	1874	19,600	1895	190,307	1916	963,925
1854	2,520	1875	20,160	1896	230,031	1917	943,060
1855	3,360	1876	21,280	1897	247,039	1918	954,267
1856	4,480	1877	23,520	1898	263,256	1919	643,210
1857	5,376	1878	24,080	1899	284,333	1920	604,531
1858	6,160	1879	25,760	1900	303,059	1921	252,798
1859	7,056	1880	30,240	1901	301,036	1922	475,143
1860	8,064	1881	35,840	1902	329,754	1923	717,500
1861	8,400	1882	45,323	1903	349,022	1924	817,125
1862	10,580	1883	57,763	1904	406,269	1925	837,435
1863	9,520	1884	72,473	1905	444,392	1926	869,811
1864	8,960	1885	82,938	1906	458,903	1927	842,020
1865	9,520	1886	78,882	1907	434,498		

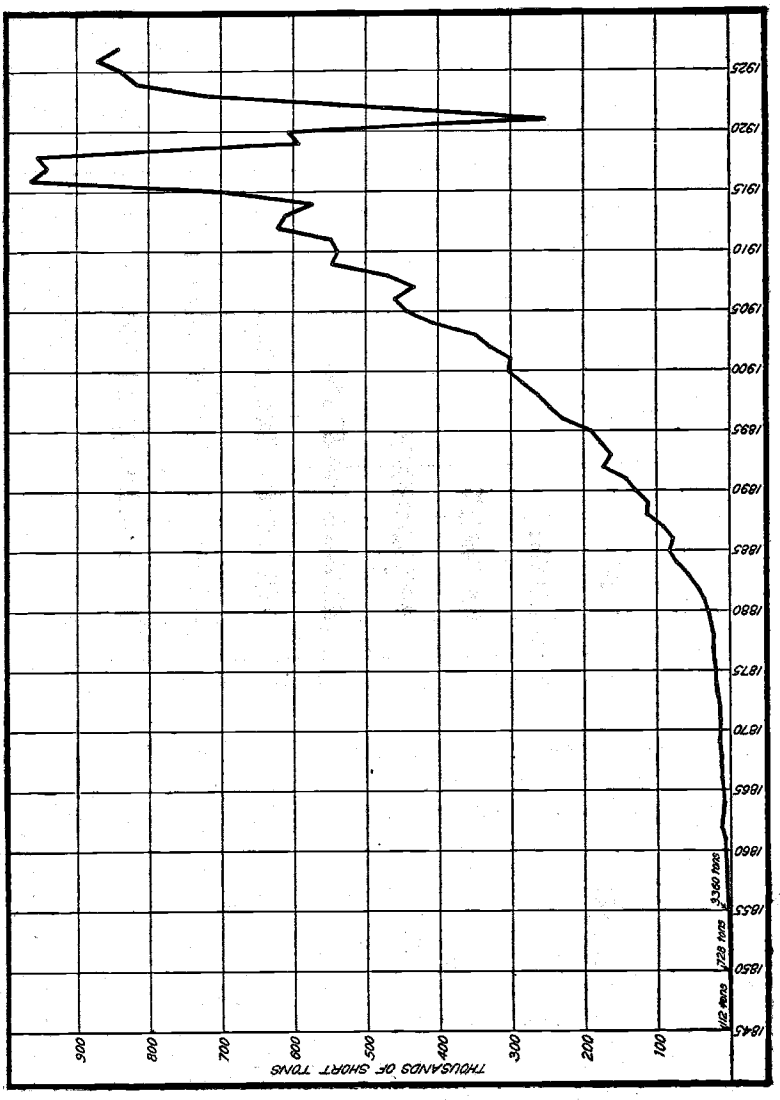


FIGURE 12.—Annual smelter production of copper in the United States, 1845–1927

The first important copper production in the United States came from the Lake Superior district in Michigan. This State continued to be the most important source until 1887, when it was surpassed by Montana. In 1907 Arizona became the leading producer and with the exception of one year has held that position to date. Utah became the fourth largest producer of copper in 1903 and in 1926 ranked second. Table 11 shows the relative rank of States in copper production for various periods.

TABLE 11.—*Smelter production of copper in the United States, by States, for various periods, showing rank and percentage of total production*

Rank	1845–1900		1901–1925		1926		1845–1926	
	State	Per cent	State	Per cent	State	Per cent	State	Per cent
1	Michigan	39.90	Arizona	34.25	Arizona	41.93	Arizona	31.06
2	Montana	33.06	Montana	22.06	Utah	14.92	Montana	24.58
3	Arizona	14.54	Michigan	16.59	Montana	14.78	Michigan	20.46
4	California	1.83	Utah	10.78	Michigan	10.05	Utah	9.21
5	Undistributed	1.71	Nevada	4.10	Nevada	6.27	Nevada	3.48
6	Colorado	1.62	Alaska	3.28	New Mexico	4.76	New Mexico	2.77
7	Tennessee	.93	New Mexico	3.20	Alaska	3.89	Alaska	2.72
8	Utah	.91	California	2.81	California	1.75	California	2.59
9	New Mexico	.40	Tennessee	1.40	Tennessee	1.07	Tennessee	1.30
10	Idaho	.06	Colorado	.68	Colorado	.27	Colorado	.83
11	Nevada	.04	Idaho	.43	Undistributed	.24	Undistributed	.65
12			Undistributed	.43	Idaho	.07	Idaho	.34

Table 12 summarizes the amount of copper produced by States in various periods.

TABLE 12.—*Smelter production of copper in the United States, by States (short tons)*

Period	Alaska		Arizona		California		Colorado		Idaho		Michigan		Montana	
	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent
1845–1875			1,427	0.60	10,425	4.36	984	0.41	4		196,130	82.02	106	0.04
1876–1880			5,842		1,206		1,403				104,836		1,491	
1881–1885			49,650		2,136		3,345		44		158,880		73,032	
1886–1890			65,779		1,888		4,694		147		216,503		222,706	
1891–1895			107,340		3,478		17,094		918		296,833		401,862	
1896–1900			258,498		42,168		26,820		925		370,080		578,989	
1876–1900			487,109	15.61	50,876	1.63	53,416	1.71	2,034	0.07	1,144,132	36.67	1,278,080	40.97
1845–1900			488,536	14.54	61,301	1.83	54,400	1.62	2,038	.06	1,340,262	39.90	1,278,186	38.06
1901–1905	4,142	0.23	408,415	22.31	60,855	3.32	20,647	1.13	5,484	.30	478,948	26.17	702,934	38.40
1906–1910	14,264	.58	698,614	28.50	100,411	4.10	28,081	1.15	19,758	.80	559,793	22.84	684,726	27.93
1911–1915	86,673	2.84	940,861	30.83	83,644	2.74	20,698	.68	16,250	.53	500,989	16.42	685,702	22.47
1916–1920	194,146	4.72	1,636,454	39.83	83,928	2.04	18,179	.44	12,710	.31	550,238	13.39	654,413	15.93
1921–1925	177,307	5.72	1,296,939	41.84	79,884	2.58	10,947	.35	7,717	.25	322,259	10.40	479,547	15.47
1901–1925	476,532	3.28	4,981,283	34.25	408,722	2.81	98,552	.68	61,919	.43	2,412,227	16.59	3,207,322	22.06
1926	33,816	3.89	364,662	41.93	15,221	1.75	2,329	.27	586	.07	87,389	10.05	128,636	14.78
1845–1926	510,348	2.72	5,834,481	31.06	485,244	2.59	155,281	.83	64,543	.34	3,839,878	20.46	4,614,144	24.58

TABLE 12.—*Smelter production of copper in the United States, by States (short tons)*—Continued

Period	Nevada		New Mexico		Tennessee		Utah		Undistributed		Total	Per cent
	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent		
1845–1875	257	0.11	697	0.29	(1)	------	1,529	0.64	27,556	11.53	239,114	100
1876–1880	67	------	156	------	(1)	------	1,348	------	8,470	------	124,879	------
1881–1885	373	------	1,166	------	(1)	------	863	------	7,848	------	298,337	------
1886–1890	63	------	3,505	------	(1)	------	3,102	------	7,684	------	526,071	------
1891–1895	10	------	1,439	------	(1)	------	4,120	------	15,545	------	846,639	------
1896–1900	701	------	6,550	------	(1)	------	19,555	------	23,431	------	1,327,717	------
1876–1900	1,214	.04	12,815	.41	(2)	------	28,988	.93	60,978	1.95	3,119,643	100
1845–1900	1,471	.04	13,513	.40	[3] 31,264	0.93	30,516	.91	57,270	1.71	3,358,757	100
1901–1905	661	.04	17,124	.93	[3] 28,000	1.53	91,753	5.01	11,512	.63	1,830,475	100
1906–1910	66,337	2.73	15,524	.63	46,582	1.90	207,272	8.46	9,380	.38	2,451,242	100
1911–1915	181,032	5.93	104,625	3.43	46,858	1.54	379,158	12.42	5,077	.17	3,051,567	100
1916–1920	221,188	5.38	198,279	4.83	39,030	.95	472,668	11.50	27,760	.68	4,108,993	100
1921–1925	126,721	4.09	129,669	4.18	43,037	1.39	417,439	13.46	8,529	.27	3,099,995	100
1901–1925	596,439	4.10	465,221	3.20	203,507	1.40	1,568,290	10.78	62,258	.43	14,542,272	100
1926	54,521	6.27	41,424	4.76	9,301	1.07	129,825	14.92	2,101	.24	869,811	100
1845–1926	652,431	3.48	520,158	2.77	244,072	1.30	1,728,631	9.21	121,629	.65	18,770,840	100

[1] No separate data. Tonnage included in undistributed. [2] Approximate production. [3] Estimate.

MEXICO

The production of copper in Mexico from 1801 to 1927, inclusive, was 1,584,066 tons, or 3.9 per cent of the world total, slightly more than the production of Canada for the same period. The greatest increase in production was during the first five-year period of the twentieth century, when more than three times as much copper was produced as in the preceding five-year period. Before 1900, the Boleo mine in Lower California had been the most important producer. Cananea and Nacozari also became important producers during the first quarter of the twentieth century.

The 1926 production shows a very substantial increase over the annual average for any previous five-year period. Table 13 and Figure 13 show the production by five-year periods from 1881 to 1925, inclusive, and the 1926 production. (See also Table 26.)

TABLE 13.—*Production of copper in Mexico by five-year periods, 1881–1925, and for 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	2,116	423	1906–1910	270,954	54,190
1886–1890	14,752	2,950	1911–1915	247,167	49,433
1891–1895	49,710	9,942	1916–1920	281,071	56,214
1896–1900	93,340	18,668	1921–1925	216,082	43,216
1901–1905	283,164	56,632	1926	61,950	61,950

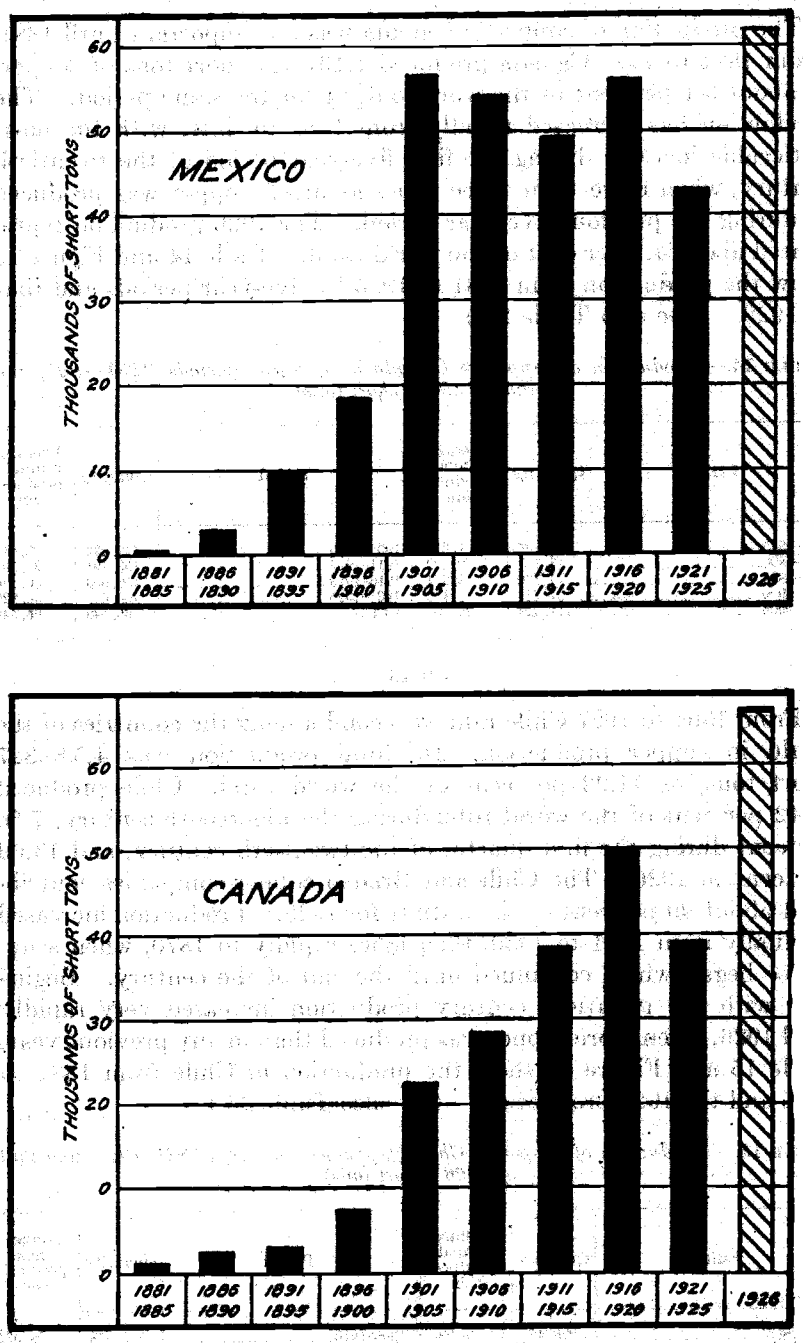


FIGURE 13.—Average annual production of copper in Mexico and Canada, by five-year periods, 1881–1925, and that of 1926

CANADA

The production of copper in Canada was not important until 1881. From 1881 to 1927 Canada produced 1,101,641 short tons of copper, or about 3.1 per cent of the world output for the same period. The production has increased rapidly from 1881 to date, with the most noticeable increase during the first five-year period of the twentieth century, when more than three times as much copper was produced as during the previous five-year period. The 1926 production represented about 4.1 per cent of the world total. Table 14 and Figure 13 show the production from 1881 to 1925 by five-year periods and that of 1926. (See also Table 26.)

TABLE 14.—*Production of copper in Canada by five-year periods, 1881–1925, and that of 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	5,365	1,073	1906–1910	142,239	28,447
1886–1890	12,111	2,422	1911–1915	193,491	38,698
1891–1895	14,870	2,974	1916–1920	250,903	50,180
1896–1900	37,347	7,469	1921–1925	196,645	39,329
1901–1905	111,424	22,284	1926	66,548	66,548

CHILE

From 1801 to 1927 Chile ranked second among the countries of the world in copper production. Its total production was 4,545,827 short tons, or 11.22 per cent of the world total. Chile produced 18.42 per cent of the world total during the nineteenth century, 7.56 per cent during the first quarter of the twentieth century, and 13.69 per cent in 1926. The Chile and Braden copper companies contributed about 90 per cent of the output for 1926. Production increased gradually from 1851 to 1850, then more rapidly to 1870, when a decrease began which continued until the end of the century. Beginning with the twentieth century production increased very rapidly until 1926, when more copper was produced than in any previous year. Table 15 and Figure 14 show the production in Chile from 1881 to 1925 and the 1926 production. (See also Table 26.)

TABLE 15.—*Production of copper in Chile by five-year periods, 1881–1925, and that of 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	226,402	45,280	1906–1910	195,358	39,072
1886–1890	163,279	32,656	1911–1915	239,572	47,914
1891–1895	120,070	24,014	1916–1920	515,162	103,032
1896–1900	135,464	27,093	1921–1925	827,799	165,560
1901–1905	167,906	33,581	1926	223,015	223,015

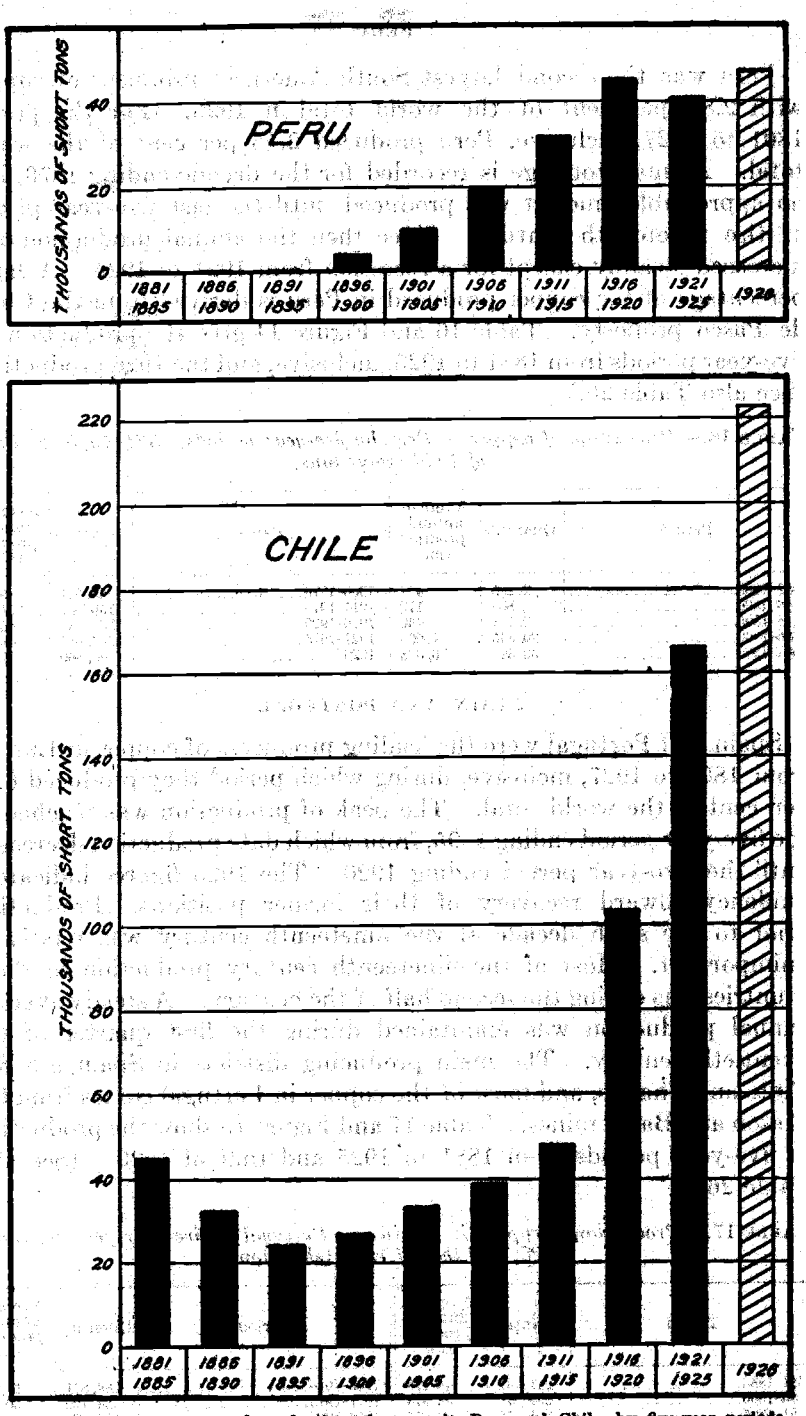


FIGURE 14.—Average annual production of copper in Peru and Chile, by five-year periods, 1881–1925, and that of 1926

PERU

Peru was the second largest South American producer of copper with 2.88 per cent of the world total in 1926. For the period 1801 to 1927, inclusive, Peru produced 2.15 per cent of the world total. A small tonnage is recorded for the decade ending 1870, but no appreciable amount was produced until the last five-year period of the nineteenth century. Since then the annual production has increased steadily except for a recession from 1921 to 1925. A large percentage of the copper produced in Peru is derived from the Cerro de Pasco property. Table 16 and Figure 14 give the production by five-year periods from 1881 to 1925, inclusive, and the 1926 production. (See also Table 26.)

TABLE 16.—*Production of copper in Peru by five-year periods, 1881–1925, and that of 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	2,285	457	1906–1910	95,551	19,110
1886–1890	896	179	1911–1915	159,062	31,812
1891–1895	2,151	430	1916–1920	225,841	45,168
1896–1900	20,345	4,069	1921–1925	203,655	40,731
1901–1905	50,394	10,078	1926	46,860	46,860

SPAIN AND PORTUGAL

Spain and Portugal were the leading producers of copper in Europe from 1801 to 1927, inclusive, during which period they produced 6.97 per cent of the world total. The peak of production was reached in the five-year period ending 1895, from which date production decreased until the five-year period ending 1920. The 1926 figures indicate a tendency toward recovery of their former positions. Production prior to the sixth decade of the nineteenth century was relatively unimportant. Most of the nineteenth century production in these countries was during the second half of the century. A steady average annual production was maintained during the first quarter of the twentieth century. The main producing districts in Spain are Rio Tinto and Tharsis, and most of the copper in Portugal comes from the Mason and Barry mines. Table 17 and Figure 15 show the production in five-year periods from 1881 to 1925 and that of 1926. (See also Table 26.)

TABLE 17.—*Production of copper in Spain and Portugal by five-year periods, 1881–1925, and that of 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	241,142	48,228	1906–1910	288,871	57,774
1886–1890	296,870	59,974	1911–1915	254,129	50,825
1891–1895	304,776	60,955	1916–1920	194,720	38,944
1896–1900	297,163	59,432	1921–1925	205,916	41,183
1901–1905	274,396	54,879	1926	57,018	57,018

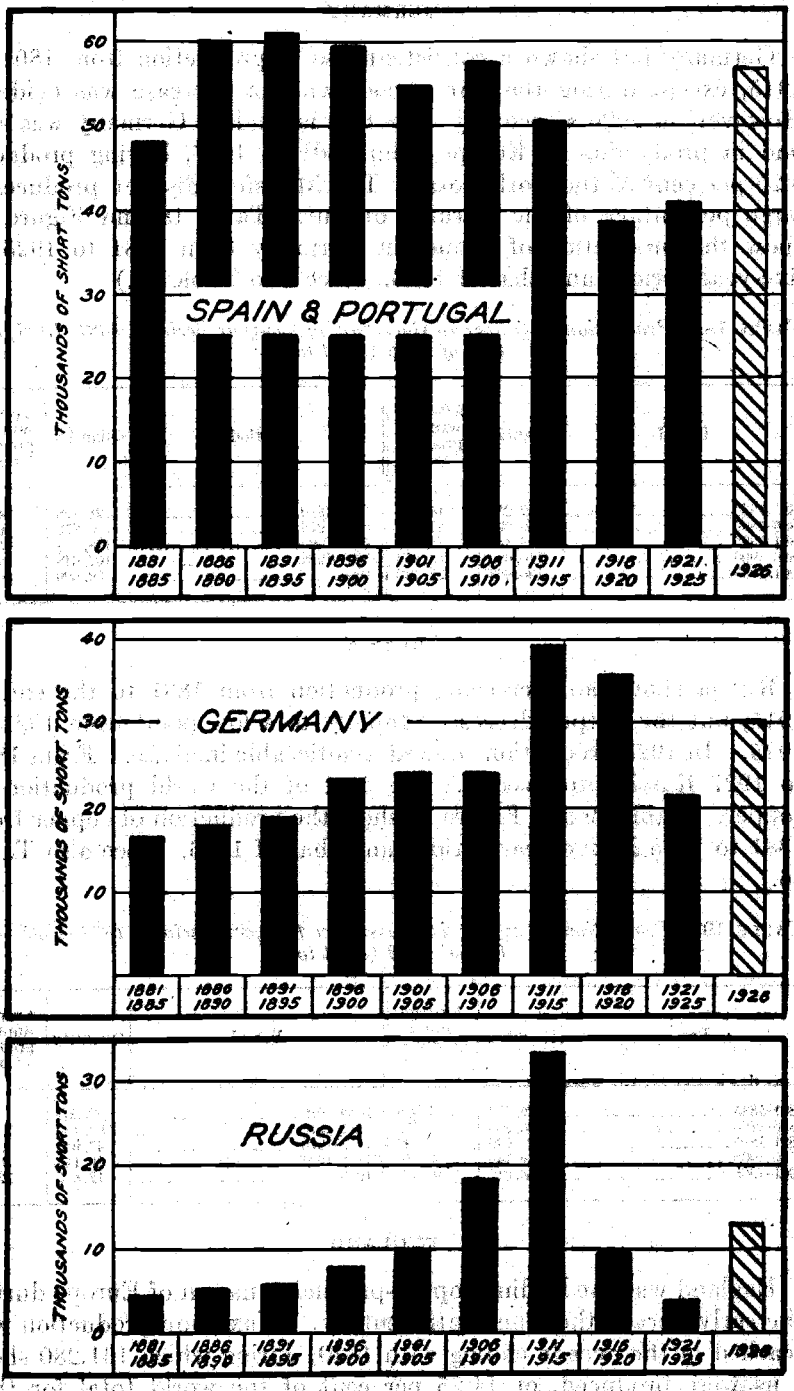


FIGURE 15.—Average annual production of copper in Spain and Portugal, Germany, and Russia, by five-year periods, 1881–1925, and that of 1926

GERMANY

Germany has shown a consistent rise in production from 1801 to 1915, except during the war period, when a decrease was evident. However, in 1926 a recovery of note was made. Germany was second in production in Europe from 1801 to 1927, having produced 3.25 per cent of the world total. The Mansfeld district produces a large percentage of the German output. Table 18 and Figure 15 show the production of copper in Germany from 1881 to 1925 in five-year periods and that of 1926. (See also Table 26.)

TABLE 18.—*Production of copper in Germany by five-year periods, 1881–1925, and that of 1926 (short tons).*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	82,951	16,590	1906–1910	121,128	24,225
1886–1890	89,032	17,806	1911–1915	196,873	39,374
1891–1895	83,353	16,670	1916–1920	178,768	35,753
1896–1900	116,663	23,333	1921–1925	107,648	21,529
1901–1905	120,663	24,132	1926	30,520	30,520

RUSSIA

Russia shows an increasing production from 1881 to the end of 1915, but the output decreased rapidly to a low point from 1921 to 1925. In 1926 production showed a noticeable increase. From 1801 to 1927 Russia produced 2.2 per cent of the world production of copper. Table 19 and Figure 15 show the production of copper from 1881 to 1925 in five-year periods and that of 1926. (See also Table 26.)

TABLE 19.—*Production of copper in Russia by five-year periods, 1881–1925, and that of 1926 (short tons).*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	22,677	4,535	1906–1910	92,064	18,412
1886–1890	26,258	5,251	1911–1915	167,450	33,490
1891–1895	29,049	5,809	1916–1920	47,956	9,591
1896–1900	39,749	7,949	1921–1925	16,148	3,229
1901–1905	50,017	10,003	1926	12,827	12,827

ENGLAND

England was the [illegible] copper-producing nation of Europe during the early part of the nineteenth century. Maximum production was reached in the decade ending with 1840, during which 161,280 short tons were produced, or 44.25 per cent of the world total for that period. The production has decreased steadily since that time until

it has become comparatively insignificant. The production in 1926 was only 0.01 per cent of the world total. This striking decrease in production is no doubt due to the exhaustion of the copper resources of Cornwall and Devon that can be mined profitably at present prices for copper. England produced 99 per cent of her total output from 1801 to 1927 during the nineteenth century. Table 20 shows the production data from 1801 through 1927. (See also Table 26.)

TABLE 20.—*Production of copper in England by 10-year periods, 1801–1927* (*short tons*)

Decade	Quantity	Percentage of world total	Decade	Quantity	Percentage of world total
1801–1810	72,800	40.89	1881–1890	28,827	1.02
1811–1820	82,208	43.61	1891–1900	6,526	.16
1821–1830	128,098	45.00	1851–1900	374,427	2.76
1831–1840	161,290	44.25			
1841–1850	154,784	31.34	1901–1910	5,330	.08
1801–1850	594,160	39.55	1911–1920	2,905	.02
			1921–1925	9,273	.04
1851–1860	159,264	20.99	1926	121	.01
1861–1870	130,256	11.33			
1871–1880	54,544	3.83	1801–1927	997,981	2.42

JAPAN

Japan has been the main producer of copper in Asia from 1801 to 1927, having contributed 99.5 per cent of the total known Asiatic output. During this period Japan produced 6.03 per cent of the total world production—5.94 per cent during the nineteenth century and 6.28 per cent during the first quarter of the twentieth century. The 1926 output was 4.67 per cent of the world production. The rate of increase in production from 1881 to 1920 in Japan has been very rapid and in general follows a geometric curve similar to that for the United States. The average annual production for the five years ending in 1925 showed a material drop from the preceding period, but the 1926 production indicates a recovery. The main producing districts include Besshi, Furukawa, and Ashio, all of which produce about the same quantity of copper. Table 21 and Figure 16 show the production of Japan from 1881 to 1925 in five-year periods and that of 1926. (See also Table 26.)

TABLE 21.—*Production of copper in Japan by five-year periods, 1881–1925, and that of 1926* (*short tons*)

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	41,068	8,213	1906–1910	252,389	50,477
1886–1890	75,964	15,192	1911–1915	361,784	72,356
1891–1895	106,258	21,051	1916–1920	492,542	98,508
1896–1900	139,841	27,968	1921–1925	329,664	65,932
1901–1905	178,494	35,698	1926	76,150	76,150

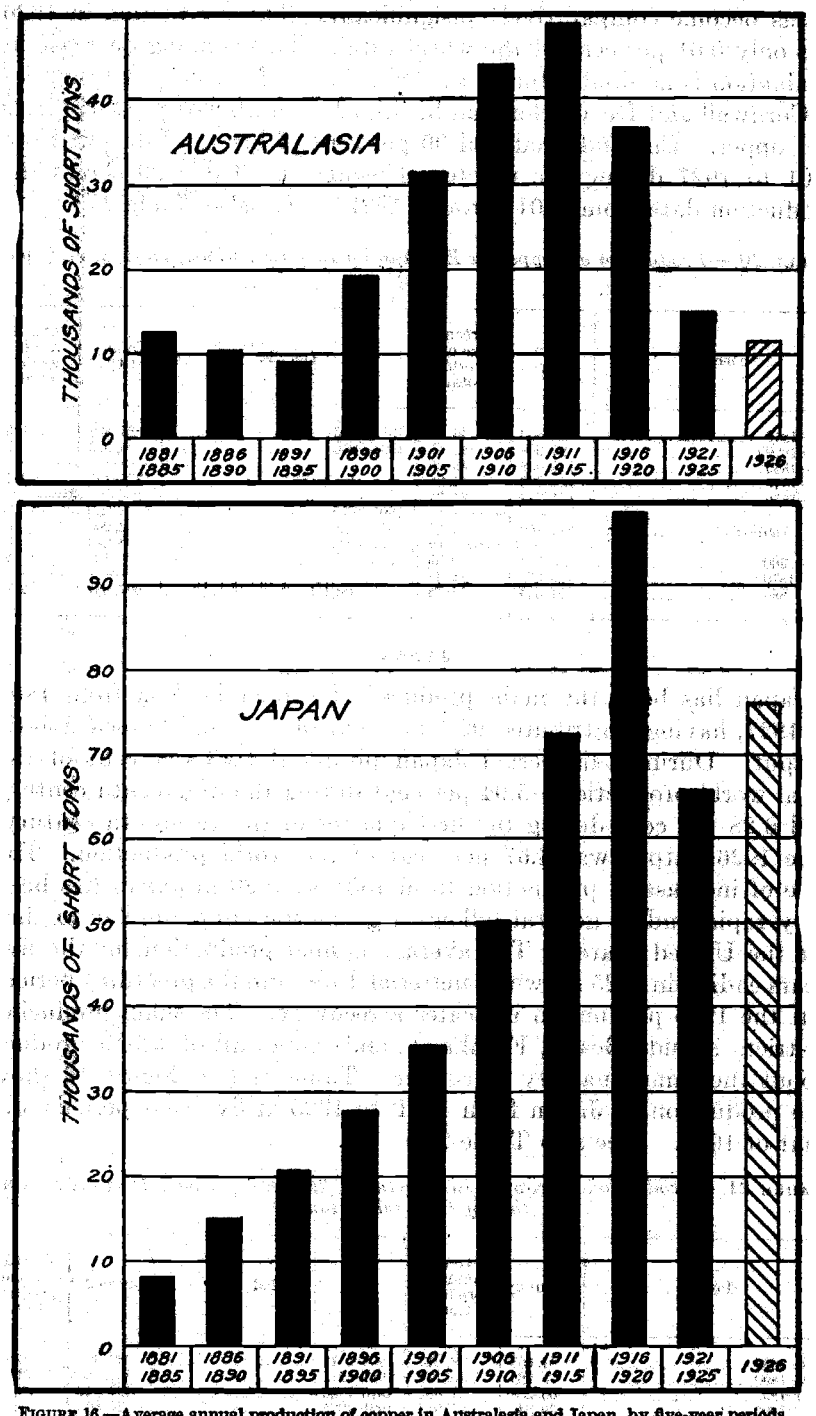


FIGURE 16.—Average annual production of copper in Australasia and Japan, by five-year periods, 1881–1925, and that of 1926

AUSTRALASIA

Australasia includes production from Australia, New Zealand, Tasmania, and Papua. Production began during the decade 1841 to 1850 and increased to a maximum from 1911 to 1915. Since then it has decreased steadily to the end of 1926. From 1801 to 1927 Australasia contributed 3.52 per cent of the total world production. The main producing areas include Mount Lyell and Mount Morgan in Tasmania, Mugana and Chillogee, and the Wallaroo in Australia; only a small tonnage has recently come from Papua. Table 22 and Figure 16 show the production of copper in Australasia from 1881 to 1925 in five-year periods and that of 1926. (See also Table 26.)

TABLE 22.—*Production of copper in Australasia by five-year periods, 1881–1925, and that of 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	63,037	12,607	1906–1910	220,284	44,056
1886–1890	51,506	10,301	1911–1915	244,888	48,977
1891–1895	45,471	9,094	1916–1920	183,044	36,608
1896–1900	96,276	19,255	1921–1925	75,685	15,137
1901–1905	156,935	31,387	1926	11,627	11,627

BELGIAN CONGO

Belgian Congo began producing in 1914, and its output has risen very rapidly since that time, 1926 production being greatest. From 1911 to 1915 the output was 39,947 short tons; from 1916 to 1920 it was 124,141 short tons; and from 1921 to 1925 it was 338,834 short tons. In 1926 the output was 88,889 short tons. Practically the entire production was from the mine of the Union Miniere d' Haut Katanga near the Rhodesian boundary. Table 23 and Figure 17 show the production of Belgian Congo from 1911 to 1925 in five-year periods and that of 1926. (See also Table 26.)

TABLE 23.—*Production of copper in Belgian Congo, by five-year periods, 1911–1925 and that of 1926 (short tons)*

Period	Quantity	Average annual production
1911–1915	39,947	7,989
1916–1920	124,141	24,828
1921–1925	338,835	67,767
1926	88,889	88,889

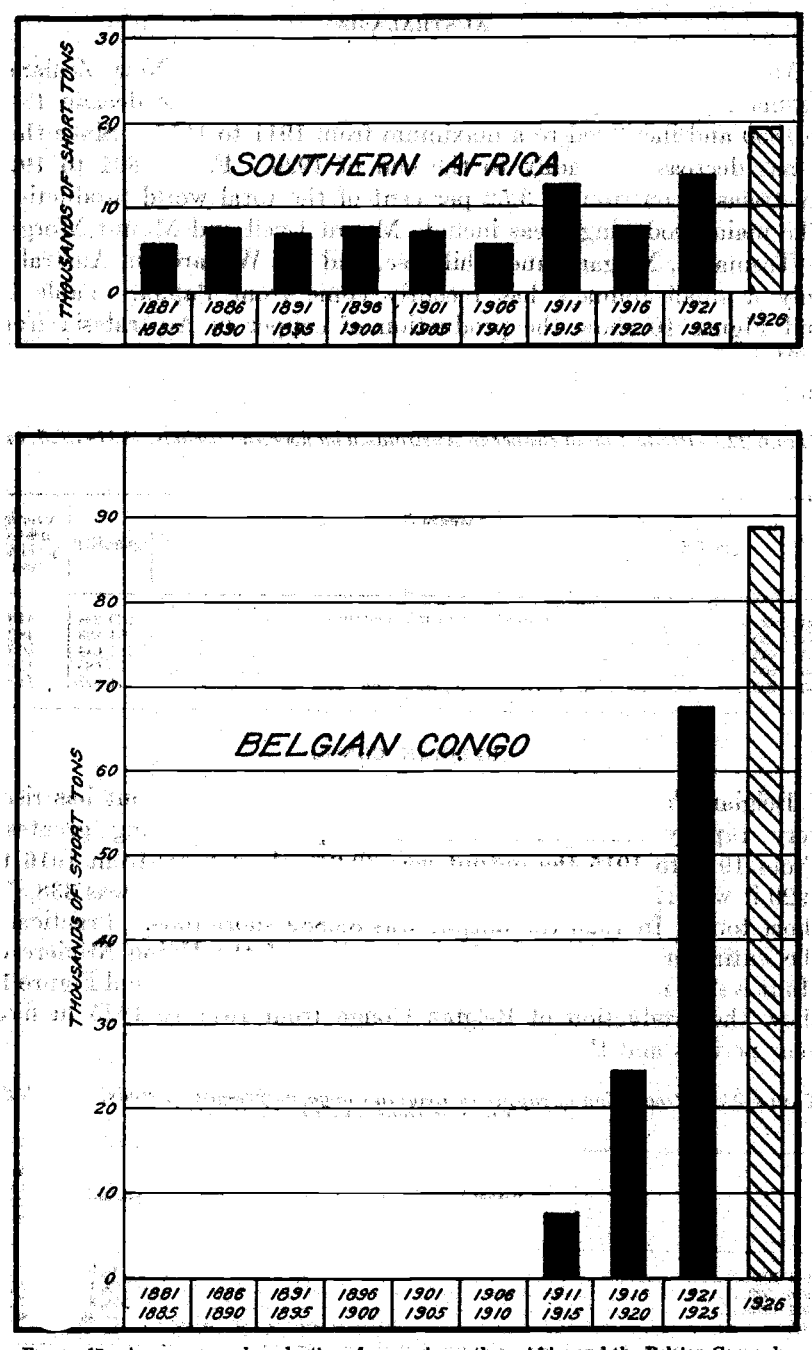


FIGURE 17.—Average annual production of copper in southern Africa and the Belgian Congo, by five-year periods, 1881–1925, and that of 1926

SOUTHERN AFRICA

Southern Africa shows a steady production from the decade 1871 to 1880 until the present. The 1926 production was greater than the average annual production for the preceding five-year period. Southern Africa contributed 1.17 per cent of the total world production from 1801 to 1927. The Cape Copper Co. was the main producer. Table 24 and Figure 17 show the production in South Africa from 1881 to 1925 by five-year periods and that of 1926. (See also Table 26.)

TABLE 24.—*Production of copper in Southern Africa, by five-year periods, 1881–1925, and that of 1926 (short tons)*

Period	Quantity	Average annual production	Period	Quantity	Average annual production
1881–1885	28,681	5,736	1906–1910	28,730	5,746
1886–1890	39,105	7,821	1911–1915	63,830	12,766
1891–1895	35,605	7,121	1916–1920	38,465	7,693
1896–1900	39,379	7,875	1921–1925	69,300	13,860
1901–1905	36,121	7,224	1926	19,626	19,626

GENERAL SUMMARY

As far as practicable, the data previously given have been consolidated into a single folded table (Table 26) in which the comprehensive relationship of all data may be studied, but a few of its salient features should be pointed out.

TABLE 25.—*Salient features of world production of copper*

Period	Years	Figures in last column are for—	Quantity, short tons
1801–1810	10	Average annual production	18,269
1901–1910	10	Average annual production 100 years later	763,000
1911–1920	10	Average annual production in the next decade	1,218,000
1927	1	Production	1,670,000
1801–1825	25	Total production	484,018
1826–1850	25	do	1,038,000
1851–1875	25	do	2,368,000
1876–1900	25	do	7,612,000
1901–1925	25	do	25,725,000
1801–1850	50	do	1,502,000
1851–1900	50	do	9,979,000
1801–1900	100	do	11,472,000
1901–1910	10	do	7,628,000
1911–1920	10	do	12,187,000
1801–1910	110	do	19,100,000
1911–1927	17	do	21,398,000
1801–1927	127	do	40,498,000

Before the last few centuries the quantity of metals available for man's use was almost insignificant in comparison with the supply now employed. In very early times small quantities of copper were jealously guarded in the treasuries of kings, and for many centuries the metal appears to have been possessed chiefly by kings, nobles, and persons of considerable wealth. Mining operations were generally confined to relatively rich ores and to those near the surface; other factors as well tended to prevent large production. But by the end of the eighteenth century greatly increased ability to produce copper had resulted from the invention of gunpowder, used in blasting rock; the mine pump that freed many abandoned workings of water, thus permitting a resumption of mining operations; and, finally, the steam engine, used for hoisting. Better understanding of smelting had made reduction of ores more efficient and less costly, and laws that had formerly given the bulk of metal production to the sovereign or the landowner had been amended liberally.

It is therefore probable that the annual world production of 18,000 tons of copper at the beginning of the nineteenth century was in itself the culmination of a great increase in production that had been in progress for several centuries.

In 1800 there was as yet no established production from North America, Africa, or Australasia, but Europe produced an average of about 12,400 tons a year, including about 7,300 tons from Great Britain, 3,300 tons from Russia, and 1,700 tons from Sweden, Norway, and Germany. Japan produced about 3,100 tons a year and South America about 2,600 tons a year—1,700 tons from Chile and 900 tons from Venezuela. All other production appears to have been casual in character and slight in quantity.

Table 25 reveals the remarkable expansion in copper production since 1800, but a brief statement as to world distribution of production should follow.

From the middle of the last century it gradually became apparent that the United States possessed extensive resources of copper. Michigan, Montana, Arizona, Utah, Nevada, New Mexico, California, Colorado, Tennessee, and finally Alaska, became producers of large tonnages. The annual production of the United States rose to nearly a million tons during the war period, 1916–1918 (964,000 tons in 1916) and is now normal at about 850,000 tons. United States production averaged 60 per cent of world production during 1916–1920 but has since decreased to 50 per cent as a result of increased production elsewhere.

It is safe to say that the United States production will continue to be the chief item of world production for many years, although its proportion in the world total may be expected to decrease slowly for a time, while the South American, African, and Canadian propor-

tion will probably continue to increase. Great reserves of proven ore exist in the United States to support its production of the near future, and there probably are also enormous quantities of very low-grade copper-bearing rocks that will become of economic importance as the relatively high-grade ores of the world approach exhaustion some decades hence.

Mexico and Canada during the past 50 years have likewise developed steadily as dependable producers, the former having yielded a somewhat larger tonnage in the past, while the latter has made such important copper discoveries of late that its rank as a producer may be expected to improve substantially in the near future.

North America as a whole produced nearly 66 per cent of the world production for the first quarter of the present century and 61 per cent in 1926–27.

The annual production from South America increased from approximately 2,600 tons in 1800 to approximately 300,000 tons in 1926–27, the production of Chile having risen steadily until it is now about a quarter of a million tons—nearly a third as much as the United States production or about 18 per cent of the world total. Peru, also, now produces nearly 50,000 tons of copper associated with considerable amounts of gold and silver.

The South American production may be regarded as well established and of stability comparable to that of North America.

The production of North and South America together in 1926–27 was nearly 80 per cent of world production.

In Asia, Japan steadily maintained a production of 3,000 to 5,000 tons a year for about 80 years but in 1883 commenced to expand production until it now averages about 70,000 tons a year or about the same amount as Canada and Mexico. The production of Japan serves to meet its own requirements but is not likely to affect the world situation otherwise.

Australasia began to produce just before the middle of the last century and since has produced continuously although production has fluctuated greatly in amount. It reached about 50,000 tons a year during the period 1910–1913 but has since fallen to about 12,000 tons.

Further potential resources are known in Australasia, and their mining may become profitable again when higher prices for the metal prevail.

Africa is the great new source of copper production, especially the Katanga deposits in Belgian Congo. Production started in 1911, has steadily increased to about 100,000 tons, and will certainly continue to increase, as the known reserves of ore are large and of relatively high grade.

European production of copper has steadily increased from 12,000 tons a year, which amounted to 68 per cent of the world production, to over ten times that amount (about 135,000 tons), which is only about 8 per cent of world production in 1926–27.

England's production, formerly 40 per cent of the world total and amounting in a decade to as much as the present annual production of Mexico, Canada, or Japan, has virtually ceased.

Russian production showed little change for a century, then increased substantially until the beginning of the Great War, when it relapsed to its former magnitude. In 1926–27 it suddenly increased again to about 13,000 tons. Moderate production may be expected of Russia, which may possibly play a much more important part in the distant future when known high-grade ores approach exhaustion.

The most important production of Europe has come from Spain and Portugal, whose deposits being similar in character and of the same mineralized zone have been considered together. This production was insignificant at the beginning of the nineteenth century but began to expand 50 years later. Since 1880 it has averaged about 50,000 tons a year. In 1926–27 it was about 60,000 tons, slightly less than the production of Mexico, Canada, or Japan.

Germany's production steadily increased from the beginning of the nineteenth century to an annual production of more than 20,000 tons. This output was considerably exceeded during the World War and in 1926–27 had risen to about 30,000 tons.

In conclusion, it should be realized that the production of an important common metal, such as copper, is by no means casual or sporadic, but is closely related to such factors as the existence of metallogenic provinces, the distribution and movements of populations, and the nationality of the financial control of industries. World production may be regarded as the integration of many such factors. Some of these will be discussed in a subsequent paper which will show the source of production here tabulated by mines and districts.

Only through the cooperation of all who are interested in the subject can such data as these be perfected. Suggestions and criticism will therefore be cordially welcomed.

TABLE 26.—*General summary of world production of copper, 1801–1927 (short tons)*

Period	World total Quantity	World total Per cent	North America Quantity	North America Per cent	United States Quantity	United States Per cent	Mexico Quantity	Mexico Per cent	Canada Quantity	Canada Per cent	Newfoundland Quantity	Newfoundland Per cent	Cuba Quantity	Cuba Per cent
1801–1810	182,000	100												
1811–1820	188,496	100												
1821–1830	273,504	100	896	0.33									896	0.33
1831–1840	364,448	100	10,730	2.94									10,730	2.94
1841–1850	493,808	100	65,856	13.33	2,688	0.54							63,168	12.79
1801–1850	1,502,256	100	77,482	5.16	2,688	.18							74,794	4.98
1851–1860	759,079	100	94,640	12.47	41,440	5.46							53,200	7.01
1861–1870	1,149,344	100	138,081	12.01	108,752	9.46					657	0.06	28,672	2.49
1871–1880	1,423,744	100	221,245	15.54	208,768	14.66			112	0.01	12,365	.87		
1881	181,342		38,697		35,840		373		560		1,924			
1882	202,036		48,012		45,323		449		560		1,680			
1883	224,306		60,671		57,763		548		1,181		1,179			
1884	245,005		73,811		72,473		326		264		748			
1885	253,120		87,029		82,938		420		2,800		871			
1881–1885	1,105,809	100	308,220	27.88	294,337	26.62	2,116	0.19	5,365	.49	6,402	.58		
1886	241,089		82,034		78,882		280		1,612		1,260			
1887	250,538		95,925		90,739		2,296		1,568		1,322			
1888	294,803		121,094		113,180		3,098		2,520		2,296			
1889	291,018		123,955		113,388		4,234		3,404		2,929			
1890	305,334		139,676		129,882		4,844		3,007		1,943			
1886–1890	1,382,782	100	562,684	40.69	526,071	38.04	14,752	1.07	12,111	.88	9,750	.70		
1881–1890	2,488,591	100	870,904	34.29	820,408	32.33	16,868	.63	17,476	.69	16,152	.64		
1891	316,672		154,633		142,060		5,824		4,464		2,285			
1892	352,249		186,974		172,560		8,193		3,544		2,677			
1893	334,928		177,579		164,677		9,497		1,120		2,285			
1894	353,493		193,752		177,094		13,182		1,348		2,128			
1895	368,963		209,731		190,307		13,014		4,394		2,016			
1891–1895	1,726,305	99.99	922,669	53.45	846,698	49.05	49,710	2.88	14,870	.86	11,391	.66		
1896	422,838		249,227		230,030		12,488		4,693		2,016			
1897	454,531		271,800		247,039		16,094		6,651		2,016			
1898	480,904		293,020		263,256		18,407		9,005		2,352			
1899	519,336		316,552		284,334		21,655		7,539		3,024			
1900	545,439		340,238		303,059		24,696		9,459		3,024			
1896–1900	2,423,048	99.99	1,470,483	60.70	1,327,718	54.80	93,340	3.85	37,347	1.54	12,432	.51		
1891–1900	4,149,353	100	2,393,506	37.08	2,174,416	51.92	143,050	3.37	52,217	1.20	23,823	.59		
1851–1900	9,970,111	100	3,718,376	37.29	3,353,784	33.65	159,918	1.60	69,805	.70	52,997	.53	81,872	.82
1801–1900	11,472,367	100	3,795,858	33.09	3,356,472	29.26	159,918	1.39	69,805	.61	52,997	.46	156,666	1.37
1901	580,011		358,450		301,036		34,082		20,716		2,616			
1902	615,052		397,913		329,754		45,679		19,584		2,896			
1903	656,482		430,234		349,022		56,538		21,639		3,035			
1904	726,992		500,952		406,268		68,258		21,485		4,392		549	
1905	778,841		556,599		444,392		78,607		28,000		4,480		1,120	
1901–1905	3,357,378	100	2,244,148	66.84	1,830,472	54.52	283,164	8.43	111,424	3.32	17,419	.52	1,669	.05
1906	797,777		557,178		458,903		67,900		27,805		2,570			
1907	794,704		528,278		434,498		63,353		28,489		1,938			
1908	820,104		541,621		471,285		33,525		31,851		1,653		3,307	
1909	912,241		625,632		546,476		48,059		26,247		1,543		3,307	
1910	946,130		631,114		540,080		58,117		27,847		1,212		3,858	
1906–1910	4,270,956	100	2,883,823	67.52	2,451,242	57.39	270,954	6.34	142,239	3.33	8,916	.21	10,472	.25
1901–1910	7,628,334	100	5,127,971	67.23	4,281,714	56.13	554,118	7.26	253,663	3.33	26,335	.35	12,141	.16
1911	980,761		647,452		548,616		65,500		27,825		1,322		4,189	
1912	1,102,509		726,653		621,634		60,702		38,916		551		4,850	
1913	1,090,629		712,680		612,242		58,202		38,488				3,748	
1914	1,027,051		659,941		575,069		40,058		37,869				6,945	
1915	1,165,447		776,914		694,005		22,705		50,393				9,811	
1911–1915	5,366,397	100	3,523,640	65.66	3,051,566	56.86	247,167	4.61	193,491	3.61	1,873	.03	29,543	.55
1916	1,518,622		1,064,291		963,925		31,318		58,576				10,472	
1917	1,575,281		1,065,671		943,060		56,202		54,614				11,795	
1918	1,574,256		1,105,720		954,267		77,407		59,385				14,661	
1919	1,095,617		750,923		643,210		61,919		37,527				8,267	
1920	1,057,168		708,816		604,531		54,225		40,801				9,259	
1916–1920	6,820,944	100	4,695,421	68.84	4,108,993	60.24	281,071	4.12	250,903	3.68			54,454	.80
1911–1920	12,187,341	100	8,219,061	67.44	7,160,559	58.75	528,238	4.33	444,394	3.65	1,873	.02	83,997	.69
1921	614,636		302,428		252,793		16,786		23,810				9,039	
1922	934,927		538,887		475,143		29,738		21,440				12,566	
1923	1,354,796		831,457		717,500		58,832		43,441				11,684	
1924	1,479,377		935,176		817,125		54,138		52,229				11,684	
1925	1,526,995		965,731		837,435		56,588		55,725				15,983	
1921–1925	5,910,731	100	3,573,679	60.46	3,099,996	52.44	216,082	3.66	196,645	3.33			60,956	1.03
1901–1925	25,726,406	100	16,920,711	65.77	14,542,269	56.53	1,298,438	5.05	894,702	3.48	28,208	.11	157,094	.61
1926	1,629,140	100	1,008,255	61.89	869,805	53.39	61,950	3.80	66,548	4.09			9,952	.61
1927	[4] 1,670,409	100	997,415	59.71	847,419	50.60	63,760	3.81	70,698	4.22			15,538	.93

Period	South America Quantity	South America Per cent	Chile Quantity	Chile Per cent	Peru Quantity	Peru Per cent	Bolivia Quantity	Bolivia Per cent	Argentina Quantity	Argentina Per cent	Venezuela Quantity	Venezuela Per cent
1801–1810	26,320	14.46	16,800	9.23							[1] 9,520	5.23
1811–1820	26,320	13.96	16,800	8.91							[1] 9,520	5.05
1821–1830	39,760	14.54	30,240	11.06							[1] 9,520	3.48
1831–1840	59,920	16.44	50,400	13.83							[1] 9,520	2.61
1841–1850	108,192	21.91	98,672	19.98							[1] 9,520	1.93
1801–1850	260,512	17.34	212,912	14.17							[1] 47,600	3.17
1851–1860	251,227	33.10	240,240	31.66					1,467	0.19	[1] 9,520	1.25
1861–1870	510,641	44.43	500,662	43.56	11		414	0.04	7,650	.67	1,904	.17
1871–1880	551,779	38.75	513,744	36.08	12,544	0.88	15,008	1.05	5,219	.37	5,264	.37
1881	49,715		42,547		689		2,973		344		3,162	
1882	57,241		48,058		493		3,650		896		4,144	
1883	53,183		46,031		442		1,882		328		4,500	
1884	54,061		46,646		405		1,680		178		5,152	
1885	49,921		43,120		256		1,680		261		4,604	
1881–1885	264,121	23.88	226,402	20.47	2,285	.21	11,865	1.07	2,007	.18	21,562	1.95
1886	44,898		39,228		84		1,232		202		4,152	
1887	37,598		32,648		56		1,456		190		3,248	
1888	41,541		34,989		280		1,624		168		4,480	
1889	35,821		27,160		308		1,344		213		6,796	
1890	38,035		29,254		168		2,128		168		6,317	
1886–1890	197,893	14.31	163,279	11.81	896	.06	7,784	.56	941	.07	24,993	1.81
1881–1890	462,014	19.09	389,681	16.14	3,181	.13	19,649	.82	2,948	.12	46,555	1.88
1891	32,497		22,260		314		2,408		235		7,280	
1892	32,497		25,273		325		3,203		224		3,472	
1893	30,598		23,912		515		2,800		179		3,192	
1894	30,028		23,901		493		2,576		258		2,800	
1895	27,916		24,724		504		2,520		168			
1891–1895	153,536	8.89	120,070	6.96	2,151	.12	13,507	.78	1,064	.06	16,744	.97
1896	29,501		26,320		829		2,240		112			
1897	28,336		24,528		1,120		2,464		224			
1898	33,673		27,832		3,405		2,296		140			
1899	36,658		28,000		5,785		2,800		73			
1900	40,426		28,784		9,206		2,352		84			
1896–1900	168,594	6.96	135,464	5.59	20,345	.84	12,152	.50	633	.03		
1891–1900	322,130	7.92	255,534	6.27	22,496	.48	25,659	.64	1,697	.05	16,744	.48
1851–1900	2,097,791	21.04	1,899,861	19.06	38,232	.38	60,730	.61	18,981	.19	79,987	.80
1801–1900	2,358,303	20.56	2,112,773	18.42	38,232	.33	60,730	.53	18,981	.17	127,587	1.11
1901	48,250		34,474		10,662		2,240		874			
1902	43,703		32,402		8,792		2,240		269			
1903	47,669		34,642		10,636		2,240		151			
1904	46,781		33,723		10,644		2,240		174			
1905	44,739		32,665		9,660		2,240		174			
1901–1905	231,142	6.88	167,906	5.00	50,394	1.50	11,200	.33	1,642	.05		
1906	41,278		28,834		9,526		2,800		118			
1907	44,777		29,887		11,844		2,800		246			
1908	72,301		47,396		21,885		2,800		220			
1909	72,119		47,097		22,121		2,240		661			
1910	75,450		42,144		30,175		2,800		331			
1906–1910	305,925	7.16	195,358	4.57	95,551	2.24	13,440	.31	1,576	.04		
1901–1910	537,067	7.04	363,264	4.76	145,945	1.92	24,640	.32	3,218	.04		
1911	74,642		40,146		30,573		2,016		1,102		805	
1912	78,976		45,908		29,728		2,072		331		937	
1913	79,100		46,587		30,618		992		110		793	
1914	82,315		49,235		29,862		2,094		331		793	
1915	104,902		57,696		38,281		8,267				658	
1911–1915	419,935	7.83	239,572	4.47	159,062	2.96	15,441	.29	1,874	.04	3,986	.07
1916	137,447		78,581		47,485		10,086				1,295	
1917	177,783		113,017		49,798		11,707				3,261	
1918	187,300		126,766		48,958		9,284				2,292	
1919	141,671		87,722		43,244		10,498				207	
1920	156,876		109,076		36,356		11,003				441	
1916–1920	801,077	11.74	515,162	7.55	225,841	3.31	52,578	.77			7,496	.11
1911–1920	1,221,012	10.02	754,734	6.20	384,903	3.17	68,019	.56	1,874	.01	11,482	.09
1921	114,547		65,300		36,689		11,676				882	
1922	196,447		142,832		40,133		11,608				1,874	
1923	261,798		201,044		48,685		11,077				992	
1924	255,458		208,966		37,410		8,200				882	
1925	259,472		209,657		40,738		7,975				1,102	
1921–1925	1,087,722	18.40	827,799	14.00	203,655	3.45	50,536	.85			5,732	.10
1901–1925	2,845,801	11.07	1,945,797	7.56	734,503	2.86	143,195	.56	5,092	.02	17,214	.07
1926	280,163	17.20	223,015	13.69	46,860	2.88	8,977	.55	331	.02	1,000	.06
1927	324,680	19.44	264,242	15.78	52,438	3.13	7,850	.47			150	

Period	Europe Quantity	Europe Per cent	Spain and Portugal Quantity	Spain and Portugal Per cent	England Quantity	England Per cent	Germany Quantity	Germany Per cent	Russia Quantity	Russia Per cent	Finland Quantity	Finland Per cent	Sweden Quantity	Sweden Per cent	Norway Quantity	Norway Per cent
1801–1810	124,320	68.31	560	0.31	72,800	40.00	4,144	2.28	[1] 33,600	18.46			7,840	4.31	5,376	2.95
1811–1820	130,816	69.40	112	.06	82,208	43.61	4,256	2.26	[1] 33,600	17.83			7,728	4.09	2,912	1.55
1821–1830	188,048	68.75	784	.29	123,088	45.00	6,496	2.38	[1] 42,560	15.56			6,720	2.45	4,592	1.68
1831–1840	248,999	68.33	2,369	.65	161,280	44.25	7,504	2.06	[1] 51,520	14.15			11,088	3.04	6,496	1.78
1841–1850	257,376	52.13	4,312	.87	154,784	31.34	9,408	1.91	[1] 54,768	11.09			15,680	3.18	6,496	1.32
1801–1850	949,559	63.21	8,137	.54	594,160	39.55	31,808	2.12	[1] 216,048	14.38			49,056	3.27	25,872	1.72
1851–1860	324,844	42.80	27,664	3.64	159,264	20.99	14,112	1.86	61,600	8.12			23,072	3.04	6,608	.87
1861–1870	367,789	32.00	90,608	7.88	130,256	11.33	27,888	2.43	44,800	3.90			20,944	1.82	10,080	.88
1871–1880	446,880	31.39	219,408	15.41	54,544	3.83	73,360	5.15	36,960	2.60			11,648	.82	20,384	1.43
1881	72,807		43,220		4,340		14,271		3,820				1,114		2,957	
1882	74,800		43,427		3,880		16,898		3,961				894		2,901	
1883	80,832		48,893		2,934		18,146		3,920				820		2,946	
1884	84,250		51,984		3,752		16,556		5,264				741		3,031	
1885	85,406		53,618		3,106		17,080		5,712				868		2,867	
1881–1885	398,095	36.00	241,142	21.81	18,012	1.63	82,951	7.50	22,677	2.05			4,437	.40	14,702	1.33
1886	85,571		55,611		1,648		16,201		5,460				582		2,486	
1887	87,810		58,093		436		16,660		5,600				1,013		1,624	
1888	100,636		67,704		1,680		17,058		5,264				1,160		1,758	
1889	91,407		60,782		1,014		19,439		4,558				930		1,520	
1890	89,546		57,680		1,047		19,740		5,376				930		1,557	
1886–1890	454,970	32.90	299,870	21.69	5,825	.42	89,098	6.44	26,258	1.90			4,615	.33	8,945	.65
1881–1890	853,065	34.45	541,012	21.75	23,837	1.02	172,049	6.97	48,935	1.98			9,052	.36	23,647	.99
1891	90,441		60,863		806		18,088		5,376				734		1,397	
1892	94,805		63,010		554		19,370		5,402				823		1,579	
1893	92,873		61,431		476		18,088		5,991				599		2,083	
1894	92,371		58,505		498		19,264		6,315				392		2,111	
1895	93,103		60,967		650		18,542		5,965				227		3,007	
1891–1895	463,593	26.85	304,776	17.65	2,984	.17	93,352	5.41	29,049	1.68			2,775	.16	10,177	.59
1896	99,622		61,405		622		22,473		6,532				560		2,800	
1897	100,637		59,453		622		22,562		7,774				610		3,864	
1898	99,670		58,660		717		22,494		8,166				538		4,049	
1899	103,558		58,428		711		26,275		8,437				582		4,043	
1900	101,348		59,217		870		22,859		8,840				504		4,407	
1896–1900	548,835	20.83	297,163	12.26	3,542	.15	116,663	4.81	39,749	1.64			2,794	.12	19,163	.79
1891–1900	968,428	23.84	601,939	14.96	6,526	.16	210,015	5.11	68,798	1.66			5,569	.14	29,340	.69
1851–1900	2,961,006	29.70	1,480,631	14.84	374,427	3.76	497,424	4.99	261,093	2.62			70,285	.70	90,059	.90
1801–1900	3,910,565	34.08	1,488,768	12.98	968,587	8.44	529,232	4.61	477,141	4.16			119,341	1.04	115,931	1.01
1901	101,003		60,056		596		24,326		7,015				358		3,780	
1902	101,307		55,765		538		24,198		9,716				510		5,113	
1903	103,776		55,709		600		23,750		11,558				510		6,625	
1904	100,648		52,679		554		23,570		11,984				437		6,065	
1905	97,776		50,187		560		24,819		9,744				616		7,062	
1901–1905	504,510	15.03	274,396	8.18	2,848	.08	120,663	3.59	50,017	1.49			2,431	.07	28,645	.85
1906	102,558		55,238		560		22,781		11,749				560		6,851	
1907	111,626		55,636		784		22,949		16,800				2,240		8,351	
1908	112,874		58,481		648		22,597		18,886				3,095		1,754	
1909	117,605		58,303		487		25,133		19,622				2,618		1,703	
1910	129,703		61,213		503		27,668		25,000				3,429		2,000	
1906–1910	574,366	13.45	288,871	6.76	2,982	.07	121,128	2.84	92,064	2.16			11,942	.28	20,662	.48
1901–1910	1,078,876	14.14	563,267	7.39	5,830	.08	241,791	3.18	142,081	1.86			14,373	.18	49,307	.65
1911	133,939		62,513		439		24,692		28,601				3,551		1,725	
1912	162,251		74,426		326		28,219		37,448				4,362		2,348	
1913	154,451		40,838		472		54,454		37,141				4,646		3,021	
1914	134,314		33,374		381		50,927		35,642				5,172		3,153	
1915	120,686		42,978		263		38,581		28,618				5,028		3,117	
1911–1915	705,641	13.15	254,129	4.73	1,881	.04	196,873	3.67	167,450	3.12			22,759	.42	13,364	.25
1916	121,504		40,995		311		56,591		14,749				3,506		1,779	
1917	125,203		47,208		209		49,604		18,739				4,876		1,995	
1918	107,434		54,128		201		38,581		5,510				3,258		3,148	
1919	58,240		26,531		161		17,484		[1] 4,823		804		3,921		481	
1920	54,784		25,858		142		16,508		4,135		507		1,421		613	
1916–1920	467,165	6.86	194,720	2.86	1,024	.02	178,768	2.62	47,956	.70	1,311	0.02	16,982	.25	8,016	.12
1911–1920	1,172,806	9.62	448,849	3.68	2,905	.02	375,641	3.08	215,406	1.77	1,311	.01	39,741	.33	21,380	.18
1921	77,582		41,827		80		17,101		5,146		220		1,267		1,486	
1922	63,697		28,372		117		19,547		2,205		827				88	
1923	88,163		50,338		98		20,356		2,205		559				74	
1924	85,233		40,836		136		25,291		3,638		406				78	
1925	91,739		44,543		107		25,353		5,952		1,433				277	
1921–1925	406,414	6.88	205,916	3.49	538	.01	107,648	1.82	19,146	.32	3,445	.06	1,267	.02	2,003	.03
1901–1925	2,658,096	10.33	1,218,032	4.73	9,273	.04	725,080	2.82	376,633	1.46	4,756	.02	55,381	.22	72,690	.28
1926	[2] 130,539	8.01	57,018	3.50	121	.01	30,520	1.87	12,827	.79	1,092	.07	1,927	.12	6,842	.42
1927	138,779	8.31	60,351	3.60	([5])		31,306	1.87	[1] 13,227	.79	([5])		([5])		13,227	.79

Period	Italy Quantity	Italy Per cent	France Quantity	France Per cent	Austria-Hungary Quantity	Austria-Hungary Per cent	Serbia Quantity	Serbia Per cent	Yugoslavia Quantity	Yugoslavia Per cent	Bulgaria Quantity	Bulgaria Per cent	Rumania Quantity	Rumania Per cent
1801–1810														
1811–1820														
1821–1830	784	0.29			3,024	1.10								
1831–1840	3,136	.86			5,606	1.54								
1841–1850	3,136	.64			8,792	1.78								
1801–1850	7,056	.47			17,422	1.16								
1851–1860	4,480	.59			28,044	3.69								
1861–1870	13,126	1.14			30,087	2.61								
1871–1880	14,414	1.01			16,162	1.14								
1881	1,658				1,427									
1882	1,568				1,271									
1883	1,792				1,381									
1884	1,484				1,438									
1885	935				1,220									
1881–1885	7,437	.67			6,737	.61								
1886	2,352				1,231									
1887	2,800				1,584									
1888	3,920				2,092									
1889	1,456				1,708									
1890	1,525				1,691									
1886–1890	12,053	.87			8,306	.60								
1881–1890	19,490	.77			15,043	.61								
1891	1,720				1,457									
1892	2,826				1,241									
1893	2,613				1,592									
1894	2,944				2,342									
1895	2,504				1,241									
1891–1895	12,607	.73			7,873	.46								
1896	3,808				1,422									
1897	3,898				1,854									
1898	3,321				1,725									
1899	3,396				1,686									
1900	3,133				1,518									
1896–1900	17,556	.72			8,205	.34								
1891–1900	30,163	.72			16,078	.40								
1851–1900	81,673	.82			105,414	1.06								
1801–1900	88,729	.77			122,836	1.07								
1901	3,360				1,512									
1902	3,774				1,693									
1903	3,472				1,552									
1904	3,735				1,624									
1905	3,304				1,484									
1901–1905	17,645	.53			7,265	.24								
1906	3,209				1,607									
1907	3,696				1,170									
1908	3,114				1,874		2,425							
1909	2,794				1,874		5,071							
1910	1,947				2,535		5,401							
1906–1910	14,760	.35			9,060	.21	12,897	0.30						
1901–1910	32,405	.42			16,325	.21	12,897	.17						
1911	1,836				2,866		7,716							
1912	2,556				4,409		8,157							
1913	2,305				4,519		7,055							
1914	2,027				3,638									
1915	1,036		1,065											
1911–1915	9,760	.18	1,065	0.02	15,432	.29	22,928	.43						
1916	2,058		1,515											
1917	1,467		1,105											
1918	1,255		1,353											
1919	1,515				714				[1] 1,791				15	
1920	700				1,813				2,685		220		182	
1916–1920	6,995	.10	3,973	.06	2,527	.04			[1] 4,476	0.07	220		197	
1911–1920	16,755	.14	5,038	.04	17,959	.15	22,928	.19	4,476	.03	220		197	
1921	392				4,715				4,568		661		119	
1922	352				5,063				5,902		1,102		122	
1923	544				5,327				7,482		1,102		78	
1924	475				4,242				8,930		1,102		99	
1925	1,052				3,724				8,048		1,102		147	
1921–1925	2,815	.05			23,064	.39			34,930	.59	5,069	0.09	565	0.01
1901–1925	51,975	.20	5,038	.02	57,956	.23	35,825	.14	39,406	.15	5,289	.02	762	.01
1926	1,644	.10			2,467	.15			13,338	.82	1,874	.11	208	.01
1927	([5])		[1] 2,480	.15	3,968	.24			14,220	.85	([5])		([5])	

Period	Asia Quantity	Asia Per cent	Japan Quantity	Japan Per cent	Turkey Quantity	Turkey Per cent	China Quantity	China Per cent	India Quantity	India Per cent
1801–1810	31,360	17.23	31,360	17.23						
1811–1820	31,360	16.64	31,360	16.64						
1821–1830	44,800	16.38	44,800	16.38						
1831–1840	44,800	12.29	44,800	12.29						
1841–1850	44,800	9.07	44,800	9.07						
1801–1850	197,120	13.12	197,120	13.12						
1851–1860	44,800	5.90	44,800	5.90						
1861–1870	39,200	3.41	39,200	3.41						
1871–1880	38,080	2.68	38,080	2.68						
1881	4,368		4,368							
1882	5,376		5,376							
1883	8,512		8,512							
1884	11,200		11,200							
1885	11,612		11,612							
1881–1885	41,068	3.71	41,068	3.71						
1886	10,862		10,862							
1887	12,293		12,293							
1888	14,620		14,620							
1889	18,060		18,060							
1890	20,129		20,129							
1886–1890	75,964	5.49	75,964	5.49						
1881–1890	117,032	4.70	117,032	4.60						
1891	20,720		20,720							
1892	21,280		21,280							
1893	20,160		20,160							
1894	22,456		22,456							
1895	20,642		20,642							
1891–1895	105,258	6.10	105,258	6.10						
1896	23,520		23,520							
1897	26,852		25,760		1,092					
1898	28,722		28,196		526					
1899	31,898		30,868		1,030					
1900	32,079		31,497		582					
1896–1900	143,071	5.90	139,841	5.77	3,230	0.13				
1891–1900	248,329	5.98	245,099	5.93	3,230	.07				
1851–1900	487,441	4.89	484,211	4.86	3,230	.07				
1801–1900	684,561	5.97	681,331	5.94	3,230	.03				
1901	31,870		30,772		1,098					
1902	34,580		33,348		1,232					
1903	36,691		35,123		1,568					
1904	40,096		39,032		1,064					
1905	41,283		40,219		1,064					
1901–1905	184,520	5.50	178,494	5.32	6,026	.18				
1906	48,345		47,869		476					
1907	56,207		54,807		1,400					
1908	46,026		44,812		1,214					
1909	51,413		50,531		882					
1910	55,081		54,370		661					
1906–1910	257,022	6.02	252,389	5.91	4,633	.11				
1901–1910	441,542	5.79	430,883	5.65	10,659	.14				
1911	59,968		58,866		1,102					
1912	69,360		68,809		551					
1913	73,856		73,305		551					
1914	77,672		77,672							
1915	83,132		83,132							
1911–1915	363,988	6.78	361,784	6.74	2,204	.04				
1916	110,932		110,932							
1917	119,091		119,091							
1918	99,584		99,584							
1919	88,055		87,444				611			
1920	76,274		75,491				210		573	
1916–1920	493,986	7.24	492,542	7.22			821	0.01	573	0.01
1911–1920	857,930	7.04	854,326	7.01	2,204	.02	821	.01	573	
1921	63,232		60,946				1,056		1,280	
1922	62,379		60,872				345		1,162	
1923	67,342		66,197				936		209	
1924	71,597		69,236				928		1,433	
1925	77,276		72,413				1,155		3,708	
1921–1925	341,876	5.78	329,664	5.58			4,420	.07	7,792	.13
1901–1925	1,641,342	6.38	1,614,873	6.28	12,863	.05	5,241	.02	8,365	.03
1926	88,662	5.44	76,150	4.67	([3])		2,279	.14	6,834	.42
1927	75,952	4.55	69,872	4.17	([5])		([5])	([5])	[1] 6,100	.36

Period	Africa Quantity	Africa Per cent	South Africa Quantity	South Africa Per cent	Algeria Quantity	Algeria Per cent	Belgian Congo Quantity	Belgian Congo Per cent	Rhodesia Quantity	Rhodesia Per cent	Australasia Quantity	Australasia Per cent	References
1801–1810													
1811–1820													
1821–1830													
1831–1840													
1841–1850											17,584	3.56	Converted from long-ton figures of Nicol Brown and Charles Turnbull, A Century of Copper, London, 1906.
1801–1850											17,584	1.17	
1851–1860	3,753	0.49	3,584	0.47	169	0.02					39,815	5.24	
1861–1870	8,512	.74	8,512	.74							85,120	7.41	
1871–1880	42,112	2.96	42,112	2.96							123,648	8.68	
1881	4,555		3,883		672						11,200		Mineral Resources, 1888, p. 73.
1882	7,074		6,402		672						9,533		Do.
1883	7,364		6,692		672						13,744		Mineral Resources, 1899–90, p. 73 (United States figures obtained for all years from Mineral Resources, 1925, p. 359, "Smelter production").
1884	5,891		5,600		291						15,792		Do.
1885	6,384		6,104		280						12,768		Mineral Resources, 1892, p. 114.
1881–1885	31,268	2.83	28,681	2.59	2,587	.24					63,037	5.70	
1886	6,860		6,737		123						10,864		Mineral Resources, 1893, p. 86.
1887	8,288		8,120		168						8,624		Mineral Resources, 1894, p. 352.
1888	8,456		8,400		56						8,456		Do.
1889	8,803		8,624		179						12,972		Mineral Resources, 1900, p. 184.
1890	7,358		7,224		134						10,590		Do.
1886–1890	39,765	2.88	39,105	2.83	660	.05					51,506	3.73	
1881–1890	71,033	2.85	67,786	2.71	3,247	.14					114,543	4.72	
1891	6,854		6,720		134						11,527		Do.
1892	6,854		6,854								9,839		Do.
1893	6,821		6,821								6,897		Do.
1894	7,280		7,280								7,606		Do.
1895	7,969		7,930		39						9,602		Mineral Resources, 1902, p. 198.
1891–1895	35,778	2.07	35,605	2.06	173	.01					45,471	2.63	
1896	8,344		8,344								12,624		Mineral Resources, 1903, p. 224.
1897	8,333		8,333								18,573		Do.
1898	7,963		7,907		56						17,856		Do.
1899	7,269		7,269								23,401		Do.
1900	7,526		7,526								23,822		Do.
1896–1900	39,435	1.63	39,379	1.63	56						96,276	3.97	
1891–1900	75,213	1.85	74,984	1.85	229						141,747	3.30	
1851–1900	200,623	2.01	196,978	1.98	3,645	.03					504,873	5.06	
1801–1900	200,623	1.75	196,978	1.72	3,645	.03					522,457	4.55	
1901	8,369		8,369								32,069		Do.
1902	4,984		4,984								32,565		Do.
1903	5,858		5,858								32,254		Mineral Resources, 1905, p. 356.
1904	8,708		8,708								29,807		Do.
1905	8,204		8,204								30,240		Do.
1901–1905	36,123	1.08	36,123	1.08							156,935	4.67	
1906	7,818		7,325						[1] 493		40,600		Mineral Resources, 1916, p. 625.
1907	7,616		7,538						[1] 78		46,200		Do.
1908	3,930		3,836						94		43,352		Mineral Resources, 1919, p. 543.
1909	4,452		4,354						98		41,020		Do.
1910	5,720		5,677						43		49,112		Do.
1906–1910	29,536	.69	28,730	.67					806	0.02	220,284	5.16	
1901–1910	65,659	.86	64,853	.85					806	.01	377,219	4.94	
1911	14,077		12,964				1,113				50,683		Do.
1912	14,185		11,396				2,789				51,084		Do.
1913	20,225		11,925				8,300				50,317		Do.
1914	28,442		15,427				12,004		1,011		44,367		Mineral Resources, 1919, p. 544.
1915	31,376		12,118				15,741		3,517		48,437		Mineral Resources, 1920, p. 455.
1911–1915	108,305	2.02	63,830	1.20			39,947	0.74	4,528	.08	244,888	4.56	
1916	39,951		11,628				24,802		3,521		44,497		Mineral Resources, 1921, p. 237.
1917	43,595		8,930				30,754		3,911		43,938		Do.
1918	30,881		5,318				22,309		3,254		43,337		Do.
1919	35,243		6,588		66		25,374		3,215		21,485		Mineral Resources, 1923, p. 185.
1920	30,631		6,001		474		20,902		3,254		29,787		Mineral Resources, 1924, p. 369.
1916–1920	180,301	2.64	38,465	.56	540	.01	124,141	1.82	17,155	.25	183,044	2.68	
1911–1920	288,606	2.37	101,295	.84	540		164,088	1.35	21,683	.18	427,932	3.51	
1921	44,510		7,298		331		33,581		3,300		12,287		Mineral Resources, 1925, p. 350.
1922	59,514		7,654		474		47,798		3,588		14,003		Do.
1923	86,198		18,765		507		63,808		3,118		19,838		Do.
1924	115,591		17,777		551		94,325		2,938		16,322		Do.
1925	119,542		17,806		441		99,323		1,972		13,235		Do.
1921–1925	425,355	7.20	69,300	1.18	2,304	.04	338,835	5.73	14,916	.25	75,685	1.28	
1901–1925	779,620	3.03	236,448	.92	2,844	.01	502,923	1.96	37,405	.15	880,836	3.42	
1926	109,904	6.75	19,626	1.21	539	.03	88,889	5.46	[1] 850	.05	11,627	.71	
1927	120,763	7.22	([5])	([5])	([5])	([5])	([5])	([5])	([5])	([5])	12,800	.77	America Bureau of Metal Statistics, 1927 (4,409 [1] attributed to "Other countries").

[1] Estimated.

[2] Czechoslovakia, 661 tons; 0.04 per cent.

[3] Cyprus, 3,367 tons, 1926.

[4] Other countries, 4,409 (1927).

[5] No segregation made.

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