

CENSUS BULLETIN.

No. 110.

WASHINGTON, D. C.

September 3, 1891.

POPULATION OF WASHINGTON

BY MINOR CIVIL DIVISIONS.

DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE,

WASHINGTON, D. C., August 25, 1891.

This bulletin gives the population of the state of Washington in detail by counties, precincts, cities, wards of cities, towns, and villages, according to the official count of the returns made under the Eleventh Census, taken as of June 1, 1890. The figures for such of the same divisions as had population returns in 1880 are presented for purposes of comparison.

The population of the state in 1880 was 75,116; in 1890 a population of 349,390 was returned, an increase of 274,274, or 365.13 per cent.

Since 1880 the following counties have been formed: In 1881, Garfield from Columbia; in 1883, Adams from Whitman, Asotin from Garfield, Douglas from Lincoln, Franklin from Whitman, Kittitas from Yakima, Lincoln from Spokane, Okanogan from Stevens, and Skagit from Whatcom. In Columbia county there is an apparent though not real decrease, because of the loss of territory taken to form Garfield county. Skamania county shows a slight decrease. In all the other counties large increases are shown.

The summary which follows gives the population of each county according to the censuses of 1890 and 1880, together with the increase in number and per cent during the decade.

SUMMARY BY COUNTIES.

COUNTIES.	POPULATION.		INCREASE.		COUNTIES.	POPULATION.		INCREASE.	
	1800.	1880.	Number.	Per cent.		1890.	1880.	Number.	Per cent.
The State	349,390	75,116	274,274	365.13	Lewis.....	11,499	2,800	8,899	312.27
Adams.....	2,098		2,098		Lincoln	9,312		9,312	
Asotin.....	1,580		1,580		Mason.....	2,826	630	2,187	342.25
Chehalis	9,249	921	8,328	901.23	Okanogan	1,467		1,467	
Clallam	2,771	638	2,133	331.33	Pacific.....	4,358	1,645	2,713	164.92
Clarke	11,709	5,490	6,219	113.28	Pierce.....	50,940	3,319	47,621	1,431.80
Columbia.....	6,709	7,103	4304	65.55	San Juan	2,072	918	1,154	118.57
Cowlitz.....	5,917	2,062	3,855	186.05	Skagit.....	8,747		8,747	
Douglas.....	3,161		3,161		Skamania	774	800	635	61.33
Franklin	696		696		Snohomish	8,514	1,387	7,127	513.84
Garfield	3,897		3,897		Spokane.....	37,487	4,262	33,225	779.56
Island.....	1,787	1,087	700	64.40	Stevens	4,341	1,245	3,096	218.67
Jefferson	8,868	1,712	6,656	388.79	Thurston	9,675	3,270	6,405	195.87
King.....	63,989	6,910	57,079	826.03	Wahkinkum	2,526	1,598	928	58.07
Kitsap.....	4,624	1,738	2,886	166.05	Walla Walla.....	12,224	8,716	3,508	40.25
Kittitas	8,777		8,777		Whatcom	18,591	3,137	15,454	492.64
Klickitat	5,167	4,055	1,112	27.42	Whitman	19,109	7,014	12,095	172.44
					Yakima	4,420	2,811	1,618	57.56

a Decrease.

In 1880 the largest body of urban population in the state of Washington was found at Wallawalla, which had a population of 3,588. The next largest body of urban population was Seattle, with a population of 3,533. Up to June 1, 1890, Seattle had increased 39,304, or 1,112.48 per cent. The population of Seattle in 1890 was 42,837. The same enormous increases are found in Tacoma and Spokane Falls, the former having increased from 1,098 in 1880 to 36,006 in 1890, and the latter from 350 in 1880 to 19,922 in 1890.

The population of the twenty cities and towns having 1,500 or more inhabitants, in the order of their rank, is as follows:

CITIES AND TOWNS.	COUNTIES.	POPULATION.		INCREASE.		CITIES AND TOWNS.	COUNTIES.	POPULATION.		INCREASE.	
		1890.	1880.	Number.	Per cent.			1890.	1880.	Number.	Per cent.
Seattle city.....	King.....	42,837	3,533	39,304	1,112.48	Centralia city.....	Lewis.....	2,026	.....	2,026	.....
Tacoma city.....	Pierce.....	36,006	1,098	34,908	3,179.28	Snohomish city.....	Snohomish.....	1,993	149	1,844	1,237.58
Spokane Falls city..	Spokane.....	19,922	350	19,572	5,592.00	Dayton city.....	Columbia.....	1,880	996	884	88.76
Wallawalla city.....	Wallawalla.....	4,709	3,588	1,121	31.24	Puyallup town.....	Pierce.....	1,732	207	1,435	483.16
Olympia city.....	Thurston.....	4,698	1,232	3,466	281.33	Sprague town.....	Lincoln.....	1,689	.....	1,689	.....
Port Townsend city..	Jefferson.....	4,558	917	3,641	397.06	Colfax town.....	Whitman.....	1,649	444	1,205	271.40
Fairhaven city.....	Whatcom.....	4,070	.....	4,070	.....	Aberdeen town.....	Chehalis.....	1,638	.....	1,638	.....
Whatcom city.....	Whatcom.....	4,059	.....	4,059	.....	Montesano town.....	Chehalis.....	1,632	.....	1,632	.....
Vancouver city.....	Clawke.....	3,545	1,722	1,823	105.87	Blaine city.....	Whatcom.....	1,563	.....	1,563	.....
Ellensburg city.....	Kittitas.....	2,768	.....	2,768	.....	North Yakima city..	Yakima.....	1,535	.....	1,535	.....

The table on the following pages shows the population of each county in detail by minor civil divisions; also the population of all incorporated places, and all unincorporated places having 200 inhabitants or more, so far as it has been possible to make the separation from the returns of the enumerators. In many counties it is impossible to show the population of the various precincts and of some towns and villages, because of the failure of the enumerators to properly designate civil divisions. Much that is given in regard to precincts, as well as incorporated places, has been obtained through correspondence with county officials since the enumeration.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
LEWIS COUNTY.....	11,499	2,600	PIERCE COUNTY—Continued.		
Alpha precinct.....	887		Tacoma city.....	36,006	1,098
Bolsfort precinct.....	517		Ward 1.....	3,779	
Centralia precinct, including Centralia city.....	2,842		Ward 2.....	12,343	
Centralia city.....	2,026		Ward 3.....	11,252	
Chehalis precinct, including Chehalis city.....	1,818		Ward 4.....	8,602	
Chehalis city.....	1,399		Tanwax precinct.....	278	
Cloquato precinct.....	716		Vaughn precinct.....	185	
Cowlitz precinct, including Cowlitz town.....	883		Wilkeson precinct.....	499	
Cowlitz town.....	375		Not located by precincts.....	339	
Edonia precinct.....	260				
Elk precinct.....	128		SAN JUAN COUNTY.....	2,072	048
Hanford precinct.....	188				
Klickitat precinct.....	434		Henry Island precinct.....	13	
Lincoln Creek precinct.....	294		Lopez Island precinct.....	321	
Little Falls precinct.....	440		Orens Island precinct.....	543	
Naselle precinct.....	808		San Juan Island precinct, including Roche Har- bor village.....	992	
Salkum precinct.....	337		Roche Harbor village.....	247	
Simon Creek precinct.....	280		Smith Island precinct.....	8	
Toledo precinct, including Toledo town.....	364		Not located by precincts.....	195	
Toledo town.....	276				
Yancey precinct.....	220		SKAGIT COUNTY (d).....	8,747	
Winlock precinct.....	877				
Not located by precincts.....	168		Anacortes town.....	1,131	
LINCOLN COUNTY (a).....	9,312		Deception town.....	297	
Davenport town.....	396		Fir town.....	280	
Sprague town.....	1,689		Hamilton town.....	203	
Wilbur town.....	410		La Conner town.....	398	
			Mount Vernon town.....	770	
MASON COUNTY.....	2,826	690	SIAMANIA COUNTY.....	774	800
Shelton town.....	648		Cascades town.....	164	149
OKANOGAN COUNTY (b).....	1,467		SNOHOMISH COUNTY.....	8,514	1,387
Concochully town.....	232				
PACIFIC COUNTY.....	4,358	1,045	Bear Creek precinct.....	114	
Iltwaco town.....	517	85	Beecher Lake precinct.....	78	
Oysterville town.....	197	125	Edmonds precinct.....	384	
			Fernwood precinct.....	200	
PIERCE COUNTY.....	50,940	8,319	Florence precinct.....	295	
Alderton precinct.....	202		Fort Susan precinct.....	19	
Antondale precinct.....	208		Gold Bar precinct.....	184	
Buckley precinct.....	878		Highland precinct.....	150	
Carbonado precinct, including Carbonado vil- lage.....	727		Kent Prairie precinct.....	514	
Carbonado village.....	705		Lake precinct.....	126	
Clover Creek precinct.....	101		Lowell precinct.....	287	
Fox Island precinct.....	120		Maketeo precinct.....	92	
Gig Harbor precinct, including Gig Harbor vil- lage.....	407		Marysville precinct, including Marysville town.....	664	
Gig Harbor village.....	321		Marysville town.....	262	
Lake Bay precinct.....	124		Mountain precinct.....	94	
Lake Tarps precinct.....	226		North Fork precinct.....	180	
Lake View precinct, including Lake View town.....	430		Park Place precinct.....	103	
Lake View town.....	256		Pilehuck precinct.....	498	
McNeil Island precinct.....	161		Portage precinct.....	129	
Minter precinct.....	174		Snohomish precinct, including Snohomish city.....	2,469	
Musk precinct.....	338		Snohomish city.....	1,993	149
Orting precinct, including Orting village.....	680		Stanwood precinct.....	808	
Orting village.....	623		Sillanumish precinct.....	730	
Puyallup precinct, including Puyallup town.....	2,001		Sultan precinct.....	236	
Puyallup town.....	1,732	297	Tualco precinct.....	215	
Rosedale precinct.....	70				
Roy precinct.....	705		SPOKANE COUNTY (e).....	37,487	4,202
South Prairie precinct.....	530				
Sprague and Fern Hill precincts (c).....	2,804		Cheney town.....	647	
Stellacoom precinct, including Stellacoom City town.....	878		Latah village.....	232	
Stellacoom City town.....	270	250	Medical Lake town.....	617	
Summer precinct, including Summer town.....	1,206		Rockford town.....	644	
Summer town.....	580		Spangle town.....	303	36
			Spokane Falls city.....	19,922	350
			Ward 1.....	5,403	
			Ward 2.....	4,324	
			Ward 3.....	3,598	
			Ward 4.....	6,597	
			STEVENS COUNTY (f).....	4,341	1,245
			Colville village (g).....	539	67
			Marcus village.....	311	

a Organized in 1883 from part of Spokane county; part taken to form Douglas county in 1883.

b Organized in 1883 from part of Stevens county.

c Not separately returned.

d Organized in 1883 from part of Whatcom county.

e Part taken to form Lincoln county in 1883.

f Part taken to form Okanogan county in 1883.

g Formerly Fort Colville.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
THURSTON COUNTY	9,675	3,270	WHATCOM COUNTY—Continued.		
Bucoda town.....	945		Lake precinct.....	82	
Olympia city.....	4,698	1,232	Licking precinct.....	221	
Ward 1.....	2,343		Lumas precinct.....	178	
Ward 2.....	1,126		Lummi precinct.....	230	
Ward 3.....	1,220		Lynden precinct, including Lynden village.....	823	
Tenino town.....	339		Lynden village.....	560	
Tumwater town.....	410	171	New Whatcom precinct, including Schome vil- lage (b).....	2,110	
WAIKIAKUM COUNTY	2,526	1,598	Nooksachk precinct.....	670	
WALLAWALLA COUNTY	12,224	8,716	Rome precinct.....	248	
Prescott village.....	313		Seminahmoo precinct.....	100	
Waitsburg village.....	817	248	Ton Mile precinct.....	351	
Walla Walla city.....	4,709	3,588	Terry precinct.....	80	
Ward 1.....	1,427		West Ferndale precinct.....	679	
Ward 2.....	1,340		Whatcom precinct, including Whatcom city.....	4,827	
Ward 3.....	954		Whatcom city.....	4,959	
Ward 4.....	979		Not located by precincts.....	307	
Wallula village.....	518	142	WHITMAN COUNTY (c)	19,100	7,014
WHATCOM COUNTY (a)	18,591	8,137	Colfax town.....	1,649	444
Baker precinct.....	349		Farmington town.....	418	76
Barnes precinct.....	182		Garfield town.....	317	
Bellingham precinct.....	263		Oakesdale town.....	528	
Birch Bay precinct.....	237		Palouse city.....	1,119	148
Blaine precinct (coextensive with Blaine city).....	1,563		Pullman town.....	868	
Delta precinct.....	236		Rosalia village.....	248	
East Ferndale precinct.....	350		Tekoa town.....	301	
Excelsior precinct.....	319		Uniontown town.....	479	
Fairhaven city.....	4,076		YAKIMA COUNTY (d)	4,420	2,811
			North Yakima city.....	1,538	
			Yakima city.....	106	267

a Part taken to form Skagit county in 1883.

b Not separately returned.

c Parts taken to form Adams and Franklin counties in 1883.

d Part taken to form Kittitas county in 1883.

ROBERT P. PORTIER,
Superintendent of Census.

CENSUS BULLETIN.

No. 111.

WASHINGTON, D. C.

September 4, 1891.

HORTICULTURE.—SEED FARMS.

DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE,

WASHINGTON, D. C., August 18, 1891.

The production of seeds as an industry has been for the first time made a subject of census investigation. This report is prepared by Mr. J. H. HALE, special agent, under the direction of Mr. MORTIMER WHITEHEAD, special agent in charge of horticulture. The material from which these statistics are compiled was obtained directly from the seed growers upon schedules prepared for that purpose and by personal visits of special agents to seed farms and dealers in all parts of the country. The figures are subject to revision before publication in the final report.

This investigation included only such farms as were devoted to seed growing as a business, and did not consider the large amount of field and garden seeds grown as side crops on thousands of farms, which would greatly swell the aggregate yield of seeds, but would not fairly estimate seed growing as a special industry. It will be noted that seed growing has been carried on as a business in this country for more than a century, but that only within the past 30 years has it assumed large proportions. More than one-half the total number of establishments reported were started between 1870 and 1890. This report shows that there were in the United States in the census year 596 farms, with a total of 169,851 acres, devoted exclusively to seed growing, of which 96,567 $\frac{3}{4}$ acres were reported as producing seeds. Of these, 12,905 acres were devoted to beans, 1,268 to cabbage, 919 to beets, 10,219 to cucumbers, 71 to celery, 15,004 to sweet corn, 16,322 to field corn, 4,663 to squashes, 7,971 to peas, 5,149 to muskmelons, 662 to radishes, and 4,356 to tomatoes. The 596 seed farms reported represent a total value of farms, implements, and buildings of \$18,325,935.86, and employed in the census year 13,500 men and 1,541 women. 258 of these farms are in the North Atlantic division, with an average of 185 acres per farm. In the North Central division there are 157 seed farms, with an average of 555 acres per farm. The seed farms in Iowa and Nebraska average 695 acres, several being nearly 3,000 acres in extent.



Superintendent of Census.

SEED FARMS.

BY J. H. HALE.

Seeds of all staple garden and farm grains, fruits, and vegetables have been in steady demand since the first settlement of the country. In early times families preserved seed supplies from their own productions from year to year, in most cases from whatever might be left on the farm, while in other cases a careful selection was made and purer and better seeds obtained, which not only furnished the home supply, but were eagerly sought by friends and neighbors. For many years little was known of seeds as a commercial product, and even at the present time in many rural communities some of the more common farm seeds are freely exchanged among the farmers.

The first regular seed farm of those now in the country, as far as we have any record, was established in connection with the nursery business in Philadelphia in 1784.

The general growth of the country, the great increase of population in cities and villages and consequent establishment of market gardens, the demand for choice seeds and often the inability to procure them, induced market gardeners to grow and save seeds, at first for their own uses only, later to supply an ever increasing demand, until some finally drifted into seed production as a regular business.

This branch of horticulture has never before been made the subject of census inquiry. Therefore, with no recorded data to guide in the work, it has been somewhat difficult to procure even the few facts and figures of the tables herewith submitted.

After careful inquiry by circular letter (often many times repeated) to each and every seed dealer in the United States, a record was made showing a total of 596 farms in the United States devoted exclusively to seed production. These farms occupy 169,851 acres of land, of which 96,567 $\frac{1}{4}$ acres were reported as devoted to seed production during the census year, divided as follows: 1,437 acres of asparagus; 12,905 of beans; 919 of beets; 1,268 of cabbage; 569 of carrots; 11 of cauliflower; one-half of celeriac; 71 of celery; 13 of collards; 1 $\frac{1}{2}$ of corn salad; 15,004 of sweet corn; 16,322 of field corn; 1 $\frac{1}{2}$ of cress; 10,219 of cucumbers; 39 $\frac{3}{4}$ of dandelion; 252 of eggplants; 16 of endive; 105 of kale; 19 of kohlrabi; 13 $\frac{1}{2}$ of leek; 486 $\frac{1}{2}$ of lettuce; 5,149 of muskmelons; 3,978 of watermelons; 2 of nasturtium; 13 of okra; 3,560 of onions; 352 of onion sets; 75 of parsley; 374 of parsnips; 7,971 of peas; 365 of pepper; 4,102 of potatoes; 105 of pumpkins; 662 of radishes; 25 of rhubarb; 26 of salsify; 150 of spinach; 4,356 of tomatoes; 885 of turnips; 4,663 of squashes, and 81 of flower seeds.

Aside from these special seed farms which have been under investigation, there are a number of extensive dealers in seeds having test gardens and farms, where side by side all new and old varieties are grown for the purpose of comparison. On these farms are also tested all seeds handled by these dealers, whose custom it is to secure their supplies by importation and by contracting with farmers in various favored sections of this country to grow any particular

variety of seed best adapted to that farmer's land or locality. Some of these are among the regular seed farms here enumerated; others grow one or more varieties of seeds each year only as a branch of their other farming operations, and as no special note of their productions was made by the regular census enumerator, and the dealers in some instances have failed or refused to furnish the names of these farmers, it has been impossible to get at them by special schedule, which has been the medium for collecting this information. Therefore, while this report shows the extent and production of the seed farms proper, the total of garden seeds produced in the United States is considerably in excess of the amount here given. One dealer reports supplying farmers annually 1,000 bushels of peas and 2,000 bushels of beans for planting, and then buying back all the seeds that can be grown from this stock, which amounts to about 10,000 bushels each of peas and beans; and as many other dealers have contracts in like proportion on various other seeds, it will be seen that the garden-seed business alone is assuming great importance in the agriculture of the country. Again, while the greater amount of seed grains, cotton, tobacco, etc., used upon farms is of home and neighborhood production and is freely exchanged for labor or for other products, there are in nearly every county one or more successful farmers who by a careful selection of seed stock and by better methods secure greater returns than their neighbors and are able to dispose of part of their productions for seed purposes at advanced rates. These men can not be classed as seed farmers, and would hardly be able to estimate what proportion of their crops was sold for seed purposes annually; but it is safe to assume that such farmers produce one-third of all the small grains, corn, potatoes, tobacco, and cotton seed planted. In addition to these, there are annually sold for seed purposes upward of 1,000,000 bushels of selected grains, both of the standard and newer varieties, very little of which is produced upon regular seed farms. The same is true of grass seeds, which are produced in enormous quantities in New York, Pennsylvania, Ohio, Indiana, Illinois, Kentucky, Michigan, Minnesota, Missouri, Kansas, and Nebraska, largely supplying the demands of the country as well as furnishing a considerable surplus for export. The quantity and value of this production will be shown in the final census reports.

Of the 596 seed farms in the United States, 258, or nearly one-half, are in the North Atlantic division, the original center of seed production. These farms have an acreage of 47,813, or an average of 185 acres per farm, while in the North Central division there are 157 farms, with an acreage of 87,096, or an average of 555 acres per farm. The seed farms of Massachusetts and Connecticut average 142 acres per farm, while those of Iowa and Nebraska are 695 acres in extent, and are producing seeds on a scale of equal magnitude to the other products of that section of the country. Several of these seed-producing farms embrace nearly 3,000 acres each.

The table showing date of establishment as seed farms indicates in a general way the growth and prosperity of the business. So far as reported, there were but 2 seed farms in the country previous to 1800 (one of these was established in Philadelphia in 1784, and the other at Enfield, New Hampshire, in 1795), only 3 in 1820, 6 in 1830, 19 in 1840, 34 in 1850, 53 in 1860, 100 in 1870, 207 in 1880, and 200 more were established between 1880 and 1890, leaving 189 unaccounted for as to date of establishment. But as the proprietors of the older seed farms take great pride in this matter, it is safe to assume that 90 per cent of the unreported farms have come into existence within the past 20 years.

The following table shows, by states, the number of seed farms in the United States, number of acres of land in farms, average value per acre, value of tools and implements used, and total value of farms, tools, implements, buildings, etc.:

NUMBER AND VALUE OF SEED FARMS IN THE UNITED STATES.

GEOGRAPHICAL DIVISIONS.	Number of seed farms.	Acres of land in farms.	Value of land per acre.	Value of implements.	Total value of farms, implements, and buildings.	GEOGRAPHICAL DIVISIONS.	Number of seed farms.	Acres of land in farms.	Value of land per acre.	Value of implements.	Total value of farms, implements, and buildings.
The United States.	596	169,851		\$221,736.90	\$18,325,935.86	North Central	157	87,096		\$54,425.54	\$7,095,665.42
North Atlantic	258	47,813		121,212.61	7,856,492.86	Ohio	32	19,048	\$95.00	23,116.80	2,110,000.00
Maine	2	110	\$20.00	80.00	6,594.00	Indiana	12	7,092	80.00	3,800.00	600,918.00
New Hampshire	5	225	50.00	625.00	24,543.75	Illinois	21	13,357	125.00	3,220.14	1,717,432.25
Vermont	6	618	87.50	1,050.00	59,140.25	Michigan	20	11,020	40.71	4,500.00	527,350.00
Massachusetts	25	3,000	216.67	13,750.00	809,448.00	Wisconsin	21	2,919	50.00	3,500.00	180,878.50
Rhode Island	5	605	200.00	3,416.70	141,137.53	Minnesota	6	1,140	32.50	1,200.00	47,737.00
Connecticut	85	12,665	96.00	44,306.25	1,501,653.50	Iowa	18	11,152	53.75	3,578.60	633,423.67
New York	78	18,252	111.19	43,014.06	2,176,076.72	Missouri	2	790	80.00	400.00	68,000.00
New Jersey	34	6,272	200.00	4,800.00	2,333,066.08	North Dakota	1	60	30.00	75.00	3,000.00
Pennsylvania	18	6,060	118.75	10,170.00	804,832.37	Nebraska	18	13,870	63.20	9,675.00	907,746.00
						Kansas	6	6,048	50.00	1,300.00	298,680.00
South Atlantic	89	4,958		23,355.00	406,698.64	South Central (b)	57	23,130		4,950.00	1,015,200.00
Maryland	2	212	125.00	800.00	32,865.00	Kentucky	2	250	100.00	300.00	28,300.00
District of Columbia	1	120	200.00	100.00	20,000.00	Tennessee	35	21,560	40.00	3,500.00	437,500.00
Virginia	3	240	50.00	1,500.00	15,000.00	Mississippi	2	80	35.00	100.00	4,900.00
West Virginia	1	50	40.00	50.00	4,000.00	Texas	17	1,200	25.00	1,000.00	42,500.00
North Carolina	1	180	30.00	100.00	7,400.00	Arkansas	1	40	30.00	50.00	2,000.00
South Carolina	4	760	100.00	1,300.00	82,100.00	Western	35	6,854		17,793.75	1,951,878.94
Georgia	31	2,627	40.00	9,921.00	177,000.00	Colorado	1				
Florida	46	760	45.00	9,581.00	62,333.64	Washington	2	150	100.00	100.00	18,000.00
						Oregon	17	289	170.00	1,700.00	80,588.00
						California	15	6,415	287.50	15,903.75	1,853,290.94

^a This amount represents the total acreage in farms, only a portion of which is cultivated for seeds any one year. The balance is devoted to grass, pasturage, or a rotation of farm crops in preparation for seed production. Some seed farmers, however, lease a considerable area of land or contract to have seeds grown for them by neighboring farmers, and so show a greater acreage of seed production than the total acreage of their farms. This is especially true in the North Atlantic division.

^b No record of any seed farm in Alabama, except a floating newspaper paragraph, which credits 1 man with the production of 32,000 pounds of garden seeds, which were sold to northern dealers.

The following table shows, by decades, the date of establishment of 407 out of the 596 seed farms in the country, the date of the others being unknown or unreported:

DATE OF ESTABLISHMENT OF SEED FARMS.

GEOGRAPHICAL DIVISIONS.	Total seed farms.	Date unknown or not reported.	Previous to 1800.	1800 to 1810.	1810 to 1820.	1820 to 1830.	1830 to 1840.	1840 to 1850.	1850 to 1860.	1860 to 1870.	1870 to 1880.	1880 to 1890.
The United States.	596	180	2		1	3	13	15	19	47	107	200
North Atlantic.....	258	50	2		1	3	13	15	18	40	62	54
Maine.....	2	1										1
New Hampshire.....	5	2	a				1	1				
Vermont.....	6	2									1	3
Massachusetts.....	25	8					1	1	3	4	5	3
Rhode Island.....	5	2					1	1				1
Connecticut.....	85	17		1	1	7	4	10		21	15	9
New York.....	78	15			2	4	6	2		12	16	21
New Jersey.....	34									2	20	12
Pennsylvania.....	18	3	b				1	2	1	1	5	4
South Atlantic.....	89	35									10	44
Maryland.....	2	1										1
District of Columbia.....	1											1
Virginia.....	3	1										2
West Virginia.....	1											1
North Carolina.....	1											1
South Carolina.....	4											4
Georgia.....	31	8									1	22
Florida.....	40	25									9	13
North Central.....	157	47							1	7	24	78
Ohio.....	32	12						1	2		3	14
Indiana.....	12	4									3	5
Illinois.....	21	2								3	5	11
Michigan.....	20	4								1	3	12
Wisconsin.....	21	9									3	9
Minnesota.....	6	2									2	2
Iowa.....	18	4								1	3	10
Missouri.....	2	2										
North Dakota.....	1	1										
Nebraska.....	18	5									2	11
Kansas.....	6	2										4
South Central.....	57	43									6	8
Kentucky.....	2										2	
Tennessee.....	35	27									3	5
Mississippi.....	2	2										
Texas.....	17	13									1	3
Arkansas.....	1	1										
Western.....	35	14									5	10
Colorado.....	1	1										
Washington.....	2	2										
Oregon.....	17	7									2	8
California.....	15	4									3	8

a Established at Enfield, Grafton county, New Hampshire, in 1795.

b Established by David Landreth at Philadelphia, Pennsylvania, in 1784, in connection with the nursery business.

NUMBER OF EMPLOYÉS, WAGES PAID, AND NUMBER OF ANIMALS USED.

GEOGRAPHICAL DIVISIONS.	Number of men employed.	Wages paid men per day.	Number of women employed.	Wages paid women per day.	Number of horses and other animals employed.	GEOGRAPHICAL DIVISIONS.	Number of men employed.	Wages paid men per day.	Number of women employed.	Wages paid women per day.	Number of horses and other animals employed.
The United States	13,500		1,541		4,419	North Central	6,779		527		1,927
North Atlantic	5,420		881		1,971	Ohio	1,524	\$0.93	61	\$0.56	460
Maine	27	\$1.25			12	Indiana	218	1.00			72
New Hampshire	10	1.00			5	Illinois	1,163	1.50	315	0.87½	312
Vermont	62	0.87½	1	\$0.50	28	Michigan	1,625	1.12	80	0.50	460
Massachusetts	325	1.46			225	Wisconsin	405	1.50			105
Rhode Island	45	1.34	5	0.88	15	Minnesota	124	1.00	14	0.50	30
Connecticut	1,282	1.25	85	0.65	510	Iowa	354	1.05			72
New York	2,702	1.17	624	0.62	890	Missouri	46	1.00			8
New Jersey	209	1.16	40	1.00	70	North Dakota	2	1.25			2
Pennsylvania	608	1.20	126	0.01	210	Nebraska	872	1.00	54	0.62½	200
						Kansas	416	1.00			86
						South Central	547		70		229
South Atlantic	432		33		147	Kentucky	15	1.00			6
Maryland	18	1.10			7	Tennessee	475	0.50	70	0.35	190
District of Columbia	5	1.00	2	0.75	2	Mississippi	4	0.50			
Virginia	21	1.00			9	Texas	51	0.50			31
West Virginia						Arkansas	2	0.60			2
North Carolina	9	0.60			4	Western	322		30		145
South Carolina	10	0.60			6	Colorado					
Georgia	293	0.72	31	0.50	92	Washington	5	1.25			4
Florida	70	1.13			27	Oregon	17	1.25			51
						California	300	0.90	30	0.75	90

ACREAGE OF SEED PRODUCTION.

GEOGRAPHICAL DIVISIONS.	Total.	Aspara- gus. (a)	Beans. (b)	Beet.	Cab- bage.	Carrot.	Cauli- flower.	Celeriac.	Celery.	Collard.	Corn salad.	Corn (sweet).	Corn (field).	Cress.
North Atlantic:														
Maine.....	133		14	1		1						30		
New Hampshire.....	163 $\frac{1}{4}$			1								5		$\frac{1}{2}$
Vermont.....	312	2												
Massachusetts.....	1,221 $\frac{1}{2}$	6		8	48	18			1			193	139	
Rhode Island.....	356 $\frac{1}{2}$	3		4	9	11			1			96	75	
Connecticut.....	5,127 $\frac{1}{2}$			27	167	64					$\frac{1}{2}$	1,573	765	
New York.....	14,032 $\frac{1}{2}$	370	4,600	116	274	187	1	$\frac{1}{2}$	4		1	170	624	1
New Jersey.....	4,049	640	12	1	2								50	
Pennsylvania.....	3,237	68	180	34	230	131			2			95	900	
South Atlantic:														
Maryland.....	144													
District of Columbia.....	7				1		3							
Virginia.....	55	12			2				1				17	
North Carolina.....	30													
South Carolina.....	52	40												
Georgia.....	1,338	45	275	2						11			620	
Florida.....	470	4												
North Central: (c)														
Ohio.....	12,166	6	1,624	128	184	13			1			3,200	4,432	
Indiana.....	2,751	2	110	36	16	36						1,800	340	
Illinois.....	8,330	27	2,860	75	116	4			1			800	667	
Michigan.....	9,754		2,015	43	42	2						286	160	
Wisconsin.....	2,974			13	13	16						40	672	
Minnesota.....	856		84	4								18		
Iowa.....	2,632	3	71	2	42	7						568	952	
Missouri.....	403			1	2								460	
Nebraska.....	11,588	2		210	60	7						3,780	1,638	
Kansas.....	5,480		180	24	4	1						1,790	700	
South Central: (c)														
Kentucky.....	40													
Tennessee.....	4,382	27		18	21							260	3,220	
Western: (c)														
Washington.....	50				28		2							
Oregon.....	10				4									
California.....	3,950 $\frac{1}{2}$	180	280	165		71	5		60	2				

a Nearly all seed asparagus comes from selected stock of market gardens, as a second crop following the marketing of the green produce.

b The beans here reported include but a very small proportion of limas, seed of that variety now being nearly all from California, where they are grown by the thousands of acres as a staple farm crop, and the warehouse men select a portion of the largest and finest to supply the seed trade.

c No reports received from North Dakota, Mississippi, Texas, Arkansas, or Colorado.

ACREAGE OF SEED PRODUCTION—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Cucum-ber.	Dando-lion.	Egg-plant.	Endive.	Kale.	Kohl-rabi.	Leek.	Lettuce.	Melon (muskt).	Melon (water).	Nastur-tium.	Okra.	Onion.	Onion sets.
North Atlantic :														
Maine.....	5													
New Hampshire.....		$\frac{1}{4}$						1					2	
Vermont.....														
Massachusetts.....	150	8						$8\frac{1}{2}$	5				150	12
Rhode Island.....	20	$\frac{1}{2}$							7	5			28	
Connecticut.....	910							16	195	150			285	7
New York.....	916	16	40		78	2	1	40	370	370	2	1	320	23
New Jersey.....	40		116						2,750	350				25
Pennsylvania.....	563		9			3	1	36	72	80			82	90
South Atlantic :														
Maryland.....									118					
District of Columbia.....														
Virginia.....					12	2		2						
North Carolina.....										40				
South Carolina.....			12											
Georgia.....	8		60			7		6	67	217		10		
Florida.....			8							461				
North Central : (a)														
Ohio.....	318	8						25	85				312	38
Indiana.....	284	1						12	68					
Illinois.....	630	4	3		2	3	1	60	252	315			168	40
Michigan.....	873	2					1	12	40	20			16	
Wisconsin.....								60						
Minnesota.....	6													
Iowa.....	472		4					3	30	27		2	16	3
Missouri.....														
Nebraska.....	3,724							30	558	416			28	9
Kansas.....	1,300								460	600			6	30
South Central : (a)														
Kentucky.....														40
Tennessee.....										927			32	35
Western : (a)														
Washington.....														
Oregon.....					16	13	2	$9\frac{1}{2}$	175	82				
California.....													2,165	

a No reports received from North Dakota, Mississippi, Texas, Arkansas, or Colorado.

ACREAGE OF SEED PRODUCTION—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Parsley.	Parsnip.	Peas.	Pepper.	Potato. (a)	Pump- kin.	Radish.	Rhu- barb. (b)	Salsify.	Spinach.	Squash.	Tomato.	Turnip.	Flower seed.
North Atlantic :														
Maine.....		1	20		60								1	
New Hampshire.....					5						2			
Vermont.....			66		244									
Massachusetts.....	2	3	25		375	2	16	2		12	26	12	2	7
Rhode Island.....	3	1		2	35	12	2			1	20	4	7	
Connecticut.....	4	18	40	27	140	6	43	6	2	21	186	160	315	
New York.....	18	6	2,282	234	1,092	14	187	4	8	30	780	134	404	12
New Jersey.....					56								5	2
Pennsylvania.....	12	38		72	288	8		8	1	12	55	81	76	10
South Atlantic :														
Maryland.....	2												21	
District of Columbia.....														
Virginia.....									1			6		
North Carolina.....														
South Carolina.....														
Georgia.....			4		2									4
Florida.....														6
North Central : (c)														
Ohio.....		41	20		250	2	2	1		8	180	1,312	2	4
Indiana.....		16			25					5				
Illinois.....	4	142	672	11	840	5	210		2	11	230	212	63	
Michigan.....	2	16	1,440	1	22	4	3		1	13	1,940	2,200		
Wisconsin.....		4	1,800		294					2				
Minnesota.....			720		24									
Iowa.....		8	46		180	19	6	2	2	12	118	15	2	20
Missouri.....														
Nebraska.....	11	34	180	18		27	18			17	756	59		
Kansas.....	7										370	18		
South Central : (c)														
Kentucky.....														
Tennessee.....		6	105		160	6		2	1			54	8	
Western : (c)														
Washington.....			16		4									
Oregon.....					6									
California.....	10	40	475				175		8	6		65		16

^aNearly all seed potatoes of the newer varieties are produced by seed farmers who are potato specialists or under contract by seed dealers, but a very large portion of the seed stock offered for sale comes from selected tubers grown as staple farm crops, the potato farms of Arcostock county, Maine, alone supplying nearly 2,000,000 bushels for seed purposes only to the states in the North and South Atlantic divisions, farms of northern Vermont, New York, Ohio, Michigan, Wisconsin, and Minnesota furnishing the rest of the country. Therefore the acreage here given represents but a very small percentage of seed potatoes actually grown.

^bNearly all seed rhubarb comes from selected stock of market gardens, as a second crop following the marketing of the green produce.

^cNo reports received from North Dakota, Mississippi, Texas, Arkansas, or Colorado.

Chervil and chicory did not appear upon any of the schedule reports, while celeriac, endive, and nasturtium show such a very small area as to almost lead to the belief that they have either been neglected in some of the reports or are grown by some of the contract farmers and not reported by the dealers.

VALUE OF PLANTING STOCK PER ACRE. (a)

GEOGRAPHICAL DIVISIONS.	Beans.	Beet.	Cab- bago.	Carrot.	Celery.	Collard.	Corn (sweet).	Corn (field).	Cucum- ber.	Danda- tion.	Egg- plant.	Lef- tuce.	Melon (musk).	Melon (water).
North Atlantic:														
Maine		\$25.00		\$20.00										
New Hampshire		30.00					\$1.50			\$0.50		\$12.00		
Vermont														
Massachusetts		75.00	\$145.00	20.00	\$35.00		3.33	\$1.00	\$1.50	0.50		15.00	\$9.00	\$2.00
Rhode Island		50.00	62.50	35.00	35.00		3.00	1.00	1.50	0.50				2.00
Connecticut		43.33	94.44	32.00			2.81	0.75	1.50			13.00	3.00	2.25
New York	\$2.43	57.50	80.00	30.00	37.50		2.00	0.75	1.50		\$31.00	12.50	3.00	2.00
New Jersey	2.50	35.00	45.00					0.75	1.50		2.50		2.00	1.50
Pennsylvania	2.50	40.00	41.25	27.50	25.00		3.70	1.00	1.70		3.00	0.00	2.00	1.50
South Atlantic:														
Maryland														1.25
Virginia			30.00		20.00			0.65				7.00		
Georgia	3.33	30.00				\$8.83		0.60	0.25		2.00	10.00	1.50	1.00
Florida											2.00			1.00
North Central:														
Ohio	2.00	35.00	35.00	21.50	22.50		2.16	0.50	0.50	0.25		6.40	1.25	1.50
Indiana	2.00	32.50	28.00	20.00			1.75	0.50	0.50					1.50
Illinois	1.75	30.00	25.00	18.00	20.00		1.50	0.50	0.50					1.25
Michigan	2.00	37.00	35.50	21.00			1.30	0.70	0.37				1.25	2.00
Wisconsin		37.50	33.00	25.00			1.25	0.75				10.00		
Minnesota	1.75	30.00					1.25		0.50					
Iowa	1.00	12.00	15.00	20.00			1.10	0.65	1.60			10.00	1.00	1.00
Missouri			15.00											
Nebraska		10.00	20.00	8.00			0.37	0.16	1.04			8.00	1.03	0.97
Kansas	1.00	10.00	18.00	10.00			0.50	0.15	1.50				1.00	0.80
South Central:														
Kentucky														
Tennessee		15.00	15.00				0.75	0.35						0.75
Western:														
Washington			25.00											
Oregon			25.00											
California		50.00	20.00	15.00	15.00									

a Cauliflower, celeriac, corn salad, cross, endive, kale, kohlrabi, leek, nasturtium, parsley, and spinach not reported.

VALUE OF PLANTING STOCK PER ACRE—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Okra.	Onion.	Onion sets.	Parsnip.	Pears.	Pepper.	Potato.	Pumpkin.	Radish.	Salsify.	Squash.	Tomato.	Turnip.
North Atlantic:													
Maine				\$30.00	\$5.00		\$8.00						\$40.00
New Hampshire		\$175.00					8.00				\$4.00		
Vermont					8.00		7.50						
Massachusetts		100.00	\$12.00	30.00	9.00		10.00		\$4.50		3.00	\$18.00	40.00
Rhode Island		112.50		30.00		\$5.00	10.00		3.50		2.50	18.00	40.00
Connecticut		157.61	12.00	31.66	10.00	5.00	7.95	\$0.50	3.00	\$0.00	2.00	10.00	22.50
New York		65.00	12.00	28.00	5.50	4.50	7.50		2.75	5.00	2.00	15.00	20.00
New Jersey			10.00				8.80						14.00
Pennsylvania		25.00	11.10	25.00		5.00	9.00	2.00		5.50	2.50	9.50	12.75
South Atlantic:													
Maryland												10.00	
Virginia							11.00			5.00		7.00	
Georgia	\$0.25				4.00		12.50						
Florida													
North Central:													
Ohio		60.00	10.00		9.00		11.44	1.60	2.00		3.40	12.00	8.00
Indiana							9.50						
Illinois		55.00	10.00	20.00	7.00	4.00	10.25		2.25	4.75	3.00	10.00	12.00
Michigan				19.00	6.50		10.00	1.00			4.375	11.80	
Wisconsin					6.50		7.75						
Minnesota					6.50		6.00						
Iowa		24.50	12.00	20.00	6.00		5.50	0.20	2.00	4.50	3.50	14.00	8.00
Missouri													
Nebraska		25.00	13.00	20.00	5.00	2.50		0.90	3.00		1.60	11.81	
Kansas		30.00	12.00								1.30	20.00	
South Central:													
Kentucky			10.00										
Tennessee			10.00	14.00			12.00			3.50		10.00	6.00
Western:													
Washington					10.00		6.00						
Oregon													
California					5.00								

There is no expense for planting asparagus and rhubarb, seeds being taken from established market garden fields.

The value of flower seeds is from \$6 to \$25, according to variety.

COST OF FERTILIZER PER ACRE.

GEOGRAPHICAL DIVISIONS.	Asparagus. (a)	Beans.	Beet.	Cabbage.	Carrot.	Cauliflower.	Celery.	Collard.	Corn (sweet).	Corn (field).	Cucumber.	Egg-plant.	Lettuce.	Melon (musk).	Melon (water).	Okra.
North Atlantic :																
Maine		\$10.00	\$25.00		\$30.00				\$15.00		\$20.00					
New Hampshire			25.00						25.00				\$25.00	\$30.00		
Vermont	\$40.00															
Massachusetts	40.00		25.00	\$37.50	50.00		\$75.00		24.00	\$37.00	30.00		28.00	14.00	\$18.00	
Rhode Island	40.00		22.50	25.00	25.00		100.00		30.00	25.00	28.00			12.00	20.00	
Connecticut			23.33	25.00	20.00				22.73	25.00	27.50		24.50	15.00	16.00	
New York	30.00	1.87	11.00	20.33	12.00		50.00		11.42	20.00	15.00	\$16.00	20.00	11.00	12.00	
New Jersey		10.00	10.00	25.00							18.00	20.00		12.00	10.00	
Pennsylvania	33.00	6.00	12.00	8.00	10.00		10.00		10.00	10.00	10.00	12.00	12.00	8.00	8.00	
South Atlantic :																
District of Columbia				20.00		\$30.00										
Virginia	25.00			10.00						8.00			8.00			
Georgia	20.00	8.40	8.00				\$17.00			4.75	11.50	8.00	3.00	3.00	3.25	\$1.50
Florida												12.00			50.00	
North Central :																
Ohio	10.00	2.00							6.50	7.00	25.00		4.00			
Illinois	10.00															
Michigan																
Minnesota		10.00							15.00		20.00					
Kansas																
South Central :																
Tennessee	10.00															

a Fertilizer cost on asparagus should not all be charged to the seed crop, as most of the seeds come from market garden fields where the green "grass" is the main crop and draws most largely on the most costly nitrogenous fertility of the soil. The same is true of rhubarb.

COST OF FERTILIZER PER ACRE—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Onion.	Onion sets.	Parsley.	Parsnip.	Peas.	Pepper.	Potato.	Pumpkin.	Radish.	Salsify.	Spinach.	Squash.	Tomato.	Turnip.	Flower seed.
North Atlantic:															
Maine				\$25.00	\$14.00		\$30.00							\$20.00	
New Hampshire	\$25.00						25.00					\$30.00			
Vermont					15.00		20.00								
Massachusetts	68.00	\$40.00		31.00	36.00		36.00	\$12.00	\$36.00		\$40.00	25.00	\$36.00	15.00	\$25.00
Rhode Island	47.00		\$30.00	30.00		\$35.00	38.00	12.50	40.00		40.00	25.00	35.00	27.50	
Connecticut	32.72	38.00		21.66	20.00	27.50	22.50	10.00	20.00	\$25.00		35.00	27.50	19.22	
New York	30.00	16.00		20.00	2.58	25.00	13.50		20.00	20.00	25.00	18.00	25.00	16.00	22.50
New Jersey		30.00					30.00							10.00	20.00
Pennsylvania	15.00	30.00		8.00		12.00	22.50	6.00		12.00		10.00	8.50	6.25	29.00
South Atlantic:															
District of Columbia															
Virginia										10.00			7.00		
Georgia					3.00		16.50								
Florida															
North Central:															
Ohio		30.00			16.00		12.53					3.00	11.75		
Illinois												5.50	5.50		
Michigan															
Minnesota					10.00		30.00								
Kansas	3.00														
South Central:															
Tennessee															

Where no cost is given fertilizers are not used, except in few instances, and in these no record has been kept.

YIELD PER ACRE IN POUNDS AND BUSHELS.

GEOGRAPHICAL DIVISIONS.	Aspara- gus. Pounds.	Beans. Bushels.	Beet. Pounds.	Cabbage. Pounds.	Carrot. Pounds.	Cauli- flower. Pounds.	Cele- riac. Pounds.	Celery. Pounds.	Gollard. Pounds.	Corn salad. Pounds.	Corn (sweet). Bushels.	Corn (field). Bushels.	Cress. Pounds.
North Atlantic :													
Maine		25			600								
New Hampshire			925		300						33		220
Vermont	450												
Massachusetts	475		875	357	350			405			34	50	
Rhode Island	500		850	350	650			400			37	40	
Connecticut			1,085	544	464						44	79	
New York	500	16	910	375	500	75	400	250		400	44	75	200
New Jersey		13	900	360									60
Pennsylvania	600	12	1,000	410	480			300			40	50	
South Atlantic :													
Maryland													
District of Columbia				450		30							
Virginia	550			310									
West Virginia	400												
North Carolina													
South Carolina													
Georgia		10	700						360				25
Florida													
North Central :													
Ohio	500	15	850	375	350						28	53	
Indiana			800	325	390						26	35	
Illinois	475		900	395	360						25	34	
Michigan			950	410	480						22	35	
Wisconsin			825	425	400						29	51	
Minnesota		10	850								40		
Iowa		9	900	210	350						31	43	
Missouri													24
Nebraska	800		525	150	320						18	42	
Kansas		12	600	180	300						24	20	
South Central :													
Kentucky													
Tennessee	400		550	175							18	22	
Western :													
Washington				600									
California		15	1,000	450	650			600					

YIELD PER ACRE IN POUNDS AND BUSHELS—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Cucum- ber. Pounds.	Danús- hon. Pounds.	Egg- plant. Pounds.	Kale. Pounds.	Kohl-rabi. Pounds.	Leek. Pounds.	Lettuce. Pounds.	Melon (musk). Pounds.	Melon (water). Pounds.	Nastur- tium. Pounds.	Okra. Pounds.	Onion. Pounds.	Onion sets. Bushel
North Atlantic:													
Maine	300												
New Hampshire	300	75					150	150	150			400	
Vermont													
Massachusetts	290	120					190	136	180			313	3
Rhode Island	300	90						145	200			425	
Connecticut	375							170	300	180		383	3
New York	250		200	200	200	200	250	250	250	250	200	274	2
New Jersey	260							160	230				4
Pennsylvania	200		200				150	150	200			250	2
South Atlantic:													
Maryland													
District of Columbia													
Virginia													
West Virginia													
North Carolina													
South Carolina													
Georgia	160		150				80	116	183		100		
Florida									150				
North Central:													
Ohio	300	80					156	124	125				
Indiana	250								130				
Illinois	240								120				
Michigan	236							112	100				
Wisconsin							150						
Minnesota	300												
Iowa	148						200	170	162			300	
Missouri													
Nebraska	172						180	203	164			200	
Kansas	200							226	150			350	
South Central:													
Kentucky													
Tennessee													
Western:													
Washington													
California							500	270				600	

YIELD PER ACRE IN POUNDS AND BUSHELS—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Parsley. Pounds.	Parsnip. Pounds.	Peas. Bushels.	Pepper. Pounds.	Potato. Bushels.	Pump- kin. Pounds.	Radish. Pounds.	Rhu- barb. Pounds.	Salsify. Pounds.	Spin- ach. Pounds.	Squash. Pounds.	Tomato. Pounds.	Turnip. Pounds.
North Atlantic:													
Maine.....		310	25		300								350
New Hampshire.....		350			240					330	400	110	300
Vermont.....			30		230								
Massachusetts.....		480	26		233	300	380			400	546	117	580
Rhode Island.....	500	325		292	175	221	300			500	350	106	500
Connecticut.....		575	24	430	154	250	500		400		400	191	550
New York.....	500	400	28	333	131	202	340	50	225	400	500	200	350
New Jersey.....					103							300	300
Pennsylvania.....		340		200	150	150		40	260		300	212	350
South Atlantic:													
Maryland.....												350	
District of Columbia.....													
Virginia.....									105			225	
West Virginia.....													
North Carolina.....													
South Carolina.....													
Georgia.....			20		122								
Florida.....													
North Central:													
Ohio.....			38		291	160		45			280	150	375
Indiana.....					240								
Illinois.....					200				225		270		
Michigan.....					181	150					242	175	
Wisconsin.....			12		150								
Minnesota.....			20		200								
Iowa.....		320	9		167	300	260	40	230		248	140	275
Missouri.....													
Nebraska.....		600	10	200		190	400				200	131	
Kansas.....												180	
South Central:													
Kentucky.....													
Tennessee.....					50			50	187				
Western:													
Washington.....			23		116								
California.....			30				625		450	550		250	

The yield of endive per acre was not reported. The yield per acre of flower seed is from 10 to 1,000 pounds, according to variety.

WHOLESALE PRICE PER POUND OR BUSHEL.

GEOGRAPHICAL DIVISIONS.	Aspara- gus. Pound.	Beans, Bushel.	Beet, Pound.	Cabbage, Pound.	Carrot, Pound.	Cauli- flower, Pound. (a)	Cele- riac, Pound.	Celery, Pound.	Collard, Pound.	Corn salad, Pound.	Corn (sweet), Bushel.	Corn (field), Bushel.	Cress, Pound.
North Atlantic :													
Maine			\$0.20		\$0.30								
New Hampshire			0.20		0.30						\$1.25		
Vermont	\$0.15												
Massachusetts (b)	0.25		0.32 $\frac{1}{2}$	\$1.87 $\frac{1}{2}$	1.15			\$3.00			2.12 $\frac{1}{2}$	\$2.00	
Rhode Island	0.17		0.13 $\frac{1}{2}$	0.67 $\frac{1}{2}$	0.25			1.00			1.62 $\frac{1}{2}$	1.00	
Connecticut			0.15 $\frac{1}{4}$	0.60 $\frac{1}{2}$	0.26 $\frac{1}{4}$						1.31	0.97	
New York	0.15	\$2.35	0.12 $\frac{1}{4}$	0.61	0.25	\$4.00	\$0.25	0.40		\$0.25	1.15 $\frac{3}{4}$	1.00	\$0.10
New Jersey		2.00	0.13	0.65								1.05	
Pennsylvania	0.15	2.50	0.15	0.60	0.25			0.65			1.50	1.00	
South Atlantic :													
District of Columbia				0.50		15.00							
Virginia	0.13			0.65								0.75	
South Carolina	0.13												
Georgia	0.13	3.00	0.15					\$0.13 $\frac{1}{4}$				1.63 $\frac{1}{4}$	
Florida													
North Central :													
Ohio	0.15	2.50	0.14 $\frac{1}{2}$	0.65	0.25						1.25	1.05	
Indiana		2.25	0.15 $\frac{3}{4}$	0.65	0.24						1.25	1.00	
Illinois	0.15	2.25	0.15	0.64	0.25						1.70	1.00	
Michigan		2.40	0.16	0.67	0.25						0.94	0.85	
Wisconsin			0.15	0.68	0.25						1.00	0.90	
Minnesota		2.25	0.18								1.05		
Iowa		2.00	0.1	0.70	0.26						1.14	0.73 $\frac{1}{4}$	
Missouri													
Nebraska	0.20		0.17	0.65	0.25						0.92	0.65	
Kansas		1.70	0.16 $\frac{1}{2}$								1.12 $\frac{1}{2}$	0.70	
South Central :													
Kentucky													
Tennessee	0.15		0.15								1.70	0.60	
Western :													
Washington				0.42 $\frac{1}{2}$									
California		2.50	0.12		0.25			0.54					

a The vast difference in the price of cauliflower seed is owing to the difference in the variety grown rather than to the quality of the seed produced in the different sections.

b An investigation into the great excess in price received by the Massachusetts seed farmers shows 2 causes: first, that 1 of the largest growers there is also a dealer and disposes of most of his stock direct to planters, thus obtaining a somewhat higher price than would be possible if sold to the general wholesale trade; second, that many expert and successful gardeners of that state, afraid to risk their crop on seeds of unknown origin, are willing to pay higher prices to their own neighboring seed farmers to grow their extra choice seeds from selected stocks.

WHOLESALE PRICE PER POUND OR BUSHEL—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Cucum- ber, Pound.	Dande- lion, Pound.	Egg- plant, Pound.	Endive, Pound.	Kale, Pound.	Kohl- rabi, Pound.	Leek, Pound.	Loftuee, Pound.	Melon (musc), Pound.	Melon (water), Pound.	Nastur- tium, Pound.	Okra, Pound.	Onion, Pound.	Onion sets, Bushel.
North Atlantic:														
Maine.....														
New Hampshire.....	\$0.31	\$1.50						\$0.65	\$0.30	\$0.25			\$1.25	
Vermont.....														
Massachusetts.....	0.65							0.50	0.50	0.25			2.08 $\frac{1}{2}$	\$2.00
Rhode Island.....	0.22	3.25							0.30	0.20			0.60	
Connecticut.....	0.23	2.00							0.50	0.25	0.20		0.75 $\frac{3}{4}$	1.67 $\frac{1}{2}$
New York.....	0.20		\$2.50		\$0.25	\$0.25	\$0.25	0.35	0.25	0.20	\$0.30	\$0.30	0.60 $\frac{1}{2}$	1.75
New Jersey.....	0.20		1.50											3.00
Pennsylvania.....	0.25		1.25					0.60	0.25	0.20			0.65	2.00
South Atlantic:														
District of Columbia.....														
Virginia.....														
South Carolina.....			1.75											
Georgia.....	0.50		1.75					0.50	0.20	0.37 $\frac{1}{2}$		0.30		
Florida.....										0.23				
North Central:														
Ohio.....	0.20	2.00						0.50	0.20		0.20		0.58	1.60
Indiana.....	0.20										0.10		0.60	
Illinois.....	0.20										0.10 $\frac{1}{2}$		0.70	1.60
Michigan.....	0.16 $\frac{3}{4}$								0.10 $\frac{2}{3}$		0.20			
Wisconsin.....								0.50						
Minnesota.....	0.18													
Iowa.....	0.21 $\frac{1}{2}$							0.48	0.21		0.20		0.60	1.80
Missouri.....														
Nebraska.....	0.10 $\frac{1}{4}$							0.50	0.20 $\frac{1}{2}$		0.17 $\frac{1}{2}$		0.65	2.00
Kansas.....	0.20								0.15		0.15		0.60	2.00
South Central:														
Kentucky.....														1.60
Tennessee.....											0.15			
Western:														
Washington.....														
California.....				\$0.30	0.30	0.37 $\frac{1}{2}$	0.30	0.31	0.60				0.50	

WHOLESALE PRICE PER POUND OR BUSHEL—CONTINUED.

GEOGRAPHICAL DIVISIONS.	Parsley. Pound.	Parsnip. Pound.	Pars. Bushel.	Pepper. Pound.	Potato. Bushel.	Pump- kin. Pound.	Radish. Pound.	Rhu- barb. Pound.	Subsify. Pound.	Spinach. Pound.	Squash. Pound.	Tomato. Pound.	Turnip. Pound.
North Atlantic:													
Maine.....			\$2.50		\$0.50								\$0.15
New Hampshire.....		\$0.25			0.50					\$0.12	\$0.25	\$1.50	0.17
Vermont.....			4.25		0.50								
Massachusetts.....		0.60	3.00		0.80	\$0.15	\$0.50			3.00	0.60 ² / ₁₀	2.25	0.15
Rhode Island.....	\$0.15			\$1.15	0.60	0.17 ¹ / ₂	0.20			0.15	0.22	1.00	0.13 ¹ / ₂
Connecticut.....		0.10 ¹ / ₂	2.75	1.25	0.85 ¹ / ₂	0.15	0.16		\$0.50		0.25	0.78 ¹ / ₄	0.14 ¹ / ₂
New York.....	0.15	0.15	2.11 ¹ / ₄	1.00	0.93 ¹ / ₈	0.20	0.16	\$1.00	0.45	0.10	0.20	0.75	0.13 ¹ / ₂
New Jersey.....					0.70							0.75	0.12
Pennsylvania.....		0.16		1.25	1.00	0.17		1.00	0.48		0.20	1.05	0.15
South Atlantic:													
District of Columbia.....													
Virginia.....									0.47			0.75	
South Carolina.....													
Georgia.....			3.00		1.00								
Florida.....													
North Central:													
Ohio.....			3.00		1.11 ² / ₃	0.17	0.14	1.00			0.20	0.85	0.13 ¹ / ₂
Indiana.....					1.00		0.15						
Illinois.....	0.15				0.75		0.14 ¹ / ₂		0.45			0.85	
Michigan.....	0.15				0.75	0.18					0.17	0.65	
Wisconsin.....			2.75		1.00								
Minnesota.....			2.75		0.65								
Iowa.....	0.15		3.50		0.63 ¹ / ₃	0.15	0.15	1.00	0.43		0.23 ¹ / ₃	0.70	0.13 ¹ / ₂
Missouri.....													
Nebraska.....	0.15		3.00	0.75		0.15	0.15				0.18 ¹ / ₃	0.71 ¹ / ₄	
Kansas.....											0.19	0.70	
South Central:													
Kentucky.....													
Tennessee.....					0.75			1.00	0.48			0.75	0.12 ¹ / ₂
Western:													
Washington.....			3.00		0.60								
California.....	0.14	0.12 ¹ / ₂	1.32 ¹ / ₂				0.19		0.47 ¹ / ₂	0.12		0.65	

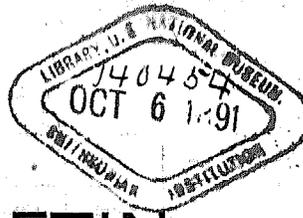
New or scarce varieties of vegetables often sell at 3 and 4 times the prices given in the preceding table, and some expert growers who have a special trade obtain prices far in excess of them. In the tables in this bulletin the prices given are averages based on reports sent in by a majority of the seed growers in each state. The great bulk of the crop was delivered to contractors or sold to dealers, who largely supply the wholesale trade; consequently prices in most instances average somewhat below the market rates in the commercial centers.

The returns show a selling price of flower seeds ranging from 3 cents to \$50 per pound. It is therefore impossible to make an average price where there is such a vast difference, and the various species and varieties are not given.

From general information obtained from the seed farmers and a study of the figures in this bulletin it appears that this branch of agriculture has kept fully apace with the general march of national progress.

Prior to 1850 all the seed farms of the country were in the few northeastern states of the Union, Connecticut and New York for more than half a century producing more seeds than all other states combined ; and while each has at present more seed farms than any other state, the general westward tendency of all that pertains to agriculture has stimulated seed growing on a very extensive scale in the central west and on the Pacific coast. There has of late been a feeling of depression among the growers generally, who, previous to 1883, made exceptionally fine profits out of the business, and were thus stimulated to establish more seed farms than could profitably find market for their products during the past few years. The general feeling now is that prices must be advanced or some method of production be discovered whereby a greater yield may be secured at less cost of labor.

Final census reports will strive to show in detail some of the methods adopted by the more successful seed farmers in the different sections.



[7-010]

CENSUS BULLETIN.

No. 112.

WASHINGTON, D. C.

September 19, 1891.

POPULATION OF ARKANSAS

BY MINOR CIVIL DIVISIONS.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,

WASHINGTON, D. C., September 5, 1891.

The following bulletin gives the population of the state of Arkansas in detail by counties, townships, cities, wards of cities, towns, and villages, according to the official count of the returns made under the Eleventh Census, taken as of June 1, 1890. The figures for the same divisions according to the census of 1880 are also given for purposes of comparison.

The population of the state in 1890 was 1,128,179, an increase of 325,654, or 40.58 per cent, since 1880, when a population of 802,525 was returned.

In 1883 Cleburne county was formed from parts of Independence, Van Buren, and White counties. In 1885 the name of Dorsey county was changed to Cleveland. From several counties in the state townships have been taken to form parts of other counties.

In every county in the state an increase is shown, except in Van Buren, where the decrease is due to a decrease in territory. In Jefferson, Pulaski, and Sebastian counties the largest numerical increases are found. Nineteen counties show increases of more than 50 per cent.

The following summary shows the population of each county according to the censuses of 1890 and 1880, together with the increase in number and per cent during the decade:

SUMMARY BY COUNTIES.

COUNTIES.	POPULATION.		INCREASE.		COUNTIES.	POPULATION.		INCREASE.	
	1890.	1880.	Number.	Per cent.		1890.	1880.	Number.	Per cent.
The State	1,128,170	802,525	325,654	40.58	Clark	20,997	15,771	5,226	33.14
Arkansas	11,432	8,038	3,394	42.22	Clay	12,200	7,213	4,987	65.14
Ashley	13,205	10,156	3,139	30.91	Cleburne	7,884		7,884	
Buxton	8,527	6,004	2,523	42.02	Cleveland	11,362	8,370	2,992	35.75
Benton	27,716	20,328	7,388	36.34	Columbia	19,893	14,090	5,803	41.19
Boone	16,810	12,146	4,670	30.22	Conway	19,450	12,755	6,704	52.56
Bradley	7,072	6,285	787	12.60	Craighead	12,025	7,037	4,988	70.88
Calhoun	7,267	5,671	1,596	28.14	Crawford	21,714	14,740	6,974	47.31
Carroll	17,288	13,337	3,951	29.62	Crittenden	13,940	9,415	4,525	48.06
Chester	11,419	10,117	1,302	12.87	Cross	7,093	5,050	2,043	29.34
					Dallas	9,200	6,505	2,701	42.91

(5050-10,000.)

SUMMARY BY COUNTIES—CONTINUED.

COUNTIES.	POPULATION.		INCREASE.		COUNTIES.	POPULATION.		INCREASE.	
	1890.	1880.	Number.	Per cent.		1890.	1880.	Number.	Per cent.
Desha	10,324	8,978	1,351	15.06	Montgomery	7,923	5,720	2,194	38.30
Drew	17,352	12,231	5,121	41.87	Nevada	14,832	12,959	1,873	14.45
Faulkner	18,342	12,786	5,556	43.45	Newton	9,950	6,120	3,830	62.58
Franklin	19,934	14,951	4,983	33.33	Osachita	17,033	11,758	5,275	44.86
Fulton	10,984	6,720	4,264	63.45	Perry	5,538	3,872	1,666	43.03
Garland	15,328	9,023	6,305	69.88	Phillips	25,311	21,262	4,049	19.18
Grant	7,786	6,185	1,601	25.80	Pike	8,537	6,345	2,192	34.35
Greene	12,908	7,480	5,428	72.57	Poinsett	4,272	2,192	2,080	94.89
Hempstead	22,796	19,015	3,781	19.88	Polk	9,283	5,857	3,426	58.49
Hot Spring	11,603	7,775	3,828	49.23	Pope	19,458	14,322	5,136	35.86
Howard	13,789	9,917	3,872	39.04	Prairie	11,374	8,435	2,939	34.84
Independence	21,961	18,086	3,875	21.43	Pulaski	47,329	32,616	14,713	45.11
Lard	13,038	10,857	2,181	20.09	Randolph	14,485	11,724	2,761	23.55
Jackson	15,179	10,877	4,302	39.55	Saint Francis	13,543	8,389	5,154	61.41
Jefferson	40,881	22,386	18,495	82.62	Saline	11,311	8,953	2,358	26.31
Johnson	16,768	11,565	5,193	44.90	Scott	12,635	9,174	3,461	37.33
Lafayette	7,700	5,730	1,970	34.38	Searcy	9,664	7,278	2,386	32.78
Lawrence	12,984	8,782	4,202	47.85	Sebastian	33,200	19,560	13,640	69.73
Lee	18,886	13,288	5,598	42.13	Sevier	10,072	6,192	3,880	62.66
Lincoln	10,265	9,255	1,000	10.80	Sharp	10,418	9,047	1,371	15.15
Little River	8,908	6,404	2,499	30.02	Stone	7,043	5,089	1,954	38.40
Logan	20,774	14,885	5,889	39.56	Union	14,977	13,419	1,558	11.61
Lonoke	19,263	12,146	7,117	58.60	Van Buren	8,567	9,565	998	10.43
Madison	17,402	11,465	5,947	51.92	Washington	32,024	23,844	8,180	34.31
Marion	10,390	7,907	2,483	31.40	White	22,946	17,794	5,152	28.95
Miller	14,714	9,919	4,795	48.34	Woodruff	14,009	8,046	5,963	62.03
Mississippi	11,635	7,332	4,303	58.69	Yell	18,015	13,852	4,163	30.05
Monroe	15,336	9,574	5,762	60.18					

α Decrease.

The population of the thirteen cities and towns having 2,000 or more inhabitants, in the order of their rank, is as follows:

CITIES AND TOWNS.	COUNTIES.	POPULATION.		INCREASE.		CITIES AND TOWNS.	COUNTIES.	POPULATION.		INCREASE.	
		1890.	1880.	Number.	Per cent.			1890.	1880.	Number.	Per cent.
Little Rock city	Pulaski	25,874	13,138	12,736	96.94	Fayetteville city	Washington	2,942	1,788	1,154	64.54
Fort Smith city	Sebastian	11,311	3,099	8,212	264.90	Camden city	Osachita	2,571	1,503	1,068	71.06
Pine Bluff city	Jefferson	9,952	3,203	6,749	210.71	Arkadelphia town	Clark	2,455	1,506	949	63.01
Hot Springs city	Garland	8,080	3,554	4,526	127.52	Van Buren city	Crawford	2,201	1,029	1,172	122.64
Helena city	Phillips	5,189	3,652	1,537	42.09	Batesville town	Independence	2,150	1,261	889	70.09
Eureka Springs city	Carroll	3,706	3,984	α278	α6.98	Jonesboro town	Craighead	2,065		2,065	
Texarkana city (b)	Miller	3,528	1,390	2,138	153.81						

α Decrease.

b Total for Texarkana city, in Miller county, Arkansas, and Bowie county, Texas, 6,380.

The following table shows the population of each county in detail by minor civil divisions; also the population of all incorporated places, and all unincorporated places having 200 inhabitants or more, so far as it has been possible to make the separation from the returns of the enumerators. In some instances it has been difficult to separate the population of a village from that of a township, owing to the manner in which the schedules were returned to the Census Office.

POPULATION BY MINOR CIVIL DIVISIONS.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
ARKANSAS COUNTY (a)			BENTON COUNTY--Continued.		
Arkansas township.....	704	507	Battle township (i).....	1,110	1,114
Bayou Metee township.....	920	403	Big Spring township (j).....	380	1,050
Chester township (b).....	595	220	Brightwater township (k).....	950	1,417
Cricket township.....	628	342	Cherokee township (l).....	385	.....
Kenton township.....	1,510	1,016	Colville township (m).....	833	1,520
LaGrue township, including Dewitt village	1,009	900	Decatur township (n).....	592	.....
Dewitt village.....	246	165	Dickson township.....	1,080	821
McFall township, including Stuttgart village	1,410	212	Eldorado township (o), including Eldorado Springs	604	.....
Stuttgart village.....	1,165	.....	town (d).....	.....	.....
Mill Bayou township.....	507	190	Esculapia township (p), including Rogers town.....	2,844	.....
Morris township, including Goldman town	1,057	408	Rogers town.....	1,265	.....
Goldman town.....	168	.....	Flint township (b).....	1,233	1,130
Point de Laue township.....	528	482	Garfield township (q).....	1,024	.....
Prairie township.....	2,321	1,550	Heo township, including Siloam Springs town	1,951	1,070
Stanley township.....	217	110	Siloam Springs town.....	801	.....
ASHLEY COUNTY			Mount Vernon township.....	905	730
Bayou township (c).....	255	.....	Osage township (r), including Bentonville town	3,787	3,234
Beaumont township.....	948	777	Bentonville town.....	1,677	606
Booth Creek township.....	809	617	Roller Ridge township (s).....	420	404
Carter township, including Hamburg town	1,090	1,410	Round Prairie township (e), including Bloomfield town	849	1,502
Hamburg town.....	555	747	Bloomfield town.....	80	102
De Hartrop township, including Poplar Bluff vil-	2,185	2,247	Sugar Creek township.....	620	650
lago (d).....	.....	.....	Sulphur Springs township, including Sulphur Springs	602	612
Egypt township.....	737	640	town (z).....	.....	.....
Extra township.....	535	387	Wager township (f).....	740	.....
Grant township (e).....	827	.....	Wallace township (v).....	1,028	1,031
Longview township.....	364	385	Walnut township.....	785	687
Marie Saline township.....	450	524	War Eagle township.....	471	482
Mill Creek township.....	1,180	941	Washington township (w).....	1,274	.....
Portland township.....	1,584	1,085	Yell township (u).....	885	.....
Union township.....	1,054	670	BOONE COUNTY		
White township.....	711	640	Boone Creek township.....	856	688
BAXTER COUNTY			Bellefonte township, including Bellefonte town (d).....	1,018	1,370
Barren Creek township.....	655	600	Blythe township.....	856	469
Bayou township.....	403	493	Carrollton township.....	1,129	802
Big Flat township.....	443	231	Crooked Creek township.....	1,082	1,110
Buckhorn township.....	830	100	Elkirk township (c).....	710	.....
Greenwood township.....	357	245	Ewing township (e).....	698	.....
Independence township (e).....	800	829	Harrison township, including Harrison town	2,240	1,834
Logan township (f).....	541	.....	Harrison town.....	1,438	582
Maltby township.....	900	853	Jackson township.....	717	710
Mill township.....	401	284	Jefferson township.....	1,110	987
Mountain Home township, including Mountain Home	1,322	1,008	Leo township.....	660	288
town.....	.....	.....	Long Creek township.....	618	480
Mountain Home town.....	249	137	Omaha township.....	632	273
North Fork township.....	486	462	Prairie township.....	617	667
Pigeon township.....	613	277	Sugar Loaf township, including Lead Hill town	1,712	1,370
Union township.....	493	260	Lead Hill town.....	333	253
Whiteville township.....	994	806	Summit township.....	322	341
BENTON COUNTY			Washington township.....	764	810
Anderson township (g).....	1,677	2,018	Young township (c).....	377	.....
Bell township (h).....	554	1,049	BRADLEY COUNTY		
BENTON COUNTY--Continued.			Clay township.....	7,072	0,285
Anderson township (g).....	1,677	2,018	Clay township.....	2,008	882
Bell township (h).....	554	1,049	Eagle township.....	214	276
BENTON COUNTY--Continued.			Marion township.....	460	366
Anderson township (g).....	1,677	2,018	BRADLEY COUNTY		
Bell township (h).....	554	1,049	Clay township.....	7,072	0,285
BENTON COUNTY--Continued.			Clay township.....	2,008	882
Anderson township (g).....	1,677	2,018	Eagle township.....	214	276
Bell township (h).....	554	1,049	Marion township.....	460	366

a Chester township, formerly in Desha county, annexed since 1880; Old River and Villamont townships given to Jefferson county since 1880.

b Formerly in Desha county.

c Organized since 1880.

d Not separately returned.

e Part taken to form Logan township in 1887.

f Organized in 1887 from part of Independence township.

g Parts taken to form Decatur and Wager townships in 1885.

h Part taken to form Yell township in 1888.

i Part taken to form Eldorado township in 1881.

j Parts taken to form Esculapia township in 1883 and Washington township in 1888.

k Part taken to form Garfield township in 1885.

l Organized in 1887 from part of Round Prairie township.

m Part taken to form Washington township in 1888.

n Organized in 1885 from parts of Anderson and Wallace townships.

o Organized in 1881 from parts of Battle and Wallace townships.

p Organized in 1883 from parts of Big Spring and Osage townships.

q Organized in 1885 from parts of Brightwater and Roller Ridge townships.

r Part taken to form Esculapia township in 1883.

s Part taken to form Cherokee township in 1887.

t Organized in 1885 from part of Anderson township.

u Parts taken to form Eldorado township in 1881 and Decatur township in 1885.

v Organized in 1888 from parts of Big Spring and Colville townships.

w Organized in 1888 from parts of Ball and Flint townships.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
BRADLEY COUNTY—Continued.			CLARK COUNTY—Continued.		
More township.....	412	292	Missouri township, including Garden town	2,012	1,842
Onachita township.....	290	438	Garden town.....	869	.....
Palmetto township.....	768	629	South Fork township.....	1,413	1,229
Pennington township, including Warren town	3,224	2,328	Terre Noire township.....	1,089	1,769
Warren town.....	492	304			
River township.....	423	314			
Sumpter township (a).....	417	.....		
Washington township.....	780	731			
			CLAY COUNTY	12,200	7,225
CALHOUN COUNTY	7,207	5,671	Bradshaw township.....	441	528
Caswell township, including Thornton town	1,164	320	Brown township (d).....	416	.....
Thornton town.....	406	829	Cacho township.....	635	272
Champagnolle township.....	692	615	Carpenter township.....	279	1,100
Dallas township.....	692	615	Chalk Bluff township.....	929	3,229
Fayette township.....	138	109	Cleveland township (e).....	417	.....
Franklin township, including Hampton town	606	659	Current River township (e).....	146	.....
Hampton town.....	132	180	Haywood township, including Greenway town	1,352	3,026
Huey township.....	328	389	Greenway town.....	41	.....
Jackson township.....	737	688	Johnson township.....	1,444	2,300
Jefferson township.....	393	281	Killgore township, including Corning town	1,645	2,262
Locust Bayou township.....	592	325	Corning town.....	84	30,222
More township.....	1,010	760	Liddell township (f), including Saint Francis town	483	.....
Polk township.....	630	440	Saint Francis town.....	10	.....
River township.....	645	449	Nelson township (g).....	389	.....
			Oak Bluff township, including Rector town	1,827	2,000
CARROLL COUNTY	17,288	13,337	Rector town.....	490	.....
Carrollton township.....	1,573	1,138	Pollard township (h).....	581	.....
Cedar township (b), including Eureka Springs city	4,445	4,349	Saint Francis township.....	813	3,212
Eureka Springs city.....	3,706	3,984			
Ward 1.....	857	.....		
Ward 2.....	1,384	.....	CLEBURNE COUNTY (i)	7,884	.....
Ward 3.....	1,349	.....	Big Creek township (j).....	75	2,000
Not located in wards.....	536	.....	Cudron township (k), including Quitman town	1,112	.....
Clifty township.....	320	501	Quitman town.....	167	3,100
Dry Fork township.....	349	274	Cafforth township (l).....	306	2,940
Franklin township (c).....	363	.....	Clayton township (m).....	477	.....
Hickory township.....	1,372	1,020	Giles township (n), including Shiloh town	1,175	4,013
King River township (b).....	828	410	Shiloh town.....	94	.....
Liberty township.....	523	295	Grassy township (o).....	503	.....
Long Creek township.....	630	674	Hodding Springs township (p).....	285	2,200
Osage township.....	618	663	Mountain township (q).....	369	2,000
Piney township.....	564	319	Peter Creek township (r).....	313	1,100
Polo township.....	1,240	781	Pine township (k).....	455	2,100
Berryville town.....	2,065	2,100	Piney township (o).....	361	2,100
Winona township (e).....	414	253	Sallie township (s).....	347	.....
Yocum township.....	768	413	South Sugar Loaf township (a), including Sugar Loaf	921	.....
			Springs town.....	.....	.....
CHOCTAW COUNTY	11,410	10,117	Sugar Loaf Springs town.....	322	.....
Bayou Macon township.....	658	798	Sugar Loaf township (t).....	270	2,100
Bowls township (a).....	1,470	.....	Valley township (u).....	402	2,000
Louisiana township.....	2,102	2,582			
McConnell township.....	3,111	2,575	CLEVELAND COUNTY (v)	11,302	8,210
Masona township.....	318	259	Downum township.....	747	4,100
Odon township.....	2,035	2,407	Harper township.....	674	2,800
Planter township.....	648	540	Harrisville township.....	524	4,100
Railroad township.....	717	947	Lee township.....	717	2,000
			Miller township.....	1,308	2,100
CLARK COUNTY	20,097	15,771	Nixon township.....	492	2,000
Alpine township.....	538	480	Prairie township, including Kingsland town	1,882	2,100
Amity township, including Amity town	1,440	1,439	Kingsland town.....	474	.....
Amity town.....	211	140	Redford township.....	1,288	2,100
Anderson township.....	840	621	Sallie township.....	302	2,000
Antoine township.....	1,091	1,288	Smith township.....	382	2,100
Beech Creek township.....	1,002	654	Tisdale township (a).....	737	.....
Belrne township (a).....	533	.....	White Oak township.....	377	2,200
Caddo township, including Arkadelphia town	6,872	5,020	Whiteville township.....	719	3,200
Arkadelphia town.....	2,455	1,506			
Elkins township.....	409	473	COLUMBIA COUNTY	19,894	12,000
Greenville township, including Hollywood town	1,011	1,256	Boone township.....	1,014	2,100
Hollywood town.....	103	138	Brown township.....	1,200	2,100
Leard township (a).....	345	.....	Buena Vista township.....	1,361	3,000
Long Creek township (a).....	147	.....	Calhoun township.....	1,027	2,000
Manchester township.....	1,048	1,220	Clay township.....	928	2,000
			Cleveland township (a).....	579	.....
			Corrino township.....	875	4,000
			Dorchest township (c).....	508	.....

a Organized since 1880.

b Part taken to form Franklin township in 1883.

c Organized in 1883 from parts of Cedar and King River townships.

d Part taken to form Winona township in 1882.

e Organized in 1882 from part of Prairie township.

f Organized in 1883 from parts of Independence, Van Buren, and White

counties.

g Formerly in Independence county.

h Organized since 1880 from part of Cudron township, Van Buren county.

i Formerly in Van Buren county.

j Formerly in Van Buren county; part of White county annexed since

1880.

k Formerly in White county.

l Formerly Dorsey; name changed by act of legislature in 1865.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
DESHA COUNTY—Continued.			FRANKLIN COUNTY—Continued.		
Richland township (a).....	305	285	Prarie township, including Charleston town	2,671	2,419
Silver Lake township, including Pendleton town	945	610	Charleston town.....	379	393
Pendleton town.....	482	.....	Walker township.....	304	365
Walnut Lake township (b).....	817	.....	Wallace township (c).....	460	.....
Wilkerson township (c).....	296	268	Watulula township (d).....	582	.....
DREW COUNTY.....			White Oak township (e), including Ozark town	3,938	3,863
Bartholomew township (d), including Bartholomew town (e).....	2,176	.....	Ozark town.....	822	822
Bearhouse township.....	737	590	White Rock township.....	654	657
Clear Creek township.....	1,284	1,168	Wittich township.....	1,208	661
Collins township (f), including Collins town (e).....	1,069	954	FULTON COUNTY.....		
Crook township.....	608	549	Afton township (a).....	373	.....
Ferguson township (g).....	.....	526	Bennett Bayou township.....	747	.....
Franklin township.....	2,563	1,849	Benton township.....	1,119	1,296
Marion township, including Monticello town	4,163	3,960	Big Creek township.....	1,098	1,092
Monticello town.....	1,265	891	Cleveland township (a).....	799	.....
Prairie township.....	881	613	Fulton township.....	916	.....
Saline township.....	1,493	934	Mammoth Springs township, including Mammoth Springs town (c).....	1,697	1,691
Spring Hill township.....	1,163	967	Mount Calu township (a).....	471	.....
Veney township.....	1,275	1,051	Myatt township.....	563	.....
FAULKNER COUNTY.....			Pleasant Ridge township.....	768	772
Benedict township (h).....	700	.....	South Fork township.....	507	512
Benton township.....	1,013	600	Strawberry township (a).....	149	.....
Cadron township (i), including Conway town	1,367	2,010	Union township.....	505	.....
Conway town.....	1,207	1,628	Washington township (a).....	450	.....
California township.....	714	498	GARLAND COUNTY.....		
Caney township (j).....	605	.....	Antioch township.....	441	.....
Cleveland township (j).....	872	.....	Bain township (a).....	589	.....
Cypress township.....	1,167	665	Baxter township.....	591	.....
Danley township (k).....	396	222	Bale township.....	591	.....
East Fork township.....	894	708	Hot Springs township, including Hot Springs city	9,180	7,472
Hardin township, including Greenbrier town (e).....	1,128	886	Hot Springs city.....	8,686	6,884
Havre township.....	886	792	Ward 1.....	1,862	.....
Matthews township.....	570	450	Ward 2.....	2,221	.....
Mount Vernon township, including Mount Vernon town (e).....	490	678	Ward 3.....	2,068	.....
Muddy Bayou township.....	792	825	Ward 4.....	2,089	.....
Newton township.....	819	740	Not located in wards.....	958	.....
Palarm township.....	1,161	793	Leo township.....	555	.....
Pierce Creek township.....	326	168	Lincoln township (a).....	597	.....
Pine Mountain township (h).....	357	447	Marble township.....	596	.....
Powell township (j).....	325	.....	Mill township.....	788	.....
Stone township (j).....	719	.....	Mountain township.....	482	.....
Tupelo township (j).....	614	.....	Ouchita township.....	157	.....
Union township.....	1,284	860	Phillips township.....	159	.....
Walker township.....	660	399	Sulphur township.....	571	.....
Wilson township.....	604	319	Washington township.....	824	.....
FRANKLIN COUNTY (l).....			GRANT COUNTY.....		
Boston township (m).....	397	220	Calvert township.....	627	.....
Hogan township, including Altus town	1,524	1,201	Darysaw township.....	694	.....
Altus town.....	469	254	Davis township.....	643	.....
Hurricane township.....	1,286	616	Dekalb township.....	891	.....
Ivy township (n).....	610	750	Fenter township.....	262	.....
Limestone township (o).....	528	364	Franklin township.....	643	.....
Muxey township, including Mulberry town	1,366	1,048	Madison township.....	1,233	1,028
Mulberry town.....	321	.....	Morry Green township, including Sheridan town	851	828
Middle township.....	1,165	1,068	Sheridan town.....	494	.....
Mill Creek township.....	1,400	1,160	Simpson township.....	634	.....
Morgan township (p).....	411	.....	Tennessee township.....	521	.....
Mountain township (q).....	237	.....	Washington township.....	461	.....
Mulberry township.....	1,163	990	Part taken to form Clayton township since 1880.		

a Part taken to form Clayton township since 1880.

b Organized since 1880 from parts of Jefferson and Randolph townships.

c Part taken to form Old River township since 1880.

d Organized since 1880 from part of Ferguson township.

e Not separately returned.

f Part of Ferguson township annexed since 1880.

g Part taken to form Bartholomew township and part given to Collins township since 1880.

h Organized since 1880 from parts of Danley and Pine Mountain townships.

i Parts taken to form Caney, Cleveland, Powell, Stone, and Tupelo townships since 1880.

j Organized since 1880 from part of Cadron township.

k Part taken to form Benedict township since 1880.

l Part of Madison county annexed in 1885.

m Part taken to form Watulula township in 1882.

n Part taken to form Wallace township in 1882.

o Part taken to form Mountain township in 1880.

p Organized in 1886 from territory taken from Madison county in 1885.

q Organized in 1880 from parts of Limestone and White Oak townships.

r Organized in 1882 from parts of Ivy and White Oak townships.

s Organized in 1882 from parts of Boston and White Oak townships.

t Parts taken to form Mountain township in 1880 and Wallace and Watulula townships in 1882.

u Organized since 1880.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
GREENE COUNTY	12,008	7,480	HOWARD COUNTY—Continued.		
Blue Cano township.....	414	150	Saline township.....	770	688
Cacha township.....	823	750	Saratoga township (a), including Saratoga town.....	1,032	211
Clark township, including Paragould town.....	2,574	744	Saratoga town.....	809	483
Paragould town.....	1,666	.....	Sulphur Springs township.....	324	191
Crowley township (a).....	612	.....	Washington township.....	.....	.....
Friendship township, including Halliday town.....	710	530			
Halliday town.....	327	.....	INDEPENDENCE COUNTY (d).....	21,901	18,056
Hurricane township.....	1,721	1,224	Ashley township.....	860	918
Jones township.....	304	231	Barron township.....	1,003	805
Lake township (a).....	478	.....	Big Bottom township, including Newark town (b).....	1,735	1,418
Main Stone township (a).....	309	.....	Black River township.....	1,937	1,050
Poland township.....	1,131	981	Casey township.....	168	206
Salat Francis township.....	1,072	815	Christian township.....	2,066	1,861
Salem township.....	1,111	742	Fairview township.....	371	319
Union township, including Gainoville town (b).....	1,743	1,301	Gainboro township.....	1,171	1,073
			Groombriar township, including Jamestown town (b).....	2,487	1,834
HEMPSTEAD COUNTY	22,706	19,015	Jefferson township.....	867	469
Bodenaw township (a).....	903	.....	Liberty township.....	722	512
Bois d'Arc township, including Fulton town.....	1,434	1,501	Logan township (a).....	341	.....
Fulton town.....	337	374	Ruddell township, including Batesville town.....	3,204	2,176
Do Roane township, including Hops town.....	4,002	3,878	Batesville town.....	2,150	1,264
Hops town.....	1,237	1,233	Salado township (a).....	281	.....
Garland township.....	905	1,543	Stubbs township (a).....	420	.....
Mine Creek township.....	1,173	2,071	Union township.....	818	766
Nowland township (a).....	1,143	.....	Washington township.....	1,367	1,126
Ozan township, including Ozan and Washington towns.....	4,318	4,021	White River township, including Sulphur Rock town.....	1,913	1,778
Ozan town.....	91	.....	Sulphur Rock town.....	387	188
Washington town.....	519	730			
Redland township.....	804	678	IZARD COUNTY	13,038	10,867
Saline township, including Columbus village.....	1,969	1,731	Barron Fork township (a).....	385	.....
Columbus village.....	217	171	Big Spring township.....	427	523
Spring Hill township.....	1,747	2,549	Olaborne township (a).....	631	.....
Union township (a).....	1,772	.....	Dry Town township.....	534	550
Wallacuburg township.....	1,238	1,134	Franklin township.....	676	711
Water Creek township (a).....	308	.....	Guthrie township.....	612	661
			Jefferson township.....	537	406
HOOT SPRING COUNTY	11,603	7,775	La Crosse township.....	1,091	1,412
Antioch township (a).....	392	.....	Lafferty township (e).....	620	507
Big Creek township.....	434	305	Linnburg township.....	889	813
Bismarck township (a).....	879	.....	Mill Creek township, including Melbourne town.....	1,330	990
Clear Creek township.....	466	285	Melbourne town.....	209	149
De Roche township.....	745	775	Nowburg township.....	1,064	918
Fenton township, including Malvern town.....	3,128	2,458	New Hope township.....	921	874
Malvern town.....	1,530	.....	Pleasant Hill township.....	818	814
Gifford township (a).....	616	.....	Union township.....	1,407	1,384
Harrison township (a).....	541	.....	Violet Hill township (a).....	781	.....
Lone Hill township (a).....	403	.....	White River township.....	410	307
Magnet Cove township.....	935	380			
Ouchita township.....	1,065	1,047	JACKSON COUNTY	16,179	10,877
Prairie Bayou township.....	617	1,368	Barron township.....	555	407
Saline township.....	532	204	Bird township.....	2,617	2,428
Valley township.....	1,059	903	Brockenridge township.....	2,023	1,253
			Cacha township.....	907	600
HOWARD COUNTY	13,789	9,917	Cow Lake township.....	577	347
Baker township (a).....	274	.....	Glaize township, including Grand Glaize town (b).....	690	605
Blackland township.....	860	1,130	Glass township (a).....	1,190	.....
Blue Ridge township (a).....	288	.....	Grubb township (a).....	539	.....
Brewer township.....	682	892	Jefferson township, including Jacksonport town.....	1,972	1,372
Center Point township, including Center Point town.....	1,691	1,643	Jacksonport town.....	421	656
Center Point town.....	297	316	Richwood township.....	457	267
Clay township (c).....	488	607	Union township, including Newport town.....	3,251	2,075
County Line township (a).....	553	.....	Newport town.....	1,571	683
Dillard township (a).....	438	.....	Village township.....	477	743
Franklin township.....	241	186			
Holly Creek township (a).....	538	.....	JEFFERSON COUNTY (f).....	40,881	22,386
Madison township.....	394	835	Barrage township (g), including Redfield town.....	1,307	601
Mineral Springs township, including Mineral Springs town (b).....	1,163	1,303	Redfield town.....	400	.....
Mountain township (a).....	358	.....	Bozy township.....	2,453	2,291
Muddy Fork township.....	664	634	Bolivar township.....	1,643	1,020
Nashville township, including Nashville town.....	2,243	1,243			
Nashville town.....	810	172			

a Organized since 1880.

b Not separately returned.

c Formerly Blackwood.

d Big Creek and Healing Springs townships taken to form Cleburne county in 1883.

e Formerly Lafferty Creek.

f Old River and Villmont townships, formerly in Arkansas county, annexed since 1880.

g Part taken to form Jefferson township since 1880.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
JEFFERSON COUNTY—Continued.			LAWRENCE COUNTY—Continued.		
Dudley Lake township.....	2,155	908	Black Rock township (e); including Black Rock town.....	1,490	.....
Dunnington township (a).....	860	259	Black Rock town.....	761	.....
Jefferson township (b).....	1,005	.....	Cacho township.....	305	334
Melton township.....	1,095	671	Campbell township, including Hoxie and Walnut Ridge towns.....	2,460	1,467
Niven township (c).....	341	.....	Hoxie town.....	182	.....
Old River township (d).....	1,452	1,695	Walnut Ridge town.....	437	391
Pastoria township.....	1,730	1,230	Dent township, including Imboden town.....	191	420
Plum Bayou township.....	4,676	2,968	Imboden town.....	137	.....
Richland township.....	2,435	1,631	Duty township, including Portia town.....	1,271	.....
Roberts township (e).....	321	.....	Portia town.....	571	.....
Spring township.....	605	600	Lawrence township (e).....	839	.....
Talladega township.....	413	493	Marion township.....	783	1,141
Vaughn township, including Pine Bluff city.....	13,593	6,746	Morgan township (e).....	336	.....
Pine Bluff city.....	9,952	3,293	Promised Land township (e).....	205	.....
Ward 1.....	3,165	.....	Reed Creek township.....	917	.....
Ward 2.....	2,359	.....	Spring River township.....	601	.....
Ward 3.....	2,393	.....	Strawberry township.....	1,501	1,420
Ward 4.....	2,035	.....	Thacker township (e).....	166	.....
Victoria township.....	2,084	1,967			
Villemont township (d).....	718	344			
Washington township.....	884	625			
Whiteville township.....	1,051	463			
JOHNSON COUNTY.....			LEE COUNTY.....		
	16,758	11,565		18,886	13,288
Batson township.....	322	167	Bear Creek township.....	267	250
Grant township (f), including Coal Hill town.....	1,956	1,238	Rig Creek township.....	485	191
Coal Hill town.....	802	200	Council township.....	918	878
Hickey township.....	412	248	Flemer township.....	735	278
Hill township (g).....	406	.....	Hampton township.....	1,520	809
Horsehead township (h).....	1,021	1,240	Hardy township.....	486	478
Howel township.....	759	497	Independence township, including Marianna village.....	3,237	2,020
King township (i).....	682	.....	Marianna village.....	1,126	122
Lee township.....	476	678	Liberity township.....	514	205
Low Gap township (j).....	149	.....	Oak Forest township.....	1,402	702
McKennon township, including Berlin town.....	217	194	Richard township, including Lagrange town.....	2,147	1,733
Berlin town.....	79	.....	Lagrange town.....	210	234
Mulberry township (k).....	467	558	Saint Francis township.....	798	688
Perry township.....	1,146	977	Spring Creek township, including Spring Creek town.....	1,789	984
Pilot Rock township.....	415	267	Spring Creek town.....	69	.....
Piney township.....	333	226	Texas township.....	1,600	1,121
Pittsburg township, including Lamar town (l).....	1,682	1,364	Union township, including Haynes town.....	1,775	1,145
Prairie township (m).....	806	690	Haynes town.....	275	.....
Red Lick township (n).....	685	.....	Walnut township.....	881	948
Sherman township (o).....	314	266			
Spadra township (p), including Clarksville city.....	2,686	3,055			
Clarksville city.....	937	656			
Stonewall township (q).....	691	.....		
Ward township (r).....	1,133	.....		
LAFAYETTE COUNTY.....			LINCOLN COUNTY.....		
	7,700	6,730		10,255	9,050
Baker township (e).....	602	.....	Anburn township.....	2,075	1,701
Boyd township (e).....	660	.....	Bartholomew township.....	1,155	800
Conway township (e).....	681	.....	Cano Creek township, including Star city.....	1,630	1,667
Douglas township (e).....	802	.....	Star city.....	304	.....
French township (e).....	283	.....	Choctaw township.....	883	952
Lagrange township, including Lewisville town.....	1,065	2,060	Kimbrough township.....	814	804
Lewisville town.....	255	301	Lone Pine township.....	793	682
Mars Hill township.....	511	457	Mill Creek township.....	647	650
Roane township.....	1,261	1,683	Owen township.....	522	604
Steel township (e), including New Lewisville town.....	1,221	.....	Smith township.....	1,017	903
New Lewisville town.....	500	.....	Spring Creek township.....	492	466
Walker Creek township.....	564	630	Wells Bayou township.....	821	350
LAWRENCE COUNTY.....			LITTLE RIVER COUNTY.....		
	12,684	8,782		8,903	6,191
Ashland township.....	435	220	Burke township.....	591	114
Black River township, including Powhatan town.....	949	1,466	Caney township (y).....	363	.....
Powhatan town.....	220	196	Cleveland township (v).....	426	.....
			Franklin township (s).....	794	915
			Jackson township, including Rocky Comfort town.....	2,542	2,614
			Rocky Comfort town.....	234	202
			Johnson township.....	809	540
			Lick Creek township (s).....	312	317
			Little River township (t).....	770	530
			Red River township, including Richmond town.....	2,196	2,060
			Richmond town.....	397	150

a Part taken to form Roberts township since 1880.

b Organized since 1880 from part of Barraque township.

c Organized since 1880.

d Formerly in Arkansas county.

e Organized since 1880 from part of Dunnington township.

f Part taken to form Ward township in 1880.

g Organized in 1886 from part of Mulberry township.

h Part taken to form Stonewall township in 1884.

i Organized in 1888 from part of Spadra township.

j Organized in 1882 from parts of Mulberry and Sherman townships.

k Parts taken to form Hill township in 1886 and Low Gap township in 1882.

l Not separately returned.

m Part taken to form Low Gap township in 1882.

n Parts taken to form King and Red Lick townships in 1888.

o Organized in 1884 from part of Horsehead township.

p Organized in 1880 from parts of Grant and Prairie townships.

q Organized since 1880 from part of Little River township.

r Organized since 1880 from parts of Franklin and Lick Creek townships.

s Part taken to form Cleveland township since 1880.

t Part taken to form Caney township since 1880.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
LOGAN COUNTY.	20,774	14,885	MARION COUNTY.	10,300	7,007
Beard township (a).....	382		Bearden township (i).....	465	350
Boone township, including Booneville town	1,736	1,204	Blythe township.....	1,121	959
Booneville town.....	495	275	Buffalo township (j).....	446	450
Cane Creek township.....	1,056	705	Crockett township (k).....	267	
Canthron township.....	789	648	Desoto township (l).....	281	
Clark township.....	1,115	850	Franklin township (m).....	664	550
Delaware township.....	740	600	Hampton township.....	750	629
Deiggs township (n).....	892		James Creek township.....	578	273
Ellsworth township.....	755	532	North Fork township (o).....	838	600
Johnson township (a).....	814		Prairie township.....	909	880
Logan township.....	642	1,055	Sugar Loaf township.....	720	616
Mountain township.....	566	600	Tombhawk township.....	451	351
Pettit Jean township.....	989	611	Union township, including Yellville town	1,318	1,290
Reville township, including Magazine town	1,875	1,023	Yellville town.....	263	345
Magazine town.....	183	478	Water Creek township (h).....	571	350
River township (a).....	705		White River township.....	951	641
Roseville township, including Roseville town	1,228	981			
Roseville town.....	103	215	MILLER COUNTY.	14,714	9,910
Short Creek township.....	1,131	849	Beech township (a).....	917	720
Short Mountain township, including Paris town	2,232	1,297	Cleveland township (p).....	1,202	
Paris town.....	547		Cut Off township.....	768	577
Six Mile township, including National Springs town	1,128	1,121	Day Creek township (q).....	416	
National Springs town.....	128		Garland township (r), including part of Texarkana city	6,660	4,310
Sugar Creek township.....	1,025	594	Texarkana city (part of).....	3,528	1,390
Washburn township.....	1,214	1,019	Total for Texarkana city, in Garland township, and in Bowie county, Texas.	6,380	3,223
			Ward 1.....	1,410	
LONOKE COUNTY (b).	19,263	12,146	Ward 2.....	1,914	
Butler township.....	628	853	Ward 3.....	3,056	
Carlisle township (c), including Carlisle town	1,085	440	Homan township.....	1,115	1,122
Carlisle town.....	185	159	Lost Prairie township (a).....	653	
Caroline township.....	1,455	1,297	Red River township.....	601	887
Crooked Creek township (a).....	605		Sulphur township.....	2,882	2,303
Eagle township.....	353	728			
Goodrum township (a).....	457		MISSISSIPPI COUNTY.	11,035	7,332
Gruy township.....	462	346	Big Lake township.....	424	649
Gunwoods township.....	1,156	467	Canadian township.....	403	672
Hamilton township.....	720	583	Carson Lake township.....	451	169
Indian Bayou township.....	930	273	Chickasaw township.....	1,404	864
Lafayette township.....	744	182	Chickasaw township.....	232	238
Lonoke township, including Lonoke town	2,491	1,874	Clear Lake township.....	662	
Lonoke town.....	858	659	Fletcher township (a).....	398	
Magness township.....	641	510	Hickman township (a).....	104	62
Pettus township.....	992	443	Little River township.....	2,723	2,040
Prairie township.....	734	550	Monroe township, including Osceola town	458	277
Pulaski township.....	1,051	655	Osceola town.....	1,047	764
Richwoods township.....	1,230	714	Pecan township.....	2,144	1,117
Totton township.....	666	840	Scott township.....	225	172
Williams township.....	1,003	1,098	Swayne township.....	1,200	776
York township.....	815	705	Troy township.....	152	
			Whitten township (a).....		
MADISON COUNTY (d).	17,402	11,455			
Boston township (e).....	680	552	MONROE COUNTY (e).	15,330	9,574
Bowen township (e).....	1,263	977	Brinkley township, including Brinkley town	2,741	1,437
California township.....	919	589	Brinkley town.....	1,510	325
Hilburn township (e), including Saint Paul town	1,325	988	Cacho township, including Clarendon town	2,147	1,435
Saint Paul town.....	417		Clarendon town.....	1,060	400
Independence township (f).....	254		Cleburne township (b).....	835	
Kentucky township (g).....	935		Cypress Ridge township.....	544	322
Kling River township.....	1,568	1,270	Duncan township (u), including Holly Grove town	2,404	1,730
Lamar township.....	941	861	Holly Grove town.....	353	161
Marble township.....	672	554	Greenfield township (a).....	318	
Pinoy township.....	569	411	Jackson township.....	1,308	1,058
Prairie township.....	1,600	1,441	Kuyl township (a).....	339	
Richland township.....	1,016	605	Montgomery township, including Indian Bay town	1,704	1,721
Union township.....	673	443	Indian Bay town.....	140	167
Valley township (h).....	1,328	622	Pine Ridge township (u).....	997	828
War Eagle township, including Huntsville town	2,512	1,879			
Huntsville town.....	362	312			
Wharton Creek township.....	547	303			

a Organized since 1880.

b Carlisle township, formerly in Prairie county, annexed since 1880.

c Formerly in Prairie county.

d Part given to Franklin county in 1885.

e Part taken to form Kentucky township in 1885.

f Organized in 1884 from part of Valley township.

g Organized in 1885 from parts of Boston, Bowen, and Hilburn townships.

h Part taken to form Independence township in 1884.

i Part taken to form Desoto township in 1888.

j Formerly Buffalo Fork.

k Organized in 1888 from part of Franklin township.

l Organized in 1888 from parts of Bearden and Water Creek townships.

m Part taken to form Crockett township in 1888.

n Formerly Little North Fork.

o Part taken to form Day Creek township since 1880.

p Organized since 1880 from part of Garland township.

q Organized since 1880 from parts of Beech and Garland townships.

r Parts taken to form Cleveland and Day Creek townships since 1880.

s Part of Rockree township, Prairie county, annexed since 1880.

t Organized since 1880 from parts of Duncan and Pine Ridge townships.

u Part taken to form Cleburne township since 1880.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
MONROE COUNTY—Continued.			OUACHITA COUNTY—Continued.		
Richland township.....	1,489	1,013	Jefferson township.....	600	470
Rockroe township (a).....	420		Lafayette township.....	1,552	1,181
MONTGOMERY COUNTY			Liberty township (f).....	531	1,196
	7,923	5,729	Marion township.....	1,349	949
Bear township (b).....	250		Red Hill township.....	1,472	591
Big Fork township.....	474	288	Smackover township, including Stephens town.....	1,867	831
Caddo township.....	746	625	Stephens town.....	379	
Caney township (b).....	730		Tremont township (g).....		260
Center township.....	451	346	Union township (h).....		621
Crystal township.....	112	179	Valley township (i).....	1,025	
Gap township.....	850	911	Washington township (j).....	805	427
Lovervey township (b).....	387		PERRY COUNTY		
Mazamez township.....	332	686		5,438	3,872
Missouri township.....	176	170	Aplin township.....		467
Mountain township.....	694	632	Casa township.....	712	467
Ouachita township (b).....	418		Fourcho Lafavo township, including Perryville town.....	532	401
Parkes township (b).....	198		Perryville town.....	715	690
Folk township.....	834	603	Houston township (b).....	310	256
South Fork township.....	712	860	Howell township (b).....	665	
Sulphur Springs township.....	659	609	McCool township.....	109	
NEVADA COUNTY			Maumelle township.....	266	322
	14,832	12,950	New Tennessee township.....	156	141
Alabama township, including Falcon town.....	827	874	Omega township (b).....	225	354
Falcon town.....	40	766	Perry township.....	45	
Albany township.....	1,535	1,342	Petit Jean township.....	574	542
Boughton township.....	942	920	Ranckin township (b).....	382	345
Caney township.....	1,087	873	Rose Creek township (b).....	316	
Emmett township.....	608	473	Taylor township (b).....	214	
Georgia township.....	513	548	Union township.....	179	610
Jackson township.....	956	964	PHILLIPS COUNTY		
Lake township.....	768	967		25,311	21,262
Missouri township, including Prescott town.....	3,227	2,809	Big Creek township.....	2,159	1,752
Prescott town.....	1,287	1,253	Cypress township.....	1,619	898
Parker township.....	1,247	956	Hickory Ridge township.....	1,731	1,188
Redland township.....	1,022	624	Lake township.....	1,079	1,667
Taylor township.....	1,150	970	L'Anquille township.....	2,171	2,438
Union township.....	944	650	Marion township, including Poplar Grove town.....	2,080	1,610
NEWTON COUNTY			Poplar Grove town.....	200	119
	9,950	6,120	Mooney township.....	532	396
Big Creek township (b).....	476		Saint Francis township, including Helena city.....	9,880	7,014
Boston township.....	821	92	Helena city.....	5,189	3,652
Grant township (b).....	383		Ward 1.....	1,153	
Jackson township.....	1,082	1,320	Ward 2.....	1,953	
Jefferson township.....	320	353	Ward 3.....	2,083	
Lincoln township (b).....	391		Searcy township.....	1,387	1,782
Mill Creek township.....	620	496	Spring Creek township.....	2,812	2,508
New Hope township (b).....	477		PIKE COUNTY		
Osage township.....	394	267		8,537	6,345
Pleasant Hill township.....	637	424	Antoine township.....	777	534
Plumlee township.....	334	140	Brewer township.....	434	294
Polk township.....	637	459	Caney Fork township.....	491	245
Prairie township.....	808	751	Clark township.....	1,074	1,056
Richland township.....	339	210	Missouri township.....	1,204	897
Union township.....	433	359	Mountain township.....	610	446
Van Baren township.....	859	698	Muddy Fork township.....	489	304
Walnut Fork township (b).....	219		Self Creek township (b).....	351	
White township.....	454	641	Thompson township, including Murfreesboro town.....	1,613	1,154
OUACHITA COUNTY			Murfreesboro town.....	159	84
	17,033	11,758	White township.....	927	947
Behestian township.....	1,070	800	Wolf Creek township.....	567	469
Bradley township (c).....	354	315	POINSETT COUNTY		
Bragg township (d).....	636			4,272	2,192
Bridge Creek township.....	754	651	Bolivar township, including Harrisburg town.....	1,302	727
Carroll township (e).....	269	832	Harrisburg town.....	482	
Cleveland township (e).....	241		Greenfield township.....	511	273
Ecote Fabre township, including Camden city.....	3,320	2,210	Little River township.....	433	142
Camden city.....	2,571	1,593	Owen township (h).....	298	
Ward 1.....	595		Scott township.....	1,375	872
Ward 2.....	1,122		West Prairie township (l).....	323	178
Ward 3.....	944		MONROE COUNTY—Continued.		
Freeo township.....	562	524			

a Organized since 1880 from part of Rockroe township, Prairie county.
 b Organized since 1880.
 c Part taken to form Valley township since 1880.
 d Organized since 1880 from part of Liberty township.
 e Organized since 1880 from part of Union township.
 f Part taken to form Bragg township since 1880.

g Annexed to Washington township since 1880.
 h Part taken to form Cleveland township since 1880.
 i Organized since 1880 from parts of Bradley and Carroll townships.
 j Tremont township annexed since 1880.
 k Organized in 1885 from part of West Prairie township.
 l Part taken to form Owen township in 1885.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
SCOTT COUNTY			SEVIER COUNTY—Continued.		
	12,635	9,174			
Barber township (a).....	515	312	Clear Creek township.....	1,708	1,044
Black Fork township.....	419	569	Jefferson township.....	440	659
Blausett township.....	687	569	Mineral township.....	851	387
Brawley township.....	718	417	Mourne township.....	1,101	971
Cauthron township (a).....	466	.....	Paracelita township.....	363	503
Cedar township.....	303	223	Red Colony township, including Lockesburg town	2,115	1,394
Hickman township, including Waldron city	3,939	3,065	Lockesburg town.....	451	256
Waldron city.....	487	239	Saline township (a).....	1,063	.....
Hunt township.....	466	245	Washington township.....	957	925
James township.....	275	217			
Lafave township.....	589	454	SHARP COUNTY	10,418	9,047
Lafayette township.....	554	971			
Lewis township (a).....	984	.....	Big Creek township.....	503	484
Mill Creek township.....	123	104	Cave township.....	515	395
Mountain township.....	607	411	Davidson township (a).....	556	.....
Park township.....	592	427	Hardy township (a).....	303	.....
Fate township.....	305	213	Highland township (a).....	282	.....
Tomlinson township.....	1,093	1,606	Jackson township.....	365	512
			Johnson township.....	283	350
SEARCY COUNTY	9,664	7,276	Lave Creek township (a).....	330	.....
			Lebanon township.....	521	517
Bear Creek township, including Marshall town.....	2,238	1,792	Morgan township.....	474	449
Marshall town.....	278	160	North township.....	722	331
Beaver township.....	337	251	Piney Fork township, including Evening Shade town	1,041	1,299
Calf Creek township.....	1,350	953	Evening Shade town.....	281	286
Campbell township.....	681	413	Richwoods township.....	703	1,529
Mount Pleasant township.....	364	278	Scott township.....	993	872
Prairie township.....	418	331	Strawberry township.....	391	358
Red River township.....	717	600	Sullivan township.....	1,037	844
Richland township.....	784	694	Union township.....	333	299
Saint Joe township.....	738	582	Washington township.....	970	826
Sulphur Springs township.....	336	350			
Tomahawk township.....	674	485	STONE COUNTY	7,043	5,989
Wiley Cove township.....	947	649			
			Blue Mountain township.....	1,200	869
SEBASTIAN COUNTY	33,200	19,560	Chalybonte Springs township (b).....	257	.....
			Farris township (c).....	653	.....
Bates township.....	788	1,090	Franklin township.....	1,092	849
Beverly township (a).....	1,126	.....	Harris township.....	579	532
Big Creek township.....	1,110	2,030	Hixson township (d).....	351	291
Bloomer township (a).....	1,056	.....	Locust Grove township (e).....	522	892
Center township, including Greenwood town	2,167	2,516	Northwest township (f).....	132	.....
Greenwood town.....	587	204	Red River township (g).....	111	.....
Cole township, including Hackett city.....	1,571	1,100	Richwoods township (h).....	566	544
Hackett city.....	458	172	Sylamore township (d).....	829	744
Dayton township.....	971	975	Turkey Creek township (i).....	238	237
Diamond township (a), including Huntington town	1,271	.....	Wallace township (h).....	622	430
Huntington town.....	893	.....		
Eagle township (a).....	507	.....	UNION COUNTY	14,977	13,419
Hartford township.....	1,035	1,040			
Little Bass township (a).....	710	.....	Boone township.....	704	801
Marion township.....	1,587	1,049	Cornio township.....	1,150	1,110
Mississippi township.....	854	691	Eldorado township, including Eldorado town.....	2,660	2,516
Prairie township, including Salem city.....	1,013	927	Eldorado town.....	455	443
Salem city.....	117	168	Franklin township.....	650	1,267
Rogers township (a).....	905	.....	Garner township.....	591	600
Sugar Loaf township, including Mansfield town	1,201	1,338	Harrison township.....	877	793
Mansfield town.....	243	.....	Jackson township.....	1,664	1,235
Sulphur township.....	1,152	1,229	Johnson township.....	1,909	1,565
Upper township, including Fort Smith city.....	13,120	4,292	Laple township.....	1,536	967
Fort Smith city.....	11,311	3,999	Tubal township.....	489	465
Ward 1.....	2,388	.....	Van Buren township.....	1,596	1,427
Ward 2.....	2,341	.....	Wilington township.....	758	638
Ward 3.....	4,132	.....		
Ward 4.....	2,450	.....	VAN BUREN COUNTY (j)	8,507	9,565
Washburn township.....	552	683			
White Oak township (a).....	504	.....	Archey Valley township.....	269	481
			Bradley township.....	1,013	536
SEVIER COUNTY	10,072	6,192	Cadron township (k).....	517	994
			Choctaw township (a).....	690	.....
Bear Creek township.....	496	409	Cleveland township (a).....	267	.....
Ben Lomond township (a).....	655	.....	Craig township.....	680	612
Buckhorn township (a).....	284	.....		

a Organized since 1880.

b Organized in 1884 from parts of Richwoods and Wallace townships.

c Organized in 1884 from part of Locust Grove township.

d Part taken to form Northwest township in 1881.

e Part taken to form Farris township in 1884.

f Organized in 1881 from parts of Hixson and Sylamore townships.

g Organized in 1882 from part of Turkey Creek township.

h Part taken to form Chalybonte Springs township in 1884.

i Part taken to form Red River township in 1882.

j Part of Cadron, and California, Giles, Mountain, Peter Creek, Piney, Sugar Loaf, and Valley townships taken to form Cleburne county in 1883.

k Part taken to form Cleburne county in 1883.

POPULATION BY MINOR CIVIL DIVISIONS—CONTINUED.

MINOR CIVIL DIVISIONS.	1890.	1880.	MINOR CIVIL DIVISIONS.	1890.	1880.
VAN BUREN COUNTY—Continued.			WHITE COUNTY—Continued.		
Davis township.....	007	819	Gray township, including Searcy town.....	3,545	2,954
Griggs township, including Clinton town.....	868	1,289	Searcy town.....	1,203	840
Clinton town.....	176	166	Harrison township, including Judsonia town.....	2,097	1,599
Hartsugg township.....	122	309	Judsonia town.....	475	267
Holly township.....	251	95	Higginson township (a).....	570	897
Liberty township.....	098	646	Jackson township.....	539	516
Red River township.....	731	724	Kensett township.....	730	565
Union township.....	074	475	Kentucky township.....	442	892
Washington township.....	395	135	Liberty township.....	861	760
Wheeler township (a).....	469		Marion township.....	744	550
White Oak township (a).....	320		Marshall township.....	116	119
			Negro Hill township.....	844	066
			Red River township, including West Point town (b).....	549	1,294
			Royal township.....	583	
WASHINGTON COUNTY	32,024	23,844	Russell township (a).....	2,620	2,187
Boston township (a).....	580		Union township, including Beebe town.....	86	428
Brush Creek township.....	1,050	790	Beebe town.....	100	
Cano Hill township.....	1,379	1,744	Volvet Ridge township (c).....		
Center township (a).....	1,359				
Cove Creek township.....	824	571	WOODRUFF COUNTY	14,009	8,646
Crawford township.....	040	572	Augusta township, including Augusta town.....	4,202	2,620
Durham township (a).....	873		Augusta town.....	519	702
Dutch Mill township (a).....	760		Barnes township.....	569	540
Elm Springs township, including Elm Springs town (b).....	1,591	1,517	Caches township (d).....	1,113	
Goshen township.....	1,247	788	Caney township (e).....	209	89
Illinois township, including Cincinnati town.....	1,169	2,195	Caney township (e).....	2,018	1,686
Cincinnati town.....	138	200	Cotton Plant township, including Cotton Plant town.....	429	98
Leo Creek township.....	740	500	Cotton Plant town.....	104	
Mars Hill township.....	584	1,740	Dent township (f).....	1,022	1,086
Mountain township.....	1,250	1,088	De View township (g), including McCrory town.....	299	
Prairie Grove township, including Prairie Grove town.....	1,337	994	McCrory town.....	850	564
Prairie Grove town.....	412		Freeman township.....	1,800	1,020
Prairie township, including Fayetteville city.....	6,032	5,110	Paint township.....	159	
Fayetteville city.....	2,942	1,788	Pumpkin township (a).....	1,343	1,141
Prica township (a).....	073		White River township.....		
Reed township (a).....	076				
Rhea Mills township (a).....	387		YRELL COUNTY	18,015	13,852
Richland township.....	1,056	1,087	Bluffton township (h).....	023	749
Springdale township, including Springdale town.....	2,361	1,205	Briggsville township (a).....	562	
Springdale town.....	906	198	Canterville township (a).....	374	
Star Hill township (a).....	517		Chickmah township.....	247	240
Vineyard township.....	771	1,233	Crawford township.....	383	231
Weddington township (a).....	687		Danville township (i).....	085	1,731
West Fork township, including West Fork town (b).....	1,268	798	Dardanelle township, including Dardanelle town.....	3,055	2,487
Wheeler township (a).....	473		Dardanelle town.....	1,456	748
White River township.....	970	1,766	Delaware township.....	252	509
Winslow township (a).....	959		Dutch Creek township.....	518	678
			Forquon township (a), including Belleville town.....	1,324	
WHITE COUNTY (c)	22,940	17,794	Belleville town.....	247	
Bald Knob township, including Bald Knob town (b).....	850	550	Galley Rock township.....	774	713
Big Creek township (a).....	322		Gilkey township (a).....	360	
Cadron township.....	530	300	Gravelly Hill township.....	670	625
Cane township.....	868	694	Herring township (a).....	349	
Clay township.....	634	842	Iron Creek township.....	306	145
Cleveland township (a).....	272		Lamar township (a).....	501	
Coffey township.....	006	542	Lower Lafave township.....	480	1,040
Coldwell township.....	350	816	Magnolia township.....	1,433	1,070
Donmark township.....	561	299	Mason township (a).....	205	
Des Arc township.....	875	1,027	Mountain township.....	376	865
Dogwood township.....	005	578	Prairie township (a).....	509	
El Paso township (a).....	893		Richland township (a).....	595	
Garner township (a).....	449		Riley township.....	861	1,109
Gravel Hill township (a).....	237		Rover township.....	088	447
			Ward township.....	373	651
			Wilson township.....	986	675

a Organized since 1880.

b Not separately returned.

c Part taken to form Cleburne county in 1883.

d Organized since 1880 from part of De View township.

e Part taken to form Dent township since 1880.

f Organized since 1880 from part of Caney township.

g Part taken to form Cache township since 1880.

h Formerly Upper Lafave.

i Formerly Spring Creek.

ROBERT P. PORTER,

Superintendent of Census.



CENSUS BULLETIN.

No. 113.

WASHINGTON, D. C.

September 24, 1891.

MINES AND MINING.—IRON ORE.

DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE,

WASHINGTON, D. C., September 1, 1891.

The following bulletin in relation to iron ore, prepared by Mr. JOHN BIRKINBINE, special agent, under the supervision of Dr. DAVID T. DAY, special agent in charge of the Division of Mines and Mining of the Census Office, shows the quantity of iron ore produced in the United States during the year 1889 to be 14,518,041 long tons, valued at \$33,351,978, an average of \$2.30 per ton. The total product reported at the Tenth Census was 7,120,362 long tons, valued at \$23,156,957. Of the twenty-six states and two territories producing iron ore in 1889 the four leading ones are as follows: Michigan, 5,856,169 tons; Alabama, 1,570,319 tons; Pennsylvania, 1,560,234 tons, and New York, 1,247,537 tons, aggregating 10,234,259 tons, or 70.49 per cent of the total product. The number of employes engaged in mining iron ore was 37,707, who were paid in wages \$13,880,108. The capital invested was \$109,766,199, distributed as follows: Land, \$78,474,881; buildings, fixtures, etc., \$7,673,520; tools, implements, etc., \$8,045,545; cash and stock on hand, \$15,572,253. The report shows a remarkable increase in production and activity over that of the Tenth Census.

Superintendent of Census.

IRON-ORE MINING INDUSTRY.

BY JOHN BIRKINBINE.

PRODUCTION.

During the year ended December 31, 1889, the production of iron ore amounted to 14,518,041 long tons, which was contributed by twenty-six states and two territories, and this output represented a value on cars or carts at the mines of \$33,351,978, an average of \$2.30 per ton.

The stock of ore on hand at the commencement of the census year was 1,966,824 long tons, while at its close this amount was augmented to 2,256,973 tons, an increase for the entire country of 290,149 tons, or nearly 15 per cent. The stock of iron ore carried over is equivalent to 15.55 per cent of the production for the census year, but the increased stock, that is, the amount of ore mined but not consumed, represents but 2 per cent of the total output for 1889. Owing to the fact that the census year for mining corresponded with the calendar year 1889, the stocks of iron ore on hand at the commencement and end of the year represented a larger amount than would have been the case a few months earlier, the practice of mine managers whose products must reach a market by means of water transportation encouraging a depletion of stock at the mines during the shipping season and an augmentation during the winter months, when navigation is suspended.

The statistics of production are given by states, except where the names or operations of individuals would be disclosed. As the iron ore in several of the states is mined, respectively, by one firm or corporation, the figures of these states are grouped with those of other states.

Some of the large mines reporting adopt a fiscal year, which, while not corresponding with the census year, offered more detailed information in regard to labor, wages, supplies, etc., than could be obtained for the calendar year 1889. Therefore, wherever the data furnished did not materially affect the figures of production the reports were accepted for a few mines for the fiscal year which corresponded closely with the census year.

The returns made to this office for the various states and territories were compared with the publications and reports of state officials wherever these were obtainable, and any discrepancies were carefully investigated.

Michigan was by far the largest producer of iron ore in the census year 1889, a total of 5,856,169 long tons having been mined, the value of which was \$15,800,521 at the mines, an average of \$2.70 per ton. The tonnage from Michigan therefore represents 40.34 per cent of the total, while the aggregate value is 47.38 per cent of that of the entire country.

The credit of holding second rank lies between the states of Alabama and Pennsylvania, the former, from the figures collected, having apparently a slightly greater output than the latter. This uncertainty is owing to the fact that the reports obtained from two of the larger Alabama mines covered operations commencing May 1, 1889, and ending May 1, 1890, and no detailed record of the amount of ore produced and labor employed during the three months of 1890 was obtainable. The position of Pennsylvania

is also affected by the refusal of one large producer to supply absolute figures, but it will be noted that in the shipments or apparent consumption of iron ores Pennsylvania takes precedence of Alabama.

Alabama is therefore placed second as a producer of iron ore, with 1,570,319 long tons, valued at \$1,511,611, an average of 96 cents per ton. These figures represent 10.82 and 4.53 per cent, respectively, of the total output and value.

Pennsylvania closely follows Alabama, its output being 1,560,234 long tons, valued at \$3,063,534, an average of \$1.96 per ton, and 10.75 and 9.19 per cent, respectively, of the total output and value.

The other state which produced over 1,000,000 tons in the present census year was New York, which is credited with 1,247,537 long tons, valued at \$3,100,216, an average of \$2.49 per ton, the figures representing, respectively, 8.59 and 9.30 per cent of the total output and value.

These four states therefore produced a total of 10,234,259 long tons, or 70.49 per cent of the entire output of the iron-ore mines of the United States, while the value of the ore aggregates \$23,475,882, or 70.39 per cent of the total valuation.

The following table shows the number of iron-ore mines reported, the number of mines producing in 1889, the amount of iron ore produced, the average value per long ton, the total valuation of iron ore produced and consumed, the stock on hand at the commencement and end of the census year, and the apparent consumption or shipments of iron ore:

PRODUCT AND VALUE OF IRON ORE IN 1889, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	Number of mines reporting.	Number of mines producing.	Amount produced. (Long tons.)	Stock on hand January 1, 1889. (Long tons.)	Stock on hand January 1, 1890. (Long tons.)	Total value of production.	Value per long ton.	Total shipments. (Long tons.)	Total value of shipments.
Total.....	685	592	14,518,041	1,006,824	2,256,973	\$33,351,978	\$2.30	14,227,892	\$32,760,506
Alabama.....	48	45	1,570,319	61,125	104,462	1,511,611	0.96	1,526,082	1,457,314
Colorado.....	19	18	109,136	1,628	7,193	487,433	4.47	103,571	469,546
Connecticut, Maine, and Massachusetts.....	11	7	88,251	22,279	18,723	265,901	3.01	91,807	278,888
Delaware and Maryland.....	16	14	29,980	7,298	14,476	68,240	2.32	22,292	54,469
Georgia and North Carolina.....	20	17	258,145	19,443	32,148	334,025	1.29	216,440	317,372
Idaho and Montana.....	9	7	24,072	1,893	4,216	158,974	6.60	21,749	140,647
Kentucky.....	6	4	77,487	17,290	16,401	136,659	1.75	78,286	133,885
Michigan.....	99	73	5,856,169	863,700	993,499	15,800,621	2.70	5,759,370	15,598,369
Minnesota.....	4	4	864,508	273,395	276,936	2,478,041	2.87	858,907	2,461,419
Missouri.....	8	8	265,718	251,091	291,760	561,041	2.11	225,019	470,457
New Jersey.....	32	24	415,519	98,249	94,899	1,841,543	3.23	418,869	1,352,509
New Mexico and Utah.....	3	2	96,050	500	1,000	70,956	1.97	35,650	69,950
New York.....	42	35	1,247,537	158,223	185,869	3,100,216	2.49	1,219,870	3,028,678
Ohio.....	74	70	254,294	58,209	71,083	532,725	2.09	241,420	515,148
Oregon and Washington.....	5	3	26,283	3,575	2,740	30,234	1.49	27,118	40,380
Pennsylvania.....	198	180	1,560,234	82,322	91,989	3,063,534	1.96	1,550,597	3,045,100
Tennessee.....	19	16	473,294	29,863	16,844	606,476	1.28	489,313	629,454
Texas.....	3	2	13,000	200	4,300	19,750	1.52	8,900	16,554
Virginia and West Virginia.....	54	38	511,255	53,184	69,684	935,290	1.83	494,805	894,051
Wisconsin.....	17	10	837,399	23,337	46,609	1,840,908	2.20	814,087	1,798,493

The above statement is tabulated from actual returns, verified in every way possible except by individual visitations to all of the iron-ore mines. The figures of production are possibly below the actual results, for in some localities farmers gather ore at odd times and sell to blast furnaces in small lots. Wherever this amount could be obtained it is included in the table. No returns have yet been secured from a few mines; hence their outputs were omitted where they could not be closely estimated. Some persons who mine ore on a small scale keep such insufficient records that allowances have to be made from the figures given. In other mines the practice of recording the output by the number of cars or skips handled has a tendency to underestimate the actual product.

Making fair allowance for all of the above, and possibly also for some scattered iron-ore mining of which the Census Office had no knowledge, the total amount of iron ore produced in the United States in the year 1889 probably exceeded 14,650,000 long tons. In the discussion of distribution, value, cost, etc., however, the actual figures as determined, viz, 14,518,041 long tons, will be used.

VALUE.—The value of iron ore given in the above table represents averages only, as the location of the mines in relation to blast furnaces, etc., and the character of the ores so influence their values that, except in a few instances, no detailed information as to specific values can be given without violating the

promise to protect those who contribute information for the census. The returns from the various mines were tabulated, and the difference between the stock on hand January 1, 1889, and January 1, 1890, was either added or subtracted, as the case might be, from the total amount of ore mined, giving the apparent shipments from each mine. These amounts multiplied by the average value per ton gave the value of iron ore for each mine, and the products so obtained when added show the total value of the ore produced by the various mines. Dividing this total by the number of tons mined gave the average value per ton.

With the exception of a few mines in Wisconsin, the value of iron ore at the mines and the costs of mining in the states of Michigan, Minnesota, and Wisconsin may be taken as representing the operations of mines in the Lake Superior region, which are worked principally under ground, producing ores rich enough in iron to withstand heavy transport charges to distant points. On the other hand, the figures for Alabama, Tennessee, and Virginia and West Virginia represent the winning of leaner iron ore, which is chiefly consumed close to the mines. While much of this ore is obtained from underground workings, a considerable portion is won from open-cut operations. The value given for ores obtained from mines which may properly be considered in the Lake Superior region averaged \$2.66 per ton, and the value of ores from the states of Alabama, Tennessee, and Virginia and West Virginia averaged \$1.20 per ton.

The highest average value per ton is reported in the returns from Idaho and Montana, where a limited amount of iron ore is won for fluxing ores of the precious metals. The lowest average value for any state is that of Alabama, where new but liberal underground exploitations of limited depths, or large open workings and facilities of mining, due to the character and the location of the ore deposits, contribute to place the value of iron ore at the mines at a low figure.

The above reasons also influenced to a greater or less extent the results in other states.

NUMBER OF MINES.—The number of persons, firms, or corporations reported to this office as having iron-ore mines which may be considered as active is 685, of which 592 were producers in the census year 1889. Compared with the returns made in 1880, when the number of regular mining establishments was 805, besides a large number of irregular producers, aggregating, according to the directory published, 1,325, it is found that there has been a material decrease in the number of operators, which is accounted for by the fact that iron-ore mining as a business has assumed such proportions as to command greater capital and more intelligent management. Many producers in 1880 mined but a few tons. This class of producers has in the ten years which have elapsed become practically extinct, except in a few localities. In the returns for the Eleventh Census there were but 81 mines which produced under 300 tons, while in the returns for the previous census 1,125 of the irregular producers furnished less than 300 tons.

All the mines reported in 1880 which were known or believed to have continued operations were supplied with schedules for the present census returns, and numerous new enterprises were sought out and data collected from them.

The growing demand for, and the appreciation of, the value of ores rich in iron have caused the abandonment or suspension of operations at numerous mines which produce ores carrying small percentages of iron or high percentages of phosphorus, sulphur, etc. The development of the Bessemer steel industry, which in the Tenth Census reported a production of 879,650 long tons of steel and in the Eleventh Census 3,382,654 long tons, is also largely responsible for the exploration on a liberal scale of numerous mines from which ores specially valuable to this industry were obtained because they were low in phosphorus.

The number of operations is also affected by consolidation of adjoining properties, so as to work them under one management, and in a number of cases several mines which, though adjacent, are practically distinct workings are operated as a single plant, and hence separate reports of each mine were not required or obtained.

Placing the states in the order of the number of producing mines in 1889, the rank for the larger producers is as follows:

The number of active mining operations (189) places Pennsylvania first, while the state ranks third in the amount of ore produced.

Michigan, which had by far the largest output of iron ore for the year 1889, had for its product but a comparatively small number of mines, viz, 73, many of which, however, were large operations.

Ohio follows next, with 70 producing mines, but as a producer it occupied eleventh position.

The fourth place is taken by Alabama, with 45 mines, while the state occupied second position as to the amount of ore won, the average output of the mines being large.

Virginia and West Virginia combined, with 38 mines, come next, and stand seventh as to the amount of ore won.

New York ranks sixth in regard to the number of mines, viz, 35, many of which are large operations and contributed to place the state in fourth place as a producer.

New Jersey follows with 24 mines, while its 1889 output gave it ninth rank.

Minnesota reports but 4 active mines, and occupies a low rank in this respect. It, however, was fifth in the amount of ore produced, indicating large mines.

Colorado produced but a small amount of ore during the year 1889, holding thirteenth position in this respect, and had 18 active iron-ore mines, showing but a small average from each.

Wisconsin, which held a high rank as a producer, had but 16 mines, most of which were large operations.

The following statement, exhibiting the average output per mining operation, is presented as illustrating in a general way one of the causes which affect the labor employed and the average cost of producing iron ore in each state:

AVERAGE PRODUCT IN LONG TONS PER IRON-ORE MINING OPERATION IN 1889.

The United States	24,524	New Jersey	17,313
Alabama	34,896	New Mexico and Utah	18,025
Colorado	6,063	New York	35,644
Connecticut, Maine, and Massachusetts	12,607	Ohio	3,633
Delaware and Maryland	2,099	Oregon and Washington	8,761
Georgia and North Carolina	15,185	Pennsylvania	8,255
Idaho and Montana	3,439	Tennessee	21,581
Kentucky	19,372	Texas	6,500
Michigan	80,221	Virginia and West Virginia	13,454
Minnesota	216,127	Wisconsin	62,037
Missouri	33,215		

In comparing the above statement with that of the tons of ore won per employé, it is noted that, with the exception of Tennessee, each state which shows an output per mining operation above the average for the United States is among those which mined the largest quantity of ore per man in 1889.

In the preceding census year 19 mines were reported as producing over 50,000 long tons each, of which 10 furnished red hematite and 9 magnetite. These 19 mines contributed 2,197,183 long tons, or 30.86 per cent of the total amount of iron ore produced, valued at \$8,222,640, or 35.51 per cent of the total valuation. The largest production of any individual operation in that year was 250,000 tons. Another mine had an output of 200,000 tons, and 8 additional mines produced 100,000 tons each, or over, in 1880.

In 1889 there were 65 mining operations, each of which reported a product exceeding 50,000 long tons. Of these 46 furnished red hematite, 9 magnetite, 8 brown hematite, and 2 carbonate ores. These 65 mines aggregated a production of 10,391,490 long tons, representing 71.58 per cent of the total output of the country. The ore was valued at \$24,340,611, or 72.98 per cent of the total valuation.

Of the 65 mines mentioned, 31 produced between 50,000 and 100,000 tons, 17 between 100,000 and 200,000 tons, 11 between 200,000 and 300,000 tons, 2 between 300,000 and 400,000 tons, 2 between 500,000 and 600,000 tons, 1 produced 769,000 tons, and 1 produced 809,000 tons. Of these mines Michigan held the largest number, 29, 11 producing between 50,000 and 100,000 tons, 9 between 100,000 and 200,000 tons, 6 between 200,000 and 300,000 tons, 1 over 300,000 tons, 1 over 500,000 tons, and 1 over 800,000 tons.

The apparent discrepancy between the number of producing mines and mines reported in the tables is accounted for by the fact that inquiries were directed to all known mines which were in process of development or were temporarily idle but equipped with mining machinery and appliances, or which were inactive by reason of flooding or other exceptional causes. As all mining enterprises must first go through a course of development, and as a majority of mines are at times temporarily

inactive for one cause or another, it seemed proper that as far as possible the labor employed in development work, with the cost of supplies for the same purpose, should be noted, and also that the figures tabulated should embrace as nearly as practicable the valuation of the plants and machinery at most of the mines which were temporarily inactive. The number of such operations which can not be included in the list of producing mines was not proportionately greater in the census year than during other years of the past decade, nor was the capital invested in equipment, machinery, and labor for development in excess of what is generally so employed.

The mines reported do not include any that were abandoned prior to December 31, 1888, or those concerning which it was impossible to obtain specific information. The actual number of reports received, viz, 685, was for active mines or mines in position for immediate or future work, and these, as before indicated, in a number of cases represent several adjacent openings under one management and operated as one mine. Numerous small openings, which have been exploited to a greater or less extent, and scattered exploratory work in progress would augment the number of apparent mining operations without increasing the quantity of iron ore won. These have not been considered, as it is impracticable to obtain full data of all such operations, and the figures of capital and labor would be misleading.

CHARACTER OF IRON ORE MINED.—In classifying the iron ores produced in the year 1889, four general divisions were made, without particular reference to the geological occurrence of the ores, as follows: Brown hematite, including limonite or bog ore; red hematite, including specular or fossil ore; magnetite ore; carbonate, including siderite, spathic, or blackband ores.

The purpose of the present inquiry has been confined to the commercial features of the iron ore supply. The formation and geological distribution of iron ores were considered at length by Professor Raphael Pumpelly in the reports of the Tenth Census. (*a*) In the Tenth Census the ores were divided into five classes, viz, limonite, hematite, fossil, magnetite, and carbonate. In order to simplify the classification of iron ores, the hematite and fossil ores were combined under one head. The gradations from one class of ore to another are so gradual that the divisions adopted can not be considered as perfect, but they approach within narrow limits the commercial classification generally accepted in the sale and purchase of American iron ores. The classification adopted may be briefly defined as follows:

Brown hematite: In this class are included all the varieties of hydrated sesquioxide of iron, such as limonite, göthite, turgite, bog ores, pipe ores, etc. There are also included some manganeseiferous iron ores and most of the ores mined in the Rocky Mountain region specially for smelting argentiferous ores, but it does not embrace the ores obtained from the Coal Measures, which are merely outcrops or portions of deposits of carbonate ores under light covering which have been weathered into a limonite ore. The brown hematites are the most widely distributed of the four classes, but the deposits are seldom localized in great masses.

Red hematite: This division embraces all practically anhydrous hematites recognized as red hematite, specular, micaceous, fossil, and slate iron ore, martite, blue hematite, etc. The terms "hard and soft hematite," "flaxseed ore," etc., used locally or in trade journals, are, like "blue hematite," merely expressions indicating physical characteristics. In the quantity of red hematite ore reported there are also included some hydrated ores, which, occurring in the same workings, are not separable. The same holds true, to a less extent, however, of those deposits in which red hematites occur closely associated with magnetite.

Magnetite: Magnetite embraces all ores in which the magnetic oxide of iron (Fe_3O_4) is the predominant constituent, and the reports of this ore necessarily include some martite occurring with magnetite.

Carbonate: Carbonate ore includes all ores in which protoxide of iron is found associated with a considerable percentage of carbonic acid, such as spathic ore, blackband ore, siderite, etc.

The term "kidney ore" and other similar appellations merely indicate physical characteristics.

a See Tenth Census reports, vol. xv, pp. 3 to 22, inclusive.

The following table has been prepared upon this classification, from which it is evident that 9,056,288 long tons, or 62.38 per cent of the iron ores produced in the United States in the census year, was of the red hematite variety; 2,523,087 long tons, or 17.38 per cent, was brown hematite; 2,506,415 long tons, or 17.26 per cent, was magnetite, and 432,251 long tons, or 2.98 per cent, was carbonate:

PRODUCTION OF VARIETIES OF IRON ORE.

[Long tons.]

STATES AND TERRITORIES.	Brown hematite.	Per cent of total.	Red hematite.	Per cent of total.	Magnetite.	Per cent of total.	Carbonate.	Per cent of total.	Total production 1889.	Per cent of total.	Total production 1880.
Total	2,523,087	100.00	9,056,288	100.00	2,506,415	100.00	432,251	100.00	14,518,041	100.00	7,320,362
Percentage of total output		17.38	62.38		17.26		2.98				
Alabama	379,334	15.03	1,190,985	13.15					1,570,319	10.82	171,139
Colorado	190,421	3.98	4,821	0.05	3,894	0.15			100,136	0.75	
Connecticut, Maine, and Massachusetts	88,251	3.50							88,251	0.61	92,519
Delaware and Maryland	18,061	0.72					11,319	2.62	29,380	0.20	127,102
Georgia and North Carolina	235,057	9.32	12,063	0.14	10,125	0.40			258,145	1.78	81,584
Idaho and Montana	10,479	0.42	12,069	0.14	1,504	0.06			24,072	0.17	
Kentucky	25,212	1.00					52,275	12.09	77,487	0.53	57,865
Michigan	332,257	13.17	5,272,915	58.22	250,997	10.01			5,856,109	40.34	1,649,814
Minnesota			864,508	9.55					864,508	5.95	
Missouri	400	0.02	265,318	2.93					265,718	1.83	311,819
New Jersey					415,510	16.58			415,510	2.80	676,225
New Mexico and Utah	4,033	0.16	2,017	0.02	30,000	1.20			36,050	0.25	
New York	30,374	1.20	224,438	2.48	927,269	37.00	65,456	15.14	1,247,537	8.59	1,128,889
Ohio							254,294	58.83	254,294	1.75	488,753
Oregon and Washington	26,283	1.04							26,283	0.18	6,225
Pennsylvania	496,555	19.68	162,057	1.80	860,916	34.35	39,806	9.21	1,598,234	10.76	1,951,496
Tennessee	174,192	6.90	299,102	3.30					473,294	3.26	93,272
Texas	14,000	0.51							13,000	0.09	3,214
Virginia and West Virginia	487,208	19.31	8,746	0.10	6,200	0.25	9,101	2.11	511,255	3.52	217,448
Wisconsin	101,070	4.04	735,429	8.12					837,399	5.77	37,000
Indiana and Vermont											95*
Output in 1880	1,919,122		2,243,493		2,134,276		823,471		7,120,362		
Percentage of total output		26.95	31.51		29.07		11.57				
Amount of increase or decrease	a603,965		a6,812,795		a372,139		b391,220		a7,397,679		
Percentage of increase or decrease		a31.47	a303.67		a17.44		b90.51		a103.89		

a Increase.

b Decrease.

The largest producer of red hematite was Michigan, which is credited with 5,272,915 long tons, or 58.22 per cent of the total. In this class of ore Alabama comes next, with 1,190,985 long tons, or 13.15 per cent. Minnesota follows with 864,508 long tons, or 9.55 per cent; Wisconsin with 735,429 long tons, or 8.12 per cent, and Tennessee with 299,102 long tons, or 3.30 per cent. These five states contributed 8,362,939 long tons, or 92.34 per cent of the total output of red hematite mined in the census year.

Nearly equal proportions of brown hematite and magnetite were produced, the former representing 2,523,087 long tons, or 17.38 per cent, and the latter 2,506,415 long tons, or 17.26 per cent, of the total iron ore output.

Pennsylvania contributed 496,555 long tons, or 19.68 per cent; Virginia and West Virginia together, 487,208 long tons, or 19.31 per cent; Alabama, 379,334 long tons, or 15.03 per cent, and Michigan 332,257 long tons, or 13.17 per cent, of the brown hematite mined in 1889. These five states therefore are credited with 1,695,354 long tons, or 67.19 per cent of the total output of brown hematite ore.

New York is the largest producer of magnetite, and is credited with 927,269 long tons, or 37.00 per cent of the total of that class of ore mined, Pennsylvania coming next, with 860,916 long tons, or 34.35 per cent, followed by New Jersey, with 415,510 long tons, or 16.58 per cent, and Michigan, with 250,997 long tons, or 10.01 per cent. These four states produced 2,454,692 long tons, or 97.94 per cent of all the magnetic iron ore mined in 1889.

The carbonate ores amounted to but 432,251 long tons, or 2.98 per cent of the total output, of which Ohio contributed 254,294 long tons, or 58.83 per cent; New York, 65,456 long tons, or 15.14 per cent; Kentucky, 52,275 long tons, or 12.09 per cent, and Pennsylvania, 39,806 long tons, or 9.21 per cent. These four states produced 411,831 long tons, or 95.28 per cent of the total of this kind of ore mined.

New York and Pennsylvania are the only states reported as producing the four kinds of ore. Colorado, Michigan, and Virginia produced three kinds of ore.

Comparing the relative rank of the states as producers of the various characters of ore with their positions a decade before, it is found that Michigan, with a largely increased output, still heads the list of red hematite producers. Alabama has risen from sixth place in 1880 to second place in 1889. Pennsylvania and New York, which occupied third and fourth places, respectively, in the Tenth Census, have fallen to eighth and seventh places, respectively, while Minnesota, which did not produce ore in 1880, has taken third place, and Wisconsin fourth place in 1889 as producers of red hematite iron ore.

In the brown hematite class Pennsylvania still occupies first place. Virginia and West Virginia combined have risen from fourth place in 1880 to second place in 1889; Alabama, which was fifth in 1880, takes third place, and Michigan has fallen from second to fourth place.

The relative rank of the first four states producing magnetite in the year 1889 remains the same, with the exception that Pennsylvania and New Jersey have changed places, the former now taking precedence of the latter, New York heading and Michigan closing the list.

Ohio still contributes more than one-half of the output of carbonate ores, outranking other states in this particular. It is followed by New York, which is reported as not producing any carbonate ores in 1880. Kentucky and Pennsylvania, which held, respectively, fifth and second places in 1880, take third and fourth places in 1889.

While the total amount of iron ore produced in 1889, 14,518,041 long tons, is more than double (an increase of 103.89 per cent) that given in the census of 1880, viz, 7,120,362 long tons, the increase has been most marked in the amount of red hematite, the product of which in 1889 was 9,056,288 long tons, or over four times that of 1880, when the output amounted to 2,243,493 long tons. The amount of magnetite increased from 2,134,276 long tons in 1880 to 2,506,415 long tons in 1889 (17.44 per cent), and the brown hematite class was augmented in production nearly one-third (31.47 per cent), from 1,919,122 long tons in 1880 to 2,523,087 long tons in 1889. The production of carbonate ore, however, showed a decline of about one-half (47.51 per cent) the production of the Tenth Census, viz, 823,471 long tons, to 432,251 long tons.

The production of the various kinds of ore mined at the Tenth and Eleventh Censuses shows that in relation to the total amount of iron ore won the red hematite produced in 1889 was 62.38 per cent, or nearly double the proportion reported in 1880, viz, 31.51 per cent. The proportion of magnetite decreased from 29.97 per cent in 1880 to 17.26 per cent in 1889; the brown hematite similarly fell from 26.95 per cent in 1880 to 17.38 per cent in 1889, and the carbonate from 11.57 per cent in 1880 to 2.98 per cent of the total in 1889.

The division by states does not fairly represent the importance of the iron-mining industry locally. Taking the figures from the preceding table, they show that the red hematite ore produced in Michigan, Minnesota, and Wisconsin, amounting together to 6,872,852 long tons, represents 75.89 per cent of the total amount of the output, all of which, with the exception of a small amount obtained from the fossil ore deposits of eastern Wisconsin, was taken from the portions of the three states named which are recognized as the Lake Superior region.

Similarly, the production of this class of ore in Alabama, Georgia, and Tennessee should be grouped, giving a total of 1,503,050 long tons, or 16.60 per cent of the total red hematite ore production. The output of this class of ore in New York is divided between the red hematite of the northern portion and the fossil ores of the central portion of the state; that of Missouri is divided between the specular ores of the Iron Mountain and Pilot Knob district and the softer ores of central Missouri.

The brown hematite or limonite ores credited to Michigan and most of those credited to Wisconsin are found with the red hematite in the Lake Superior region. A portion of the brown hematite, however, is obtained from the southern and western central portions of the latter state. It is proper to group the brown hematites of Alabama and Georgia, and also most of those credited to Tennessee, as one district. Taking the total of the three states named, their output aggregates 788,583 long tons, or 31.25 per cent of the total brown hematite production.

Of the magnetite ore of New York the major portion comes from the Lake Champlain district, the balance being from the vicinity of the lower Hudson river. Most of the magnetite from Pennsylvania

is obtained from the Cornwall ore hills, the balance being distributed among numerous mines along the South mountain, while New Jersey magnetites come chiefly from the mines grouped in the center of the state. Michigan's contribution of magnetic ore was obtained from a limited area in the Marquette range of the Lake Superior region.

The limonite of Pennsylvania covers a considerable area, and embraces several districts, a broad band of this ore practically passing through the state into Maryland and through Virginia into Tennessee, Alabama, and Georgia.

The entire product of Ohio consists of carbonate ores, which are produced chiefly in two contiguous districts in the central and southern portions of the state. The carbonate ores obtained from Kentucky are from a district separated from a similar producing territory in southern Ohio by the Ohio river, the portions of the two states being generally grouped under the name of the Hanging Rock region. At the outcrops or under light covering many of the carbonate ores are weathered into limonite ore, but no attempt has been made to subdivide the weathered from the unweathered ores.

The carbonate ores of New York are found near the Hudson river, 110 miles from its mouth, and those in Pennsylvania mostly in the western section of the state.

In discussing the character of the ores mined, attention is called to the fact that most of the ores imported from foreign countries are hematites, the red hematites predominating. No actual subdivision, however, is authentically published.

GEOGRAPHICAL DISTRIBUTION OF IRON ORE MINES.

Although the iron ores of the United States are very liberally distributed, the production in the year 1889 came from comparatively limited areas. This statement will be made more prominent by taking the output of various sections of the country for this purpose.

If the United States be divided into eastern and western sections by the most prominent physical feature, namely, the Mississippi river, and connecting the headwaters of this stream by an imaginary line with the Lake of the Woods, the output of that portion of the United States east of this division in 1889 was 14,043,782 long tons, or 96.73 per cent of the total production of the United States, and that of the western division 474,259 long tons, or 3.27 per cent. If the eastern division is again subdivided by a line nearly east and west, following the Ohio and Potomac rivers, uniting these along the southern boundary of Pennsylvania, the northern portion produced 11,153,282 long tons in 1889, or 79.42 per cent of the output of the eastern division and 76.82 per cent of the total for the United States, and the southern portion 2,890,500 long tons, or 20.58 per cent of the product of the eastern division and 19.91 per cent of the total for the United States.

While the above include practically state divisions as far as output is concerned, and show groupings of iron-ore producers in but a limited portion of the territory, these groupings would, if subdivided into districts, demonstrate that the comparatively small areas actually contributing to the supply of iron ore are quite marked. To illustrate this fact, take a few of the prominent producing centers. The four districts or ranges embraced in the Lake Superior region are none of them of great extent geographically, and if a circle was struck from a center in Lake Superior with a radius of 135 miles, all of the iron-ore producing territory of the Lake Superior region would be embraced within one-half of the circle, and most of the deposits would be near the periphery. The output of this section was 7,519,614 long tons. A parallelogram 60 miles in length and 20 miles in width would embrace all of the producing mines in the Lake Champlain district of northern New York, whose output in 1889 aggregated 779,850 long tons. A single locality, namely, Cornwall, in Lebanon county, Pennsylvania, contributed 769,020 long tons in 1889. A circle of 50 miles radius, embracing portions of eastern Alabama and western Georgia, included mines which in 1889 produced 1,545,066 long tons.

There are other important centers of iron ore production, but the above sufficiently demonstrates the fact that in the four areas named, which, with the exception of the one locality of Cornwall, are only occupied to a limited extent by iron-ore mines, there were produced in 1889 a total of 10,613,550 long tons, or 73.11 per cent of the entire production of iron ore for the United States.

CONSUMPTION.

Adding to the stock of iron ore on hand January 1, 1889, 1,966,824 long tons, the production for the year, 14,518,041 tons, and deducting the stock on hand January 1, 1890, 2,256,973 long tons, there is an apparent total consumption of 14,227,892 tons, valued at \$32,766,506. To this apparent consumption, however, should be added: (1) The materials which are charged into blast furnaces as ore, but which are products coming from the puddling and heating furnaces and the rolls and hammers of rolling mills; (2) the materials from the retorts in which the franklinite of New Jersey is treated for the removal of zinc, leaving as a residuum a mixture of iron and manganese oxides, employed in blast furnaces for producing spiegeleisen, and (3) the blue billy or purple ore, the residuum of pyrites burned to produce sulphuric acid, and some of the silicates of iron, which, as cinder, result from the treatment of copper ores, may also be utilized and smelted as iron ores.

The approximate amounts of these materials which were fed to blast furnaces in 1889 are as follows (the figures being partly from estimates and partly from data specially collected for the purpose):

APPARENT CONSUMPTION OF IRON ORE.

	LONG TONS.
Domestic iron ore	14,227,892
Rolling-mill cinder, roll and hammer scale, residuum from treating zinc ores, blue billy, and slags	652,000
Imported iron ore, mostly for producing pig iron	853,573
Total consumption of iron ore or other material used as iron ore in the United States	15,733,465

This consumption can not be distributed with any great degree of accuracy, for the reason that the inquiries did not include following the ore to the individual consumers; but approximate figures obtained from other sources permit of giving a general idea as to the extent to which iron ore is used for special purposes.

The rolling mills of the country consumed in the year 1889 for "fix" or "fettling" about 385,000 long tons of iron ore, mostly from domestic mines. The silver smelters used for flux, as reported by operators of mines to this office, 157,908 long tons of iron ore. This does not include any ores which were high enough in silver to encourage their use independent of their iron contents. In the open-hearth steel furnaces, and in making blooms direct from the ore in forges or other direct processes, the consumption approximated 39,500 long tons. This leaves for the consumption of blast furnaces of the United States, say, 15,151,057 long tons of iron ore, mill cinder, etc.

Making allowances for mill cinder, roll and hammer scale, etc., used, there is a total consumption of iron ore of, say, 14,499,057 long tons in the blast furnaces of the United States, or, if the foreign ores (of which 7,500 tons are estimated as used in rolling mills, forges, etc.) are omitted from the calculation, the consumption in American blast furnaces of iron ore produced from domestic mines was 13,652,984 long tons.

Allowing for discrepancies in the figures presented, as mentioned under the head of "Production," there were supplied to American blast furnaces in the year 1889 fully 13,780,000 long tons of domestic ore.

The following résumé illustrates the apparent consumption of iron ore and materials used as iron ore in the year 1889:

APPROXIMATE CONSUMPTION OF IRON ORE, ETC., BY VARIOUS INDUSTRIES IN 1889.

[Long tons.]

ITEMS.	Total.	Used in rolling mills, forges, etc.	Used in silver smelting.	Used in blast furnaces.
Total	15,733,465	424,500	157,908	15,151,057
Domestic iron ore	14,227,892	417,000	157,908	13,652,984
Foreign iron ore	853,573	7,500	.....	846,073
Mill cinder, scale, residuum, blue billy, etc.	652,000	.....	.....	652,000

YIELD OF METAL FROM IRON ORES USED.

From the apparent consumption, 13,652,984 long tons of domestic iron ore used in blast furnaces, it is possible to estimate the average yield of American iron ore fed to these furnaces. As near as can be estimated, the average yield in blast furnaces of foreign iron ore, mill cinder, residuum, blue billy, etc., was 57 per cent, producing 853,902 long tons of pig iron.

Dr. William M. Sweet, special agent, gives the total production of pig iron for the census year ended June 30, 1890, as 9,579,779 short tons, equivalent to 8,553,374 long tons, and Mr. James M. Swank, general manager of the American Iron and Steel Association, reported the production for the calendar year 1889 to be 8,516,079 short tons, or 7,603,642 long tons. The difference of nearly one million tons between these two statements is due to the two periods covered by the tables of statistics; that of Mr. Swank, however, being for the same period as the inquiry into the production of iron ore under direction of the Census Office, would seem to be the fairer basis for calculation. A considerable portion of iron ore mined in the Lake Superior district and in northern New York is accumulated at docks and at blast furnaces toward the close of the calendar year and held there on account of suspension of navigation during the winter months. It would seem equitable, therefore, in determining the percentages of iron in the ores used, to base the calculation upon an amount of pig iron somewhat greater than that reported by Mr. Swank, and yet not so much as that given by Dr. Sweet, for the reason that the year 1890 showed a much larger output than that of 1889.

Taking the 853,902 long tons as the amount of pig iron obtained from foreign ore, mill cinder, etc., from 7,603,642 long tons, as reported by Mr. Swank, there is a balance of 6,749,740 long tons, to produce which 13,652,984 long tons of domestic iron ore were used. If, however, for the reason above mentioned, a total production of 7,000,000 long tons of pig iron is allowed from a total of 13,652,984 tons of iron ore, the average yield would be 51.27 per cent.

In the Tenth Census the average yield of iron ore was determined by analyzing samples collected and multiplying the product in tons by the approximate percentage of iron so determined. The result was an apparent average yield of 51.22 per cent. This would indicate that but slightly richer mixtures were used in 1889 than in 1880, and had the estimates for the Tenth Census been made upon the same basis as those above given for the Eleventh Census the difference would be more apparent. The tendency to use richer ores has encouraged the large development of the mines in the Lake Superior region, and caused an enrichment of ores by sorting, separating, and concentration; also the liberal importation of foreign iron ore. The result has been the abandonment of many mines producing ores carrying low percentages of iron which were active in the year 1880. The large increase in blast furnace capacity and necessarily augmented demand for iron ores in some of the southern states, where comparatively lean ores abound, has not, however, been sufficient to keep the average yield of iron ore below what it was in 1880.

In order to check up the totals of the different kinds of iron ore reported and obtain approximately the yield of iron ores in the blast furnaces, letters were sent to the blast furnace managers in the United States, inclosing schedules which they were requested to fill out. On these schedules the amounts of the different characters of ore, viz, red hematite, brown hematite, magnetite, carbonate, and the general localities from which the ores were obtained, as well as the amount of foreign ores, mill cinder, etc., used and the amounts of pig iron produced in 1889, were given. Complete returns were obtained from most of the states, and in those which failed to supply all the desired information it was possible to estimate closely from other data accessible the amounts of iron ore used and pig iron made.

From these returns and supplementary information the following statement concerning the pig iron producing value of the iron ores used in the different states was prepared, and wherever possible the yield of ores obtained from the various states was determined.

The returns received from Alabama blast furnaces represent over 90 per cent of its output, and show that a great majority of the ores used were obtained from local mines, although some ore was brought in from Georgia. The average yield in the blast furnaces of the iron ores used was 46 per cent. Over 70 per cent of these ores was red hematite, the balance being brown hematite, with the exception of 2,100 long tons of mill cinder, etc. The blast furnace reports show that the ores used ranged from 30.5 to 51.6 per cent of iron.

The ores used in Colorado are all local, and show an average yield of 55 per cent of iron.

The three New England states, Maine, Connecticut, and Massachusetts, used local ores entirely, and full reports have been received from that section showing an average of 44 per cent of iron in the brown hematites smelted, this being the only character of ore at present mined in these states.

Most of the ores used in Georgia and North Carolina blast furnaces are local, the approximate proportion being one-third brown hematite and two-thirds red hematite, with a small amount of magnetite and mill cinder, the average yield being 44.7 per cent of iron.

Illinois produced no iron ores and obtained the entire supply of its furnaces from the Lake Superior region. The returns for the entire pig iron production should therefore be credited to that district, and these showed a yield of 60 per cent, which is practically a fair indication of the iron ore shipped to points of consumption from the Lake Superior region. Ninety-four per cent of the ore charged to the Illinois furnaces was red hematite, 2.5 per cent magnetite, and 3.5 per cent mill cinder, etc.

Kentucky blast furnaces depended upon local ores, chiefly roasted carbonates and brown hematites. These ores gave a yield of 46.2 per cent in the blast furnaces.

The yield of ore in the blast furnaces in Maryland, using nearly all local and Virginia ores, averaged about 41 per cent of iron, but those consuming foreign ores imported from Cuba and the Mediterranean sea bring the average for the state up to 47.7 per cent.

The location of the majority of the Michigan blast furnaces within convenient distance of the ore supply gave these plants, which use charcoal as fuel, some of the ores of lower grade than could stand transportation to distant points, and hence the yield of ore in these furnaces is lower than would be supposed, viz, 58 per cent of iron, and lower than the yield of Lake Superior ores in furnaces at greater distances. The red hematites formed the bulk of the supply, but some magnetites and brown hematites were also used.

The Missouri blast furnaces used local ores, chiefly red hematite, with a small admixture of brown hematite, and yielding 56.4 per cent of iron.

The blast furnaces in New Jersey, while depending chiefly upon the local magnetites of that state, also receive a portion of their supply from the Lake Superior region, from New York, a small amount from Pennsylvania, and some foreign ores, the yield for the state being 51.9 per cent.

About one-half of the ores used in New York are local magnetites; over 30 per cent were red hematite from that State and the Lake Superior region, the balance being made up of brown hematite from New York and the New England states, carbonates from New York, and mill cinder, etc., the average yield being 47.6 per cent of iron.

Ohio obtains the bulk of its ores from the Lake Superior region and from its local carbonates, although some magnetite from New York, carbonate ores from Kentucky, and red hematite from Missouri are used. These ores yielded on an average 56.7 per cent of iron.

Oregon supplies the brown hematite ore which is used in its blast furnaces, which yielded about 32 per cent of iron.

Pennsylvania is the largest consumer of foreign ores, fully 85 per cent of the reported total of this class of ore being shipped into that state, and several furnaces draw their entire supply from this source, with an occasional admixture of local cinder. It is also the heaviest consumer for the Lake Superior ores, obtaining most of its red hematite from that region, which are supplemented by some of the local ores. In addition to its liberal supply of magnetite from the Cornwall ore hills, Dillsburg, etc., it obtains this class of ore from New York, New Jersey, and Lake Superior region. The brown hematites are mostly obtained from local mines, although some were sent from Virginia. Some local carbonates and some from Ohio are also used. Instances of dependence upon one class of ore show a yield from hematites obtained from Spain and Africa of 63.6 and 60.2 per cent; of all Lake Superior ores, 61.5, 61.8, 62.6, 60.8, 60, and 59.5 per cent; of all Pennsylvania magnetites, 51, 50.9, 49.1, 48.9, and 48.5 per cent; of Pennsylvania brown hematite, 41.5, 45.6, and 41.2 per cent; of local fossil ores, 37.9 and 36.9 per cent, and of ore from Cuba and Mediterranean ports 56.6 per cent. The average for the state is 55.3 per cent.

The brown and red hematites, which form the chief base of supply for the Tennessee furnaces, come from local mines, with additions from Alabama and Georgia. Some carbonate ore and mill cinder are also used, the yield for the state being 39.6. Furnaces using only brown hematites showed an average iron contents of 38.8 per cent.

The Texas brown hematites, the only character of ore used in that state, yielded 45.8 per cent of iron when roasted.

Virginia depends principally upon her brown hematite mines, which supplied over 85 per cent of the ore used in that state, the balance coming from local red hematite mines, magnetites mined in North Carolina, and a small amount of mill cinder. These gave an average yield of 43.4 per cent of iron. Several furnaces depended entirely upon the use of brown hematites, which showed percentages of 48.6, 43.3, and 41.4 of iron, respectively.

Local brown hematite and magnetite from British Columbia were used in the Washington blast furnace, the latter yielding 64 per cent of iron when roasted.

West Virginia obtains most of the ore for its furnaces from the Lake Superior district, and, with the exception of some mill cinder, local brown hematite and carbonate ores, and a small amount of magnetite, is entirely dependent upon that section of the country. This raises its percentage close to 60 of iron.

Wisconsin's blast furnaces also draw their supply from the Lake Superior district, and with the exception of some mill cinder the red and brown hematites were the only ores used, and gave an average yield of 57.2 per cent of iron.

BENEFICIATING AND CONCENTRATING IRON ORE.

The figures given in this report are for the ores as shipped to consumers, and therefore the actual amount mined aggregates considerably greater than the tonnage named, because in a number of instances the ores are treated at the mines to enrich them. Thus most of the carbonate ores which are produced are roasted at or close to the mines to drive off the carbonic acid. Some of the sulphurous ores are similarly treated, but as a rule the ores which carry sufficient sulphur to require roasting are delivered to blast furnaces or other consumers as mined, and the roasting is done at the point of consumption. Most of the mines which produce brown hematite are equipped with washing appliances for removing the clay, sand, etc., from the ores, so that the material is shipped to the furnaces comparatively free from these objectionable features, which decrease the value of the ore. Jigs are employed to a limited extent to cleanse some of the red hematites and magnetites, and in Missouri lean specular ores or old dumps are hydraulicked before the material is jigged.

The year 1889 marked a revival in magnetic concentration, whereby ores carrying smaller percentages of iron than would pay for their exploitation and shipment, or iron ores which have an excess of phosphorus, as apatite, or of sulphur in the shape of pyrites, are granulated and passed over various forms of apparatuses, in which are currents of electricity or fixed magnets, to attract the magnetic material, allowing the nonmagnetic to pass away as tailings. This revival in 1889 was confined largely to the construction and equipment of plants for treating ores on a liberal scale or experiments with various machines under different conditions. As a result of this the amount of such ore produced was small, but subsequently the completion of the plants, aggregating a cost of over \$500,000, and their operation and the results of experiments made this feature an important one, and one which will probably grow with each year. The amount of iron ore which had been prepared and passed through water jigs or magnetic separators in 1889 amounted to 95,425 long tons. This does not include red or brown hematite ores which were washed or hydraulicked or any sulphurous or carbonate iron ores which were roasted at the mines where they were produced; nor does it include ore which had been cobbled or sorted at mines by hand.

COMPARISONS WITH THE TENTH CENSUS.

Comparing the figures for the census year ended December 31, 1889, with the census year 1880, it is found that a total of 7,120,362 long tons of ore were mined in 1880, valued at \$23,156,957, while the production of the census year 1889 shows a total output of 14,518,041 long tons, valued at \$33,351,978, an increase of 7,397,679 long tons, or 103.89 per cent, over the production of 1880, and an augmented value of \$10,195,021, or 44.03 per cent.

The average value per ton of iron ore at the mines has been reduced from \$3.25 per long ton in 1880 to \$2.30 per ton in 1889. This is due to the consolidation of a number of mines which have been grouped under one management, reducing the cost of superintendence, office force, administration, etc., encouraging the use of improved machinery and permitting systematic and advanced methods of mining, greatly increasing the output of the mines. The reduced freight rates, due to improved facilities, shipping and receiving docks, special vessels and cars having been built for ore handling and transportation, render the competition between the mines much keener than in 1880. The low cost of mining ore in the southern states has also contributed to this diminution of value at the mines.

Iron ore was obtained from twenty-three states in 1880, and all of these states, with the exception of Indiana and Vermont, were producers, as reported to the Eleventh Census. In addition to the states which mined ore as reported to the Tenth Census, there are added Colorado, Idaho, Minnesota, Montana, New Mexico, Utah, and Washington as new producers for the Eleventh Census. Of these, Colorado and Minnesota were the only states which contributed largely to the output of 1889. The states which have augmented the output of iron ore, including the new producers mentioned and those which have decreased in production, and the percentages of such increase or decrease, are as follows:

STATES AND TERRITORIES WITH AN INCREASED PRODUCT OF IRON ORE AT THE ELEVENTH CENSUS.

STATES AND TERRITORIES.	1880. (Long tons.)	1889. (Long tons.)	Percent- age of increase.	STATES AND TERRITORIES.	1880. (Long tons.)	1889. (Long tons.)	Percent- age of increase.
Alabama	1,570,319	171,139	817.57	New Mexico and Utah (a)	36,050	.....	.....
Colorado (a)	100,136	.....	.....	New York	1,247,537	1,120,800	10.71
Georgia and North Carolina	258,145	81,584	205.10	Oregon and Washington	20,283	20,225	322.22
Idaho and Montana (a)	24,072	.....	.....	Tennessee	473,294	61,272	407.43
Kentucky	77,487	57,865	33.01	Texas	13,000	3,214	304.48
Michigan	5,856,169	1,040,814	250.01	Virginia and West Virginia	511,255	217,448	135.12
Minnesota (a)	804,508	.....	.....	Wisconsin	837,309	37,000	2,162.24

a Not reported at the Tenth Census as producing iron ore.

b For Oregon only; Washington not reported as a producer at the Tenth Census.

STATES WITH A DECREASED OUTPUT OF IRON ORE AT THE ELEVENTH CENSUS.

STATES.	1880. (Long tons.)	1889. (Long tons.)	Percent- age of decrease.	STATES.	1880. (Long tons.)	1889. (Long tons.)	Percent- age of decrease.
Connecticut, Maine, and Massachusetts	88,251	92,540	4.64	New Jersey	415,510	676,225	38.55
Delaware and Maryland	20,380	127,102	70.88	Ohio	254,294	488,753	47.07
Indiana (a) .....	.....	458	.....	Pennsylvania	1,560,234	1,951,496	20.65
Missouri	205,718	344,819	22.94	Vermont (a) .....	.....	500	.....

a No report on iron ore mined was made for this state at the Eleventh Census.

COMPARISON OF THE IRON ORE PRODUCT WITH OTHER CENSUS REPORTS.

An examination of the iron ore product of various states as reported at the censuses of 1880 and 1889 emphasizes the changes due to improved transportation facilities, larger smelting plants, and a development of the iron-ore industry in keeping with national advancement. This may be illustrated by a table in which the various states are placed in their order of prominence as producers of iron ore. Up to 1850 little, if any, iron ore was transported except for such distances as could be conveniently covered by wagons. The blast furnaces and forges, depending chiefly on charcoal for fuel, were located close to their supplies of raw material.

The advance in the use of mineral fuel encouraged the erection of iron works at more convenient centers, but generally near ore deposits or within reach of them by water transportation; but the subsequent development of the industry caused iron workers to select points where raw materials could be assembled advantageously and market facilities secured. The report of 1870 indicated the growing use of railroads, which was greatly increased, as shown by the report of 1880, and the rank exhibited by the returns of 1889 illustrates to what a large extent the appreciation of market facilities and the character of the ore have influenced consumers. In late years the growth of the Bessemer steel industry and the demand of blast furnace plants for large quantities of ore are responsible for the exploitation of numerous iron-ore mines on a scale not previously attempted.

The following table gives the rank of states as producers of iron ore in the census years 1850, 1860, 1870, 1880, and 1889. Two states which produced over 100,000 long tons of iron ore in 1850 were increased to five states in 1860, to seven in 1870, to nine in 1880, and to thirteen in 1889. One state exceeded 500,000 tons in 1850 and 1860, two in 1870, four in 1880, and six in 1889. Pennsylvania is the only state reported as reaching an output exceeding 1,000,000 tons until 1880, when three states exceeded this amount, and in 1889 four states were numbered among the great producers. In 1870 and 1880 Pennsylvania reported over 2,000,000 tons, but in 1889 fell below that figure. In the latter year Michigan produced nearly 6,000,000 tons. In the census reports for 1850, 1860, and 1870 the statistics of the production of iron ore were obtained largely from reports made by the various blast furnaces as to the amount of ore consumed. These tables did not specify in what states the ore was produced, but merely gave the amounts reported as being used by blast furnaces. It was, however, deemed advisable to use the data as given in previous reports, except where published reports giving reliable information were accessible, although in several instances states are evidently placed in position different from that which they should actually assume as producers of iron ores, particularly in the Ninth Census. As iron ores were used elsewhere than at blast furnaces, the error can not be corrected by states, as the record shows that the blast furnaces in 1860 used 2,309,975 short tons, and, in addition, 908,300 short tons were produced by mining companies, making a total of 3,218,275 short tons, but no distribution of this ore as to points of production is mentioned.

RANK OF STATES AND TERRITORIES AS PRODUCERS OF IRON ORE IN THE CENSUS YEARS.

1850.	1860.	1870.	1880.	1889.
1 Pennsylvania.	1 Pennsylvania.	1 Pennsylvania.	1 Pennsylvania.	1 Michigan.
2 Ohio.	2 Ohio.	2 Michigan.	2 Michigan.	2 Alabama.
3 Maryland.	3 New Jersey.	3 Ohio.	3 New York.	3 Pennsylvania.
4 Tennessee.	4 New Jersey.	4 New York.	4 New Jersey.	4 New York. 1,000,000.
5 Kentucky.	5 Michigan.	5 Maryland.	5 Ohio.	5 Minnesota.
6 Virginia.	6 Kentucky.	6 Kentucky.	6 Missouri.	6 Wisconsin. 500,000.
7 New Jersey.	7 Maryland.	7 Missouri.	7 Alabama.	7 Virginia.
8 New York.	8 Tennessee.	8 New Jersey.	8 Virginia.	8 Tennessee.
9 Missouri.	9 Massachusetts.	9 Tennessee.	9 Maryland.	9 New Jersey.
10 Connecticut.	10 Missouri.	10 Indiana.	10 Tennessee.	10 Missouri.
11 Massachusetts.	11 Virginia.	11 Wisconsin.	11 Georgia.	11 Ohio.
12 Vermont.	12 Connecticut.	12 Virginia.	12 Kentucky.	12 Georgia.
13 Illinois.	13 Wisconsin.	13 Connecticut.	13 Massachusetts.	13 Colorado. 100,000.
14 Indiana.	14 Illinois.	14 West Virginia.	14 West Virginia.	14 Kentucky. 50,000.
15 Georgia.	15 Alabama.	15 Massachusetts.	15 Wisconsin.	15 Massachusetts.
16 Wisconsin.	16 Vermont.	16 Alabama.	16 Connecticut.	16 New Mexico.
17 Maine.	17 Georgia.	17 North Carolina.	17 Oregon.	17 Connecticut.
18 Michigan.	18 Indiana.	18 Vermont.	18 Maine.	18 Maryland.
19 Alabama.		19 Georgia.	19 Texas.	19 Oregon.
20 North Carolina.		20 Mississippi.	20 North Carolina.	20 Montana.
21 New Hampshire.		21 South Carolina.	21 Delaware.	21 West Virginia.
			22 Vermont.	22 Texas.
			23 Indiana.	23 Maine.
				24 North Carolina.
				25 Utah.
				26 Delaware.
				27 Idaho.
				28 Washington.

CAPITAL.

The total value of the iron-ore mines of the United States December 31, 1889, was \$109,766,199, as against \$61,782,287 invested in 1880 in regular mining establishments, an increase of \$47,983,912, or 77.67 per cent, divided as follows:

TOTAL VALUE OF THE IRON-ORE MINES OF THE UNITED STATES.

ITEMS.	1880.	1889.
Total	\$109,766,199	\$61,782,287
Land	78,474,881	48,274,149
Buildings and fixtures	7,673,520	8,667,375
Tools, implements, live stock, machinery, etc..	8,045,545	
Cash and stock on hand.....	15,572,253	4,850,763

The state of Michigan has advanced from second place in 1880, with a total reported investment of \$17,496,775, to first position in 1889, with an investment of \$41,958,571, an increase of \$24,461,796, or nearly 140 per cent, or 38.23 per cent of the total capital used in iron-ore mining for the United States, which was subdivided as follows:

VALUE OF THE IRON-ORE MINES OF MICHIGAN.

ITEMS.	1880.	1889.
Total	\$17,496,775	\$41,958,571
Land	12,452,311	27,032,732
Buildings and fixtures	2,789,944	2,819,107
Tools, implements, live stock, machinery, etc..		3,732,410
Cash and stock on hand.....	2,254,520	8,374,322

Pennsylvania occupies second place, with a valuation of \$16,249,313, or 14.80 per cent of the total, a decrease of \$1,372,388, or 7.79 per cent from the 1880 valuation of \$17,621,701, when it occupied first place.

New York follows next, occupying the same relative rank as in 1880, with \$12,489,481, or 11.38 per cent of the total valuation for the United States, an increase in capital of \$4,226,342, or 51.15 per cent.

Minnesota, which produced no ore in 1880, Alabama, Missouri, and Wisconsin follow in the order named, the last three occupying, respectively, ninth, fifth, and fourteenth places in 1880.

The valuation of the iron-ore mines of the above seven states as reported is \$93,422,218, or 85.11 per cent of the total capital invested in ore mining.

The inquiry concerning the capital invested in iron-ore mines has presented difficulties which made it practically impossible in many cases to obtain valuations on the basis of the questions presented in the schedules prepared by the Census Office. In the Lake Superior region a large proportion of the mines are leased, and in other districts mines are worked under leases, a stipulated sum per ton, with a minimum yearly royalty provision, being paid to the owners of the fee. The lessor in a majority of instances owns tracts of greater or less extent as yet unproved, of which the mines occupy but a limited portion. Some of the large deposits in other sections have been in the hands of the present owners for a number of years, and have grown from small operations to great enterprises. During this time no actual appraisement of values has been made, as the properties have not been offered for sale, nor have any propositions of purchase been entertained. In these instances the assessors' valuation gave an approximate basis for formulating an estimate.

The following table shows, by states and territories, the amount of capital invested in iron-ore mining in the year 1889, as reported by the various individuals, firms, or companies to the Census Office:

CAPITAL INVESTED IN IRON-ORE MINING IN 1889, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	Total.	Land.	Buildings and fixtures.	Tools, implements, live stock, machinery, etc.	Cash and stock on hand.	Total capital invested in mines in 1889.
Total.....	\$109,766,199	\$78,474,881	\$7,673,520	\$8,045,545	\$15,572,253	\$61,782,287
Alabama.....	5,214,006	4,258,645	306,713	382,548	297,000	536,442
Colorado.....	2,480,445	2,241,672	69,015	74,948	94,810	---
Connecticut, Maine, and Massachusetts.....	551,365	322,240	97,743	66,163	65,219	708,800
Delaware and Maryland.....	355,074	233,075	35,500	65,450	31,049	338,814
Georgia and North Carolina.....	1,634,434	1,230,450	194,148	149,422	60,434	184,225
Idaho and Montana.....	342,870	301,500	4,600	11,350	25,420	---
Kentucky.....	405,868	302,201	23,237	16,712	69,718	770,829
Michigan.....	41,068,571	27,082,732	2,819,107	3,732,410	8,374,322	17,496,775
Minnesota.....	8,481,282	4,280,000	626,504	451,904	3,222,874	---
Missouri.....	4,619,396	3,531,817	95,569	178,335	807,675	5,598,556
New Jersey.....	3,168,891	2,180,380	194,564	349,944	444,063	6,201,761
New Mexico and Utah.....	152,000	139,000	8,500	2,500	2,000	---
New York.....	12,480,481	0,003,455	1,003,982	990,364	801,680	8,284,139
Ohio.....	1,311,918	917,035	135,375	64,075	194,833	1,248,725
Oregon and Washington.....	86,285	56,630	6,306	19,409	3,850	16,975
Pennsylvania.....	16,249,313	14,812,357	547,010	639,427	250,510	17,621,791
Tennessee.....	1,807,895	1,304,774	185,314	253,206	64,601	473,920
Texas.....	51,678	45,500	---	2,620	3,558	---
Vermont.....	---	---	---	---	---	2,000
Virginia and West Virginia.....	3,905,249	2,881,441	567,544	253,195	203,069	1,924,625
Wisconsin.....	4,385,269	3,229,097	252,699	340,063	561,610	186,000

A number of iron-ore mines are connected with blast-furnace plants, and these are valued as entire enterprises, no division of the capitalization being attempted by the owners. Other properties have the ore distributed over large areas, from which it is won by stripping or benching, and in some of these properties the value is partly dependent upon a deposit of coal lying close to the iron ore. Similarly, the timber upon areas worked for iron ore affects the valuation. An attempt has been made, where valuations could not be fairly determined, to arrive at a basis of estimate by using the rate of tax assessment, or by calculating a value by capitalizing an assumed royalty, depending upon the location and character of the ore, multiplied by the product for the year 1889. This explanation will indicate that the capital invested, as reported in the table, is less than that actually employed in the mining of iron ore, but it is as close an approximation as can be made.

The capital as given in the report does not include the cost of ore shipping and receiving docks, built and maintained solely for handling iron ores, nor the equipment of locomotives, cars, and tram roads, or of steam vessels which are devoted exclusively to the iron-ore trade. Exceptions are made in a few cases where the handling facilities are within the property actually exploited. Mention of the ore docks, etc., and notes of some of the railway equipment appear under the head of "Transportation."

An instance of liberal expenditure for the development of iron-ore mines is in the construction and equipment of a standard gauge railroad from Lake Superior for seventy miles through an uninhabited country in Minnesota to the deposit of iron ore near Lake Vermilion, and the subsequent extension of this road thirty miles to other deposits. The equipment of cars, docks, etc., mentioned under the subhead of "Shipping docks," the locomotives, the buildings, and the entire expenditure for locating and constructing this railroad were solely for the purpose of developing the iron-ore mines, and the handling of iron ore to-day represents the business done by this line of transportation. Millions of dollars returned in the census figures of railway and vessel transportation, and also for workmen's homes, could with propriety be added to the capital demanded for the iron-ore mining industry.

LABOR AND WAGES.

The returns recorded show that the mining of iron ore gave employment directly to 38,227 persons, an increase of 6,559 men, or 20.71 per cent, over the Tenth Census, when the number was 31,668 engaged in work connected with breaking down and raising the ore and delivering it in cars or carts or on stock piles at the mines. This force was divided as follows: 1,366 foremen (680 employed above and 686 below ground), 2,079 mechanics, 12,432 miners, 21,010 laborers (14,531 above and 6,479 below ground), 820 boys (709 being employed above and 111 below ground), and 520 men in offices. Omitting the latter, the total number actually employed in handling the ore was 37,707, and the amount paid in wages direct to miners and contractors reached a total of \$15,458,118. This would show an average earning capacity for each man employed of \$409.95 per annum, and includes the contractors' profits and the additional pay allowed to foremen. This is an increase over the figures for 1880 of \$101.01, or 32.70 per cent, which is due principally to the fact that a larger number of the mines are now under ground, permitting the men to be constantly employed throughout the year and demanding better skill.

Allowing for Sundays and holidays, necessary stoppages of plants for repairs, and for personal loss of time by employes by reason of illness, etc., it is found in practice that in the trades or employments where continuous labor is possible in protected buildings or mines full time approximates 24 days per month, or 288 days per annum. The average total days worked by employes in mining iron ore during the year 1889 amounted to 247 per annum. In open pit mining operations are largely suspended during inclement weather. At some of the underground mines the working force is considerably reduced during the winter months, as the ore is stocked. The number of individuals who obtained employment in iron-ore mines exceeded the figures given, as the inquiries covering the labor in mining was formulated as follows: Average number employed, average wages per day, and average number of days worked per year; otherwise the total number would have been much greater.

The compensation paid 520 persons employed in the offices at the mines amounted in the aggregate to \$529,043, an average annual earning of \$1,017.39. The office force above mentioned does not include officers or employes in general offices at commercial centers, where accounts are kept or sales and collections made; nor does it include the ore samplers or inspectors employed at shipping or distributing centers.

The following statement shows the expenditure per ton of iron ore won for labor above and below ground in 1889 in the various states and territories, not including the compensation paid office attendants, but including contractors' profits:

AVERAGE EXPENDITURES FOR WAGES PER LONG TON OF IRON ORE.

The United States	\$1.06	New Jersey	\$1.71
Alabama	0.69	New Mexico and Utah	1.22
Colorado	2.48	New York	1.00
Connecticut, Maine, and Massachusetts	1.82	Ohio	1.40
Delaware and Maryland	1.65	Oregon and Washington	1.20
Georgia and North Carolina	0.71	Pennsylvania	0.75
Idaho and Montana	2.21	Tennessee	0.76
Kentucky	0.87	Texas	0.91
Michigan	1.19	Virginia and West Virginia	1.09
Minnesota	1.10	Wisconsin	1.09
Missouri	0.97		

It will be seen that the lowest expenditure for labor per ton of ore was in the states of Alabama and Georgia and North Carolina, where it amounted to 69 and 71 cents per ton, respectively, due to large open workings and modern and systematic systems of mining, and in Alabama and Georgia to the soft character of the ore, etc.

In Pennsylvania one-half of the iron ore credited to the state comes from the Cornwall ore hills, where the soft character of the ore and its accessibility assist in reducing the average cost of labor employed in mining for the entire state to 75 cents per long ton. The cost of mining the hard Lake Superior ores is best illustrated in the state of Michigan, where \$1.19 was expended for wages per ton of ore won. The high cost in Colorado, Idaho, and Montana is due to the higher rates of wages prevailing in those states and the small amount of ore won.

In the New England states, New Jersey, Ohio, Delaware, and Maryland the exploitation of old workings or of scattered deposits causes a high cost per ton for wages. The use of improved machinery and the predominance of large mines assist in reducing the cost for labor in Wisconsin, Minnesota, Alabama, New York, and other states. The partial employment of convicts in Tennessee, Texas, and Georgia affects the figures for these states.

In order to obtain the average wages paid the men in the different classes and the average number of days which they worked during the year, the average number of each class of men employed in each mine was multiplied by the average number of days worked during the year at that mine, thus giving the total number of days made by each of the different classes of men. This product was then multiplied by the average wages per day paid to each class at the various mines, giving the total amount of wages earned. Adding these totals for the different mines gave the grand total for each state or district, and dividing the total number of days worked by each class by the total number of workmen in the subdivision gave the average number of days made by each workman in that class during the year, and the total number of days worked divided into the calculated wages gave very closely the wages paid to each man per day.

In this manner it has been possible to calculate the average wages and the average number of days worked by each class for the various states, and also the average for the United States. Tables are appended which will be found to agree very closely with the amounts paid to the various workmen and contractors in the preceding statement, any difference which may arise being due to the fact that it is impossible, where a large number of men are employed, to have the calculated and actual wages agree exactly, and also because a certain amount will represent contractors' profit, and therefore does not properly come under the head of average wages.

The 680 foremen above ground received wages averaging from \$1.25 per day in Kentucky to \$4.88 per day in Colorado, the mean for the United States being \$2.40, and the average number of days during the year which they worked 253. The total calculated wages which they received amounted to \$421,610. The mechanics' wages varied from \$0.50 per day in Texas, where convict labor was largely employed, to \$3.86 per day in Colorado, the average for the entire country being \$1.90, and the average number of days worked during the year 274. The total calculated wages which were received by mechanics during the year 1889 was \$1,080,406. The average wages received by the 14,531 laborers employed above ground was \$1.29, ranging from \$0.53 in Texas to \$3.50 in New Mexico and Utah. These laborers worked on an average 228 days during the year and received a total compensation of \$4,277,199. The 709 boys under sixteen years of age received a total compensation of \$97,279, and worked 221 days during the year. They therefore received an average of \$0.62 per day, the wages varying from \$0.49 in Missouri to \$2 in Colorado.

The number of foremen or overseers working under ground was 686, although at a number of mines foremen had charge both above and below ground, one-half time being charged to each. They received in wages a total of \$476,233, working on an average 282 days per year, and earned \$2.46 per day. The highest average wages were paid in Colorado, viz, \$3.99 per day, and the lowest in Pennsylvania, \$1.67 per day. The 12,432 miners received \$6,189,308 for their labor during the year, an average per man of \$1.91 per day during the days worked, viz, 261. The wages ranged from \$3.50 in New Mexico and Utah to \$1.13 in Virginia and West Virginia. The highest wages paid laborers under ground was in Colorado, \$2.68 per day, and the lowest in Georgia and North Carolina, \$0.63 per day. In Georgia, however, some convict labor was employed, reducing the general average for the state. The 6,479 laborers under ground received as wages \$2,716,424, working on an average 261 days per year, and earned an average of \$1.60 per day. The 111 boys under ground received \$19,617, working on an average 216 days and earning \$0.82 per day.

EMPLOYÉS AT IRON-ORE MINES IN 1889.

STATES AND TERRITORIES.	Total number employés above and below ground.	ABOVE GROUND.												Total number employés above ground.
		Foremen and overseers.			Mechanics.			Laborers.			Boys under 16 years.			
		Number employed.	Average wages per day.	Average number of days worked.	Number employed.	Average wages per day.	Average number of days worked.	Number employed.	Average wages per day.	Average number of days worked.	Number employed.	Average wages per day.	Average number of days worked.	
Total	37,707	680	\$2.40	258	2,079	\$1.90	274	14,531	\$1.20	228	700	\$0.62	221	17,000
Alabama.....	3,081	54	2.36	250	70	1.94	241	1,533	1.20	227	96	0.53	236	1,762
Colorado.....	391	14	4.88	177	28	3.80	210	101	2.00	186	2	2.00	74	143
Connecticut, Maine and Massachusetts.....	424	8	2.44	313	26	1.65	308	140	1.36	277				183
Delaware and Maryland ..	232	10	1.52	224				208	1.00	200	14	0.57	225	232
Georgia and North Carolina.....	780	41	1.03	214	24	1.40	214	573	1.03	208	37	0.57	219	675
Idaho and Montana.....	83	5	3.15	253	1	3.00	150	64	3.03	171				70
Kentucky.....	375	5	1.25	212	5	1.50	275	340	1.03	180	25	0.75	212	375
Michigan.....	12,947	147	2.08	289	948	2.00	285	2,904	1.00	255	82	0.53	233	4,081
Minnesota.....	1,755	21	3.27	276	93	2.26	276	611	1.90	239	17	0.86	219	742
Missouri.....	766	11	2.10	297	41	1.80	289	810	1.20	254	11	0.40	253	373
New Jersey.....	1,872	24	2.61	308	152	1.48	280	280	1.21	272	27	0.62	274	402
New Mexico and Utah.....	47	2	3.75	306				19	3.50	286				12
New York.....	3,132	59	2.44	296	257	1.66	293	1,020	1.20	208	21	0.64	264	1,348
Ohio.....	1,610	30	1.93	264	42	1.44	223	755	1.03	186	9	0.59	154	842
Oregon and Washington ..	47	1	4.50	273	4	3.50	273	7	2.44	253				12
Pennsylvania.....	4,370	110	1.69	241	159	1.70	240	2,599	1.10	214	170	0.56	207	3,038
Tennessee.....	1,515	32	2.15	259	31	1.93	257	1,162	1.05	217	88	0.58	245	1,313
Texas.....	87	2	2.29	170	2	0.50	224	82	0.53	253	1	0.50	44	87
Virginia and West Virginia.....	2,436	86	1.98	210	74	1.65	183	1,402	1.02	201	104	0.52	140	1,660
Wisconsin.....	1,817	21	2.77	262	115	2.00	292	412	1.68	257	5	1.20	265	553

STATES AND TERRITORIES.	BELOW GROUND.												Total number employés below ground.	Total wages to employés above and below ground.
	Foremen and overseers.			Minors.			Laborers.			Boys under 16 years.				
	Number employed.	Average wages per day.	Average number of days worked.	Number employed.	Average wages per day.	Average number of days worked.	Number employed.	Average wages per day.	Average number of days worked.	Number employed.	Average wages per day.	Average number of days worked.		
Total	686	\$2.46	282	12,432	\$1.01	261	6,479	\$1.60	261	111	\$0.82	216	10,708	\$13,880,108
Alabama.....	8	2.95	274	598	1.02	245	706	1.47	256	7	0.67	161	1,310	695,232
Colorado.....	11	3.99	233	205	3.00	248	20	2.68	208	3	1.69	120	248	276,872
Connecticut, Maine and Massachusetts.....	8	2.13	256	193	1.40	257	40	1.33	264				241	160,694
Delaware and Maryland ..	8	2.12	308	10	1.20	202	61	0.63	207	1	0.40	244	105	48,210
Georgia and North Carolina.....														180,190
Idaho and Montana.....	2	3.60	180	11	3.14	162							13	53,112
Kentucky.....														64,956
Michigan.....	304	2.69	291	5,341	2.23	274	3,199	1.73	272	22	1.17	277	8,800	0,136,458
Minnesota.....	87	3.00	296	498	2.55	259	478	1.98	255				1,013	953,184
Missouri.....	17	2.18	284	238	1.58	265	73	1.36	236	5	0.45	270	333	253,073
New Jersey.....	68	1.40	295	944	1.30	268	353	1.24	280	15	0.68	268	1,380	554,151
New Mexico and Utah.....				85	3.50	259							36	44,052
New York.....	71	2.15	280	1,085	1.47	278	623	1.37	261	5	0.80	106	1,784	1,044,202
Ohio.....	9	1.95	222	674	1.25	192	60	1.25	161	25	0.51	100	768	360,295
Oregon and Washington.....				85	2.56	285							85	31,542
Pennsylvania.....	41	1.67	224	1,065	1.30	230	210	1.12	227	10	0.90	800	1,332	1,114,425
Tennessee.....	5	3.04	214	176	1.20	204	20	1.00	238	1	1.00	200	202	642,872
Texas.....														11,823
Virginia and West Virginia.....	43	1.74	252	514	1.18	252	261	1.00	176	12	0.50	262	770	551,804
Wisconsin.....	59	2.69	304	810	2.00	273	390	1.81	251	5	1.14	219	1,204	768,059

Michigan as the largest producer naturally gives employment to the greatest number of persons, viz, 13,120, or 34.32 per cent of all the employés at the mines of the United States; Pennsylvania follows with 4,410 employés, or 11.54 per cent; New York ranks third, its iron-ore mining industry giving employment to 3,178 persons, or 8.31 per cent of the total number of employés, and Alabama occupies fourth place, which state reported a total of 3,122 employés, or 8.17 per cent. These four states had 23,830 persons, or 62.34 per cent of the total, employed in their iron-ore mines.

Omitting the office force, the same relative positions are held by the states named, and the number of persons employed above and below ground, that is, in actual mining, divided into the tons of iron ore produced in some of the important states, is as follows:

TONS OF IRON ORE PRODUCED PER EMPLOYÉ.

STATES.	Amount produced. (Long tons.)	Number of employes above and below ground.	Tons of ore per employé.
The United States.....	14, 518, 041	37, 707	385. 02
Michigan.....	5, 856, 109	12, 947	452. 32
Alabama.....	1, 570, 319	3, 081	509. 08
Pennsylvania.....	1, 560, 234	4, 370	357. 03
New York.....	1, 247, 537	3, 132	398. 32
Minnesota.....	864, 568	1, 765	492. 60
Wisconsin.....	837, 399	1, 817	460. 87
Virginia and West Virginia.....	511, 255	2, 436	209. 87
Tennessee.....	473, 294	1, 515	312. 41
New Jersey.....	415, 510	1, 872	221. 96
Missouri.....	265, 718	706	376. 37
Ohio.....	254, 294	1, 610	157. 95
Georgia and North Carolina.....	258, 145	780	330. 90
Colorado.....	109, 136	391	279. 12

Alabama returns the largest output per employé, Minnesota, Wisconsin, Michigan, New York, Missouri, Pennsylvania, Georgia and North Carolina, Tennessee, Colorado, New Jersey, Virginia and West Virginia, and Ohio following in the order named. The above table readily emphasizes the influence which large mines and improved mining appliances exert upon labor, and also shows the advantages which some of the newer developed sections have in mining iron ore at low cost.

SUPPLIES AND OTHER EXPENDITURES.

The supplies and materials for mining iron ore were generally furnished by the owners or lessees of mines, but in some cases the amounts so expended could not be learned, as the powder, fuel, tools, etc., were furnished by contractors, whose work had been completed and who were not accessible. A total of \$4,998,988, or 34 cents per ton of iron ore mined, represents the average cost of supplies and materials per ton of ore won, a decrease of 12 cents per ton, or 26.09 per cent, from the figures for the Tenth Census, when the cost was 46 cents per long ton.

In the southern states the soft character of the ore reduces the cost of supplies and materials, while a larger quantity is required for winning the harder ores of the Lake Superior region, New York, and New Jersey. Thus in Alabama the amount expended for supplies and materials is but 8 cents per ton, while in Michigan it amounted to 41 cents, in New York 46 cents, and in New Jersey 76 cents.

Other expenditures include taxes and royalties amounting to \$3,795,509. As royalty is only paid on a portion of the ore mined, and as the system of owners charging up a rate per ton against the mine as a sinking fund does not prevail to any great extent, it would be unfair to form any conclusions as to the average royalties, namely, so much per ton, on the basis of the reports made.

TOTAL COST OF MINING IRON ORE.

The total cost of the ore mined, as represented by schedules returned, aggregates \$24,781,658, equivalent to an average cost of \$1.71 per ton of ore mined against \$2.21 in 1880, a decrease of \$0.50 per ton, or 22.62 per cent. The cost similarly determined for each state is set forth in the statement on the following page, which can be compared with the table on page 19, showing the expenditure for labor per ton of iron ore produced, and also with the above table, indicating the quantity of ore won per employé. The difference includes more than supplies and materials. These figures indicate the advance made in labor-saving appliances and improved facilities for mining and handling the product of the mines.

In the total cost of producing iron ore Alabama is the only state which averages less than \$1 per ton, viz, 82 cents. Next in order of low cost come Texas, \$1.05; Tennessee, \$1.08; Pennsylvania, \$1.10; Georgia and North Carolina, \$1.14. In Colorado, for reasons before given, the cost of producing one long ton of ore, \$3.49, is greater than in any other state.

TOTAL COST OF PRODUCING ONE LONG TON OF IRON ORE IN THE VARIOUS STATES AND TERRITORIES.

The United States	\$1.71	New Jersey	\$2.74
Alabama	0.82	New Mexico and Utah	1.56
Colorado	3.49	New York	1.64
Connecticut, Maine, and Massachusetts	2.73	Ohio	1.67
Delaware and Maryland	2.02	Oregon and Washington	1.40
Georgia and North Carolina	1.14	Pennsylvania	1.10
Idaho and Montana	2.99	Tennessee	1.08
Kentucky	1.30	Texas	1.05
Michigan	2.07	Virginia and West Virginia	1.64
Minnesota	1.80	Wisconsin	1.78
Missouri	1.49		

The following table shows the expenditures of all kinds in the production of iron ore in the United States in 1889:

EXPENDITURES AT IRON-ORE MINES IN 1889, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	OFFICE FORCE.		Grand total employes.	Grand total wages.	Total value of supplies and materials of all kinds during 1889.	Total of all other expenditures for the mines or works.	Total mining expenditures, not including contract work.	Amount paid for contract work during 1889.	Grand total of all expenditures.
	Number.	Amount of wages.							
Total	520	\$520,043	38,227	\$14,409,151	\$4,998,988	\$3,795,500	\$23,263,648	\$1,578,010	\$24,781,658
Alabama	41	37,170	3,122	1,032,302	128,924	38,680	1,199,096	87,321	1,287,318
Colorado	23	26,425	414	207,297	58,504	25,327	381,128		381,128
Connecticut, Maine, and Massachusetts	2	1,200	420	101,894	60,930	18,163	240,936		240,936
Delaware and Maryland	1	1,200	233	40,416	5,293	4,436	59,655	400	59,455
Georgia and North Carolina	16	14,725	706	144,921	46,004	50,128	241,053	54,032	295,085
Idaho and Montana			83	53,112	15,660	3,295	72,076		72,076
Kentucky	8	7,500	383	72,456	4,000	22,094	98,550	2,218	100,768
Michigan	173	217,283	13,120	6,353,741	2,402,443	2,528,123	11,281,307	834,234	12,118,541
Minnesota	15	25,290	1,770	978,483	410,192	158,340	1,556,015		1,556,015
Missouri	23	26,874	720	263,817	45,503	63,623	393,933	2,034	395,967
New Jersey	21	14,440	1,893	508,591	316,199	90,670	981,460	157,536	1,139,002
New Mexico and Utah	1	1,000	48	45,052	7,822	3,344	56,218		56,218
New York	46	48,050	3,178	1,087,252	572,501	185,070	1,845,432	204,069	2,050,401
Ohio	34	17,560	1,644	367,855	23,920	28,367	420,151	4,568	424,719
Oregon and Washington			47	31,542	4,237	1,041	36,820		36,820
Pennsylvania	40	26,814	4,410	1,141,230	290,429	215,036	1,655,701	55,425	1,711,126
Tennessee	19	12,460	1,534	355,332	80,318	49,666	491,310	17,551	508,867
Texas	2	365	89	12,188	987	440	13,615		13,615
Virginia and West Virginia	32	23,257	2,468	575,061	128,323	128,452	811,816	7,936	830,772
Wisconsin	23	29,421	1,840	797,480	372,802	174,659	1,344,941	148,855	1,493,796

The figures in the table on page 4 give the total value of the iron-ore product at the mines in the year 1889 as \$33,351,978, and the table of expenditures shows that the total cost of mining during the same year was \$24,781,658, indicating an apparent profit of \$8,570,320, or 34.58 per cent of the total expenditure during the year for labor, supplies and materials, superintendence, incidentals, taxes, etc., and also in some cases royalties; but in addition to these expenses there is interest on capital invested, cost of betterments, renewals, replacements, and additions to machinery, fixtures, live stock, general management and offices, sinking fund, etc., to be accounted for.

The apparent profit of \$8,570,320 represents 7.81 per cent of the total capital invested, viz, \$109,766,199, but from the above allowances for depreciation, etc., must be made, and if, as before mentioned, the total capital reported is below that actually employed, the average investment will appear less satisfactory than the figures above given suggest.

POWER USED IN IRON-ORE MINING IN THE UNITED STATES.

The schedules returned from the various mines report a total of 1,109 steam boilers, with an aggregate horse power of 57,976. These boilers furnished steam to 1,093 steam engines, including air compressors, hoisting machinery, engines for driving washers, crushers, etc., some of which are of large size. These engines, however, do not in most instances include the motive power for pumps, as upon examining the returns made it has been found that in a majority of cases pumps are rated as independent of steam engines, as a locomotive would be. As the inquiry did not specifically cover this point, it was thought best not to follow it in detail as far as pumps were concerned. In the returns made, however, there were 79 pumps mentioned independent of steam engines; also 20 locomotives used in and about the mines, 4 steam shovels employed in digging or handling ore, 8 turbine wheels driving machinery, and 10 air compressors worked by water power. The application of steam and compressed air to the iron mines has very largely reduced the number of animals employed in and about iron-ore mines, but as the queries in the census schedules especially provided for the value of the ore delivered on cars or carts at the mine, the other questions were therefore interpreted to cover the same features, and only the animals employed in the mines were mentioned.

Naturally Michigan, as the largest producer of iron ore, and having numerous deep mines, has the greatest number of steam engines, a total of 387 engines, etc., and an aggregate of 332 boilers being in use, with a total of 24,180 horse power. As most of the iron ore obtained in Michigan is from underground workings (and there they are the deepest in the country), it is not surprising that 42 per cent of the total horse power of boilers connected with iron-ore mines is utilized in that state.

Much of the iron ore of Alabama, Georgia, and Tennessee is obtained from open cuts or from new exploitations, it is therefore readily understood why the large output of these states was won with a comparatively small number of steam engines and boilers. On the other hand, New York, New Jersey, and Pennsylvania have obtained a large portion of their ore from underground operations, which had been worked for many years, requiring a greater proportion of power than would otherwise have been the case.

The following table shows the power used in the mining of iron ores during the year 1889:

POWER USED IN MINING.

STATES AND TERRITORIES.	STEAM BOILERS.		Steam engines.	Animals.	STATES AND TERRITORIES.	STEAM BOILERS.		Steam engines.	Animals.
	Number.	Total horse power.				Number.	Total horse power.		
Total	1,109	57,976	1,093	2,790	Missouri.....	32	1,082	37	112
Alabama.....	46	1,971	40	283	New Jersey.....	66	5,428	87	55
Colorado.....	14	378	12	7	New Mexico and Utah.....				
Connecticut, Maine, and Massachusetts.....	30	1,471	34	25	New York.....	134	6,899	89	163
Delaware and Maryland.....	5	250	4	102	Ohio.....	0	450	3	430
Georgia and North Carolina.....	25	885	25	235	Oregon and Washington.....	4	300	6	5
Idaho and Montana.....				7	Pennsylvania.....	220	7,414	210	468
Kentucky.....	3	86	3	20	Tennessee.....	20	855	22	130
Michigan.....	332	24,180	387	368	Texas.....				19
Minnesota.....	33	1,610	30	42	Virginia and West Virginia..	40	1,813	40	238
					Wisconsin.....	48	2,065	64	57

RÉSUMÉ.

The following table presents a résumé of the figures detailed in the preceding pages as far as comparisons can be made between the Tenth and Eleventh Censuses:

COMPARISON OF THE TENTH AND ELEVENTH CENSUSES, WITH PERCENTAGES OF INCREASE.

PRODUCTION.				WAGES PER ANNUM (OFFICE FORCE EXCLUDED).			
ITEMS.	1880.	1890.	Percent- age of increase.	ITEMS.	1880.	1890.	Percent- age of increase.
Total	<i>Long tons.</i> 14, 518, 041	<i>Long tons.</i> 7, 120, 362	103. 89	Wages per man.....	\$400. 95	6\$308. 94	32. 70
Red hematite	9, 056, 288	2, 243, 493	303. 87	CAPITAL.			
Magnetite	2, 506, 415	2, 134, 276	17. 44	Total	\$100, 760, 109	6\$01, 782, 287	77. 07
Brown hematite.....	2, 523, 987	1, 019, 122	31. 47	Land	78, 474, 881	648, 274, 140	62. 56
Carbonate	432, 251	823, 471	147. 51	Buildings and fixtures.....	7, 073, 520	68, 657, 375	81. 57
VALUE OF PRODUCT.				Tools and implements.....	8, 045, 545		
Value.....	\$33, 351, 978	\$23, 156, 057	44. 03	Cash and stock on hand.....	15, 572, 253	64, 856, 763	221. 03
EMPLOYÉS.				EXPENDITURES.			
Number	38, 227	631, 608	20. 71	Supplies and materials.....	4, 998, 088	62, 804, 011	72. 74
WAGES.				Other expenditures	3, 795, 500	1, 020, 420	271. 95
Amount paid as wages (c).....	\$14, 409, 151	2\$0, 538, 117	51. 07	POWER USED IN MINING.			
				Number of boilers reported...	1, 100	61, 083	1. 46
				Horse power of boilers.....	57, 076	628, 422	103. 98
				Steam engines.....	1, 083	6821	33. 13

a Decrease.

b In regular establishments.

c Not including amount paid to contractors.

d Office force included.

e This amount does not include taxes, insurance, etc.

IMPORTATIONS OF IRON ORE INTO THE UNITED STATES.

Reference has been made to the quantity of foreign iron ore used, and an investigation of this subject is properly associated with a discussion of domestic iron ore production.

The importations of iron ore into the United States during the calendar year 1889 have been supplied by Major S. G. Brock, chief of the bureau of statistics of the Treasury Department. The total amount received during the calendar year 1889 was 853,573 long tons, valued at \$1,852,392. This ore was shipped from the following countries in the order named:

IMPORTS OF IRON ORE IN 1889, BY COUNTRIES.

COUNTRIES.	Quantity. (Long tons.)	Value.
Total	853, 573	\$1, 852, 392
Spain	208, 568	621, 481
Cuba	243, 255	535, 524
French Africa	97, 583	180, 697
Italy	87, 410	228, 104
England	54, 400	111, 038
Greece.....	23, 055	32, 880
Newfoundland and Labrador	14, 450	43, 100
British Columbia	13, 070	27, 860
Portugal.....	6, 050	15, 151
France.....	6, 565	17, 011
Quebec, Ontario, Manitoba, and Northwest Territory.	4, 091	10, 697
Turkey in Asia	2, 870	27, 265
Germany	1	24

SUMMARIZED IMPORTS OF IRON ORES.

COUNTRIES.	Quantity. (Long tons.)	Value.
Total	853, 573	\$1, 852, 392
British possessions in North America.....	32, 211	81, 657
Cuba	243, 255	535, 524
Europe	477, 654	1, 027, 249
Asia	2, 870	27, 235
Africa	97, 583	180, 697

The bureau of statistics has no data to demonstrate that the ore was mined in the country from which shipment was made; but little, if any, of it can be credited to other territory than above noted.

The foreign iron ore was received at the following ports, which are named in the order of their prominence:

IMPORTS OF IRON ORE, BY PORTS OF ENTRY.

PORTS.	Quantity. (Long tons.)	Value.
Total	853, 573	\$1, 852, 392
Philadelphia, Pennsylvania	525, 124	1, 193, 141
Baltimore, Maryland	273, 950	519, 736
New York, New York	25, 824	72, 297
Puget Sound, Washington	13, 670	27, 860
Port of Amboy, New Jersey (a).....	11, 558	26, 075
Oswego, New York	2, 309	6, 353
Cuyahoga, Ohio	1, 224	3, 403
Vermont district.....	402	707
Pensacola, Florida	135	608
Buffalo, New York	78	198
San Francisco, California	61	2, 525
Boston, Massachusetts	50	283
Detroit, Michigan	18	36
Chicago, Illinois	5	58
Pittsburg, Pennsylvania	4	88
Saint Louis, Missouri	1	24

^a This port may also be classed under the head of ports of New York harbor.

Grouping these ports, it is found that the receipts were as follows:

RECEIPTS OF FOREIGN IRON ORE, BY GROUPS OF PORTS.

PORTS.	Quantity. (Long tons.)	Value.
Total	853, 573	\$1, 852, 392
Atlantic	835, 741	1, 811, 140
Lake	3, 034	10, 048
Pacific	13, 731	30, 385
Miscellaneous	407	819

The high values attached to some of the smaller quantities shipped from a certain country or received at a specific port represent the importation of ores adapted for particular uses, owing to having in combination other minerals than iron.

The following statement, from information furnished by Mr. James M. Swank and others, showing the production of iron ore in such countries as furnished statistics, is given for purposes of comparison:

PRODUCTION OF IRON ORE IN THE YEAR 1889, BY VARIOUS COUNTRIES.

	TONS.
Great Britain.....	14,546,105
United States.....	14,518,041
Germany and Luxemburg.....	11,001,042
Spain (shipments from).....	5,007,144
France (a).....	2,500,000
Austria-Hungary (a).....	2,300,000
Russia (a).....	1,400,000
Sweden.....	985,904
Algeria (a).....	475,000
Cuba.....	256,278
Belgium (a).....	220,000
Italy.....	173,489
Canada.....	75,162

a Estimated.

The figures given above for Great Britain, the United States, Cuba, and Canada are long tons of 2,240 pounds, and for the remaining countries the metric ton of 2,204 pounds.

COMMERCIAL VALUE OF IRON ORE.

The success of any iron-producing enterprise is largely contingent upon the character of the materials which are accessible. Until within a few years the fuel used attracted a large share of attention, and a blast furnace manager or proprietor gave less care to the ore used than to the fuel with which this ore was to be smelted. As, however, the amount of metallic iron and other constituents of an ore, and to a large extent the physical conditions of the ore, influence the smelting and affect the fuel consumption per ton of pig iron made, the subject of a proper ore supply for iron works has gradually won more attention from those who produce pig iron, and the policy of selling and purchasing iron ores on a unit basis is becoming more prevalent. This unit basis is a system for determining the value of an ore by the number of units of iron it contains in each one hundred component parts, the price per unit being affected by the presence of other constituents than iron, and also by the number of units of iron in the ore; that is, an ore carrying 60 per cent or over of iron would command a higher price per unit than ore carrying 30 per cent or less, because a smaller amount of fuel and flux would be necessary under similar conditions to smelt a given quantity of it. Again, the unit price would be influenced by the amount of phosphorus or other materials in the ore, for if the phosphorus is greater than one part in 1,000 of iron the unit price would be considerably less than where the phosphorus was below this proportion.

In determining the value of different ores a number of factors must be considered: First, the amount of iron in the ore naturally attracts attention, and, the conditions being otherwise the same, a rich ore will require less fuel to smelt it, and therefore less cost for fuel than a leaner ore. Under ordinary circumstances a richer ore will also have less material to be fluxed out, and a smaller amount of limestone will be required for fluxing than where the iron is displaced by other constituents. The smaller amount of flux required further reduces the quantity of cinder made and the expense of providing room for this cinder and means for handling it.

Another important consideration is in the fact that the richer ores, requiring less fuel and flux, occupy less space in the blast furnace than the materials required in treating the lean ores, and generally permit of more rapid driving. Therefore a rich ore will represent a smaller outlay in the cost per ton of product, owing to the interest on the plant, the cost of management, and other fixed charges being divided by a greater tonnage than would be the case where lean ores are used. There is, therefore, good reason for the price per unit being higher with rich ores than with lean ores.

The unit basis was largely established by the importers of foreign iron ores, but it has been adopted to a limited extent by miners of domestic ores, and this method is gaining in favor.

Many of the iron ores of the country are sold under general market quotations by the long ton, which quotations are practically based upon calculations made on the unit basis, and each year finds the consumers and producers estimating iron ores more nearly at the intrinsic value of the product of individual mines rather than on a general basis, although, of course, it is essential that some market standard should be established for any ore and for any district.

In buying and selling ores on the unit basis the most approved practice is to analyze the ore dried at or above 212° Fahrenheit so as to more closely determine the amount of iron which the ore yields in the blast furnace; but this system has been objected to, because the water found in ores as mined is a practical constituent until after the material is fed to blast furnaces, and as such is subject to all costs of freight, handling, etc. The hygroscopic moisture in magnetites seldom exceeds 2 per cent; it reaches 5 per cent in some red hematites, and often 15 per cent in brown hematites.

TRANSPORTATION AND HANDLING IRON ORES.

Probably in no country has the transportation of iron ore assumed such proportions as in the United States. A number of the European countries, and also the United States, have imported iron ores from Spain, Italy, Greece, and Africa, but, taking into consideration the distance covered and the relative location of the domestic iron mines and blast furnaces, it is probable that in no other part of the world has so large an amount of iron ore been transported over such great distances, requiring so many handlings. The Lake Superior district has been the most important contributor to this tonnage, having in the year 1889 shipped 7,390,387 long tons, and since its first opening, in the year 1853, has furnished nearly 48,500,000 tons to the country's supply. Most of this ore has been, and now is, handled by lake vessels, but all-rail transportation has been growing in importance, not sufficiently, however, to retard the amount of ore sent forward by the lakes. In each of the four districts forming the Lake Superior region the iron-ore mines are located at a distance from the lakes. Thus, in the Marquette range the nearest mines are twelve miles from any shipping port; in the Menominee range none of the mines are less than forty-one miles from a shipping port; in the Gogebic range, Hurley, the center of the region, is thirty-nine miles from a shipping port, and the Tower mines, in the Vermilion range of Minnesota, are sixty-nine miles from their shipping point, Two Harbors, while the mines at Ely are twenty-six miles further removed.

Not more than 30 per cent of the Lake Superior iron ore brought by vessels to lower lake ports is consumed at these ports, but most of it is shipped by railroad to furnaces located from 60 to 475 miles from them.

The ore from the Lake Superior mines is largely consumed by furnaces as far east as Troy, New York, eastern New Jersey, and southeastern Pennsylvania, and forms the bulk of the ore used in Allegheny county, which is the largest pig-iron producing center in the United States, as well as for furnaces in central Pennsylvania, in the Shenango valley in western Pennsylvania, in the Mahoning valley in eastern Ohio, and in the Wheeling district of West Virginia and southern Ohio. Chicago, which is the second large pig-iron producing center, is solely dependent on Lake Superior ores, and the furnaces at Joliet, Illinois, are also supplied from this source. The points reached by Lake Superior ores introduce some interesting figures of transportation, and in a number of instances the ores in their routes to points of consumption cross ores shipped from other mining centers to other points of iron production. Thus, in reaching Troy, New York, the Lake Superior iron ores cross in transit ores from the Lake Champlain district and other northern New York points, going south into Pennsylvania, and in gaining access to some of the points on the Ohio river the Lake Superior ores pass Missouri ores bound up the Ohio to furnaces farther east. They also form an important factor of the charge of blast furnaces in districts which produce large quantities of local ores, and in some of these, as in the Shenango district of Pennsylvania and the Mahoning district of Ohio, they practically displace the local ores. In others, as in the Hocking region of southern Ohio, Lake Superior ores are used to enrich the ore mixture to a point which permits of furnaces being operated successfully, which could not otherwise run on the lean ores which abound in that section. The readiness with which the majority of these Lake Superior ores smelt also encourages their use in furnaces in New Jersey and eastern Pennsylvania, which are conveniently located for a supply of the more refractory magnetites, or which can command large quantities of lean brown hematite ores.

To obtain facilities for cheaply handling Lake Superior ores the railroads which penetrate the various districts have constructed expensive terminal facilities, generally consisting of one or more docks, with the railroad tracks elevated from thirty-five to forty-seven and one half feet above the water level, the sides of the docks being fitted with pockets, into which the ore from the cars is dumped by means of drop bottoms. From these pockets the ore is loaded into vessels by iron chutes, which are

let down into the vessel's hold. In this manner the ore is never handled from the time it leaves the mine until it is shoveled into buckets when the vessel is being discharged at lower lake ports, and no manual labor is necessary other than poking the ore with poles from the cars into the bin and from the bin into the chutes, and in some cases but little of this is required.

The shipping ports for the Lake Superior iron-ore district are six, and from these ports 6,810,108 long tons were sent forward in the year 1889. The most important port is Escanaba, Michigan, on Lake Michigan, from which 3,003,632 long tons were shipped in 1889, this amount being 44.11 per cent of the total shipments by vessel of Lake Superior ores during the year. The supply of ore for the Escanaba docks, four in number, came from the Menominee, the Marquette, and the Gogebic districts. All of the Menominee ore which requires lake transportation (1,684,618 tons), 40.4 per cent of the ore from the Marquette range which was loaded into vessels (1,021,006 tons), and 16.7 per cent of the shipments from the Gogebic range (298,008 tons) were handled by the Escanaba docks. The docks at Escanaba are all operated by the Chicago and Northwestern Railway Company, and represent an aggregate length of 4,898 feet, the shortest dock being 1,082 feet long, and the longest 1,500 feet. All of these docks have double tracks, and the four docks have an aggregate of 828 pockets, which will contain a total of 95,500 tons. The outlay required for the construction and equipment of these docks was about \$1,000,000.

Ashland, Wisconsin, on Lake Superior, ranked second in 1889 as a shipper of iron ore, 1,484,802 tons, or 21.80 per cent of the total lake shipments of the Lake Superior district, having been hauled to the three docks at this point. This ore was entirely from the Gogebic range, and the amount handled at Ashland and that above referred to as passing through the docks at Escanaba represent the total shipments by water from the Gogebic range in 1889 (1,782,810 tons). Two of the docks at Ashland are operated by the Milwaukee, Lake Shore and Western Railroad Company, and one is operated by the Wisconsin Central Railroad Company. They were constructed at a total cost of \$739,000. The three docks are of equal length, namely, 1,404 feet, making the aggregate length 4,212 feet. They each have 234 pockets, giving a total for the three of 702 pockets, the aggregate capacity of the pockets being 78,250 tons. Two of the docks accommodate three tracks, and one of them four tracks.

Following close upon Ashland is Marquette, Michigan, on Lake Superior, which in 1889 shipped 1,376,335 tons, being 20.21 per cent of the total lake shipments of the entire district for that year. This ore was all from the Marquette district and represented 54.6 per cent of the ore which was forwarded by the lakes from the Marquette range. Additional facilities lately added give promise of Marquette recovering her position as a shipping point for iron ores. It has four ore docks, all operated by the Duluth, South Shore and Atlantic Railway Company. These docks vary in length from 600 to 1,600 feet, the aggregate being 4,900 feet. The total number of pockets in the four docks is 798, and the total capacity of the pockets is 74,000 tons. Three of the docks accommodate three tracks, and one of them has four tracks.

A comparatively small amount of ore from the Marquette range was handled at the ports of Saint Ignace and Gladstone, Michigan, on Lake Michigan, the former shipping 51,853 and the latter 73,847 tons, being 2.1 and 2.9 per cent, respectively, of the lake shipments from the Marquette range and 0.76 and 1.08 per cent of the total lake shipments of iron ore. The dock at Saint Ignace is 800 feet long, and is operated by the Duluth, South Shore and Atlantic Railway Company. It has 100 pockets, with an aggregate capacity of 10,000 tons, and supports three railroad tracks. There is also an ore dock at L'Anse, Michigan, on Lake Superior, which was not used during 1889. This dock is 1,000 feet long, has 100 pockets, and an aggregate capacity of 8,000 tons. It was formerly used for some of the shipments from the Marquette range.

The ore from the Vermilion range in Minnesota is transferred from cars to vessels at Two Harbors, in Minnesota, on Lake Superior. The Duluth and Iron Range railway has two docks here, each 1,056 feet long, making an aggregate of 2,112 feet. These docks accommodate double tracks, and have a total of 303 pockets, the aggregate capacity of the pockets being 40,000 tons; \$800,000 was expended in constructing these docks. The amount of ore handled at the docks of Two Harbors during the year 1889 was 819,639 tons, all of which came from Minnesota, and represented 12.04 per cent of the total lake shipments from the Lake Superior region.

SHIPPING DOCKS FOR IRON ORE.

The following shipping docks are specially constructed for handling iron ore from the Lake Superior region, together with their capacity, etc.:

The Duluth, South Shore and Atlantic Railway Company, at Marquette, Michigan, has four docks of the following description:

No. 1.—Height of dock above water, 42 feet; length of dock, 1,300 feet; number of pockets, 220; number of tracks, 3; capacity, 15,000 long tons.

No. 2.—Height of dock above water, 35 feet; length of dock, 600 feet; number of pockets, 78; number of tracks, 3; capacity, 4,000 long tons.

No. 3.—Height of dock above water, 44 feet; length of dock, 1,600 feet; number of pockets, 300; number of tracks, 3; capacity, 25,000 long tons.

No. 4.—Height of dock above water, 47.5 feet; length of dock, 1,400 feet; number of pockets, 200; number of tracks, 4; capacity, 30,000 long tons.

The ore dock at L'Anse, Lake Superior, Michigan, is described as follows:

Height of dock above water, 38 feet; length of dock, 1,000 feet; number of pockets, 100; capacity, 8,000 long tons.

The ore dock at Saint Ignace, Michigan, is described as follows:

Height of dock above water, 42 feet; length of dock, 800 feet; number of pockets, 100; number of tracks, 3; capacity, 10,000 long tons.

The cars built especially for ore trade include 3,200 hopper-bottom eight-ton capacity cars and 600 hopper-bottom twenty-ton capacity cars.

At Escanaba, Michigan, the Chicago and North western Railway Company has four double ore docks, as follows:

No. 1.—Height of dock, 46 feet; length of dock, 1,104 feet; number of pockets, 184; number of tracks, 2; capacity, 23,000 long tons.

No. 2.—Height of dock, 39 feet; length of dock, 1,082 feet; number of pockets, 192; number of tracks, 2; capacity, 19,300 long tons.

No. 3.—Height of dock, 39 feet; length of dock, 1,212 feet; number of pockets, 202; number of tracks, 2; capacity, 20,000 long tons.

No. 4.—Height of dock, 46 feet; length of dock, 1,500 feet; number of pockets, 250; number of tracks, 2; capacity, 33,200 long tons.

The cost of the four ore docks at Escanaba was \$922,000; cost of cars, \$1,368,000; a total of \$2,290,000.

This company uses in the distribution of the ore 3,300 small cars of from seven to ten tons capacity and 1,800 large cars of twenty tons capacity.

At Two Harbors, Minnesota, the Duluth and Iron Range Railroad Company has two double ore docks, as follows:

No. 1.—Height of dock, 47 feet; length of dock, 1,056 feet; number of pockets, 162; number of tracks, 2.

No. 2.—Height of dock, 46 feet; length of dock, 1,056 feet; number of pockets, 141; number of tracks, 2.

The capacity of both ore docks is 40,000 long tons. The cost or value of the two docks is \$800,000, and the cost of the 750 cars is \$431,250, a total of \$1,231,250. The company has 750 double-hopper eight-wheel ore cars, having a capacity of 50,000 pounds each.

At Ashland, Wisconsin, the Wisconsin Central Railroad Company and the Milwaukee, Lake Shore and Western Railroad Company have iron-ore docks.

The Milwaukee, Lake Shore and Western Railway Company has two docks, as follows:

No. 1.—Height of dock, 40 feet; length of dock, 1,404 feet; number of pockets, 234; number of tracks, 4; capacity, 23,000 long tons.

No. 2.—Height of dock, 45 feet; length of dock, 1,404 feet; number of pockets, 234; number of tracks, 3; capacity, 27,000 long tons.

The two ore docks are valued at \$483,000, and the 850 cars at \$330,000, a total of \$813,000. Of the cars, 800 have a capacity of 45,000 pounds and 50 a capacity of 60,000 pounds each.

The Wisconsin Central Railroad Company has one double ore dock, as follows:

Height of dock, 46 feet; length of dock, 1,404 feet; number of pockets, 234; number of tracks, 3; capacity, 28,250 long tons.

The dock cost \$256,000, and the cars \$388,800, a total of \$644,800.

Of the cars, 789 have a capacity of 50,000 pounds each, and 90 drop-bottom gondola cars have each 40,000 pounds capacity.

Several of the iron-mining companies have a considerable amount invested in vessels, which are used in the transportation of their iron ore. The following named companies own such vessels: The Republic Iron Company, the Minnesota Iron Company, the Cleveland Iron Mining Company, the Lake Superior Iron Company, and the Chapin Mining Company.

The description, size, and cost of the docks above mentioned could be supplemented by a number of others, which, however, would not equal in amount the outlay which has been required in those given. The mines which produced magnetite in the vicinity of Lake Champlain transfer a considerable portion of their output each year by canal, the ore being brought to the lake by cars and then loaded from docks into boats. In addition, as the locations of the mines are upon either individual or narrow-gauge railroads, the companies' cars are not taken beyond their own road and transfer chutes are erected.

As instances of the location of additional shipping docks, the following may be mentioned: Plattsburg, Port Henry, Crown Point, on Lake Champlain; Burden and Fort Montgomery, on the Hudson river, and below Saint Louis, on the Mississippi river.

The total investment for docks especially built and equipped for handling and shipping iron ore approximated \$4,000,000 in the year 1889.

RECEIVING DOCKS.

The subject of ore transportation would not be complete unless, in addition to the ore-shipping docks, mention was made of the ore-receiving docks, which have been especially constructed for the purpose of handling the ore to blast furnaces or at points from which railroads radiate to blast furnaces. The blast furnaces at Milwaukee (Wisconsin), Chicago (Illinois), Detroit (Michigan), Cleveland (Ohio), Tonawanda (New York), as well as those along the shore of Lake Michigan, all have docks more or less extensive and equipped with steam handling machinery to facilitate the removal of ore from the holds of vessels, which bring the ore from the shipping docks on Lakes Michigan and Superior to the furnaces. In addition to these, there are docks owned by railroad companies or by corporations located on Lake Erie at Toledo, Sandusky, Huron, Loraine, Cleveland, Fairport, and Ashtabula (Ohio), at Erie (Pennsylvania), and at Buffalo (New York). Cleveland has four such docks, Buffalo three, Ashtabula and Fairport two each, the balance of the points named having one ore dock each. The largest of these ore docks is at Fairport (Ohio), and has a frontage one mile in length, with room for stocking ore extending back 180 to 350 feet in width. The two docks at Cleveland are one-half mile in length, with a storage capacity of 350 feet wide. The capacity of the three docks named will reach from 1,000,000 to 1,500,000 long tons each, as the ore is stored from 25 to 50 feet in height; but owing to the necessity of keeping the various kinds of ore and that from different mines separate and the constant demand for ore, the docks never carry their maximum capacity. About one-third of the ore as it is received is handled directly from the vessels bringing it from the upper lakes into railroad cars during the seven months of the shipping season, and about two-thirds of the ore is placed in stock on docks, from which regular shipments of ore are continuously made, but toward the close of the shipping season there is usually a large accumulation of ore on docks for shipment during the winter to blast furnaces. The average storage capacity of these receiving docks varies from 300 to 500 tons per front foot of dock, and the machinery employed in those of new construction is such as to remove the weight of ore from the dock front to insure stability, and in many cases the steam machinery which takes the ore from the hold of the vessel to the stock pile is also used to take it from stock piles to railroad cars.

Mr. Alex. E. Brown, of Cleveland, Ohio, who has made a specialty of equipping docks and handling large quantities of Lake Superior iron ore, states that the ore from the Lake Superior region, when loaded into cars, occupies from 10 to 16 cubic feet for one long ton. The average for all Lake Superior iron ores approximates 14 cubic feet per ton. If, however, these ores are piled in large quantities on

docks, the actual space occupied varies from 10 to 13 cubic feet per long ton of ore. In handling this ore in buckets, where it is loosely placed, the volume is somewhat greater, the average having been determined by a number of experiments to be 13.625 cubic feet per long ton for Marquette and 15.2 cubic feet per long ton for the Gogebic and Menominee ores.

The machinery equipment of the various docks differs greatly, but five general types may be mentioned: (1) swing-boom derricks, operated either with engines placed on them or driven by wire rope from engines at a distance, the mast being either stationary or carried on trolleys; the iron buckets being lowered into the holds of vessels, where the navvies shovel the ore into them, the steam machinery raising the buckets and swinging the boom to the point where the ore is to be deposited; (2) a similar arrangement of swing-boom derricks, which discharge into hoppers and from these into tram cars, which carry the ore from the ore dock to stock piles located at a considerable distance from the water; (3) an A frame which lifts with the buckets and discharges them into tram cars, that run to the stock pile or dump into pockets and thence into cars; (4) aprons which project over the holds of vessels; the buckets traveling up the incline of this apparatus are dumped into tram cars, which run by gravity, discharge, and return automatically; (5) booms or aprons upon which the buckets are carried, and continue their journey either over cables or on trussed bridges, the buckets dumping automatically at the point desired and returning to the hold without detaching from the machinery.

These dock equipments have been put up at great expense, some of the docks costing equipped over \$800,000, and by them it has been possible to handle quantities of ore which could not be moved in any other way, while the cost of such handling has been reduced to a minimum. The expense of shoveling the ore into buckets in the holds of vessels varies from 10 to 15 cents per long ton, while with the improved apparatus at some of the docks this ore is lifted from the vessel, carried back 350 feet and dumped at a total cost, including the labor, wear and tear, interest, and fuel account, at from three-fourths to one and one-half cent per ton. With 21 men in the hold of a vessel carrying 2,000 long tons of iron ore, the entire cargo has been stocked in 17 hours. Other instances are mentioned where with 28 men 2,200 long tons were similarly handled in 15 hours, and 2,100 long tons were handled by 18 men in 17 hours. In using these improved apparatuses in loading from stock piles to railroad cars it is not uncommon to have a gang of men shoveling into buckets and load the ore on cars at the rate of 8 or 9 tons per man per hour.

Receiving docks at some of the blast furnaces located on navigable streams will, together with those above mentioned, augment the capital invested of such facilities to an amount equal to the outlay mentioned as demanded for the shipping docks.

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