PRODUCTION OF COPPER IN THE UNITED STATES.
(Smelter output in pounds.)

	1907.	1908.	1909.	1910.	1911.	1912.
Alaska	7,034,763	4,438,863	4,057,142	4,311,026	22,314,889	31,926 209
Arizona	256,778,437	289,523,267	291,110,298	297,250,538	303,202,532	359,322,096
California	33,696,602	39,643,833	53,568,708	45,760,200	35,835,651	31,516,471
Colorado	13,998,496	13,943,878	11,485,631	9,307,497	9,791,861	7,963,520
Georgia (a) Maryland and Alabama	(a)90,655	.....	.....	724	(a)23,555	53,043
Idaho	9,707,299	7,256,086	7,096,132	6,877,515	4,514,116	7,182,185
Michigan	219,131,503	222,289,584	227,005,923	221,462,984	218,185,236	231,112,228
Montana	224,263,789	252,503,651	314,858,291	283,078,423	271,814,491	308,770,826
Nevada	1,998,164	12,241,372	53,849,281	64,494,640	65,561,015	83,413,900
New Hampshire	.....	135,139	88,944	12,409	.....	.....
New Mexico	10,140,140	4,991,351	5,031,136	3,784,609	2,860,400	29,170,400
North Carolina	544,040	29,391	120,451	181,263	13,699	63,766
Oregon	518,694	271,191	245,403	22,022	125,943	311,860
Pennsylvania	.....	.....	994,089	740,626	661,621	248,378
Philippine Islands	.....	.....	.....	1,781	9,612	.....
South Dakota (b) includes Maryland, Alabama, South Carolina and Texas	.....	(b)30,488	41,988	43	1,607	23,657
Tennessee	19,745,119	19,710,103	19,207,747	16,691,777	18,965,143	18,395,256
Texas	.....	.....	3,456	2,961	105	964
Utah	66,418,370	71,370,370	101,241,114	125,185,455	142,340,215	132,150,052
Vermont	696,102	.....	.....	1,935	.....	.....
Virginia	57,008	25,087	231,971	105,313	.....	96,753
Washington	122,263	162,201	120,611	65,021	195,503	1,069,938
Wyoming	3,026,004	2,416,197	433,672	217,127	130,499	25,080
Missouri and unapportioned (c) and other states	1,299,043	1,580,831	2,159,636	603,570	685,056	452,138
	868,996,491	942,570,721	1,092,951,624	1,080,159,509	1,097,232,749	1,243,268,720

These figures are from U. S. G. S. reports.

PRODUCTION OF MICHIGAN COPPER MINES IN RECENT YEARS.
(Pounds Avoirdupois.)

	1906.	1907.	1908.	1909.	1910.	1911.	1912.	
Adventure	1,552,628	1,244,874	90,870	.....	.....	.....	.....	Adventure.
Ahmeek	3,077,507	5,510,985	6,280,241	9,198,110	11,844,954	15,196,127	16,455,769	Ahmeek.
Allouez	3,486,900	2,934,116	3,047,051	4,031,532	4,655,702	4,780,494	5,525,455	Allouez.
Atlantic	1,439,082	.....	.....	.....	.....	.....	.....	Atlantic.
Baltic	14,397,557	16,704,868	17,721,854	17,817,836	17,549,762	15,370,449	13,373,961	Baltic.
Calumet and Hecla	100,023,420	83,863,116	82,549,979	80,096,995	72,059,545	74,130,977	67,856,429	C & H.
Centennial	2,253,015	2,373,572	2,196,377	2,583,793	1,572,566	1,493,834	2,567,385	Centennial.
Champion	16,954,986	16,489,436	17,786,763	18,005,071	19,224,174	15,639,426	17,225,508	Champion.
Franklin	4,571,570	4,401,248	3,707,518	1,615,556	966,353	820,203	1,710,651	Franklin.
Hancock	.....	.....	.....	.....	.....	754,729	.....	Hancock.
Isle Royale	2,937,098	2,667,608	3,011,664	5,719,056	7,567,339	7,490,120	8,186,957	Isle Royale.
Keweenaw	.....	.....	122,474	57,091	36,682	633,778	.....	Keweenaw.
LaSalle	.....	.....	.....	.....	.....	280,598	.....	LaSalle.
Lake	.....	.....	.....	.....	318,050	.....	.....	Lake.
Mass	2,106,739	2,078,677	1,766,930	1,723,436	1,321,885	1,326,898	2,045,006	Mass.
Michigan	2,875,341	2,665,404	3,000,206	1,979,305	.....	327,773	162,950	Michigan.
Mohawk	9,352,252	10,107,266	10,295,881	11,248,474	11,412,066	12,091,056	11,995,598	Mohawk.
Osceola	18,588,451	14,134,753	21,250,794	25,296,657	19,346,566	18,388,193	18,413,387	Osceola.
Quincy	16,194,838	19,796,058	20,600,361	22,511,984	22,517,014	22,252,943	20,634,800	Quincy.
Superior	.....	.....	21,244	1,781,315	3,181,041	3,236,233	3,921,974	Superior.
Tamarack	9,832,644	11,078,604	12,806,127	13,533,207	11,063,606	7,494,077	7,908,174	Tamarack.
Trimountain	9,507,933	8,190,711	6,034,908	5,282,404	5,694,868	6,120,417	6,908,713	Trimountain.
Victoria	546,334	1,207,237	1,290,040	1,062,218	1,164,564	1,303,331	1,224,911	Victoria.
Winona	278,182	1,285,863	.....	.....	.....	1,275,675	2,307,237	Winona.
Wolverine	9,548,123	9,272,351	9,955,233	9,971,482	9,666,534	9,630,639	9,120,485	Wolverine.
Gratiot	.....	.....	.....	.....	265,869	14,275	.....	Gratiot.
Totals (U. S. G. S. figures, including products of some other mines) (Smelter returns)	229,695,730	219,131,503	222,289,584	227,005,923	221,462,984	219,840,201	231,112,228	
Value copper	$43,791,600	$43,553,446	$29,473,844	$30,437,749	$28,280,800	$27,480,013	$35,992,837	
Value silver	148,889	197,844	127,759	148,944	178,470	263,559	324,999	
Total value	$43,940,489	$43,751,290	$29,601,603	$30,586,693	$28,459,270	$27,743,572	$36,317,836	

Most of these figures are from reports of the mining companies. The remainder are the best obtainable from other sources.

SUMMARY OF RESULTS OBTAINED IN 1908, 1909, 1910, 1911 and 1912, BY THE OUTPUT OF 18 COPPER MINES WHICH PRODUCED OVER 99 PER CENT OF THE TOTAL MICHIGAN.

		Tons of ore stamped.	Per ton of ore. Cost of mining, transportation, stamping and taxes.	Pounds of mineral obtained.	Pounds of refined copper produced.	Per cent refined copper in mineral.	Pounds of refined copper per ton of ore stamped.	Cost per pound at mine excluding construction.	Cost per pound construction.	Other costs per pound.	Cost per pound smelting, freight commission eastern office.	Cost per pound interest paid.	Total cost per pound, copper.	Price received for copper sold.
1. C. & H. All ore	1912	2,806,610	1.91	.....	67,856,429	.....	24.18	.....	0.80	.....	.....	.....	9.86	16.65
	1911	2,909,972	1.84	.....	74,130,977	.....	25.47	.....	.....	.....	.....	.....	8.52	12.82
	1910	2,795,514	1.92	.....	72,059,545	.....	25.77	.....	.....	.....	.....	.....	8.96	13.20
	1909	2,842,880	1.93	.....	80,095,995	.....	28.18	.....	.....	.....	.....	.....	8.28	13.61
	1908	2,643,938	2.15	.....	82,549,979	.....	31.22	.....	.....	.....	.....	.....	9.00	13.62
1. C. & H. Conglomerate	1912	1,746,960	2.23	.....	51,935,245	.....	29.73	.....	.....	.....	.....	.....	8.87	16.65
	1911	1,924,480	2.07	.....	58,469,399	.....	30.38	.....	.....	.....	.....	.....	8.25	12.82
	1910	1,950,040	2.11	.....	58,739,509	.....	30.12	.....	.....	.....	.....	.....	8.55	13.20
	1909	1,999,880	2.11	.....	66,285,684	.....	33.14	.....	.....	.....	.....	.....	7.77	13.61
	1908	1,958,200	2.25	.....	70,427,877	.....	35.96	.....	.....	.....	.....	.....	8.38	13.62
1. C. & H. Amygdaloid.	1912	1,040,600	1.36	.....	15,692,199	.....	15.08	.....	.....	.....	.....	.....	10.36	16.65
	1911	985,492	1.34	.....	15,661,578	.....	15.89	.....	.....	.....	.....	.....	9.95	12.82
	1910	831,194	1.41	.....	13,150,427	.....	15.82	.....	.....	.....	.....	.....	10.53	13.20
	1909	838,200	1.42	.....	13,752,276	.....	16.40	.....	.....	.....	.....	.....	10.41	13.61
	1908	685,738	1.75	.....	12,122,102	.....	17.67	.....	.....	.....	.....	.....	12.25	13.62
2. Tamarack	1912	421,385	2.23	12,118,038	7,908,174	65.26	18.8	11.90	0.0	.....	1.11	0.14	13.15	16.56
	1911	392,338	2.69	12,793,430	7,494,077	58.58	19.1	14.07	0.06	.....	1.23	0.20	15.56	12.71
	1910	525,554	2.67	22,053,480	11,063,606	50.17	21.1	12.66	0.57	.....	1.30	0.17	14.70	12.97
	1909	689,099	2.44	20,286,174	13,533,207	66.71	19.6	12.41	0.33	.....	1.18	0.38	14.30	13.32
	1908	654,894	2.57	19,134,429	12,806,127	66.93	19.6	13.14	0.64	.....	1.36	0.10	15.24	13.39
3. Osceola	1912	1,246,557	1.23	24,282,312	18,413,387	75.830	14.8	8.34	0.95	.....	1.07	.....	10.36	16.63
	1911	1,246,596	1.14	24,452,912	18,388,193	75.198	14.8	7.73	0.49	.....	1.06	.....	9.28	12.72
	1910	1,217,720	1.28	25,669,913	19,346,566	75.367	15.9	8.04	0.35	.....	0.98	.....	9.37	13.04
	1909	1,494,845	1.36	33,107,579	25,296,657	76.407	16.9	8.04	0.44	.....	0.99	.....	9.47	13.30
	1908	1,241,400	1.45	26,912,944	21,250,794	78.961	17.1	8.25	0.69	.....	1.10	.....	10.25	13.39
4. Ahmeek	1912	652,260	1.39	23,945,315	16,455,769	68.72	25.2	5.51	1.20	.....	1.14	0.00	7.85	16.61
	1911	598,549	1.42	21,917,925	15,196,127	69.33	25.4	5.61	0.32	.....	1.19	0.05	7.17	12.78
	1910	530,365	1.42	16,758,521	11,844,954	70.68	22.3	6.37	1.85	1.56	1.16	0.11	11.05	12.99
	1909	406,045	1.72	12,409,042	9,198,110	74.12	22.7	7.61	5.27	1.47	1.10	0.03	15.48	13.37
	1908	298,178	1.78	8,029,960	6,280,241	78.21	21.1	8.64	2.40	0.51	1.11	0.00	12.66	13.46
5. Allouez	1912	333,618	1.613	8,787,120	5,525,455	62.88	16.56	9.74	1.60	.....	1.87	0.31	13.52	16.668
	1911	288,610	1.668	7,532,490	4,780,494	63.47	16.56	10.07	0.90	.....	1.95	0.38	13.30	12.822
	1910	247,119	1.769	7,406,970	4,655,702	62.86	18.84	9.39	0.00	.....	1.81	0.37	11.57	12.68
	1909	253,049	1.806	6,384,450	4,031,532	63.14	15.93	11.34	0.21	.....	1.51	0.33	13.39	13.26
	1908	220,905	2.051	4,716,105	3,047,051	64.61	13.80	14.86	0.22	.....	1.40	0.33	16.81	13.35
6. Wolverine	1911–1912	401,308	1.58	12,164,780	9,408,960	.....	23.45	6.75	.....	.....	0.836	.....	7.586	14.10
	1910–1911	388,476	1.64	12,227,500	9,617,168	78.65	24.75	6.628	0.023	.....	0.891	.....	7.542	12.58
	1909–1910	390,837	1.61	12,359,000	9,757,101	78.947	24.96	6.453	0.03	.....	0.93	.....	7.413	13.24
	1908–1909	394,433	1.60	12,692,610	9,995,748	.....	26.75	6.002	0.45	.....	0.923	.....	7.375	13.35
7. Mohawk	1912	787,941	1.47	15,901,500	11,995,598	76.1	15.22	9.67	0.07	.....	0.87	.....	10.61	16.08
	1911	802,548	1.406	15,760,700	12,091,056	76.71	15.07	9.33	0.259	.....	0.81	.....	10.399	12.63
	1910	902,537	1.43	15,013,500	11,412,066	76.01	14.22	10.076	0.48	.....	.889	.....	11.44	13.09
	1909	819,019	1.40	14,690,200	11,248,474	76.57	13.73	10.22	0.01	.....	.875	.....	11.21	13.20
	1908	685,823	1.44	13,310,820	10,295,881	77.35	15.01	9.60	0.21	.....	.938	.....	10.75	13.43
8. Centennial	1912	106,517	1.92	2,567,385	1,742,338	67.86	16.36	11.74	0.00	.....	1.32	0.40	13.46	16.982
	1911	86,543	1.869	2,321,200	1,493,834	64.36	17.26	10.83	0.00	.....	1.43	0.43	12.69	12.842
	1910	101,133	1.9477	2,380,566	1,572,566	66.05	15.40	12.65	0.00	.....	1.49	0.34	14.48	13.12
	1909	196,525	1.818	3,941,820	2,583,193	65.55	13.15	13.82	0.08	.....	1.56	0.15	15.61	13.28
	1908	169,693	2.086	3,352,790	2,196,377	65.51	12.94	16.12	0.74	.....	1.63	.....	18.49	13.39
9. Baltic	1912	652,433	2.05	22,444,810	13,373,961	.....	20.50	8.89	.....	.....	0.87	1.18	10.94	16.16
	1911	696,795	1.714	25,254,160	15,370,449	.....	22.06	7.46	.....	.....	0.90	0.73	9.09	12.54
	1910	781,419	1.67	28,067,300	17,549,762	.....	22.46	6.86	.....	.....	0.90	0.56	8.32	12.74
	1909	814,260	1.55	27,421,000	17,817,836	.....	21.88	6.77	.....	.....	0.89	0.32	7.98	13.00
	1908	764,117	1.56	25,282,145	17,724,854	.....	23.20	.....	.....	.....	.....	.....	7.72	13.39

These figures are from reports of the mining companies.

SUMMARY OF RESULTS OBTAINED IN 1908, 1909, 1910, 1911, and 1912—CONCLUDED.

		Tons of ore stamped.	Per ton of ore. Cost of mining, transportation, stamping and taxes.	Pounds of mineral obtained.	Pounds of refined copper produced.	Per cent refined copper in mineral.	Pounds of refined copper per ton of ore stamped.	Cost per pound at mine excluding construction.	Cost per pound construction.	Other costs per pound.	Cost per pound smelting, freight commission eastern office.	Cost per pound interest paid.	Total cost per pound, copper.	Price received for copper sold.
10. Champion	1912	765,306	1.785	28,460,500	17,225,508	.....	22.508	7.22	.....	.....	0.92	0.74	8.88	16.16
	1911	734,392	1.743	26,137,007	15,639,426	.....	21.296	7.87	.....	.....	0.86	0.90	9.63	12.54
	1910	722,051	1.86	30,508,690	19,224,174	.....	26.62	6.53	.....	.....	0.87	0.45	7.85	12.74
	1909	753,908	1.80	27,851,720	18,005,071	.....	23.88	7.10	.....	.....	0.90	0.43	8.45	13.00
	1908	794,703	1.62	26,579,795	17,786,763	.....	22.38	.....	.....	.....	.....	.....	8.34	13.39
11. Trimountain	1912	366,663	2.057	12,417,575	6,980,713	.....	19.04	9.32	.....	.....	0.92	1.49	11.73	16.16
	1911	347,885	1.819	10,705,685	6,120,417	.....	17.59	9.79	.....	.....	0.98	0.78	11.55	12.54
	1910	317,299	2.00	9,598,900	5,694,868	.....	17.95	10.29	.....	.....	0.98	0.90	12.17	12.74
	1909	323,408	2.09	9,118,095	5,282,404	.....	16.33	11.76	.....	.....	1.04	1.09	13.89	13.00
	1908	334,929	2.05	9,634,979	6,034,908	.....	18.02	.....	.....	.....	.....	.....	12.5	13.39
12. Superior	1912	172,322	2.33	.....	3,921,974	.....	22.76	10.23	0.31	.....	1.97	0.24	12.75	16.997
	1911	162,599	2.39	.....	3,236,233	.....	19.90	12.01	0.89	.....	2.02	0.39	15.31	12.652
	1910	140,514	2.69	.....	3,181,041	.....	22.64	.....	.....	.....	.....	.....	14.29	12.63
	1909	81,641	.....	.....	1,781,315	.....	21.82	.....	.....	.....	.....	.....	.....	13.56
	1908	962	.....	.....	21,244	.....	22.08	.....	.....	.....	.....	.....	.....	.....
13. Quincy	1912	1,309,253	.....	30,040,360	20,634,800	.....	15.7	.....	.....	.....	.....	.....	11.60	16.24
	1911	1,382,254	.....	32,550,440	22,252,943	68.4	16.1	9.25	0.48	.....	0.89	.....	10.62	12.725
	1910	.....	.....	34,177,380	22,517,014	65.88	.....	8.80	0.50	0.25	0.93	.....	10.48	13.20
	1909	.....	.....	35,025,225	22,511,984	64.27	.....	8.85	0.50	0.26	0.91	.....	10.52	13.40
	1908	.....	.....	32,754,745	20,600,361	60.28	.....	9.615	0.58	0.23	0.85	.....	11.27	13.57
14. Franklin	1912	176,462	.....	.....	1,710,651	.....	9.80	.....	.....	.....	.....	.....	.....	16.794
	1911	.....	.....	.....	820,203	.....	.....	.....	.....	.....	.....	.....	.....	12.516
	1910	113,859	.....	.....	966,353	.....	.....	.....	.....	.....	.....	.....	.....	13.33
	1909	170,456	1.94	3,306,820	1,615,556	.....	9.47	.....	.....	.....	.....	.....	.....	.....
	1908	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15. Isle Royale	1912	531,105	1.54	11,461,410	8,186,957	71.43	15.4	10.01	0.20	0.13	1.31	0.09	11.89	16.66
	1911	457,440	1.47	10,339,171	7,490,120	72.44	16.4	8.97	0.25	0.13	1.21	0.29	10.85	12.38
	1910	520,860	1.42	10,433,060	7,567,399	72.53	14.5	9.75	0.16	0.33	1.26	0.34	11.84	12.68
	1909	401,280	1.87	7,926,015	5,719,056	72.16	14.3	13.12	1.28	0.55	1.44	0.25	16.64	13.00
	1908	218,940	2.33	4,013,590	3,011,664	75.04	13.8	16.91	9.65	0.44	1.99	0.00	28.99	13.29
16. Victoria	1912	131,955	.....	2,033,509	1,224,911	.....	9.04	.....	.....	.....	.....	.....	.....	.....
	1911	126,894	.....	2,128,245	1,303,331	.....	10.3	.....	.....	.....	.....	.....	.....	.....
	1910	122,497	.....	1,923,599	1,164,564	.....	.....	.....	.....	.....	.....	.....	13.4	12.3
	1909	118,605	.....	1,843,152	1,062,218	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1908	109,015	1.51	2,259,928	1,290,040	.....	11.18	12.366	.....	.....	1.97	.....	14.335	13.10
17. Mass	1912	132,891	.....	2,985,335	2,045,006	68.502	15.39	.....	.....	.....	.....	.....	.....	.....
	1911	73,475	.....	1,949,720	1,326,898	68.055	17.58	.....	.....	.....	.....	.....	.....	12.50
	1910	90,747	.....	1,790,795	1,321,885	73.837	14.59	.....	.....	.....	.....	.....	.....	.....
	1909	139,404	.....	.....	.....	.....	12.36	.....	.....	.....	.....	.....	.....	.....
	1908	171,268	.....	.....	.....	.....	10.31	.....	.....	.....	.....	.....	.....	.....
18. Winona	1912	181,148	.....	3,586,520	2,307,237	.....	12.74	.....	.....	.....	.....	.....	.....	.....
Total production (from U. S. G. S. Reports).	1912	11,411,941	.....	339,756,812	231,112,228	64.24	19.1	.....	.....	.....	.....	.....	.....	16.5
	1911	10,978,827	.....	338,908,309	219,840,201	64.86	20.0	.....	.....	.....	.....	.....	.....	12.5
	1910	10,869,561	.....	360,840,547	222,683,461	61.71	20.5	.....	.....	.....	.....	.....	.....	13.00
	1909	11,429,394	.....	358,862,935	234,136,529	65.24	20.5	.....	.....	.....	.....	.....	.....	12.7
	1908	10,531,271	.....	339,233,252	223,286,700	65.82	21.2	.....	.....	.....	.....	.....	.....	13.2

SUMMARY OF RESULTS OBTAINED BY MICHIGAN COPPER MINES IN 1912.

	Tons of ore stamped.	Cost of min'g trans'n and stamping per ton ore.	Pounds of concentrate obtained.	Pounds of refined copper produced.	Per cent of refined copper in concentrate.	Pounds refined copper per ton of ore stamped.	Cost per pound at mine excluding construction.	Cost per pound construction.	Cost per pound smelting f'g't com'n eat'n office.	Other costs per pound.	Cost per pound interest paid.	Total cost per pound copper produced.	Price received for copper sold.
Ahmeek	652,260	1.39	23,945,315	16,455,769	68.72	25.2	5.51	1.20	.....	1.14	0.00	7.85	16.61
Allouez	333,618	1.613	8,787,120	5,525,455	62.88	16.56	9.74	*1.60	.....	1.87	0.31	13.52	16.668
Baltic	652,433	2.05	22,444,810	13,373,961	.....	20.50	8.89	.....	0.87	1.18	.....	10.94	16.16
Calumet & Hecla. All ore	2,806,610	1.91	.....	67,856,429	.....	24.18	.....	0.80	.....	.....	.....	9.86	16.65
C. & H. Conglomerate only	1,746,960	2.23	.....	51,935,245	.....	29.73	.....	.....	.....	.....	.....	8.87	16.65
C. & H. Amygdaloid only	1,040,600	1.36	.....	15,692,199	.....	15.08	.....	.....	.....	.....	.....	10.36	16.65
Centennial	106,517	1.92	2,567,385	1,742,338	67.86	16.36	11.74	0.00	.....	1.32	0.40	13.46	16.982
Champion	765,306	1.785	28,460,500	17,225,508	.....	22.508	7.22	.....	0.92	0.74	.....	8.88	16.16
Franklin	176,462	.....	.....	1,710,651	.....	9.80	.....	.....	.....	.....	.....	.....	16.794
Isle Royale	531,105	1.54	11,461,410	8,186,957	71.43	15.4	10.01	0.20	0.13	1.31	0.09	11.89	16.66
Mass	132,891	.....	2,985,335	2,045,006	68.50	15.39	.....	.....	.....	.....	.....	.....	.....
Mohawk	787,941	1.47	15,901,500	11,995,598	76.1	15.22	9.67	.....	0.87	0.07	.....	10.61	16.08
Osceola	1,246,557	1.23	24,282,312	18,413,387	75.83	14.8	8.34	0.95	.....	1.07	.....	10.36	16.63
Quincy	1,309,253	.....	30,040,360	20,634,800	.....	15.7	.....	.....	.....	.....	.....	11.60	.....
Superior	172,322	2.33	.....	3,921,974	.....	22.76	10.23	0.31	.....	1.97	0.24	12.75	16.997
Tamarack	421,385	2.23	12,118,038	7,908,174	65.26	18.8	11.90	0.0	.....	1.11	0.14	13.15	16.56
Trimountain	366,663	2.057	12,417,575	6,980,713	.....	19.04	9.32	.....	0.92	1.49	.....	11.73	16.16
Victoria	131,955	.....	2,033,509	1,224,911	.....	9.04	.....	.....	.....	.....	.....	.....	.....
Winona	181,148	.....	3,586,520	2,307,237	.....	12.74	.....	.....	.....	.....	.....	.....	.....
Wolverine (1911-1912)	401,308	1.58	12,164,780	9,408,960	.....	23.45	6.75	.....	.....	0.836	.....	7.586	14.10

FINANCIAL STATEMENTS OF MICHIGAN COPPER MINING COMPANIES.

Operating in year 1912.

	Balance of assets, Dec. 31, 1911.	Operation expenditures, 1912.	Operation receipts, 1912.	Net profits from operations, 1912.	Dividends paid, 1912.	Assessments, 1912.	Balance of assets, Dec. 31, 1912.
Adventure	$72,375 27	$40,013 75	.....	.....	.....	.....	$33,633 91
Ahmeek	1,013,812 45	1,292,179 78	$2,757,576 67	$1,465,396 89	$1,100,000 00	.....	1,379,209 34
*Algomah	†1,134 00	53,601 94	.....	.....	.....	$70,000 00	†12,299 58
Allouez	†77,700 04	729,824 60	918,435 79	188,611 19	.....	.....	93,564 21
Baltic	308,712 50	1,406,679 97	2,160,313 01	697,393 85	700,000 00	.....	306,106 35
Calumet & Hecla	2,644,106 93	(?)	(?)	(?)	a4,200,000 00	.....	4,897,414 31
Centennial	†54,061 19	227,523 86	285,075 55	57,551 69	.....	.....	†3,549 22
Champion	792,256 14	1,471,592 57	2,782,457 60	1,251,619 40	1,100,000 00	.....	943,875 84
Cliff	75,756 59	16,483 68	.....	.....	.....	.....	62,571 79
Contact	20,462 39	15,430 22	.....	.....	.....	.....	17,886 04
Copper Range Consolidated	199,389 83	3,661,837 00	6,071,095 18	1,692,566 13	788,428 50	.....	904,137 63
*Franklin	†46,687 44	403,102 57	287,285 80	.....	.....	332,716 00	41,839 27
Hancock	.....	267,542 75	.....	.....	.....	180,057 00	†124,288 66
Houghton	†17,426 80	48,771 44	.....	.....	.....	63,255 00	3,353 46
*Indiana	74,191 24	77,867 52	.....	.....	.....	80,000 00	53,060 23
Isle Royale	137,976 75	965,591 05	1,395,636 32	430,045 57	.....	.....	557,743 48
Keweenaw	.....	2,389 97	.....	.....	.....	200,000 00	240,659 65
Lake	.....	.....	.....	.....	.....	.....	.....
LaSalle	261,783 84	31,368 56	.....	.....	.....	.....	240,659 65
Laurium	68,532 42	51,910 33	.....	.....	.....	.....	18,465 42
Mass	30,710 63	367,420 71	348,070 52	.....	.....	.....	9,347 76
Mayflower	.....	.....	.....	.....	.....	.....	55,646 00
Michigan	†83,572 00	30,666 00	26,509 00	.....	.....	.....	†101,351 00
Mohawk	590,880 86	1,264,177 55	1,929,418 00	656,435 54	350,000 00	.....	897,316 40
Naumkeag	.....	18,915 46	.....	.....	.....	.....	253,000 00
‡New Arcadian	20,375 44	33,347 99	.....	.....	.....	.....	624 76
New Baltic	50,279 85	26,779 36	.....	.....	.....	.....	23,576 73
*North Lake	179,789 35	38,875 87	.....	.....	.....	.....	†13,835 30
Ojibway	.....	.....	.....	.....	.....	.....	.....
Old Colony	.....	.....	.....	.....	.....	.....	.....
Oneco	.....	.....	.....	.....	.....	70,000 00	60,196 00

FINANCIAL STATEMENTS OF MICHIGAN COPPER MINING COMPANIES.

Operating in year 1912.

	Balance of assets, Dec. 31, 1911.	Operation expenditures, 1912.	Operation receipts, 1912.	Net profits from operations, 1912.	Dividends paid, 1912.	Assessments, 1912.	Balance of assets, Dec. 31, 1912.
Onondaga							
Osceola	$1,832,183 52	$1,908,530 00	$3,071,818 78	$1,163,288 78	$1,153,800 00		$1,888,458 05
Quincy	972,499 31	2,401,962 30	3,381,587 10	2,979,624 70	*a*550,000 00		1,233,278 15
South Lake	†46,055 12	39,978 11				$115,838 00	29,885 77
Superior	†73,089 06	490,559 46	673,032 04	182,472 58			99,784 08
Tamarack	851,249 02	1,028,613 28	1,300,238 89	271,625 61			1,120,861 68
Trimountain	522,921 79	783,564 75	1,127,603 33	308,472 55	300,000 00		531,394 34
Victoria	64,044 26	239,098 10	202,168 80				27,623 58
White Pine	†13,206 90						†16,701 36
Winona	146,814 01	479,094 13	376,219 76			14,770 00	62,034 00
§Wolverine	§673,339 62	§713,850 20	§1,327,030 73	§613,180 53	600,000 00		§746,520 15
Wyandot	69,267 78	31,276 29				14,405 00	‖53,704 48

*Algomah (Dow loss $28,725.66) *Franklin (Dow loss $81,393.62). *North Lake (Dow loss $160,188.17). *Indiana (Dow loss $32,702.06)
†Liabilities. ‡Year ending May 1. §Report for June 30, 1911 to June 30, 1912. ‖March 31, 1913.
*a*Calumet & Hecla Mining Company also retired notes amounting to $2,700,000. In addition to profits from the C. & H. mine, the company received dividends from Osceola and Ahmeek.
*a*Quincy Mining Company also paid $150,000 on note given St. Mary's Canal Co. for property purchased in 1910 and declared dividend of $165,000 payable March 24, 1913.

ASSESSMENTS CALLED BY MICHIGAN COPPER COMPANIES IN 1910, 1911 and 1912.

	1910.		1911.		1912.	
	Per Share.	Amount.	Per Share.	Amount.	Per Share.	Amount.
Adventure	$1 00	$100,000	$1 00	$100,000		
Algomah					$1 00	$70,000
Franklin			2 00	332,652	2 00	332,652
Hancock	4 00	400,000	4 00	400,900		
Houghton					1 00	67,000
Indiana			1 50	120,000	1 00	80,000
Keweenaw					1 00	200,000
King Philip			1 00	100,000		
Mass	2 00	200,000	2 00	200,000		
Mayflower			1 00	100,000		
New Arcadian						
Ojibway	0 50	75,000				
Old Colony	2 00	168,000	2 00	168,000		
Oneco			1 00	100,000	1 00	58,940
St. Louis			2 50	100,000		
South Lake					2 00	120,000
Victoria			1 00	100,000		
Winona	2 00	200,000	1 00	165,647		
Wyandot			1 00	100,000		
Total		$1,143,000		$2,086,299		$928,592

COPPER PRODUCTION OF UNITED STATES AND MICHIGAN.

1845—1912.

Year.	United States.	Michigan.		
	Production (pounds.)	Production (pounds.)	Gross value of production.	Total dividends paid.
1845.....	224,000	24,880	$5,000	.....
1846.....	336,000	58,240	10,000	.....
1847.....	672,000	297,120	55,000	.....
1848.....	1,120,000	1,032,640	200,900	.....
1849.....	1,568,000	1,505,280	336,000	$60,000
1850.....	1,456,000	1,281,280	286,000	84,000
1851.....	2,016,000	1,744,960	289,500	60,000
1852.....	2,464,000	1,774,080	396,000	60,000
1853.....	4,480,000	2,905,280	648,500	90,000
1854.....	5,040,000	4,074,560	909,500	198,000
1855.....	6,720,000	5,809,334	1,586,160	168,000
1856.....	8,460,000	8,217,392	2,218,320	380,000
1857.....	10,752,000	9,530,830	2,382,500	480,000
1858.....	12,320,000	9,159,916	2,129,235	460,000
1859.....	14,112,000	8,937,995	1,950,355	360,000
1860.....	16,128,000	12,068,375	2,654,960	120,000
1861.....	16,800,000	15,182,837	3,487,995	260,000
1862.....	20,160,000	13,586,318	3,634,255	440,000
1863.....	19,040,000	12,985,444	4,415,600	720,000
1864.....	17,920,000	12,491,965	5,870,300	1,150,000
1865.....	19,040,000	14,358,592	5,635,515	510,000
1866.....	19,936,000	13,750,063	4,629,375	170,000
1867.....	22,400,000	17,515,607	4,442,841	110,000
1868.....	25,984,000	20,934,124	4,940,424	100,000
1869.....	28,000,000	26,625,301	6,230,016	210,000
1870.....	28,224,000	24,622,759	5,096,752	700,000
1871.....	29,120,000	25,746,448	5,728,485	1,640,000
1872.....	28,000,000	24,553,523	7,979,400	3,080,000
1873.....	34,700,000	30,291,505	8,726,100	2,330,000
1874.....	39,200,000	34,334,389	8,009,356	1,940,000
1875.....	40,320,000	36,039,497	8,180,625	1,920,000
1876.....	42,560,000	38,270,997	7,998,430	1,870,000
1877.....	47,040,000	39,026,671	7,327,880	1,840,000
1878.....	48,160,000	41,687,266	6,920,540	1,860,000
1879.....	51,520,000	42,671,529	7,327,350	1,818,620
1880.....	60,480,000	49,718,337	9,947,673	3,080,000
1881.....	71,680,000	54,548,909	9,971,702	2,665,000
1882.....	90,646,080	57,155,980	10,522,416	2,850,000
1883.....	115,526,053	59,702,404	9,457,853	2,670,000
1884.....	144,946,653	69,353,202	9,494,306	1,327,500
1885.....	165,875,766	72,147,889	7,942,597	1,970,000
1886.....	156,735,381	80,918,460	8,788,476	1,900,000
1887.....	180,920,524	76,028,697	8,530,342	1,370,000
1888.....	226,361,466	86,472,034	14,510,001	3,260,000
1889.....	226,775,962	88,175,675	11,894,942	2,670,000
1890.....	259,763,092	101,410,277	15,819,960	3,415,000
1891.....	284,121,764	114,222,709	14,574,727	3,540,000
1892.....	344,998,679	123,198,460	12,431,624	3,260,000
1893.....	329,354,398	112,605,078	12,105,145	3,520,000
1894.....	354,188,374	114,308,870	10,852,122	2,380,000
1895.....	380,613,404	129,330,749	13,877,109	3,280,000
1896.....	460,061,430	143,524,069	15,758,935	3,985,000
1897.....	494,078,274	145,282,059	16,530,843	5,431,000
1898.....	526,512,987	158,491,703	17,829,871	6,857,250
1899.....	568,666,921	147,400,338	26,098,382	12,318,450
1900.....	606,117,166	145,461,498	23,691,928	9,811,200

COPPER PRODUCTION, 1845—1912. (*Concluded.*)

Year.	United States.	Michigan.		
	Production (Pounds)	Production (Pounds)	Gross value of production.	Total dividends paid.
1901.....	602,072,519	156,289,481	$26,038,857	$7,496,900
1902.....	659,508,644	170,609,228	20,711,592	3,440,000
1903.....	698,044,517	192,400,577	26,383,449	4,980,000
1904.....	812,537,267	208,309,130	27,107,107	5,432,300
1905.....	888,784,267	230,287,992	36,616,586	9,224,600
1906.....	917,805,682	229,695,730	43,044,732	13,911,500
1907.....	868,996,491	219,131,503	43,319,940	13,469,950
1908.....	942,570,721	222,289,584	30,239,253	4,837,300
1909.....	1,092,951,624	227,005,923	31,256,141	6,309,200
1910.....	1,080,159,509	221,462,984	29,072,951	6,974,000
1911.....	1,097,232,749	219,840,201	27,743,572	5,376,125
1912.....	1,243,268,720	231,112,228	36,317,836	9,901,875
Total value of Mich. production and dividends.			$790,911,248	$198,102,770

WORLD'S PRODUCTION OF COPPER.*

(In tons of 2,240 lbs.)

	1909.	1910.	1911.
Africa—			
Cape Co	4,645	4,405	4,480
Namaqua	2,300	2,500	2,500
Sundries	8,000	8,300	10,000
Argentina	600	300	1,020
Australia	34,400	40,315	41,840
Austria	1,615	2,130	2,440
Bolivia, Coro-Coro	2,000	2,500	1,800
Canada	24,105	25,715	24,930
Chili	35,785	35,235	25,595
Cuba	2,960	3,475	4,455
England	435	500	500
Germany—Mansfield	18,715	19,995	20,520
Other German	3,470	4,715	1,490
Hungary, including Servia and Bosnia	4,600	4,955	6,970
Italy	2,725	3,220	2,600
Japan	47,000	46,000	55,000
Mexico—Boleo	12,230	12,795	12,165
Other Mexican	44,095	48,720	41,865
Newfoundland	1,380	1,080	1,155
Norway—Sulitelma	4,295	4,925	3,590
Other Norwegian	4,785	5,500	5,835
Peru	16,000	18,305	25,445
Russia	17,750	22,310	25,570
Sweden	2,000	2,000	2,000
Spain and Portugal—			
Rio Tinto	35,370	33,575	34,500
Tharsis	4,355	3,495	3,395
Mason & Barry	2,365	2,955	2,920
Sevilla	1,820	1,630	1,530
Other mines	8,275	8,600	9,700
United States	490,280	484,935	492,650
Turkey	800	600	1,000
Total	839,425	855,685	873,460

*Figures issued by Henry R. Merton & Co., London.

PRODUCTION OF COPPER IN THE UNITED STATES.*

According to class. (In pounds.)

Year.	Lake.	Electrolytic (d).	Casting (d).	Pig Copper (a).	Total.
1904	208,329,248	705,478,400	b45,000,000	44,408,000	1,003,215,648
1905	219,000,000	c760,000,000	46,000,000	33,495,000	c1,058,494,000
1906	224,071,000	c860,000,000	52,000,000	29,098,000	c1,165,169,000
1907	220,317,041	854,441,000	47,957,000	30,032,000	1,152,747,890
1908	222,267,444	850,660,325	44,967,250	35,000,000	1,152,895,019
1909e	226,602,134	1,101,518,458	67,471,446	43,159,018	1,438,751,056
f1910	221,400,864	1,151,624,597	g55,673,196	49,903,463	1,475,602,120
1911	216,412,867	1,156,627,311	22,977,534	35,920,626	1,431,938,338
1912	221,400,864	1,151,624,597	32,193,196	46,903,463	1,452,122,120

*From Metal Statistics, 1913.

(a) Exported. (b) Estimated. (c) Partly estimated. (d) included copper from scrap and junk. (e) The statistics for 1909 are officially communicated by the Copper Producers' Association, except that to its report of 34,123,446 lbs. of casting copper there has been added 33,348,000 lbs. reported by the junk smelters. The term "Lake" copper is here used to designate all copper sold in the trade as such regardless of the process by which it is refined. (f) Copper Producers' Association through Engineering and Mining Journal, May 6, 1911. (g) Includes 23,480,000 lbs. from scrap.

PRICE OF COPPER AT NEW YORK.

(In cents per pound.)

	Electrolytic.						Lake.					
	1907.	1908.	1909.	1910.	1911.	1912.	1907.	1908.	1909.	1910.	1911.	1912.
January	24.404	13.726	13.893	13.620	12.295	14.094	24.825	13.901	14.280	13.870	12.680	14.337
February	24.896	12.905	12.949	13.322	12.256	14.084	25.236	13.098	13.295	13.719	12.611	14.329
March	25.065	12.704	12.387	13.255	12.139	14.698	25.560	12.875	12.826	13.586	12.447	14.868
April	24.224	12.743	12.562	12.733	12.019	15.741	25.260	12.928	12.937	13.091	12.275	15.930
May	24.048	12.598	12.893	12.550	11.989	16.031	25.072	12.788	13.238	12.885	12.214	16.245
June	22.665	12.675	13.214	12.404	12.385	17.234	24.140	12.877	13.548	12.798	12.611	17.443
July	21.130	12.702	12.880	12.215	12.463	17.190	21.923	12.933	13.363	12.570	12.720	17.353
August	18.356	13.462	13.007	12.490	12.405	17.498	19.255	13.639	13.296	12.715	12.634	17.644
September	15.565	13.388	12.870	12.379	12.201	17.508	16.047	13.600	13.210	12.668	12.508	17.698
October	13.169	13.354	12.700	12.553	12.189	17.314	13.551	13.646	13.030	12.788	12.370	17.661
November	13.391	14.130	13.125	12.742	12.616	17.326	13.870	14.386	13.354	12.914	12.769	17.617
December	13.163	14.111	13.298	12.581	13.552	17.376	13.393	14.411	13.647	12.863	13.768	17.600
Year	.....	13.208	12.982	12.738	12.376	16.341	.....	13.424	13.335	13.039	12.634	16.560

VISIBLE STOCKS OF COPPER.

(On first day of each month.)

	United States.				Europe.			
	1909.	1910.	1911.	1912.	1909.	1910.	1911.	1912.
January	122,357,266	141,766,111	122,030,195	89,454,697	124,716,480	244,204,800	236,629,120	158,323,200
February	144,130,045	98,463,339	142,439,490	66,280,643	118,574,400	248,236,800	236,992,000	154,851,200
March	173,284,248	107,187,992	156,637,770	62,939,988	117,140,800	254,150,400	233,385,600	141,142,400
April	182,279,902	123,824,874	162,007,934	62,367,557	115,024,000	249,625,600	223,014,400	136,819,200
May	183,198,073	141,984,159	165,555,908	65,066,029	114,050,320	246,870,400	212,284,800	134,176,000
June	169,848,141	160,425,973	165,995,932	49,615,643	127,352,960	239,142,400	202,540,800	117,801,600
July	154,858,061	168,386,017	157,434,164	44,335,004	150,928,960	232,892,800	195,932,800	108,186,000
August	122,596,607	170,640,678	137,738,858	50,280,421	171,492,160	222,320,000	191,891,840	113,299,200
September	135,196,930	168,881,245	133,441,501	46,701,374	197,993,600	218,444,800	191,228,800	113,568,000
October	151,472,772	148,793,714	140,894,856	46,701,374	210,224,000	211,276,800	191,945,600	107,408,000
November	153,509,626	139,261,914	134,997,642	76,744,964	222,566,400	198,060,800	176,825,600	103,801,600
December	153,003,527	130,389,069	111,785,188	86,164,059	236,857,600	193,200,000	164,281,600	96,947,200
January	.....	.....	.....	105,312,582	.....	.....	.....	96,857,600

U. S. PRODUCTION AND DELIVERIES OF COPPER IN 1912.*

(In pounds.)

	Production.	Domestic deliveries.	Export deliveries.	Total deliveries.	Surplus stock on first day of following month.
Jan.	119,337,753	62,343,901	80,167,904	142,511,805	66,280,643
Feb.	116,035,809	56,228,368	63,148,096	119,376,464	62,939,988
Mar.	125,694,601	67,487,466	58,779,566	126,267,032	62,367,557
Apr.	125,464,644	65,513,846	53,252,326	122,766,172	65,066,029
May	126,737,836	72,702,277	69,485,945	142,188,222	49,615,643
June	122,315,240	11,146,229	61,449,650	127,595,879	44,335,004
July	137,161,129	71,094,381	60,121,331	131,215,712	50,280,421
Aug.	145,628,521	78,722,418	70,485,150	149,207,568	46,701,374
Sept.	140,089,819	63,460,810	60,264,796	123,725,606	63,065,587
Oct.	145,405,453	84,104,734	47,621,342	131,726,076	76,744,964
Nov.	134,695,440	69,369,795	59,906,550	125,276,345	86,164,059
Dec.	143,354,042	58,491,723	65,713,796	124,205,519	105,312,582
Total for 1912	1,582,150,244	819,477,517	750,162,833	1,566,062,400	
Total for 1911	1,431,938,338	709,611,605	754,902,233	1,464,513,838	

*From Copper Producers' Statements.

POTASH.

For the past two or three years, the U. S. Geological Survey has been prosecuting a most diligent search after commercial supplies of potash salts, the United States at present being wholly dependent upon foreign countries. The salt producing districts of Michigan were visited and an examination of the brines, both natural and artificial, was made. The results were not at all encouraging. The percentage of potash in the brines was so small as to indicate that as far as the present salt producing regions are concerned, evaporation had never been carried far enough to cause a deposition of any of the more soluble salts. Many years ago, the Canadian Survey carried on a similar investigation with like barren results, finding little or no evidence warranting a supposition that potassium salts might even be found in the brines and salt deposits in Ontario.

It must be admitted, however, that the evidence while not favorable is certainly altogether too meager for concluding that there is no possibility of potash salts being found within the limits of the state. The investigation covered only a limited and marginal portion of the probable salt bearing areas and there is good reason to believe that the central portion of the state may also be salt bearing, and in this area, we know nothing concerning the Salina or possible salt beds.

The many drillings in southeastern Michigan and in Ontario, penetrating the Salina, have more or less perfectly outlined the southeastern limits of the rock salt beds. In a rough way, the margin extends slightly north of east from Trenton, Wayne county, where the Church wells show the exact southern edge of the salt beds, into Ontario apparently lapping around the margin of the old Cincinnati anticline which runs northeastward through Essex and Kent counties. To the northwest, in Michigan, the last well which penetra es the Salina is the Royal Oak which shows the surprising thickness of 609 ft. of salt, much thicker than to the southeast. From Detroit to Port Huron, there appears to be from 300 to 400 ft. of salt as shown by the wells. From these facts, it is but natural to infer that there is at least a very considerable extension of the salt beds to the northwest and down the dip of the strata toward the central basin. It is also to be noted that toward the north the salt comes in at higher horizons.

At Grand Lake, Alpena county, there is over 300 ft. of salt and the well was not through the formation. At Manistee and Ludington,

the salt beds do not total more than 20 to 30 ft. To the south at Muskegon and to the north at Frankfort, the salt was absent. Dr. C. W. Cook in his studies upon the salt deposits of Michigan appears to think that there is good grounds for believing that the Manistee-Ludington, the Alpena, and the much larger southeastern district are simply but parts of one and the same deposit. If this is the case, presumably much of the central basin is underlain by salt beds.

Obviously, since the soluble potash salts are the last to be deposited, the chances for finding bitterns or deposits of potash would be greater toward the central basin, rather than toward the marginal areas such as the Port Huron-Detroit, Manistee and Alpena districts.

In order that one may form a better idea of the possibilities for the occurrence of potash salts in Michigan, the following excerpt from Dr. W. H. Sherzer's report on Wayne County is given below. It is to be noted that, while several plausible theories have been advanced in explanation of the deposition of salt, and especially the more soluble compounds of potash, bromine, etc., there is probably more to the history of the real processes than given in the various theories.

"The frequent association of calcium and magnesium carbonate, calcium sulphate and the strong bitter brines with rock salt, as in the region just described, gave rise more than a century ago to the theory that they must all have originated from the evaporation, under arid conditions, of detached arms of the sea. To account, however, for such extensive beds of salt, gypsum and dolomite demanded depths for these inland seas which overtaxed one's belief. Furthermore, the deposits alternated in succession and were often interstratified with shale and sandstone, so that the simple evaporation of such a sea could furnish no adequate explanation.

"Laboratory experiments have shown that, when sea water is evaporated, there are first thrown down the calcium carbonate ($Ca\ CO_3$) (and hydrous oxide of iron); ($2\ Fe_2\ O_3 - 3\ H_2O$); next about 84% of the calcium sulphate ($Ca\ SO_4$) in solution. There is next precipitated upon further concentration about 54% of the salt (NaCl) along with the balance of the calcium sulphate, followed by 8.5% of salt free from this sulphate. The remaining salt with the more soluble compounds of magnesium, potassium, bromine and iodine, finally crystallized in various combinations, or constitute the bittern in case evaporation was not complete. As pointed out by Hubbard when such simple concentration of an inland sea takes place the bottom and sides would be coated with calcium carbonate, more or less stained with iron, upon which would be deposited a layer of gypsum or anhydrite. The concentrated brine would shrink to the deeper portions of the basin and there be precipitated along with more gypsum, the final salt layers being practically pure. If the evaporation were not completed, the bittern, or "mother liquor," would remain as a concentrated mineral water, to be incorporated into subsequent deposits. To account for a succession of the above series, for irregularities and for shale and sandstone, it has been supposed that influxes of the sea took place as during storm, or exceptionally high tides, bringing in fresh supplies of sea water and incidentally mud and sand. The enormous thickness of any single deposit, however, can not be so explained.

"In 1877 Ochsenius proposed a modification of this theory by assuming a basin of sufficient depth which continuously maintained its connection with the adjacent ocean, the water of the basin evaporating and allowing a constant inflow of sea water. The concentrated surface layers will sink, encountering layers differently charged and giving rise to the deposition of various compounds, chiefly salt and gypsum. Given sufficient time, a basin of sufficient original depth or in process of slow subsidence, the continuance of uniform conditions and an extensive bed of any of the above substances might take place. This is the theory accepted by Hubbard as explaining most satisfactorily the Salina series of Michigan.

"Grabau has recently pointed out that according to this theory there should be found abundant remains of marine organisms in the strata enclosing the salt, and it would seem, even in the salt itself. The constant influx of sea water would sweep in countless forms whose remains would settle to the bottom, whether or not they had been able to maintain themselves alive for any considerable time in the water undergoing concentration. It has already been pointed out that the Salina strata are practically barren of fossils. Grabau further calls attention to the absence of marine strata, outside of the Salina area of Michigan, Ontario and New York, which might be regarded as contemporary with the salt and gypsum strata. The complete absence of such strata, this author convincingly argues, indicates a land-locked basin or series of such in which the Salina beds are to be laid down. Widespread desert conditions with intermittent streams; long continued erosion of pre-Salina strata containing imprisoned sea-salts; the solution, transportation and final concentration of these salts in the various basins, he believes most satisfactorily explains all the phenomena of the Salina. From computations, this author concludes that the erosion of 400 ft. of Niagara limestone from Minnesota, Wisconsin, the upper Great Lake region and western Ontario would be sufficient to yield 100 ft. of pure rock salt distributed over an area of 25,000 square miles."

From the foregoing discussion of theories and facts relating to salt deposits, it is evident that, in any case, the final "mother liquor" or

bitterns containing potash, would be largely collected in pools in local depressions, more or less close to the center of the Basin, that these pools would form only a very small part of the total area of the salt and that a single deep drilling might not necessarily prove the absence of potash salts, as there would be relatively large barren areas in between the pools. If the potash was not deposited in the solid form, but remained to be included in later deposits, the occurrence of the potash brines would naturally be much more wide-spread than the potash salts and a single drilling would have a greater chance of being successful.

During the present year, serious consideration has been given to the project of putting down from one to three deep wells to the Salina to test the possibilities for the occurrence of potash salts or brines in Saginaw Valley. Upon request, a report summarizing and describing the available evidence was submitted by the Survey and the parties interested decided that, as yet, the evidence was too vague and indefinite to warrant so costly an exploration so fraught with risk without having state aid, and protection, in case success was obtained.

At the present time, a drilling to the Niagara, Clinton and Medina formations is being considered with a view of testing the oil possibilities of these formations as well as the potash of the Salina. It would probably require a hole at least 4,400 ft. deep to reach the Niagara and one 4,850 ft. to reach the Clinton, if the formations below the Dundee are at all regular in character and thickness.

SAND AND GRAVEL.

Since 1903 the statistics concerning the production and value of sand and gravel in Michigan have been collected in co-operation with the U. S. Geological Survey. A study of these tables as given in the present report shows a steady and rapid increase in the total production and value up to 1911 when there was a great decline, from 2,862,738 short tons valued at $816,377 in 1910 to 1,831,601 tons valued at $523,829. For this there was no apparent reason, when it is considered that a great era of road building has just been inaugurated. This branch of the industry should have shown a very marked increase instead of a decline from 1,197,791 short tons in 1910 valued at $364,841 to 560,069 tons valued at only $158,876 in 1911.

A careful examination of the lists of the producers disclosed the fact that a large proportion of the producers reporting were located in or near cities or towns. There were very few indeed of the reports from rural communities, even where state reward road building was in progress. It is evident that the reports up to this year inclusive, represent chiefly the industry as developed in the vicinity of cities.

In the spring of 1912, in co-operation with the State Highway Department and the U. S. Geological Survey, form letters were sent to all of the township highway commissioners in the state, some 1,300 or more, asking the location and character of the sand and gravel pits and the names and addresses of the various owners. The results were somewhat startling as the number of new producers sent in by the commissioners swelled the sand and grave directory from about 125 to more than 3,000.

From the nature of the replies, it is clearly indicated that an enormous amount of road sand and gravel has been handled in the rural communities, of which hitherto there has been no record. It is to be hoped that the reports from 1913 on will more nearly represent the status of the industry in the state as a whole.

Plans are already under way to make an examination of the sand and gravel pits in the state in order to determine their fitness and value for concrete-cement work. Much complaint has been made against cement in such concrete work and, nearly always, when a careful examination has been made, the fault is not in the cement but with the sand or gravel used.

PRELIMINARY STATEMENT ON LIMESTONE.

The last detailed report upon the limestones of Michigan appeared in Annual Report for 1901 by Dr. A C. Lane. Short notes were published in several of the later reports, but nothing in a comprehensive way.

At present most of the known reserves of good limestone, easily accessible, are in the hands of a few large companies. Michigan has a number of heavy limestone formations, but unfortunately the amount of high grade limestone in each is relatively very small. In such case, it is no little problem to discover just where this much sought for stone occurs in commercially important quantities and under favorable conditions for quarrying. Were it not for the drift, which hopelessly covers most of the state, it would be comparatively easy to locate inexhaustible supplies of limestone. The Dundee alone in Monroe and Wayne counties would supply an almost unlimited amount of limestone, suitable for nearly every purpose for which limestone is adapted.

During the present summer (1913), R. A. Smith, Assistant State Geologist of the Survey is devoting a large part of his time in making a detailed study of the various limestone outcrops in the state with a view of determining their character and the uses to which they may be best suited, and the regions which offer the more favorable chances for the development of limestone deposits of commercial size and grade.

STATISTICAL TABLES.

1912

Iron ore.	Silver.
Pig iron.	Sand lime brick.
Portland cement.	Lime.
Salt.	Pottery.
Brick and tile.	Mineral water.
Coal.	Trap rock.
Limestone.	Sandstone.
Sand and gravel.	Clay
Gypsum.	Natural gas.

Compiled from reports of the United States Geological Survey, Division of Mineral Resources. Statistics for 1910-1912 collected by Michigan Geological Survey and United States Geological Survey in coöperation, iron ore and coal excepted for the year 1912.

COMPARATIVE TABLE SHOWING PRODUCTION OF IRON ORE IN THE UNITED STATES, THE LAKE SUPERIOR REGION AND MICHIGAN.

	Total[2] shipments Lake Superior Region. Long tons.	Total[4] production United States. Long tons.	Total[3] shipments Michigan. Long tons.	Per cent total.		Percent of Lake Superior Region. Michigan.
				Lake Superior Region.	Michigan.	
1854	3,000	.....	33,000[1]	.....	.....	100
1855	1,449	.....	1,449	.....	.....	100
1856	36,343	.....	6,343	.....	.....	100
1857	25,646	.....	25,646	.....	.....	100
1858	15,876	.....	22,876	.....	.....	100
1859	68,832	.....	68,832	.....	.....	100
1860	114,401	2,873,460	114,401	4.0	4.0	100
1861	49,909	.....	49,909	.....	.....	100
1862	124,169	.....	124,169	.....	.....	100
1863	203,055	.....	203,055	.....	.....	100
1864	243,127	.....	243,127	.....	.....	100
1865	236,208	.....	186,208	.....	.....	100
1866	278,796	.....	278,796	.....	.....	100
1867	473,567	.....	443,567	.....	.....	100
1868	491,449	.....	491,454	.....	.....	100
1869	617,444	.....	617,444	.....	.....	100
1870	830,940	3,831,891	830,934	21.7	21.7	100
1871	779,607	.....	779,607	.....	.....	100
1872	900,901	.....	893,169	.....	.....	100
1873	1,162,458	.....	1,153,249	.....	.....	100
1874	919,557	.....	919,257	.....	.....	100
1875	891,257	4,017,857	889,477	22.2	22.2	100
1876	992,764	.....	1,006,785	.....	.....	100
1877	1,015,087	.....	1,010,494	.....	.....	100
1878	1,111,110	.....	1,023,083	.....	.....	100
1879	1,375,691	.....	1,130,019	.....	.....	100
1880	1,908,745	7,120,362	1,384,010	26.8	19.5	72.5
1881	2,306,505	7,119,643	2,121,558	32.4	29.8	91.8
1882	2,965,412	8,700,000	2,689,395	34.1	30.9	90.6
1883	2,353,288	8,800,000	2,291,115	26.7	26.0	97.3
1884	2,518,692	7,718,129	2,420,068	32.6	31.3	96.1
1885	2,466,372	7,600,000	2,192,243	32.4	28.8	88.8
1886	3,568,022	10,000,000	3,157,213	35.7	31.6	88.5
1887	4,730,577	11,300,000	4,004,328	41.8	35.4	85.5
1888	5,063,693	12,062,530	4,159,780	41.9	34.4	82.1
1889	7,292,754	14,518,041	5,660,495	50.2	38.8	77.6
1890	9,012,379	16,036,043	7,144,290	56.2	44.6	79.3
1891	7,062,233	14,591,178	5,754,339	48.5	39.4	81.4
1892	9,069,556	16,296,666	7,166,429	55.6	43.8	79.0
1893	6,060,492	11,587,629	4,417,155	52.3	38.1	72.8
1894	7,748,932	11,879,679	4,633,308	65.2	39.0	59.7
1895	10,429,037	15,957,614	5,916,026	65.4	37.1	56.7
1896	9,934,828	16,005,449	5,469,851	62.1	34.1	55.1
1897	12,469,638	17,518,046	6,381,301	71.1	36.4	51.1
1898	14,024,673	19,433,716	7,375,310	72.1	37.8	52.5
1899	18,251,804	24,683,173	9,307,585	73.9	37.7	50.8
1900	19,059,393	27,553,161	9,072,109	69.1	32.9	47.5
1901	20,589,237	28,887,479	9,190,349	71.3	31.8	44.6
1902	27,571,121	35,554,135	11,255,287	77.5	31.6	40.8
1903	24,289,878	35,019,308	9,154,147	69.3	26.1	37.6
1904	21,822,839	27,644,330	7,805,880	78.9	28.2	35.7
1905	34,384,116	42,526,133	11,684,432	80.8	27.4	33.9

COMPARATIVE TABLE SHOWING PRODUCTION OF IRON ORE IN THE UNITED STATES, THE LAKE SUPERIOR REGION AND MICHIGAN.

(Concluded.)

	Total shipments Lake Superior Region. Long tons.	Total production United States. Long tons.	Total shipments Michigan. Long tons.	Per cent total.		Percent of Lake Superior Region. Michigan.
				Lake Superior Region.	Michigan.	
1906	38,565,762	47,749,728	12,149,451	80.7	25.4	31.5
1907	42,266,668	51,720,619	12,166,929	81.7	23.5	28.7
1908	26,014,987	35,983,336	7,302,060	72.2	20.3	28.1
1909	42,586,869	51,294,271	12,251,965	83.0	23.8	28.7
1910	43,442,397	57,014,906	11,955,105	76.3	20.9	27.5
1911	32,793,130	43,876,552	8,898,327	74.7	20.3	27.1
1912	48,221,546	55,150,147	12,428,361	87.4	22.5	25.7
Total.	573,808,218	.....	242,449,183	.....	.....	42.2

[1]Includes 30,000 tons for years unknown.
[2]Iron Trade Review.
[3]Monograph No. 52, U. S. G. S.
[4]Mineral Resources of the United States, U. S. G. S. and Michigan Geological Survey.

NOTE.—There are disagreements for early years in the first and third columns of figures taken from different sources. Prior to 1880 Michigan produced the entire Lake Superior output.

IRON ORE RESERVES OF MICHIGAN BY COUNTIES, 1911-1913.[1]

County.	Reserves reported by companies.		Tons estimated by appraiser.		Area of ore on bottom level—square feet.	
	1911.	1913.	1911.	1913.	1911.	1913.
Gogebic...	17,354,100	23,840,028	31,605,000	31,567,579	670,000	970,779
Iron.....	11,403,113	39,055,589	33,623,842	60,785,916	2,425,730	3,341,882
Dickinson..	10,250,422	10,782,036	11,650,450	12,783,452	263,465	324,975
Baraga....	1,864,185	741,185	2,074,000	1,891,035	310,600	135,775
Marquette.	51,589,357	46,817,825	90,626,810	82,439,239	13,031,805	10,815,518
Total....	92,461,177	121,236,663	169,581,102	189,467,621	16,701,600	15,588,929

[1]Estimated for Michigan State Tax Commission by C. K. Leith 1911, and R. C. Allen, 1913.

VALUE OF MICHIGAN SHIPMENTS OF IRON ORE BY COUNTIES IN 1912.[1]

County.	Tons shipped.	Valuation.	Value per ton.
Gogebic.....	4,094,938	$10,763,458 47	$2.628
Iron.....	3,041,705	5,926,876 69	1.948
Dickinson	1,585,601	3,246,722 21	2.048
Baraga.....	53,943	68,774 74	1.275
Marquette.....	3,873,109	8,856,986 81	2.286
Total.....	12,649,296	$28,862,818 92	$2.281

[1]Value figured as gross receipts from ore sales less freights and selling commissions, as reported to Michigan State Tax Commission by the producers.

TABLES SHOWING DECREASE IN QUANTITY OF BESSEMER ORES AND IN IRON CONTENT OF SHIPMENTS FROM LAKE SUPERIOR REGION, 1902—1912.

Average Iron of Bessemer Ores.*

	Gogebic Range.			Marquette Range.			Menominee Range		
Year.	Average iron (Natural).	Average phosphorus.	Per cent of Bessemer.	Average iron (Natural).	Average phosphorus.	Per cent of Bessemer.	Average iron (Natural).	Average phosphorus.	Per cent of Bessemer.
1912	54.2386	0.04100	64.1	54.9180	0.04033	15.0	55.2117	0.02522	2.5
1911	54.5312	0.04000	73.3	54.0668	0.03746	31.1	54.5578	0.03302	3.7
1910	54.1441	0.04122	80.0	55.0838	0.04490	25.5	53.6310	0.04323	5.0
1909	53.6578	0.04227	73.9	57.1386	0.04539	25.8	53.2389	0.04180	7.4
1908	53.9843	0.04185	72.5	55.9672	0.04485	32.7	55.6941	0.03457	4.0
1907	53.8365	0.04112	81.1	56.7992	0.04539	24.1	56.6136	0.03425	4.3
1906	54.2732	0.04162	85.3	56.5151	0.04851	27.3	55.8979	0.03630	6.0
1905	54.7369	0.04093	90.2	57.5585	0.04616	27.1	56.8037	0.03197	4.6
1904	55.2144	0.04002	86.6	58.6219	0.04296	30.1	57.5432	0.02687	4.2
1903	55.9185	0.03889	84.8	57.2475	0.04488	38.5	57.7853	0.02084	4.0
1902	55.7324	0.04184	87.5	58.2631	0.04239	29.9	57.7141	0.01674	2.8

	Vermillion Range.			Mesabi Range.			Total Bessemer.		
Year	Average iron (Natural).	Average phosphorus.	Per cent of Bessemer.	Average iron (Natural).	Average phosphorus.	Per cent of Bessemer.	Average iron (Natural).	Average phosphorus.	Per cent of Bessemer.
1912	59.3095	0.03847	74.9	53.2513	0.04645	45.3	53.9009	0.04504	41.9
1911	59.5940	0.03837	82.8	52.9224	0.04620	49.3	53.6151	0.04438	46.6
1910	60.1133	0.03745	78.2	53.3587	0.04608	46.3	53.9313	0.04472	44.8
1909	60.3218	0.03904	81.7	53.2625	0.04528	48.0	53.8686	0.04446	45.1
1908	60.4392	0.03913	83.9	54.0142	0.04459	57.2	54.4690	0.04387	53.0
1907	60.1411	0.03750	92.6	54.0681	0.04558	63.2	54.6064	0.04437	56.4
1906	60.1254	0.03934	89.3	54.6196	0.04408	69.0	55.0834	0.04354	60.2
1905	60.6082	0.03857	85.7	55.3543	0.04215	70.1	55.7627	0.04183	60.9
1904	60.0113	0.04031	94.5	56.3171	0.04010	79.9	56.6337	0.04018	65.1
1903	60.4775	0.04098	84.6	55.8573	0.04044	74.9	56.4388	0.04043	63.7
1902	61.5522	0.03983	80.1	56.6690	0.03948	80.6	57.1109	0.03995	64.9

*Compiled by W. L. Tinker, Secretary Lake Superior Iron Ore Association.

AVERAGE IRON (NATURAL) OF NON-BESSEMER ORES.

Year.	Gogebic Range.	Marquette Range.	Menominee Range.	Vermillion Range.	Mesabi Range.	Total Old Range.
1912....	53.2912	52.7308	51.0527	58.7775	49.4922	52.5245
1911....	52.9294	52.4737	51.4315	59.5984	49.4934	52.2184
1910....	52.5195	52.7952	51.0734	60.2483	49.7468	51.2185
1909....	51.9749	52.9033	51.3061	61.2379	49.8474	52.2074
1908....	52.2528	52.2748	50.9742	61.2246	50.8403	51.9414
1907....	52.5835	52.9362	51.4400	63.9432	51.4601	52.3503
1906....	51.8580	53.9861	52.2508	64.5798	50.8088	53.2308
1905....	52.1136	54.3907	52.8159	64.3330	51.6239	53.8529
1904....	53.1802	54.7825	53.7339	66.4676	52.3964	54.3229
1903....	52.3980	54.0844	53.8048	62.9809	53.1948	54.2675
1902....	53.7872	55.1032	54.1020	61.9984	53.5531	54.9995

IRON CONTENT OF TOTAL BESSEMER AND NON-BESSEMER ORES.

Year.	Old Range average iron (Natural).	Mesabi Range average iron (Natural).	All Ranges Average iron (Natural).	Total non-Bessemer average iron (Natural).
1912.....	53.7116	51.1958	51.9603	50.5043
1911.....	53.6164	51.1842	51.8869	50.3792
1910.....	53.5219	51.4195	52.0703	50.5574
1909.....	53.4921	51.4864	52.1130	50.6696
1908.....	53.6255	52.6552	52.9551	51.2484
1907.....	54.0103	53.1100	53.4020	51.8434
1906.....	54.6248	53.4386	53.8652	52.0235
1905.....	55.1910	54.2392	54.6072	52.8077
1904.....	55.7600	55.4493	55.5791	53.6115
1903.....	55.9153	55.1884	55.5049	53.8449
1902.....	56.3991	56.0663	56.2233	54.5778

ANNUAL LAKE ERIE PRICES, FREIGHT RATES AND MINE VALUES OF MICHIGAN IRON ORES, 1855-1913.[1]

Year.	Marquette Range.									
	Rail freight.		Boat freight.		Price at Lake Erie ports.		Value of ore at the mines.			
							Shipped via Marquette.		Shipped via Escanaba.	
	To Marquette.	To Escanaba.	From Marquette.	From Escanaba.	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.
1855	$3 00	.....	$3 00	.....	$10 00	$10 00	$4 00	$4 00	.....	.....
1856	1 27	.....	3 00	.....	8 00	8 00	3 73	3 73	.....	.....
1857	1 27	.....	2 67	.....	8 00	8 00	4 06	4 06	.....	.....
1858	87	.....	2 09	.....	6 50	6 50	3 54	3 54	.....	.....
1859	87	.....	2 00	.....	6 00	6 00	3 13	3 13	.....	.....
1860	1 09	.....	2 00	.....	5 25	5 50	2 16	2 41	.....	.....
1861	1 09	.....	2 21	.....	5 25	5 00	1 95	1 70	.....	.....
1862	1 09	.....	2 89	.....	5 25	5 37	1 27	1 39	.....	.....
1863	1 09	.....	3 19	.....	7 50	7 50	3 22	3 22	.....	.....
1864	1 09	.....	3 37	.....	8 50	8 50	4 04	4 04	.....	.....
1865	1 10	.....	3 23	.....	7 50	7 50	3 17	3 17	.....	.....
1866	1 10	$1 55	4 17	$3 77	9 50	.....	4 23	.....	$4 23	.....
					14 00	4 23	8 73	4 18	8 68	.....
1867	1 10	1 80	2 98	3 28	10 50	8 00	.....	3 92	.....	$2 92
						11 50	6 42	7 42	5 42	6 42
1868	1 10	1 80	3 11	2 44	8 25	8 25	4 04	4 04	4 20	4 20
1869	1 10	1 85	3 21	2 43	8 25	9 50	3 94	5 19	3 97	5 22
1870	1 10	1 85	3 06	2 40	8 50	8 50	.....	4 34	.....	4 25
						9 50	4 34	5 34	4 25	5 25
1871	95	1 70	2 83	2 07	8 00	8 00	4 22	4 22	4 23	4 23
1872	84	1 70	3 59	2 50	9 00	7 50	4 57	3 07	4 80	3 30
1873	84	2 00	3 44	2 74	12 00	9 00	7 72	4 72	7 26	4 26
1874	84	2 00	3 84	.....	9 00	7 00	4 32	2 32	.....	.....
1875	65	1 25	2 87	.....	7 00	5 50	3 48	1 98	.....	.....
1876	55	1 15	2 54	.....	6 75	4 50	3 66	1 41	.....	.....
1877	55	1 15	1 40	.....	6 50	4 25	4 55	2 30	.....	.....
1878	55	1 15	1 26	85	5 50	4 25	3 69	2 44	3 50	2 25
1879	55	1 15	1 61	1 07	6 25	4 75	4 09	2 59	4 03	2 53
1880	55	1 25	2 50	1 77	9 25	8 00	6 20	4 95	6 23	4 98
1881	55	1 25	2 25	1 55	9 00	7 00	6 20	4 20	6 20	4 20
1882	55	1 25	1 50	1 22	9 00	6 25	6 95	4 20	6 53	3 78
1883	55	1 10	1 30	1 11	6 25	5 00	4 40	3 15	4 04	2 79
1884	40	80	1 21	98	5 76	4 50	4 15	2 89	3 98	2 72
1885	45	80	1 01	84	5 50	4 25	4 04	2 79	3 86	2 61
1886	55	80	1 35	1 16	5 50	4 75	3 60	2 85	3 54	2 79
1887	55	80	1 75	1 49	7 25	5 25	4 95	2 95	4 96	2 96
1888	45	70	1 22	97	5 50	4 75	3 83	3 08	3 83	3 08
1889	45	70	1 14	1 00	5 50	4 50	3 91	2 91	3 80	2 80
1890	45	70	1 16	99	6 75	5 75	5 14	4 14	5 06	4 06
1891	45	70	96	74	6 00	4 74	4 59	3 34	4 56	3 31
1892	40	65	1 06	87	5 50	4 85	4 04	3 39	3 98	3 33
1893	40	65	85	70	4 25	3 00	.....	1 75	.....	1 65
						3 50	3 00	2 25	2 90	2 15
1894	32	.....	70	53	2 75	2 15	1 73	1 13	.....	.....

[1]Compiled from various sources.

ANNUAL LAKE ERIE PRICES, FREIGHT RATES AND MINE VALUES OF MICHIGAN IRON ORES, 1855-1913.[1]

(Continued.)

Year.	Marquette Range.									
	Rail freight,		Boat freight.		Price at Lake Erie ports.		Value of ore at the mines.			
							Shipped via Marquette.		Shipped via Escanaba.	
	To Marquette.	To Escanaba.	From Marquette.	From Escanaba.	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.
1895	$0 32	$0 52	$0 83	$0 64	$2 75	$2 15	$1 60	$1 00	$1 59	$0 99
					3 50	2 30	2 35	1 15	2 34	1 14
1896	32	52	80	61	4 00	2 45	.....	1 33	.....	1 32
						2 85	2 88	1 73	2 78	1 72
1897	32	52	60	45	2 65	2 00	.....	1 08	.....	1 03
						2 60	1 73	1 68	1 68	1 63
1898	32	40	60	48	3 10	2 35	2 18	1 43	2 22	1 47
					3 35	2 45	2 43	1 53	2 47	1 57
1899	25	40	84	72	3 21	2 50	2 12	.....	2 09	.....
					3 50	.....	2 41	1 41	2 38	1 38
1900	25	40	94	85	5 93	.....	4 74	.....	4 68	.....
					6 48	5 00	5 29	3 81	5 23	3 75
1901	25	40	74	62	4 66	3 65	3 67	2 66	3 64	2 63
					4 92	3 85	3 93	2 86	3 90	2 83
1902	25	40	68	59	4 65	3 80	3 72	2 87	3 66	2 81
					5 00	4 00	4 07	3 07	4 01	3 01
1903	25	40	73	63	4 85	4 00	3 87	3 02	3 82	2 97
					5 15	4 25	4 17	3 27	4 12	3 22
1904	25	40	61	54	3 60	3 10	2 74	2 24	2 66	2 16
					3 85	3 35	2 99	2 49	2 91	2 41
1905	32	40	70	60	3 75	3 20	2 73	2 18	2 75	2 20
1906	32	40	70	60	4 25	3 70	3 23	2 68	3 25	2 70
1907	32	40	70	60	5 00	4 20	3 98	3 18	4 00	3 20
1908	32	40	60	50	4 50	3 70	3 58	2 78	3 60	2 80
1909	32	40	60	50	4 50	3 70	3 58	2 78	3 60	2 80
1910	32	40	65	55	5 00	4 20	4 03	3 23	4 05	3 25
1911	.....	.....	55	45	4 50	3 70	.....	.....	.....	.....
1912	.....	.....	.....	.....	3 75	3 00	.....	.....	.....	.....
1913	.....	.....	.....	.....	4 40	3 60	.....	.....	.....	.....

[1]Compiled from various sources.

ANNUAL LAKE ERIE PRICES, FREIGHT RATES AND MINE VALUES OF MICHIGAN IRON ORES, 1855-1913.[1]

(Concluded.)

Year.	Menominee Range.						Gogebic Range.					
	Rail freight.	Boat freight.	Price of ore at Lake Erie ports.		Value of ore at the mines.		Rail freight.	Boat freight.	Price of ore at Lake Erie ports.		Value of ore at the mines.	
	To Escanaba.	From Escanaba.	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.	To Ashland.	From Ashland.	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.
1883	.....	.....	$6 00	$4 75	.....	.....	.....	.....	.....	.....	.....	.....
1884	.....	.....	5 25	4 50	.....	.....	.....	.....	.....	.....	.....	.....
1885	.....	.....	4 75	4 00	.....	.....	.....	.....	.....	.....	.....	.....
1886	.....	.....	5 25	4 50	.....	.....	.....	.....	.....	.....	.....	.....
1887	$0 85	$1 49	6 00	5 00	$3 66	$2 66	$0 80	$2 11	$6 00	$5 00	$3 09	$2 09
1888	75	97	4 75	4 00	3 03	2 28	70	1 34	4 75	4 00	2 71	1 96
1889	75	1 00	4 50	4 50	2 75	2 75	70	1 29	4 50	4 50	2 51	2 51
1890	.....	99	5 50	5 25	4 51	4 26	70	1 26	5 50	5 25	3 54	3 29
1891	70	74	4 50	4 25	3 06	2 81	65	1 05	4 50	4 25	2 80	2 55
1892	70	87	4 50	3 65	2 93	2 08	65	1 20	4 50	3 65	2 65	1 80
1893	70	70	3 85	3 20	2 41	1 76	65	88	3 85	3 20	2 32	1 67
1894	70	53	2 75	2 50	1 52	1 27	52	.....	.....	.....	1 44	1 19
							65	79	2 75	2 50	1 31	1 06
1895	52	64	2 90	2 25	1 74	1 09	52	96	2 90	2 25	1 42	77
1896	52	61	4 00	2 70	2 87	1 57	52	91	4 00	2 70	2 57	1 27
1897	52	45	2 60	2 15	1 63	1 18	45	.....	.....	.....	1 52	1 45
							52	63	2 60	2 15	1 07	1 00
1898	45	48	2 75	1 85	1 82	92	40	.....	.....	.....	84	1 69
							45	61	2 75	1 85	1 74	79
1899	40	72	3 00	2 15	1 88	1 03	40	95	3 00	2 15	1 65	80
1900	40	85	5 50	4 25	4 25	3 00	40	1 05	5 50	4 25	4 05	2 80
1901	40	62	4 25	3 00	3 23	1 98	40	84	4 25	3 00	3 01	1 76
1902	40	59	4 25	3 25	3 30	2 26	40	76	4 25	3 25	3 09	2 09
1903	40	63	4 50	3 60	3 47	2 57	40	83	4 50	3 60	3 27	2 37
1904	40	54	3 25	2 75	2 31	1 81	40	70	3 25	2 75	2 15	1 65
1905	40	60	3 75	3 20	2 75	2 20	40	76	3 75	3 20	2 59	2 04
1906	40	60	4 25	3 70	3 25	2 70	40	75	4 25	3 70	3 10	2 55
1907	40	60	5 00	4 20	4 00	3 20	40	75	5 00	4 20	3 85	3 05
1908	40	50	5 00	4 20	4 10	3 30	40	65	5 00	4 20	3 95	3 15
1909	40	50	4 50	3 70	3 60	2 80	40	65	4 50	3 70	3 45	2 65
1910	40	55	5 00	4 20	4 05	3 25	40	70	5 00	4 20	3 90	3 10
1911	40	45	4 50	3 70	.....	.....	40	60	4 50	3 70	.....	.....
1912	40	45	3 75	3 00	2 90	2 15	40	55	3 75	3 00	.....	.....
1913	40	45	4 40	3 60	3 55	2 70	40	55	4 40	3 60	.....	.....

[1]Compiled from various sources.

COMPARATIVE ASSESSED IRON MINE VALUATIONS, 1911-1913.*

GOGEBIC COUNTY.

City of Ironwood.

Name of Mine.	Description.	1911.	1912.	1913.
Ashland	S. ½ S. W. ¼ 22-47-47	$162,000	$145,800	$145,000
Norrie	S. ½ S. E. ¼ 22-47-47	1,864,000	1,757,700	66,000
East Norrie	W. ½ S. W. ¼ 23-47-47	3,648,000	3,445,200	1,377,954
North Norrie	N. ½ S. E. ¼ 22	.....	.....	2,466,607
Aurora	E. ½ S. W. ½ 23	3,972,000	3,749,800	1,814,519
Vaughan	N. ½ S. E. ¼ 23	.....	.....	116,104
Pabst	S. ½ N. E. ¼ 23	5,107,000	4,806,300	5,862,243
North Aurora	S. ½ N. W. ¼ 23	.....	.....	194,250
Total Norrie group	.....	$14,591,000	$13,759,000	$12,042,677
Newport	N. W. ¼ 24-47-47	8,535,000	7,935,400	7,996,800
Total	City of Ironwood	$23,288,000	$21,840,200	$20,039,477

Erwin Township.

Name of Mine.	Description.	1911.	1912.	1913.
Bonnie	N. E. ¼ 24-47-47	$610,000	$630,000	$399,664
	S. E. ¼ S. E. ¼ 13-47-47	.....	.....	25,000
Total	.....	$610,000	$630,000	$424,664

Bessemer Township.

Name of Mine.	Description.	1911.	1912.	1913.
Davis	N. ½ N. W. ¼ 19-47-46	$23,000	$20,000	$20,000
Eureka	N. ½ N. W. ¼ 13-47-46	35,800	35,800	35,800
Geneva	S. W. ¼ 18-47-46	21,000	35,000	75,000
Asteroid	N. E. ¼ 13-47-46	8,000	35,000	48,600
Puritan	S. W. ¼ 17-47-46	81,000	81,000	81,000
Houghton Co. Lease	S. ½ S. W. ¼ 11-47-46	.....	.....	25,000
Royal	S. E. ¼ 18-47-46	.....	10,000	40,000
Keweenaw	S. ½ S. E. ¼ 11-47-46	.....	50,000	334,425
Ironton	W. ½ E. ½ 17-47-46	115,600	102,500	137,206
Anvil	N. E. ¼ 14-47-46	132,900	500,000	437,913
Total	.....	$417,300	$869,300	$1,234,944

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COMPARATIVE ASSESSED IRON MINE VALUATIONS,—Continued.

GOGEBIC COUNTY.—*Continued.*

City of Bessemer.

Name of Mine.	Description.	1911.	1912.	1913.
Winona	E. ½ E. ½ 17-47-46	$77,000	$69,000	$92,150
Yale	S. ½ N. W. ½ 16-47-46	432,000	326,300	400,000
Colby	N. E. ¼ 16-47-46	877,500	862,000	751,517
Tilden	N. ½ 15-47-46	200,000	170,000	150,000
Palms	N. W. ¼ 14-47-46	265,800	950,000	962,100
Total		$1,852,300	$2,377,300	$2,355,767

Wakefield Township.

Name of Mine.	Description.	1911.	1912.	1913.
Mikado	N. W. ¼ and N. W. of N. E. 18-47-45	$135,000	$135,000	$57,960
Pilgrim Lease Wakefield Expl	S. ½ N. ½ and N. ½ S. ½ 17 and W. ½ N. W. and N. W. of S. W. of 16-47-45			752,800
Castile	E. ½ 10-47-45	25,000	50,000	58,111
Brotherton	N. ½ S. E. and S. E.-N. E. 9-47-45	954,000	250,000	202,400
Sunday Lake	W. ½ 10-47-45	989,000	1,007,000	708,750
Pike	S. E. N. W. and S. W. N. E. 9-47-45			25,000
Chicago	E. ½ N. E. of 8 and W. ½ N. W. of 9-47-45	67,500	67,500	50,000
Total		$2,170,500	$1,509,500	$1,855,021

SUMMARY.

Location of Mine.	1911.	1912.	1913.
City of Ironwood	$23,288,000	$21,840,200	$20,039,477
Erwin Township	610,000	630,000	424,664
Bessemer Township	417,300	689,300	1,234,944
City of Bessemer	1,852,300	2,377,300	2,355,767
Wakefield Township	2,170,500	1,509,500	1,855,021
Total	$28,338,100	$27,226,300	$25,909,873

COMPARATIVE ASSESSED IRON MINE VALUATIONS.—Continued.

DICKINSON COUNTY.

Name of Mine.	1911.	1912.	1913.
Aragon	$578,000	$473,225	$609,757
Breen	16,500	16,500	10,000
Chapin	4,988,000	4,863,000	4,050,000
Federal		80,000	60,000
Forest		5,000	10,000
Indiana		15,000	15,000
Loretto	269,000	251,900	288,000
Millie	56,000	56,000	56,000
Munro	20,000	20,000	21,900
Penn	1,200,000	1,200,000	953,720
Pewabic	300,000	300,000	339,940
Pine Bluff, No. 1			10,000
Pine Bluff, No. 2			15,000
Calumet			29,200
Vivian			15,000
Clifford (including Traders & Cornell)			100,000
Total	$7,427,500	$7,260,625	$6,583,517

BARAGA COUNTY.

Spurr Township.

Name of Mine.	1912.	1913.
Imperial	$20,000	$95,000
Webster	20,000	20,000
Ohio Norwood	5,000	40,000
Portland	18,000	48,000
Titan	20,000	5,000
Pittsburgh & Lake Angeline	2,000	2,000
Sheldon Estate	3,500	3,500
Spurr	6,000	6,000
Stuart	10,000	10,000
Longyear	2,285	2,285
Sheldon & Douglass	3,000	3,000
Total	$109,785	$235,585

COMPARATIVE ASSESSED IRON MINE VALUATIONS.—*Continued.*

IRON COUNTY

Mastodon Township.

Name of Mine.	1911.	1912.	1913.
Alpha	$225	$303,400	$1,080,000
Carpenter	375	53,100	.....
Longyear	775	72,900	.....
Mastodon	750	67,800	.....
S. E. ¼ N. W. ¼ 13-42-33, not including triangular 5 A. of N. E. corner	.....	67,800	.....
E. ½ S. E. ¼ 12-42-33	.....	.....	751,050
N. W. ¼ S. W. ¼ 13 and E. ½ S. E. ¼ 14-42-33	.....	.....	4,016
S. W. ¼ of N. W. ¼ 13-42-33	.....	.....	26,372
S. ½ N. E. ¼, Sec. 12-42-33	.....	.....	600,715
Oliver Iron Mining Co.	.....	.....	100,000
Total	$2,125	$565,000	$2,562,153

Crystal Falls Township.

Name of Mine.	1911.	1912.	1913.
Armania	$196,600	$156,000	$37,500
Amasa-Porter	50,000	180,000	173,377
Crystal Falls	73,000	75,000	27,900
Dunn	108,000	108,000	72,580
Dunn Exploration	.....	.....	32,000
Hill Top	.....	.....	5,000
Monongahela-Carpenter	50,000	300,000	396,240
McDonald	.....	.....	37,462
Tobin	1,195,000	1,050,000	903,880
Victoria	.....	.....	5,000
S. W. ¼ N. W. ¼ 31-43-32	.....	.....	50,000
N. E. ¼ S. E. ¼ 36-43-33	.....	.....	50,000
Total	$1,672,600	$1,869,000	$1,790,939

Mansfield Township.

Name of Mine.	1911.	1912.	1913.
Hollister	$216,000	$75,000	$50,000
Mansfield.			
Total	$216,000	$75,000	$50,000

COMPARATIVE ASSESSED IRON MINE VALUATIONS.—*Continued.*

IRON COUNTY—*Continued.*

Hematite Township.

Name of Mine.	1911.	1912.	1913.
Channing	$30,000	$5,000	$5,000
Hemlock	68,000	51,000	148,527
Michigan	63,000	32,000	32,000
Warner	.....	.....	20,000
Total	$161,000	$88,000	$205,527

City of Crystal Falls.

Name of Mine.	1911.	1912.	1913.
Bristol	$865,000	$552,864	$899,422
Great Western	474,000	474,000	129,366
Great Western Extension	54,000	18,500	22,400
Kimball S. E. of N. E. of 29 only	.....	.....	35,000
Lamont Lot 6 Sec. 20	.....	.....	3,000
Neeley Exploration	25,000	25,000	65,750
Ravenna	8,000	100,000	81,152
Youngstown	150,000	150,000	179,280
Lot 3 20-43-32	.....	.....	8,000
May Lot 6 Sec. 28-43-32	.....	.....	33,750
Lot 7 Sec. 28-43-32	.....	.....	6,000
S. W. of S. W. Sec. 28-43-32	.....	.....	3,000
N. W. of S. W. Sec. 28-43-32	.....	.....	3,000
Fairbanks:			
N. E. of S. E. 43-32	.....	.....	25,000
Lot 5 20-43-32	.....	.....	3,000
Lot 4 20-43-32	.....	.....	2,500
Total	$1,576,000	$1,320,364	$1,499,620

COMPARATIVE ASSESSED IRON MINE VALUATIONS.—*Concluded.*

IRON COUNTY—*Continued.*

Stambaugh Township.

Name of Mine.	1911.	1912.	1913.
Andrew Young Lease	.....	.....	$10,000
Berkshire	$216,000	$216,000	251,134
Baltic & Fogarty	1,375,000	800,000	834,637
Corry	.....	.....	6,870
Caspian	3,955,000	3,861,200	3,648,000
Chatham	45,000	45,000	176,044
Cortland	1,000	30,000	40,000
Cottrell	.....	.....	20,000
DeGrasse	.....	.....	5,000
Houlihan	1,139,000	1,139,000	.....
(Bengal)	.....	.....	782,077
Hiawatha	125,000	102,000	60,050
Lennox	.....	.....	4,000
Riverton	632,000	501,000	1,141,070
Tully	704,000	704,000	944,468
(Baker)	.....	.....	33,000
Wickwire	1,000	145,000	56,700
Youngs	375,000	345,000	208,591
Zimmerman	481,000	481,000	795,202
Total	$9,049,000	$8,369,200	$9,016,843

Bates Township.

Name of Mine.	1911.	1912.	1913.
Blair	$121,500	$121,500	$277,472
Michaels	.....	.....	107,640
Bates	45,000	80,000	80,000
Chicagon	57,600	44,000	44,000
Erickson	81,000	81,000	170,818
Rogers	414,000	414,000	726,303
Total	$719,000	$740,500	$1,406,233

Iron River Township.

Name of Mine.	1911	1912.	1913.
Arenson	$25,000	$40,000	$68,508
Davidson, No. 1	173,000	173,000	437,346
Davidson, No. 2	173,000	225,000	
Homer (Donahue	97,500	97,500	427,856
McGovern)	97,500	97,500	
Minkler	1,500	11,000	361,000
Jones & Laughlin (Forbes)	450,000	450,000	618,678
Osana	623,000	597,000	794,452
Purcell	.....	.....	20,000
Sherwood	2,000	750,000	1,034,784
Virgil	1,700	50,000	95,800
Wauseca	52,200	52,200	141,620
Total	$1,696,400	$2,543,200	$4,000,044

COMPARATIVE ASSESSED IRON MINE VALUATIONS.—*Continued.*

MARQUETTE COUNTY.

Ishpeming City.

Name of Mine.	1911.	1912.	1913.
Lake & Moro	$3,250,000	.....	$2,677,500
Salisbury	166,500	.....	117,000
Cliff Shaft	2,574,000	.....	1,961,000
Iron Mountain	.....	.....	36,500
Lake Superior Hard Ore	994,000	.....	967,000
Sec. 16 Mine	4,050,000	.....	3,237,600
Hematite L. S	.....	.....	25,000
Lake Angeline	500,000	.....	102,214
Total	$11,534,500	.....	$9,123,814

Negaunee City.

Name of Mine.	1911.	1912.	1913.
Breitung, No. 1	$592,000	.....	$670,300
Breitung, No. 2	75,000	.....	75,000
Milwaukee-Davis	.....	.....	20,000
Maas	4,505,000	.....	2,687,000
Athens (Harvey Lots)	560,000	.....	829,500
Jackson	250,000	.....	250,000
Rolling Mill	900,000	.....	702,000
Lucky Star	560,000	.....	546,000
Mary Charlotte	1,660,000	.....	854,000
Himrod	.....	.....	75,000
Negaunee Mine	5,950,000	.....	4,555,000
Race Course	255,000	.....	300,000
D. S. S. & A. Right of Way	.....	.....	253,500
Queen Group { Prince of Wales	963,000	.....	709,700
Queen Group { Blue	.....	.....	213,000
Cambria	585,000	.....	576,000
Total	$16,855,000	.....	$13,316,000

Ispheming Township.

Name of Mine.	1911.	1912.	1913.
Lloyd	$110,000	.....	$90,000
Sec. 6 Exploration	.....	.....	311,000
Total	$110,000	.....	$401,000

COMPARATIVE ASSESSED IRON MINE VALUATIONS.—*Continued.*

MARQUETTE COUNTY—*Continued.*

Tilden Township.

Name of Mine.	1911.	1912.	1913.
Cascade Sec. 19	.....	.....	$1,500
Sec. 21 Mine	$1,870,000	.....	1,587,000
Mitchell	10,000	.....	15,000
Total	$1,880,000	.....	$1,603,500

Forsyth Township.

Name of Mine.	1911.	1912.	1913.
Stegmiller	$110,500	.....	$93,500
Princeton, No. 1	70,000	.....	24,400
Princeton, No. 2	525,000	.....	565,000
Austin	425,000	.....	280,000
Stephenson	357,000	.....	228,000
C. & N. W. Expl. Sec. 19	8,500	.....	10,000
C. & N. W. Expl. Sec. 21	85,000	.....	20,000
C. & N. W. Expl. Sec. 29	42,500	.....	20,000
Francis	42,500	.....	42,500
Jopling	85,000	.....	100,000
Gwinn	204,000	.....	195,500
Gardner	76,500	.....	70,000
Mackinaw	119,000	.....	70,000
Total	$2,150,500	.....	$1,718,900

Ely Township.

Name of Mine.	1911.	1912.	1913.
American Boston	$115,000	.....	$315,000
Morris	112,000	.....	154,500
Chase	135,000	.....	40,000
Barnes & Hecker	135,000	.....	51,000
Total	$497,000	.....	$560,500

Republic Township.

Name of Mine.	1911.	1912.	1913.
Republic	$942,000	.....	$1,040,000
Champion, Champion Township	652,000	.....	652,000
Barron, Humboldt Township	.....	.....	50,000

COMPARATIVE ASSESSED IRON MINE VALUATIONS—*Concluded.*

MARQUETTE COUNTY—*Concluded.*

Richmond Township.

Name of Mine	1911.	1912.	1913.
Cascade, Sec. 29	.....	.....	$42,000
Cascade, Sec. 19	.....	.....	1,500
Star West	.....	.....	10,000
Empire	$20,000	.....	20,000
Richmond	104,000	.....	122,600
Volunteer	.....	.....	66,400
Total	$124,000	.....	$262,500
Grand total	$34,745,000	.....	$28,728,214
Total for State (1913)	.....	.....	$81,988,548

SUMMARY OF IRON ORE SHIPMENTS FROM MICHIGAN RANGES. (GROSS TONS).

Range.	1880 and prior years.	1881.	1882.	1883.	1884.
Marquette	13,849,627	1,564,823	1,797,896	1,291,695	1,554,477
Gwinn	79,840	15,011	31,498	13,730	3,557
Menominee	943,535	541,724	756,594	712,150	663,425
Crystal Falls	.....	.....	42,111	70,866	66,175
Iron River	.....	.....	31,595	129,590	90,204
Gogebic	.....	.....	.....	.....	1,022
Metropolitan	.....	.....	23,854	43,845	37,581
Calumet	.....	.....	5,847	29,239	3,627
Total	14,873,002	2,121,558	2,689,395	2,291,115	2,420,068

	1885.	1886.	1887.	1888.	1889.
Marquette	1,430,362	1,619,052	1,848,792	1,923,667	2,642,813
Gwinn	.....	8,328	2,142	.....	.....
Menominee	567,805	592,443	786,244	637,182	947,124
Crystal Falls	23,990	185,680	172,665	230,282	314,229
Iron River	55,693	86,366	116,006	115,744	180,340
Gogebic	114,393	658,951	1,069,409	1,249,415	1,575,989
Metropolitan	.....	6,393	9,070	3,490	.....
Calumet	.....	.....	.....	.....	.....
Total	2,192,243	3,157,213	4,004,328	4,159,780	5,660,495

	1890.	1891.	1892.	1893.	1894.
Marquette	2,993,663	2,504,941	2,637,453	1,816,797	2,060,260
Gwinn	.....	7,301	29,403	19,096	.....
Menominee	1,233,700	1,053,772	1,338,659	1,128,238	866,804
Crystal Falls	527,038	504,928	603,048	220,969	37,515
Iron River	159,494	81,082	46,921	3,917	.....
Gogebic	2,230,395	1,601,266	2,510,945	1,228,138	1,668,729
Metropolitan	.....	1,049	.....	.....	.....
Calumet	.....	.....	.....	.....	.....
Total	7,144,290	5,754,339	7,166,429	4,417,155	4,633,308

	1895.	1896.	1897.	1898.	1899.
Marquette	2,091,245	2,604,221	2,715,035	3,099,792	3,701,208
Gwinn	6,593	.....	.....	25,247	55,802
Menominee	1,471,543	1,139,996	1,516,004	1,816,638	2,348,205
Crystal Falls	202,600	288,209	284,986	356,268	716,971
Iron River	17,955	3,419	146	5,009	44,346
Gogebic	2,126,090	1,434,006	1,865,130	2,072,356	2,441,053
Metropolitan	.....	.....	.....	.....	.....
Calumet	.....	.....	.....	.....	.....
Total	5,916,026	5,469,851	6,381,301	7,375,310	9,307,585

SUMMARY OF IRON ORE SHIPMENTS FROM MICHIGAN RANGES. (GROSS TONS.)

(Continued.)

	1900.	1901.	1902.	1903.	1904.
Marquette	3,382,495	3,178,295	3,749,977	2,956,022	2,767,242
Gwinn	75,037	67,051	118,048	84,223	76,461
Menominee	2,312,779	2,660,030	3,001,189	2,528,819	1,712,800
Crystal Falls	720,066	696,844	1,003,785	824,461	917,969
Iron River	139,278	157,541	355,110	276,785	284,273
Gogebic	2,422,454	2,419,144	3,018,255	2,465,263	2,042,398
Metropolitan	.....	11,444	8,923	18,574	4,737
Calumet	.....	.....	.....	.....	.....
Total	9,072,109	9,190,349	11,255,287	9,154,147	7,805,880

	1905.	1906.	1907.	1908.	1909.
Marquette	4,086,493	3,935,293	3,907,955	2,214,782	3,983,436
Gwinn	129,079	166,894	380,118	199,850	272,736
Menominee	2,741,169	2,953,131	2,498,784	1,254,110	1,991,108
Crystal Falls	1,174,366	1,395,910	1,631,484	629,602	1,425,261
Iron River	337,973	568,469	589,946	630,745	1,152,076
Gogebic	3,215,352	3,113,981	3,093,083	2,348,626	3,402,415
Metropolitan	.....	.....	13,913	9,123	24,933
Calumet	.....	15,773	51,646	15,222	.....
Total	11,684,432	12,149,451	12,166,629	7,302,060	12,251,965

	1910.	1911.	1912.	Total.
Marquette	3,840,129	2,614,881	3,406,646	99,771,455
Gwinn	552,597	345,877	510,398	3,275,917
Menominee	1,674,447	1,431,840	1,538,746	49,360,737
Crystal Falls	1,206,592	1,254,135	1,304,739	19,033,744
Iron River	1,001,960	1,115,514	1,736,966	9,514,463
Gogebic	3,652,918	2,102,322	3,883,011	61,046,509
Metropolitan	26,462	33,758	12,468	289,617
Calumet	.....	.....	35,387	156,741
Total	11,955,105	8,898,327	12,428,361	242,449,183

SHIPMENTS OF IRON ORE FROM MICHIGAN RANGES BY COUNTIES.
(GROSS TONS.)

County.	1890 and prior years.	1891.	1892.	1893.	1894.
Gogebic	6,899,574	1,601,266	2,510,945	1,228,138	1,668,729
Iron	2,598,068	586,010	649,969	224,886	37,515
Dickinson	8,547,872	1,054,821	1,338,659	1,128,238	866,804
Marquette	32,542,296	2,493,690	2,659,662	1,835,893	2,060,260
Baraga	128,677	18,552	7,194	.....	.....
Total	50,716,487	5,754,339	7,166,429	4,417,155	4,633,308
	1895.	1896.	1897.	1898.	1899.
Gogebic	2,126,090	1,434,006	1,865,130	2,072,356	2,441,053
Iron	220,555	291,628	285,132	361,277	761,317
Dickinson	1,471,543	1,139,996	1,516,004	1,816,638	2,348,205
Marquette	2,097,838	2,604,221	2,715,035	3,125,039	3,733,775
Baraga	.....	.....	.....	.....	23,235
Total	5,916,026	5,469,851	6,381,301	7,375,310	9,307,585
	1900.	1901.	1902.	1903.	1904.
Gogebic	2,442,454	2,419,144	3,018,255	2,465,263	2,042,398
Iron	859,344	854,385	1,358,895	1,101,246	1,202,242
Dickinson	2,312,779	2,671,474	3,010,112	2,547,393	1,717,537
Marquette	3,393,618	3,241,008	3,808,244	2,905,597	2,817,195
Baraga	63,904	4,338	59,781	134,648	26,508
Total	9,072,099	9,190,349	11,255,287	9,154,147	7,805,880
	1905.	1906.	1907.	1908.	1909.
Gogebic	3,215,352	3,113,981	3,093,083	2,348,626	3,402,415
Iron	1,512,339	1,964,379	2,221,430	1,260,347	2,577,337
Dickinson	2,741,169	2,968,904	2,564,343	1,278,455	2,016,041
Marquette	4,175,605	4,097,111	4,154,288	2,305,366	3,888,055
Baraga	39,967	5,076	133,785	109,266	368,117
Total	11,684,432	12,149,451	12,166,929	7,302,060	12,251,965
			1910.	1911.	1912.
Gogebic			3,652,918	2,102,322	3,883,011
Iron			2,208,552	2,369,649	3,041,705
Dickinson			1,700,909	1,465,598	1,585,601
Marquette			4,236,311	2,871,116	3,864,101
Baraga			156,415	89,642	53,943
Total			11,955,105	8,898,327	12,428,361

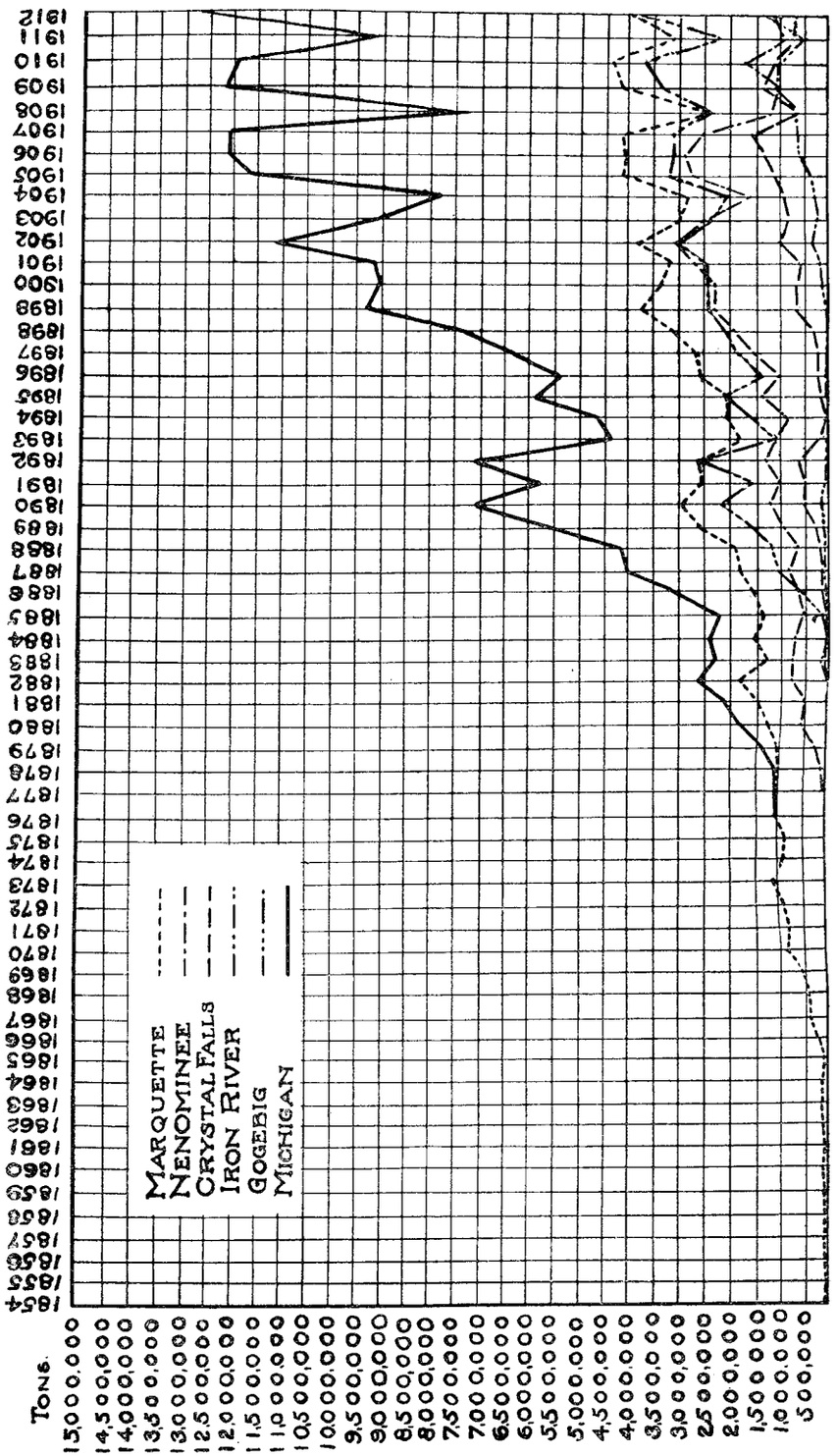

FIG. 1.—PRODUCTION CURVES FOR MICHIGAN IRON RANGES, 1854-1912.

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.

Name of Mine.	1870 and prior years.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
American (Sterling)											794
Ames											
Barnum (Cliff Shaft)[1]	92,662	45,939	38,381	48,076	41,403	43,209	37,632	37,909	26,680	24,015	24,522
Bay State							8,583			3,336	2,268
Bessemer (See Lillie)											
Bessie											
Beaufort (Ohio)											
Blue (See Queen Group)											
Boston (with American)											6,478
Braastad { Mitchell			197	8,658	7,549		5,596	3,898	4,259	11,131	13,279
Braastad { Winthrop	3,469	11,088	14,239	33,456	7,549	7,502	27,236	12,549	23,740	26,595	45,247
Breitung No. 1											
Breitung Hematite No. 2											
Buffalo[2]											
Cambria					2,610		6,329	10,083	3,754	6,724	6,958
Champion	100,951	67,588	68,408	72,782	47,097	56,877	66,002	70,883	73,464	94,027	112,401
Chester (See Rolling Mill)											
Chicago										949	2,415
Cleveland[3]	724,771	142,658	151,724	133,265	105,858	129,881	146,393	152,188	152,737	131,167	212,748
Cleveland Hematite (Included under Cleveland)											
Cleveland Cliffs Group[4]											
Columbia (Kloman)				21,065	35,088	8,059					6,663
Curry											
Dalliba (Phoenix)											
Detroit											
Dexter											
Dey											
East Champion				10,426	5,227	3,346	7,715	14,495	5,401	4,029	10,217
East New York											
Edison											
Edwards (See Sampson)											
Empire											
Erie											
Etna											
Fitch											
Foster[5]	43,998	13,532	18,684	18,107	4,719	847	125			4,804	1,122
Foxdale											
Gibson											
Goodrich							[10]6,338	503	7,547	3,992	11,131
Grand Rapids (Davis)											
Green Bay (See Bay State)											
Hartford											
Hortense (North Champion)											
Home (P. and L. S.) (Now Volunteer)			1,160	21,498	1,362				1,225	492	285
Humboldt (Washington)	219,353	48,725	38,841	38,014	27,890	9,642	3,333	16,545	23,921	18,204	14,726
Imperial											
Indiana (See Bay State)											
Iron Cliffs[6]											
Iron Mountain											
Jackson	1,005,937	132,297	119,910	130,131	105,600	90,568	98,480	80,340	83,121	103,219	120,620
Keystone (See East Champion)											
Lake[11]					31,526	26,370	22,539	19,112	28,161	25,321	14,928
Lake Angeline	226,881	33,645	35,221	43,933	114,074	129,339	111,766	127,349	109,674	173,938	204,094
Lake Superior	932,792	158,047	185,070	158,078			5,945	10,127	8,506	22,380	18,347
Lillie					2,642	10,407	17,276	19,691	30,180	28,962	31,206
Lloyd											
Lucy (McComber)	4,866	15,942	24,153	38,969							
Maas											
Magnetic (Stock Pile)											
Manganese (Negaunee)											
Marquette[7]											
Mary Charlotte											
Mesabi's Friend											
Michigamme[6]			141	29,107	45,294	44,763	70,074	28,238	58,622	56,970	52,766

See foot notes 1, 2, 3, 4, 5, 6, 7 and 11 on page 136.

[10] Includes prior shipments.

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

Name of Mine.	1870 and prior years.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Miller											
Milwaukee-Davis										941	13,142
Mitchell											
Moore											
Morris											
National									4,191	33,310	29,351
Negaunee											
Negaunee Construction Works											
New York (York)	309,207	76,381	68,950	70,882	77,017	70,103	58,863	55,581	21,903	57,528	58,512
New York Hematite	1,809	2,921	9,925	6,629		987	556	3,307	4,547	2,609	2,192
North Champion (See Hortense)											
North Republic											
Nonpareil (St. Lawrence)											
Northwest											
Norwood											
Ogden											
Pascoe											
Pendill											
Palmer											
Palmer (Cascade) (See Volunteer)									4,000	12,549	3,959
Pioneer											
Pittsburg & Lake Angeline (See Lake Angeline)											
Platt											
Portland											
Primrose											
Prince of Wales[2]											
Quartz											
Queen[2]											
Queen Group[8]											
Republic											
Republic Reduction Co			11,025	105,453							
Richards					122,639	119,726	120,095	165,836	176,221	135,231	235,387
Richmond											
Riverside											
Rolling Mill		236	6,772	11,319							
Saginaw			18,503	37,138							
Salisbury[5]					16,643	37,806	53,265	38,121	30,773	10,039	15,172
Sam Mitchell (See Mitchell)			545	11,023	45,486	55,318	56,979	44,005	54,097	43,396	35,059
Sampson (Argyle)	68,514	26,437	28,380	38,968	6,730	4,571	20,510	37,869	52,155	39,293	21,457
Schadt					2,849	12,804	19,330	10,419	10,351	5,455	
Section 12										5,027	330
South Buffalo[2]					42,068	23,094	20,276	22,801	2,225	1,409	
Spurr				31,933	2,139					851	3,323
Star West (Wheat)				1,091							
St. Lawrence (See Nonpareil)											1,110
Sterling (See American)					18,198	4,071	15,324	20,211	4,704	24,141	38,596
Taylor											
Teal Lake (See Cambria)											
Titan											
Volunteer (See Also Home)		4,171	39,495	28,920							
Washington											
Webster											
West Republic											
Wetmore											
Wheeling											
Winthrop[9]											
Wheat (See Star West)											
Totals	3,735,210	779,607	879,724	1,148,921	919,257	889,290	1,006,560	1,002,060	1,006,159	1,112,034	1,370,805

See foot notes 2, 5, 8 and 9 on page 137.

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

Name of Mine.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.
American (Sterling)	4,702	8,006	3,618	2,916			1,483	13,699	20,032	21,000	21,604
Ames					47,458	52,975	16,123	10,211	12,835		
Barnum (Cliff Shaft)[1]											
Bay State	27,883	41,778	62,752	69,408							
Bessemer (See Lillie)	583	1,236	631								
Bessie											
Beaufort (Ohio)											
Blue (See Queen Group)		5,532	18,976	18,360	17,166	17,354	12,829				847
Boston (with American)											
Braastad { Mitchell	14,824	18,245	20,190	2,218							
Braastad { Winthrop	21,146	33,396									
	43,630	23,005	50,143	73,144	53,913	7,017 58,743	16,419 74,067	4,091 86,789	155,341		
Breitung No. 1											
Breitung Hematite No. 2											
Buffalo[2]											
Cambria											
Champion	19,246	64,545	47,508	59,742		10,860	24,686	30,801	50,919	100,464	
Chester (See Rolling Mill)	145,427	159,009	104,960	210,180	50,796 173,915	58,784 137,593	41,130 146,330	57,861 174,680	72,780 215,098	80,359 223,442	34,662 133,413
Chicago											
Cleveland[3]	5,531		117								
Cleveland Hematite (Included under Cleveland)	198,569	206,120	218,219								
Cleveland Cliffs Group[4]											
Columbia (Kloman)	11,158	12,066	714	225,674	218,757	203,664	207,441	184,316	274,048	331,713	221,788
Curry											
Dalliba (Phoenix)											
Detroit	10,986	44,836	1,687						16,671		
Dexter		5,402	12,314	3,809			1,605				
Dey			4,878	16,202	19,125 750	39,400	26,099	18,500 1,821	10,112 3,895	6,080 9,136	5,448
East Champion				2,709							
East New York	3,408	4,002	5,039								
Edison									2,697		
Edwards (See Sampson)								13,694	29,739	36,431	50,293
Empire									893		
Erie											
Etna		2,731	5,405								
Fitch			1,091								
Foster[5]											
Foxdale	3,011	11,648	10,029	9,675	9,643					16,550 21,949	15,093
Gibson											
Goodrich											
Grand Rapids (Davis)	10,245	9,998			1,515	12,142	2,700				
Green Bay (See Bay State)											
Hartford							1,200	11,611	20,058	26,426	9,362
Hortense (North Champion)									566		
Home (P. and L. S.) (Now Volunteer)											
Humboldt (Washington)							886	5,685	7,757	16,246	
Imperial	26,302	43,463	31,866	23,763	11,766	20,207	19,873	11,655	15,866	23,259	19,879
Indiana (See Bay State)										38,460	18,552
Iron Cliffs[6]											
Iron Mountain											
Jackson							87,346	78,520	134,616	188,776	278,270
Keystone (See East Champion)	118,939	96,830	71,278	83,251			393				
Lake[10]					68,657	89,370	109,906	101,909	128,891	124,682	92,979
Lake Angeline	18,060	14,326	27,259	86,922	111,051	131,731	191,120	223,600	229,070	261,680	241,605
Lake Superior	262,235	296,509	200,799	204,796	226,040	267,622	302,909	240,225	288,784	318,321	308,831
Lillie	16,748	27,494	4,614	2,683	708	3,957	23,041	32,692	33,916	31,812	19,551
Lloyd							12,139	22,276	32,982	43,483	27,683
Lucy (McComber)	28,051	40,406	14,676		3,111	1,367					
Maas						5,229	20,441	7,000	70,128	23,692	16,802
Magnetic (Stock Pile)					12,373	48,790	58,726	36,448	56,999	80,777	23,169
Manganese (Negaunee)											
Marquette[7]			397	1,484							
Mary Charlotte											
Mesabi's Friend											
Michigamme[8]	57,272	43,712	42,533	25,935							

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

Name of Mine.	1881.	1882.	1883.	1884.
Miller				
Milwaukee-Davis	31,635	40,891	805	25,991
Mitchell				
Moore				
Morris				
National	24,833	23,366	21,178	13,987
Negaunee				
Negaunee Construction Works		1,177	10,394	43
New York (York)	50,074	56,806	1,517	1,677
New York Hematite		2,105		
North Champion (See Hortense)				
North Republic				
Nonpareil (St. Lawrence)		9,998	11,961	
Northwest				
Norwood				
Ogden				
Pascoe		18,880		12,605
Pendill	13,586	9,987	318	1,594
Palmer				
Palmer (Cascade) (See Volunteer)				
Pioneer				
Pittsburg & Lake Angeline (See Lake Angeline)				
Platt				
Portland				
Primrose				
Prince of Wales[2]				
Quartz				
Queen[2]				
Queen Group[3]				
Republic	233,786	235,109	152,565	277,757
Republic Reduction Co				
Richards				
Richmond				
Riverside				
Rolling Mill	1,668	163	1,528	1,820
Saginaw	30,793	16,276	9,108	946
Salisbury[5]	43,690	42,243	17,028	26,629
Sam Mitchell (See Mitchell)				
Sampson (Argyle)	4,584	12,421	15,700	1,334
Schadt				
Section 12	13,243	3,287		
South Buffalo[2]				
Spurr	2,746	8,873	9,067	
Star West (Wheat)	9,040	9,554	6,625	6,824
St. Lawrence (See Nonpareil)				
Sterling (See American)				
Taylor	10,559	15,146	6,155	
Teal Lake (See Cambria)				
Titan		1,778	13,128	19,411
Volunteer (See Also Home)	39,276	41,456	19,414	11,748
Washington				
Webster		4,443		934
West Republic	7,354	27,865	30,734	19,623
Wetmore		1,777	2,777	4,585
Wheeling				4,098
Winthrop[9]				
Wheat (See Star West)				
Totals	1,564,823	1,797,896	1,291,695	1,554,477

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

1885.	1886.	1887.	1888.	1889.	1890.	1891.
38,465	46,693	50,490	48,908	52,727	24,763	
	8,823	8,411	546			
		5,259	45,304	78,318	76,488	64,218
	1,094					
		5,128		12,844	2,422	
			289			
		1,436				
		2,200	3,553			
18,249	10,072					
	5,140	1,203	9,066			
					32,415	
				491		
			5,527	66,122	109,217	
						479,509
250,835	241,161	220,624	235,062	287,390	220,065	191,127
		87	21,050	22,122	3,915	
		1,374				
			5,622	3,712		6,783
3,437	4,403	1,058	402			
						4,320
29,503	51,667	48,304	74,947	72,449	85,798	
	1,133		4,512	2,796	1,218	
		4,964	24,706	69,359	146,383	
	752					
9,200	15,867	17,538	4,987	7,997	15,141	4,412
23,340	13,865	16,003	2,846			
5,679	24,034	47,486	56,321	60,156	141,524	92,699
	6,229	2,054		448		
12,700	10,558	12,872	9,861	1,510		
5,887	10,756	3,335	2,074	19,679		
6,323		74			109,576	122,042
1,430,362	1,619,052	1,848,792	1,923,667	2,642,813	2,993,663	2,504,941

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

Name of Mine.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
American (Sterling)	15,076										
Ames											
Barnum (Cliff Shaft)[1]		1,103	5,195								
Bay State											
Bessemer (See Lillie)											
Bessie											
Beaufort (Ohio)											
Blue (See Queen Group)											5,007
Boston (with American)									1,583	4,338	59,781
Braastad { Mitchell					587						
Braastad { Winthrop											
Breitung No. 1											
Breitung Hematite No. 2											
Buffalo[2]											
Cambria											
Champion	41,549	30,445	47,218	41,656	95,086	110,648	102,623	124,930	80,432	68,907	63,976
Chester (See Rolling Mill)	109,979	61,648	42,788	100,398	113,375	141,728	163,190	215,074	113,743	99,026	205,721
Chicago											
Cleveland[3]											
Cleveland Hematite (Included under Cleveland)											
Cleveland Cliffs Group[4]	310,907	218,105	143,706	221,153	513,119	718,408	869,482	1,011,048	881,021	860,484	1,104,864
Columbia (Kloman)											
Curry											
Dalliba (Phoenix)											
Detroit											
Dexter	13,000	7,833	21,740	13,752	18,903	1,154					
Dey											
East Champion											
East New York											
Edison	35,175	911									
Edwards (See Sampson)									27,987	31,696	38,761
Empire											
Erie											
Etna											
Fitch											
Foster[5]				174							
Foxdale											
Gibson											
Goodrich											
Grand Rapids (Davis)										4,647	15,015
Green Bay (See Bay State)	22,823	352	12,073	6,764							
Hartford	5,678	6,513	940		67						
Hortense (North Champion)					1,532						7,440
Home (P. and L. S.) (Now Volunteer)											
Humboldt (Washington)	4,571										
Imperial	7,194				2,297						
Indiana (See Bay State)								23,235	62,321		
Iron Cliffs[6]	289,395	130,812	253,760	259,042							
Iron Mountain											
Jackson	92,567	51,009	32,288	42,186	80,710	79,102	55,012	88,230	31,714	38,271	15,449
Keystone (See East Champion)											
Lake[11]					342,251	489,685	460,333	464,988	389,128	481,574	304,125
Lake Angeline	287,517	351,973	355,453	313,555	459,576	376,761	686,563	682,595	709,143	635,642	832,796
Lake Superior	366,715	329,610	344,758	342,439	107,532	112,781	211,023	196,200	114,990	98,788	79,919
Lillie	29,005	68,861	78,388	54,285		10,033	11,846				
Lloyd											
Lucy (McComber)	26,326	21,964									
Maas											
Magnetic (Stock Pile)											
Manganese (Negaunee)											
Marquette[7]	9,555										
Mary Charlotte											
Mesabi's Friend											
Michigamme[6]	1,894	935	1,610	5,503	10,540						
				3,214							

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

Name of Mine.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Miller											
Milwaukee-Davis											
Mitchell											
Moore											
Morris									4,648	37,655	
National											
Negaunee	85,846	69,732	132,581	90,682	175,394	182,169	191,330	195,573	126,829	234,713	204,286
Negaunee Construction Works											
New York (York)	11,220	25,000	21,487					6,642	3,327		
New York Hematite											
North Champion (See Hortense)											
North Republic											
Nonpareil (St. Lawrence)											
Northwest	1,687										
Norwood											
Ogden						986					
Pascoe											
Pendill					1,041						
Palmer											
Palmer (Cascade) (See Volunteer)											
Pioneer											
Pittsburg & Lake Angeline (See Lake Angeline)											
Platt	2,676	5,448	41,226	13,198	11,296						
Portland											
Primrose					6,040						
Prince of Wales[2]											
Quartz											
Queen[2]											
Queen Group[3]	379,719	120,673	252,469	204,957	323,057	242,293	61,022	342,978	398,298	400,845	418,044
Republic	167,991	64,195	105,719	174,027	127,360	124,342	140,312	137,085	130,126	104,604	157,646
Republic Reduction Co											
Richards						6,887					
Richmond					1,088	4,630	24,464	4,613	51,303	54,181	50,041
Riverside		43									
Rolling Mill						3,975			22,585	22,815	24,874
Saginaw											
Salisbury[5]											
Sam Mitchell (See Mitchell)											
Sampson (Argyle)	600										
Schadt											
Section 12				1,261							
South Buffalo[2]											
Spurr											
Star West (Wheat)			5,550	51,207	9,658	942		6,716	15,987		
St. Lawrence (See Nonpareil)											
Sterling (See American)											
Taylor											
Teal Lake (See Cambria)											
Titan											
Volunteer (See Also Home)	127,130	69,561	26,946	32,672	53,216	1,617		29,983	47,578		32,736
Washington											
Webster											
West Republic									20,797		
Wetmore											
Wheeling	191,658										
Winthrop[9]		180,071	134,365	119,120	150,496	106,894	122,592	171,318	148,945	109	129,496
Wheat (See Star West)											
Totals	2,637,453	1,816,797	2,060,260	2,091,245	2,604,221	2,715,035	3,099,792	3,701,208	3,382,495	3,178,295	3,749,977

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued*

Name of Mine.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	Totals.
American (Sterling)				419	13,764	23,222	90,001	163,290	195,197	122,211	721,034
Ames											6,298
Barnum (Cliff Shaft)[1]											801,851
Bay State											16,637
Bessemer (See Lillie)											
Bessie	29,718		21,879	1,646							59,097
Beaufort (Ohio)	134,648	25,781	38,306		78,029	61,035	72,987	23,427	2,683		592,815
Blue (See Queen Group)											
Boston (with American)											62,542
Braastad { Mitchell											136,636
Braastad { Winthrop											831,445
Breitung No. 1									63,497	57,085	120,582
Breitung Hematite No. 2	7,854	9,869		83,671	59,667	55,849	129,673	114,202	72,688	63,995	597,468
Buffalo[2]											217,730
Cambria	41,168	84,852	81,791	40,628	135,145	85,977	136,815	150,422	85,954	69,904	2,343,997
Champion	74,238	174	64,680	115,007	107,577	313	11,199	18,746			4,413,131
Chester (See Rolling Mill)											
Chicago											9,012
Cleveland[3]											2,806,298
Cleveland Hematite (Included under Cleveland)											
Cleveland Cliffs Group[4]	810,845	743,263	1,288,416	1,330,944	1,030,928	438,379	877,433	955,374	514,305	1,032,836	17,742,421
Columbia (Kloman)											94,813
Curry											16,671
Dalliba (Phoenix)											59,114
Detroit											140,841
Dexter											118,512
Dey											2,709
East Champion											76,002
East New York	22,523	7,299	33,095								327,604
Edison											893
Edwards (See Sampson)											
Empire					40,565	53,537	108,993	53,687	16,954	33,124	306,860
Erie											8,136
Etna											1,091
Fitch											31,817
Foster[5]											171,893
Foxdale	5,053	3,429	3,303								31,447
Gibson											16,357
Goodrich											49,754
Grand Rapids (Davis)											110,736
Green Bay (See Bay State)											
Hartford	20,085	179,980	322,209	364,801	328,161	278,366	250,680	183,471			1,950,422
Hortense (North Champion)											30,574
Home (P. and L. S.) (Now Volunteer)											26,022
Humboldt (Washington)											713,961
Imperial		727	1,661	5,076	55,756	48,231	115,478	83,404	86,959	53,943	600,997
Indiana (See Bay State)											
Iron Cliffs[6]											1,700,537
Iron Mountain											393
Jackson	5,409		33,180	5,066	61,345		11,060	40,320	22,303	53,559	3,995,695
Keystone (See East Champion)											
Lake[11]					283,373	220,410	280,298	244,923	167,258	151,910	8,849,550
Lake Angeline	310,950	262,486	374,183	269,116							
Lake Superior	604,829	590,339	727,378	635,671	674,066	261,955	349,435	271,445	167,352	169,326	15,539,686
Lillie	77,454	63,209	9,868	32,781	80,545	8,632	61,708	10,121	25,597	26,119	1,810,327
Lloyd									28,003	44,224	72,227
Lucy (McComber)				85		1,115	1,672	11,257	16,676	72,724	619,688
Maas					32,378	29,036	159,197	208,103	24,926	46,664	500,304
Magnetic (Stock Pile)				292							292
Manganese (Negaunee)											6,359
Marquette[7]											152,847
Mary Charlotte	34,303	48,885	221,738	257,088	155,633	99,104	240,433	197,522	340,335	250,700	1,845,741
Mesabi's Friend											16,043
Michigamme[6]											880,362

IRON ORE SHIPMENTS FROM THE MARQUETTE RANGE.—*Continued.*

Name of Mine.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	Totals.
Miller											
Milwaukee-Davis											
Mitchell									7,781	11,536	394,768
Moore		25,828				11,539		23,428	21,387	21,141	95,275
Morris											68,131
National										1,529	1,529
											150,216
Negaunee	224,665	145,132	239,554	253,448	196,170	232,219	312,217	348,818	140,040	442,190	4,493,175
Negaunee Construction Works											12,708
New York (York)											1,123,071
New York Hematite											37,587
North Champion (See Hortense)											
North Republic											289
Nonpareil (St. Lawrence)											23,395
Northwest											1,687
Norwood											5,753
Ogden											986
Pascoe											59,806
Pendill											45,993
Palmer				13,131							14,172
Palmer (Cascade) (See Volunteer)											
Pioneer											15,409
Pittsburg & Lake Angeline (See Lake Angeline)											
Platt											
Portland							79,652	49,584			73,844
Primrose											129,236
Prince of Wales[2]											6,040
											32,415
Quartz											491
Queen[2]											180,866
Queen Group[3]	254,658	311,479	253,377	221,096	309,917	104,098	237,509	230,119	295,962	224,862	6,066,941
Republic	155,415	124,506	150,699	177,220	170,554	67,999	176,575	150,732	113,137	156,867	6,614,205
Republic Reduction Co											47,174
Richards											8,261
Richmond	55,593	68,134	86,129	89,563	35,156	60,994	102,566	95,772	47,293	117,873	949,393
Riverside											16,160
Rolling Mill	6,786		28,766		49,204	52,147	133,139	115,193	96,584	115,784	906,477
Saginaw											451,424
Salisbury[5]											686,411
Sam Mitchell (See Mitchell)											
Sampson (Argyle)											267,805
Schadt											1,261
Section 12											21,887
South Buffalo[2]											245,412
Spurr											165,244
Star West (Wheat)											204,649
St. Lawrence (See Nonpareil)											
Sterling (See American)											
Taylor											32,970
Teal Lake (See Cambria)											
Titan											90,371
Volunteer (See Also Home)	7,395	71,870	106,281	38,544	10,022				51,240	9,008	1,453,423
Washington						20,625	44,716	96,769	62,010	66,540	290,660
Webster											34,905
West Republic											133,077
Wetmore											50,870
Wheeling											433,771
Winthrop[9]	72,433										1,335,839
Wheat (See Star West)											
Totals	2,956,022	2,767,242	4,086,493	3,935,293	3,907,955	2,214,782	3,983,436	3,840,129	2,666,121	3,415,654	99,831,703

[1]Under Iron Cliffs 1890-1895; under Cleveland-Cliffs group after 1895.
[2]Under Queen group after 1890.
[3]Under Cleveland-Cliffs group after 1883.
[4]Includes Cleveland after 1883; includes Barnum, Foster, Iron Cliffs, Michigamme and Salisbury after 1895.
[5]Under Iron Cliffs 1891-1895; under Cleveland-Cliffs group after 1895.
[6]Under Cleveland-Cliffs group after 1895.
[7]Under Winthrop after 1892.
[8]Includes Buffalo, Prince of Wales, Queen and South Buffalo after 1890.
[9]Prior to 1890, see Braastad; includes Marquette after 1892.
[11]Included in Cleveland Cliffs Group.

IRON ORE SHIPMENTS FROM THE GOGEBIC RANGE, MICHIGAN.[1]

	1884.	1885.	1886.	1887.	1888.
Ada (included in Ironton)					
Anvil				10,075	24,676
Ashland		6,741	74,015	175,563	174,183
Aurora		5,422	94,553	159,253	179,937
Bessemer			4,788	16,101	
Blue Jacket				1,799	
Brotherton			8,880	21,721	40,639
Castile					
Chicago					
Colby	1,022	84,303	257,432	258,518	285,880
Davis (Wisconsin)					
Eureka					
Federal					
First National				1,997	
Geneva					
Imperial (see Federal)					
Iron Chief			9,950	2,249	
Iron Chief No. 2			551		
Iron King (see Newport)					
Ironton			18,424	24,762	
Jack Pot					
Meteor (Comet)					
Mikado					
New Davis (see Davis)					
Newport			20,184	75,660	69,145
Norrie Group		15,419	124,844	237,254	412,196
Pabst		1,103	17,979	19,906	49,976
Palms				1,414	9,725
Pike					
Puritan (Ruby)			16,388	45,000	3,058
Sparta					
Sunday Lake		1,405	10,963	18,137	
Tilden					
Vaughn (see Aurora)					
Wisconsin (see Davis)					
Yale (West Colby)					
Total	1,022	114,393	658,951	1,069,409	1,249,415

[1]From Iron Trade Review.

IRON ORE SHIPMENTS FROM THE GOGEBIC RANGE, MICHIGAN.

(Continued.)

	1889.	1890.	1891.	1892.	1893.
Ada (included in Ironton)					
Anvil	47,000	73	42,090		
Ashland	257,915	435,949	267,439	231,896	66,067
Aurora	199,865	246,695	83,554	319,482	179,028
Bessemer					
Blue Jacket					
Brotherton	53,267	80,486	46,574	130,833	18,905
Castile					
Chicago					
Colby	136,833	193,038	9,619	69,968	59,346
Davis (Wisconsin)		1,497		21,754	15,210
Eureka		23,794	13,907	10,655	31,385
Federal		21,150	6,778	8,515	
First National					
Geneva					
Imperial (see Federal)					
Iron Chief					
Iron Chief No. 2					
Iron King (see Newport)					
Ironton	8,635	6,247	300		
Jack Pot				3,944	1,651
Meteor (Comet)		2,882	10,144	54,779	9,604
Mikado					
New Davis (see Davis)					
Newport	36,987	71,488	105,606	165,962	109,718
Norrie Group	674,394	906,728	758,572	985,216	472,062
Pabst	116,376	172,060	130,226	113,245	104,510
Palms	35,245	50,604	32,227	102,382	2,658
Pike					
Puritan (Ruby)	9,472	11,694	913		
Sparta				2,912	
Sunday Lake		6,010	64,902	56,046	22,876
Tilden			28,415	233,356	135,118
Vaughn (see Aurora)					
Wisconsin (see Davis)					
Yale (West Colby)					
Total	1,575,989	2,230,395	1,601,266	2,510,945	1,228,138

IRON ORE SHIPMENTS FROM THE GOGEBIC RANGE, MICHIGAN.

(*Continued.*)

	1894.	1895.	1896.	1897.	1898.
Ada (included in Ironton)	.....	.....	.....	.....	.....
Anvil	13,297	68,064	57,483	.....	5,037
Ashland	83,020	126,096	91,149	111,625	123,208
Aurora	203,152	245,883	187,169	166,122	133,076
Bessemer	.....	.....	.....	.....	.....
Blue Jacket	.....	.....	.....	.....	.....
Brotherton	47,148	40,567	50,490	46,186	73,198
Castile	.....	.....	.....	.....	.....
Chicago	.....	.....	504	.....	.....
Colby	32,616	.....	48,492	22,921	152,875
Davis (Wisconsin)	.....	10,253	.....	.....	.....
Eureka	18,329	26,105	4,544	.....	.....
Federal	.....	.....	.....	.....	.....
First National	.....	.....	.....	.....	.....
Geneva	.....	.....	.....	.....	.....
Imperial (see Federal)	.....	.....	.....	.....	.....
Iron Chief	.....	.....	.....	.....	.....
Iron Chief No. 2	.....	.....	.....	.....	.....
Iron King (see Newport)	.....	.....	.....	.....	.....
Ironton	.....	.....	.....	.....	.....
Jack Pot	.....	.....	.....	1,265	.....
Meteor (Comet)	11,782	.....	.....	.....	.....
Mikado	.....	4,788	.....	11,397	.....
New Davis (see Davis)	.....	.....	.....	.....	.....
Newport	150,392	157,821	142,369	150,979	196,953
Norrie Group	621,608	738,480	329,068	604,281	700,990
Pabst	206,074	219,960	68,984	220,496	223,891
Palms	37,911	46,965	114,108	207,153	175,925
Pike	.....	.....	.....	.....	.....
Puritan (Ruby)	.....	.....	.....	.....	.....
Sparta	.....	1,950	.....	.....	.....
Sunday Lake	34,323	20,970	89,441	45,815	.....
Tilden	209,077	418,188	250,205	276,890	287,203
Vaughn (see Aurora)	.....	.....	.....	.....	.....
Wisconsin (see Davis)	.....	.....	.....	.....	.....
Yale (West Colby)	.....	.....	.....	.....	.....
Total	1,668,729	2,126,090	1,434,006	1,865,130	2,072,356

IRON ORE SHIPMENTS FROM THE GOGEBIC RANGE, MICHIGAN.

(*Continued.*)

	1899.	1900.	1901.	1902.	1903.
Ada (included in Ironton)	.....	.....	.....	.....	.....
Anvil	.....	.....	1,101	135,502	11,309
Ashland	154,615	232,961	286,399	301,824	274,138
Aurora	170,369	193,111	223,747	402,981	355,365
Bessemer	.....	.....	.....	.....	.....
Blue Jacket	.....	.....	.....	.....	.....
Brotherton	78,858	89,804	103,109	53,255	94,986
Castile	.....	.....	.....	.....	.....
Chicago	.....	633	.....	44,625	22,965
Colby	103,239	32,572	23,475	22,526	54,915
Davis (Wisconsin)	5,029	3,569	.....	31,530	734
Eureka	.....	.....	.....	.....	.....
Federal	.....	.....	.....	.....	.....
First National	.....	.....	.....	.....	.....
Geneva	.....	.....	.....	.....	7,108
Imperial (see Federal)	.....	.....	.....	.....	.....
Iron Chief	.....	.....	.....	.....	.....
Iron Chief No. 2	.....	.....	.....	.....	.....
Iron King (see Newport)	.....	.....	.....	.....	.....
Ironton	7,977	25,047	.....	8,555	16,875
Jack Pot	.....	33,893	19,988	102	31,709
Meteor (Comet)	332	7,844	34,140	19,117	6,156
Mikado	10,324	1,090	91,846	98,834	108,709
New Davis (see Davis)	.....	.....	.....	.....	.....
Newport	263,711	217,201	190,448	141,571	279,905
Norrie Group	714,669	666,389	660,965	1,080,032	790,346
Pabst	263,869	239,242	198,686	.....	.....
Palms	154,705	139,658	7,603	32,113	60,800
Pike	.....	3,434	6,346	6,343	115
Puritan (Ruby)	.....	.....	21,788	.....	.....
Sparta	.....	.....	.....	.....	.....
Sunday Lake	12,526	74,097	89,997	144,630	91,383
Tilden	500,830	481,909	446,670	468,672	211,534
Vaughn (see Aurora)	.....	.....	.....	.....	.....
Wisconsin (see Davis)	.....	.....	.....	.....	.....
Yale (West Colby)	.....	.....	12,836	26,043	46,211
Total	2,441,053	2,442,454	2,419,144	3,018,255	2,465,263

IRON ORE SHIPMENTS FROM THE GOGEBIC RANGE, MICHIGAN.

(*Continued.*)

	1904.	1905.	1906.	1907.	1908.
Ada (included in Ironton)	.....	.....	.....	.....	.....
Anvil	45,595	82,118	79,493	39,495	35,937
Ashland	344,102	409,131	341,841	298,056	259,611
Aurora	212,920	.....	.....	.....	.....
Bessemer	.....	.....	.....	.....	.....
Blue Jacket	.....	.....	.....	.....	.....
Brotherton	84,870	137,351	147,281	104,224	96,776
Castile	.....	.....	2,108	6,157	.....
Chicago	.....	.....	.....	.....	.....
Colby	81,141	83,736	113,001	94,480	58,305
Davis (Wisconsin)	11,225	3,160	.....	.....	.....
Eureka	.....	.....	37,525	57,904	122,324
Federal	.....	.....	.....	.....	.....
First National	.....	.....	.....	.....	.....
Geneva	.....	.....	.....	.....	.....
Imperial (see Federal)	.....	.....	.....	.....	.....
Iron Chief	.....	.....	.....	.....	.....
Iron Chief No. 2	.....	.....	.....	.....	.....
Iron King (see Newport)	.....	.....	.....	.....	.....
Ironton	23,197	41,314	106,158	190,968	92,932
Jack Pot	6,538	.....	.....	.....	.....
Meteor (Comet)	59,589	.....	.....	.....	.....
Mikado	25,611	140,740	154,043	163,891	86,617
New Davis (see Davis)	.....	.....	.....	.....	.....
Newport	171,931	438,023	549,745	551,496	579,390
Norrie Group	618,638	1,527,128	1,245,997	1,109,085	773,243
Pabst	.....	.....	.....	.....	.....
Palms	53,718	13,953	5,622	.....	.....
Pike	.....	11,161	17,934	24,922	6,303
Puritan (Ruby)	1,259	.....	.....	.....	.....
Sparta	.....	.....	.....	.....	.....
Sunday Lake	50,625	79,209	86,879	101,899	111,130
Tilden	204,581	188,104	169,697	312,496	111,184
Vaughn (see Aurora)	.....	.....	.....	.....	.....
Wisconsin (see Davis)	.....	.....	.....	.....	.....
Yale (West Colby)	46,860	60,224	56,657	38,010	14,874
Total	2,042,398	3,215,352	3,113,981	3,093,083	2,348,626

IRON ORE SHIPMENTS FROM THE GOGEBIC RANGE, MICHIGAN.

(*Concluded.*)

	1909.	1910.	1911.	1912.	Total.
Ada (included in Ironton)	.....	.....	.....	.....	.....
Anvil	22,927	7,235	310	55,610	784,427
Ashland	259,612	231,506	151,478	211,927	5,982,067
Asteroid	.....	.....	20,569	70,239	90,808
Aurora (Norrie-Aurora Group after 1910)	.....	.....	.....	.....	3,961,684
Bessemer	.....	.....	.....	.....	20,889
Blue Jacket	.....	.....	.....	.....	1,799
Brotherton	103,090	102,626	65,015	148,930	2,069,069
Castile	26,982	20,197	23,597	136,703	215,744
Chicago	.....	.....	.....	.....	68,727
Colby	170,095	194,754	41,673	245,195	2,931,970
Davis (Wisconsin)	.....	.....	.....	.....	103,961
Eureka	115,662	41,611	98,609	65,723	668,077
Federal	.....	.....	.....	.....	36,443
First National	.....	.....	.....	.....	1,997
Geneva	.....	.....	.....	.....	7,108
Imperial (see Federal)	.....	.....	.....	.....	.....
Iron Chief	.....	.....	.....	.....	12,199
Iron Chief No. 2	.....	.....	.....	.....	551
Iron King (see Newport)	.....	.....	.....	.....	.....
Ironton	277,594	109,025	63,359	173,135	1,195,404
Jack Pot	.....	.....	.....	.....	99,090
Meteor (Comet)	.....	.....	.....	.....	216,367
Mikado	99,195	52,715	.....	.....	1,049,800
New Davis (see Davis)	.....	.....	.....	.....	.....
Newport and Bonnie	1,008,354	1,182,324	555,853	966,435	8,549,651
Norrie-Aurora Group (after 1910)	977,054	1,333,006	883,910	1,500,758	21,462,332
Pabst (Norrie-Aurora Group)	.....	.....	.....	.....	2,366,583
Palms	.....	.....	.....	39,152	1,323,641
Pike	22,174	3,324	.....	.....	102,056
Puritan (Ruby)	.....	50,019	.....	90,683	250,274
Sparta	.....	.....	.....	.....	4,862
Sunday Lake	93,712	115,486	56,096	155,485	1,634,042
Tilden	154,506	99,937	138,387	158,191	5,485,150
Vaughn (see Aurora) (Norrie-Aurora Group after 1910)	.....	.....	.....	.....	.....
Wisconsin (see Davis)	.....	.....	.....	.....	.....
Yale (West Colby)	71,458	108,253	154,944	76,772	713,142
Total	3,402,415	3,652,918	2,253,800	4,094,938	61,409,914

IRON ORE SHIPMENTS FROM THE IRON RIVER DISTRICT, MICHIGAN.[1]

	1882.	1883.	1884.	1885.	1886.
Baker					
Baltic					
Berkshire					
Beta					1,585
Caspian					
Chatham					
Davidson No. 1					
Davidson No. 2					
Chicagon					
Fogarty					
Hiawatha					
Iron River	29,115	100,369	52,584	55,693	78,591
James (Osana)					
Dober					
Nanaimo	2,480	29,221	37,620		5,400
Riverton					
Selden					790
Sheridan					
Tully					
Youngs					
Zimmerman					
Total	31,595	129,590	90,204	55,693	86,366

	1887.	1888.	1889.	1890.	1891.
Baker					
Baltic					
Berkshire					
Beta	1,226				1,400
Caspian					
Chatham					
Davidson No. 1					
Davidson No. 2					
Chicagon					
Fogarty					
Hiawatha					
Iron River	83,018	110,000	179,238	155,458	59,345
James (Osana)					
Dober					
Nanaimo	30,460	5,744		3,441	13,200
Riverton					
Selden	1,302				
Sheridan			1,102	595	7,137
Tully					
Youngs					
Zimmerman					
Total	116,006	115,744	180,340	159,494	81,082

[1]From Iron Trade Review.

IRON ORE SHIPMENTS FROM THE IRON RIVER DISTRICT, MICHIGAN.

(*Continued.*)

	1892.	1893.	1894.	1895.	1896.
Baker					
Baltic					
Berkshire					
Beta					
Caspian					
Chatham					
Davidson No. 1					
Davidson No. 2					
Chicagon					
Fogarty					
Hiawatha		1,683		1,201	
Iron River	1,176				
James (Osana)					
Dober					
Nanaimo					
Riverton					
Selden					
Sheridan	45,744	2,234		16,754	3,419
Tully					
Youngs					
Zimmerman					
Total	46,921	3,917		17,955	3,419

	1897.	1898.	1899.	1900.	1901.
Baker					
Baltic					17,326
Berkshire					
Beta					
Caspian					
Chatham					
Davidson No. 1					
Davidson No. 2					
Chicagon					
Fogarty					
Hiawatha				11,008	20,355
Iron River					
James (Osana)					
Dober		5,009	10,980	49,203	
Nanaimo					
Riverton			2,262	71,004	119,860
Selden					
Sheridan	146		31,104	8,063	
Tully					
Youngs					
Zimmerman					
Total	146	5,009	44,346	139,278	157,541

IRON ORE SHIPMENTS FROM THE IRON RIVER DISTRICT, MICHIGAN.

(Concluded)

	1902.	1903.	1904.	1905.	1906.
Baker					
Baltic	64,664	123,236	151,114	133,246	186,495
Berkshire					
Beta					
Caspian		2,088	4,242	10,248	80,875
Chatham					
Davidson No. 1					
Davidson No. 2					
Chicagon					
Fogarty					
Hiawatha	74,596	53,828	38,288	9,704	20
Iron River					
James (Osana)					
Dober					
Nanaimo			9,086	91,238	91,792
Riverton	215,850	97,633	81,543	82,611	161,704
Selden					
Sheridan					
Tully					
Youngs				10,926	47,583
Zimmerman					
Total	355,110	276,785	284,273	337,973	568,469

	1907.	1908.	1909.	1910.	1911.	1912.	Total.
Baker			45,003	39,417	3,290		87,710
Baltic	189,119	129,037	174,426	171,930	66,502	100,736	1,507,831
Berkshire		3,440	34,295	97,999	22,272	33,422	191,428
Beta							4,211
Caspian	138,867	102,628	189,023	171,334	165,660	306,914	1,171,879
Cortland						17,499	17,499
Chatham	14,883	45,826	68,730	51,988	58,054	135,298	374,779
Davidson No. 1					215	27,614	27,829
Davidson No. 2					45,219	98,760	143,979
Chicagon					108,947	149,619	258,566
Fogarty	7,949	32,560	77,356	51,071	67,616	84,074	320,626
Hiawatha		138,190	136,739	128,884	116,633	220,106	951,235
Iron River							904,587
James (Osana)	2,360	59,760	90,851	78,388	50,439	75,702	357,500
Dober							65,192
Nanaimo	53,778	305					373,765
Riverton	90,358	47,073	171,200	84,269	200,142	171,493	1,597,002
Selden							2,092
Sheridan							116,299
Tully				2,726	8,323		11,049
Virgil						3,750	3,750
Wauseca					749		749
Wickwire					1,919	40,417	42,336
Youngs	92,632	70,094	154,150	98,399	89,450	83,528	646,762
Zimmerman		1,832	10,303	25,555	110,084	187,584	335,358
Total	589,946	630,745	1,152,076	1,001,960	1,115,514	1,736,516	9,514,013

IRON ORE SHIPMENTS FROM THE CRYSTAL FALLS DISTRICT, MICHIGAN.[1]

	1882.	1883.	1884.	1885.	1886.
Alpha					
Armenia					50,275
Bristol (Claire)					
Columbia	15,948	4,334	6,774		14,282
Crystal Falls	1,341				
Delphic		3,410	508	9,880	17,648
Dunn					
Fairbanks	8,045	455			
Genesee (Ethel)					
Gibson					
Great Western	587	22,825	20,710		22,267
Hemlock					
Hilltop					
Hollister					
Hope					
Kimball					
Lamont (Monitor)					
Lee Peck					
Lincoln					
Manganate					
Mansfield					
Mastodon	3,477	18,577	18,187	11,737	41,640
McDonald					
Michigan					
Monongahela					
Paint River (Fairbanks)	6,515	5,973	11,652	2,373	13,933
Shelden & Shafer (Union) (see Columbia)					
South Mastodon					
Tobin					
Youngstown	6,198	15,292	8,344		25,635
Total	42,111	70,866	66,175	23,990	185,680

[1]From Iron Trade Review.

IRON ORE SHIPMENTS FROM THE CRYSTAL FALLS DISTRICT, MICHIGAN.

(Continued.)

	1887.	1888.	1889.	1890.	1891.
Alpha					
Armenia	26,649				
Bristol (Claire)					
Columbia	2,377	10,936	11,385	60,133	70,770
Crystal Falls				3,974	
Delphic	2,272				
Dunn	24,677	118,096	151,826	156,963	162,721
Fairbanks					
Genesee (Ethel)					
Gibson					
Great Western	23,239	21,860	38,454	72,546	62,464
Hemlock					35,531
Hilltop					
Hollister				2,020	1,057
Hope					
Kimball					
Lamont (Monitor)			12,348	31,139	26,226
Lee Peck					
Lincoln					1,813
Manganate				6,844	
Mansfield				18,303	49,836
Mastodon	48,792	51,463	63,511	66,526	45,370
McDonald					
Michigan					
Monongahela					
Paint River (Fairbanks)	10,240	12,506	32,700	62,654	45,435
Shelden & Shafer (Union) (see Columbia)					
South Mastodon		2,722	4,005	1,476	
Tobin					
Youngstown	34,418	12,699		44,460	3,705
Total	172,665	230,282	314,229	527,038	504,928

IRON ORE SHIPMENTS FROM THE CRYSTAL FALLS DISTRICT, MICHIGAN.

(Continued.)

	1892.	1893.	1894.	1895.	1896.
Alpha					
Armenia				2,045	
Bristol (Claire)	57,352	9,612			
Columbia	57,682	22,426	10,300	70,867	87,202
Crystal Falls				13,037	44,526
Delphic					52
Dunn	133,666	58,590	24,538	90,885	47,081
Fairbanks					
Genesee (Ethel)					
Gibson	16,357				
Great Western	87,487	661			14,643
Hemlock	65,459	11,323		949	94,645
Hilltop					
Hollister	1,021				
Hope	15,543	2,275			
Kimball					
Lamont (Monitor)	42,819	13,777	2,600		
Lee Peck	2,844				
Lincoln	26,019	8,757			
Manganate					
Mansfield	69,259	69,558			
Mastodon	9,150	23,485		23,733	60
McDonald					
Michigan		505	77	1,071	
Monongahela					
Paint River (Fairbanks)	18,390				
Shelden & Shafer (Union) (see Columbia)					
South Mastodon					
Tobin					
Youngstown				13	
Total	603,048	220,969	37,515	202,600	288,209

IRON ORE SHIPMENTS FROM THE CRYSTAL FALLS DISTRICT, MICHIGAN.

(*Continued.*)

	1897.	1898.	1899.	1900.	1901.
Alpha	.....	.....	.....	.....	.....
Armenia	.....	.....	.....	.....	18,750
Bristol (Claire)	.....	.....	80,915	51,639	36,593
Columbia	24,623	14,199	126,290	97,531	19,963
Crystal Falls	95,210	128,233	147,346	197,770	230,614
Delphic	.....	.....	.....	.....	.....
Dunn	31,062	49,381	7,458	.....	.....
Fairbanks	.....	.....	.....	.....	.....
Genesee (Ethel)	.....	.....	.....	.....	.....
Gibson	.....	.....	.....	.....	.....
Great Western	.....	33,851	43,316	98,550	123,261
Hemlock	96,032	69,865	110,269	72,413	149,966
Hilltop	.....	.....	3,496	6,410	2,503
Hollister	.....	.....	.....	.....	.....
Hope	.....	.....	.....	.....	.....
Kimball	.....	.....	.....	.....	.....
Lamont (Monitor)	.....	.....	67,652	31,323	.....
Lee Peck	.....	.....	.....	.....	.....
Lincoln	.....	.....	43,622	72,959	19,727
Manganate	.....	.....	.....	.....	.....
Mansfield	37,182	60,739	86,607	90,155	74,113
Mastodon	.....	.....	.....	.....	.....
McDonald	.....	.....	.....	.....	.....
Michigan	216	.....	.....	.....	.....
Monongahela	.....	.....	.....	.....	2,397
Paint River (Fairbanks)	.....	.....	.....	1,316	.....
Shelden & Shafer (Union) (see Columbia)	.....	.....	.....	.....	.....
South Mastodon	.....	.....	.....	.....	.....
Tobin	.....	.....	.....	.....	18,957
Youngstown	661	.....	.....	.....	.....
Total	284,986	356,268	716,971	720,066	696,844

IRON ORE SHIPMENTS FROM THE CRYSTAL FALLS DISTRICT, MICHIGAN.

(*Continued.*)

	1902.	1903.	1904.	1905.	1906.
Alpha	.....	1,370	.....	.....	.....
Armenia	100,864	31,901	16,577	.....	27,882
Bristol (Claire)	129,035	246,581	132,420	210,388	298,031
Columbia	186,798	.....	.....	27,883	.....
Crystal Falls	195,555	117,096	180,983	152,255	111,871
Delphic	.....	.....	.....	.....	.....
Dunn	2,816	5,365	.....	21,051	91,476
Fairbanks	.....	.....	.....	.....	.....
Genesee (Ethel)	14,455	61,694	132,380	77,370	80,971
Gibson	.....	.....	.....	.....	.....
Great Western	42,470	100,751	68,318	191,265	311,218
Hemlock	123,331	79,420	136,232	124,450	106,437
Hilltop	.....	.....	.....	.....	7,820
Hollister	.....	.....	.....	.....	.....
Hope	3,373	7,339	.....	.....	.....
Kimball	.....	.....	.....	.....	.....
Lamont (Monitor)	47,267	43,736	29,393	74,991	89,980
Lee Peck	.....	.....	.....	.....	.....
Lincoln	7,747	15,606	17,577	19,539	5,890
Manganate	.....	.....	.....	.....	.....
Mansfield	31,181	51,440	79,163	38,584	.....
Mastodon	.....	.....	.....	.....	.....
McDonald	.....	.....	.....	.....	.....
Michigan	53,272	.....	.....	58,088	146
Monongahela	.....	6,913	.....	.....	.....
Paint River (Fairbanks)	10,383	9,863	11,257	11,973	28,321
Shelden & Shafer (Union) (see Columbia)	.....	.....	.....	.....	.....
South Mastodon	.....	.....	.....	.....	.....
Tobin	55,238	45,386	113,669	166,529	235,867
Youngstown	.....	.....	.....	.....	.....
Total	1,003,785	824,461	917,969	1,174,366	1,395,910

IRON ORE SHIPMENTS FROM THE CRYSTAL FALLS DISTRICT, MICHIGAN.

(Concluded.)

	1907.	1908.	1909.	1910.	1911.	1912.	Total.
Alpha	.....	.....	.....	.....	.....	.....	1,370
Armenia	36,665	.....	.....	65,473	51,862	150,808	579,751
Bristol (Claire)	345,676	190,300	396,825	270,742	322,729	438,900	3,217,738
Columbia	.....	.....	.....	.....	.....	.....	942,703
Crystal Falls	114,158	296	986	.....	.....	.....	1,735,251
Delphic	.....	.....	.....	.....	.....	.....	33,770
Dunn	141,992	8,829	193,396	136,144	232,092	242,304	2,132,411
Fairbanks	.....	.....	.....	.....	.....	.....	8,500
Genesee (Ethel)	38,984	.....	65,585	66,185	25,342	4,248	567,214
Gibson	.....	4,548	36,246	45,202	56,528	.....	158,881
Great Western	234,492	124,246	112,747	80,709	84,338	3,342	2,040,617
Hemlock	117,181	83,834	112,481	115,407	107,753	126,132	1,939,110
Hilltop	.....	.....	.....	.....	.....	.....	20,229
Hollister	6,371	10,671	25,842	49,434	5,022	.....	101,438
Hope	.....	.....	.....	.....	.....	.....	28,530
Kimball	16,224	.....	.....	.....	.....	.....	16,224
Lamont (Monitor)	42,090	.....	.....	3,183	.....	.....	558,524
Lee Peck	.....	.....	.....	.....	.....	.....	2,844
Lincoln	714	.....	1,657	.....	.....	.....	241,627
Manganate	.....	.....	.....	.....	.....	.....	6,844
Mansfield	183,532	44,633	118,713	114,357	54,646	.....	1,272,001
Mastodon	.....	.....	.....	.....	.....	.....	425,708
McDonald	.....	.....	1,114	6,022	5,240	1,384	13,760
Michigan	39,819	603	.....	17,922	.....	.....	171,719
Monongahela	.....	.....	.....	.....	.....	.....	9,310
Paint River (Fairbanks)	75,805	.....	.....	.....	.....	.....	371,289
Ravenna	.....	.....	.....	.....	127	18,303	18,430
Shelden & Shafer (Union) (see Columbia)	.....	.....	.....	.....	.....	.....	.....
South Mastodon	.....	.....	.....	.....	.....	.....	8,203
Tobin	237,781	161,642	359,668	235,812	308,456	319,318	2,258,323
Youngstown	.....	.....	.....	.....	.....	.....	151,425
Total	1,631,484	629,602	1,425,261	1,206,592	1,254,135	1,304,739	19,033,774

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.[1]

	1877.	1878.	1879.	1880.	1881.
Antoine	.....	.....	.....	.....	.....
Aragon	.....	.....	.....	.....	.....
Breen	5,812	4,796	1,463	5,359	.....
Briar Hill	.....	.....	.....	.....	.....
Chapin	.....	.....	.....	34,556	134,521
Clifford	.....	.....	.....	.....	.....
Cornell	.....	.....	.....	30,856	11,816
Cuff	.....	.....	.....	.....	.....
Cundy	.....	.....	.....	.....	.....
Curry	.....	.....	12,803	21,851	17,534
Cyclops	.....	6,028	46,158	14,368	12,644
Eleanor (Appleton)	.....	.....	.....	.....	.....
Emmett	.....	12,397	22,474	31,136	648
Forest	.....	.....	.....	.....	.....
Half and Half	.....	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....	.....
Hersel	.....	.....	.....	.....	.....
Indiana	.....	.....	.....	.....	.....
Keel Ridge	.....	.....	.....	11,496	19,511
Loretto	.....	.....	.....	.....	.....
Ludington	.....	.....	.....	8,816	3,374
Millie (Hewitt)	.....	.....	.....	.....	4,352
Munro	.....	.....	.....	.....	.....
Norway	.....	7,276	73,519	198,165	137,077
Penn Iron Mining Co	.....	.....	.....	.....	.....
Perry	.....	.....	.....	.....	.....
Pewabec	.....	.....	.....	.....	.....
Quinnesec	.....	25,925	41,954	52,436	43,711
Saginaw (Perkins)	.....	.....	13,465	49,196	60,406
Stephenson	.....	.....	798	23,089	10,856
Sturgeon River	.....	.....	.....	.....	.....
Verona	.....	.....	.....	.....	.....
Vivian	.....	.....	.....	.....	.....
Vulcan	4,593	38,799	56,975	86,976	85,274
Walpole	.....	.....	.....	.....	.....
Total	10,405	95,221	269,609	568,300	541,724
METROPOLITAN TROUGH.					
Groveland	.....	.....	.....	.....	.....
Metropolitan	.....	.....	.....	.....	.....
Northwestern	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....
CALUMET TROUGH.					
Calumet	.....	.....	.....	.....	.....

[1]From Iron Trade Review.

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.

(*Continued.*)

	1882.	1883.	1884.	1885.	1886.
Antoine	.....	.....	.....	.....	.....
Aragon	.....	.....	.....	.....	.....
Breen	.....	.....	.....	.....	.....
Briar Hill	10,593	4,388	.....	.....	.....
Chapin	247,506	265,830	290,972	157,455	198,871
Clifford	.....	.....	.....	.....	.....
Cornell	.....	.....	.....	.....	4,566
Cuff	.....	.....	.....	.....	.....
Cundy	.....	.....	.....	.....	.....
Curry	13,374	3,676	10,079	4,897	.....
Cyclops	18,287	22,675	24,099	49,897	37,189
Eleanor (Appleton)	.....	.....	.....	.....	.....
Emmett	.....	.....	.....	.....	.....
Forest	.....	.....	.....	.....	.....
Half and Half	.....	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....	872
Hersel	.....	.....	.....	.....	.....
Indiana	4,280	4,362	636	2,739	5,854
Keel Ridge	23,425	5,033	.....	.....	.....
Loretto	.....	.....	.....	.....	.....
Ludington	52,152	102,632	101,165	124,194	74,454
Millie (Hewitt)	9,500	7,516	7,927	4,627	5,517
Munro	.....	.....	.....	.....	.....
Norway	165,547	114,836	71,710	67,741	93,878
Penn Iron Mining Co	.....	.....	.....	.....	.....
Perry	.....	3,138	.....	.....	.....
Pewabec	.....	.....	.....	.....	.....
Quinnesec	44,240	21,676	16,995	14,110	13,442
Saginaw (Perkins)	73,648	76,514	38,120	18,020	12,852
Stephenson	.....	.....	.....	.....	1,018
Sturgeon River	.....	.....	.....	.....	.....
Verona	.....	.....	.....	.....	.....
Vivian	.....	.....	.....	.....	.....
Vulcan	94,042	79,874	101,722	124,125	143,930
Walpole	.....	.....	.....	.....	.....
Total	756,594	712,150	663,425	567,805	592,443
METROPOLITAN TROUGH.					
Groveland	.....	.....	.....	.....	.....
Metropolitan	23,854	36,643	27,577	.....	6,393
Northwestern	.....	7,202	10,004	.....	.....
Total	23,854	43,845	37,581	.....	6,393
CALUMET TROUGH.					
Calumet	5,847	29,239	3,627	.....	.....

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.

(*Continued.*)

	1887.	1888.	1889.	1890.	1891.
Antoine	.....	.....	.....	.....	.....
Aragon	.....	.....	1,745	46,609	96,829
Breen	.....	.....	.....	.....	.....
Briar Hill	.....	.....	.....	.....	.....
Chapin	336,128	290,871	518,990	742,843	488,749
Clifford	.....	.....	.....	.....	.....
Cornell	2,064	.....	.....	.....	.....
Cuff	.....	.....	.....	.....	.....
Cundy	.....	.....	.....	.....	.....
Curry	.....	5,376	28,722	72,162	100,681
Cyclops	14,297	14,693	6,101	7,361	10,599
Eleanor (Appleton)	.....	.....	.....	.....	.....
Emmett	.....	.....	.....	.....	.....
Forest	.....	.....	.....	.....	.....
Half and Half	.....	.....	5,961	1,496	67
Hamilton	600	8,801	8,347	17,072	58,197
Hersel	.....	.....	.....	955	.....
Indiana	.....	.....	.....	.....	.....
Keel Ridge	.....	.....	.....	.....	.....
Loretto	.....	.....	.....	.....	.....
Ludington	101,653	61,883	116,297	97,355	141,303
Millie (Hewitt)	1,163	11,124	12,274	39,232	5,889
Munro	.....	.....	.....	.....	.....
Norway	95,726	87,260	68,044	61,717	4,089
Penn Iron Mining Co	.....	.....	.....	.....	.....
Perry	.....	.....	.....	.....	.....
Pewabec	.....	.....	.....	26,991	64,507
Quinnesec	6,585	2,249	.....	.....	.....
Saginaw (Perkins)	10,834	16,684	12,354	11,971	.....
Stephenson	3,589	.....	.....	.....	.....
Sturgeon River	6,827	7,800	4,775	.....	.....
Verona	.....	.....	.....	.....	.....
Vivian	.....	.....	.....	.....	.....
Vulcan	205,036	129,541	153,900	104,996	78,967
Walpole	1,740	900	9,614	2,940	3,895
Total	786,244	637,182	947,124	1,233,700	1,053,772
METROPOLITAN TROUGH.					
Groveland	.....	.....	.....	.....	1,049
Metropolitan	9,070	3,490	.....	.....	.....
Northwestern	.....	.....	.....	.....	.....
Total	9,070	3,490	.....	.....	1,049
CALUMET TROUGH.					
Calumet	.....	.....	.....	.....	.....

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.

(*Continued.*)

	1892.	1893	1894.	1895.	1896.
Antoine				27,931	110,821
Aragon	167,948	127,901	138,209	183,296	95,809
Breen					
Briar Hill					
Chapin	660,052	489,134	235,895	218,589	420,318
Clifford					
Cornell					
Cuff					
Cundy					3,395
Curry	125,773				
Cyclops	1,697				
Eleanor (Appleton)	4,377	5,618		2,107	
Emmett					
Forest					
Half and Half					
Hamilton	2,183				
Hersel					
Indiana					
Keel Ridge	5,997	3,298		19,441	
Loretto	8,131	55,983		53,160	34,334
Ludington	15,777	109	354		
Millie (Hewitt)	6,780		13,062	10,924	21,815
Munro					
Norway	44,767				
Penn Iron Mining Co		280,450	175,274	290,622	179,917
Perry					
Pewabec	115,273	165,745	303,010	262,551	273,587
Quinnesec				761	
Saginaw (Perkins)				2,161	
Stephenson					
Sturgeon River					
Verona					
Vivian					
Vulcan	179,904				
Walpole					
Total	1,338,659	1,128,238	866,804	1,471,543	1,139,996
METROPOLITAN TROUGH.					
Groveland					
Metropolitan					
Northwestern					
Total					
CALUMET TROUGH.					
Calumet					

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.

(*Continued.*)

	1897.	1898.	1899.	1900.	1901.
Antoine	98,847	104,510	93,025	119,940	63,429
Aragon	149,594	295,821	337,807	404,645	477,212
Breen					
Briar Hill					
Chapin	643,402	724,768	940,513	929,937	929,701
Clifford					
Cornell					
Cuff			20,210	38,209	
Cundy	41,942	76,877	100,902	141,148	178,800
Curry					
Cyclops					
Eleanor (Appleton)					
Emmett					
Forest					
Half and Half					
Hamilton					
Hersel					
Indiana					
Keel Ridge			4,900		
Loretto	54,104	68,447	64,824	61,219	54,985
Ludington					
Millie (Hewitt)	10,374	17,430	15,194	14,922	12,133
Munro					
Norway					
Penn Iron Mining Co	237,886	223,713	229,651	197,606	358,126
Perry					
Pewabec	279,855	305,072	530,129	374,043	507,786
Quinnesec			11,050	25,967	66,383
Saginaw (Perkins)					
Stephenson					
Sturgeon River					
Verona				5,143	11,475
Vivian					
Vulcan					
Walpole					
Total	1,516,004	1,816,638	2,348,205	2,312,779	2,660,030
METROPOLITAN TROUGH.					
Groveland					11,444
Metropolitan					
Northwestern					
Total					11,444
CALUMET TROUGH.					
Calumet					

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.

(*Continued.*)

	1902.	1903	1904.	1905.	1906.
Antoine	110,993	107,886	81,164	138,395	195,855
Aragon	646,203	522,035	374,944	423,698	431,000
Breen	.....	.....	.....	16,625	21,004
Briar Hill	.....	.....	.....	.....	.....
Chapin	956,812	704,051	541,324	902,628	943,425
Clifford	.....	.....	.....	.....	.....
Cornell	.....	.....	.....	.....	.....
Cuff	.....	.....	.....	.....	.....
Cundy	183,052	111,851	.....	.....	.....
Curry	.....	.....	.....	.....	.....
Cyclops	.....	.....	.....	.....	.....
Eleanor (Appleton)	.....	.....	.....	1,819	3,121
Emmett	.....	.....	.....	.....	.....
Forest	.....	.....	11,988	.....	.....
Half and Half	.....	.....	.....	.....	.....
Hamilton	.....	.....	.....	.....	.....
Hersel	.....	.....	.....	.....	.....
Indiana	.....	.....	.....	.....	.....
Keel Ridge	.....	.....	.....	.....	.....
Loretto	128,300	87,939	54,720	118,738	140,390
Ludington	.....	.....	.....	.....	.....
Millie (Hewitt)	25,935	40,860	.....	.....	36,815
Munro	.....	8,739	32,332	92,183	47,454
Norway	.....	.....	.....	.....	.....
Penn Iron Mining Co	273,443	343,543	141,948	423,244	496,582
Perry	.....	.....	.....	.....	.....
Pewabec	530,291	489,175	372,791	533,413	493,891
Quinnesec	62,531	49,708	33	.....	.....
Saginaw (Perkins)	.....	.....	.....	.....	21,017
Stephenson	.....	.....	.....	.....	.....
Sturgeon River	.....	.....	.....	.....	.....
Verona	43,245	50,910	20,202	.....	.....
Vivian	40,384	12,122	81,354	90,426	122,577
Vulcan	.....	.....	.....	.....	.....
Walpole	.....	.....	.....	.....	.....
Total	3,001,189	2,528,819	1,712,800	2,741,169	2,953,131
METROPOLITAN TROUGH.					
Groveland	7,599	1,294	4,737	.....	.....
Metropolitan	.....	.....	.....	.....	.....
Northwestern	1,324	17,280	.....	.....	.....
Total	8,923	18,574	4,737	.....	.....
CALUMET TROUGH.					
Calumet	.....	.....	.....	.....	15,773

IRON ORE SHIPMENTS FROM THE MENOMINEE DISTRICT, MICHIGAN.

(*Concluded.*)

	1907.	1908.	1909.	1910.	1911.	1912.	Total.
Antoine	100,996	.....	.....	.....	.....	.....	1,353,792
Aragon	441,636	226,354	246,984	241,046	201,269	244,812	6,523,406
Breen	20,366	.....	.....	.....	.....	.....	75,425
Briar Hill	.....	.....	.....	.....	.....	.....	14,981
Chapin	855,308	391,620	587,647	465,543	357,598	327,999	17,333,556
Clifford	.....	.....	103,626	91,081	90,940	74,144	359,791
Cornell	.....	.....	.....	.....	.....	.....	49,302
Cuff	.....	.....	.....	.....	.....	.....	58,419
Cundy	.....	1,410	5,512	.....	.....	.....	844,889
Curry	.....	.....	.....	.....	.....	.....	416,928
Cyclops	.....	.....	.....	.....	.....	.....	286,093
Eleanor (Appleton)	1,677	.....	.....	.....	.....	.....	18,719
Emmett	.....	.....	.....	.....	.....	.....	66,655
Forest	.....	.....	.....	.....	.....	.....	11,988
Half and Half	.....	.....	.....	.....	.....	.....	7,524
Hamilton	.....	.....	.....	.....	.....	.....	96,072
Hersel	.....	.....	.....	.....	.....	.....	955
Indiana	.....	.....	.....	.....	.....	.....	17,871
Keel Ridge	.....	.....	.....	.....	.....	.....	93,101
Loretto	99,779	13,354	96,613	116,048	18,579	135,177	1,464,824
Ludington	.....	.....	.....	.....	.....	.....	1,001,518
Millie (Hewitt)	18,691	3,322	10,887	.....	18,556	.....	386,821
Munro	46,834	27,773	23,241	20,022	9,303	20,100	327,981
Norway	.....	.....	.....	.....	.....	.....	1,291,352
Penn Iron Mining Co	381,128	176,211	428,004	344,760	377,026	426,743	5,985,877
Perry	.....	.....	.....	.....	.....	.....	3,138
Pewabec	457,796	365,341	465,453	380,376	352,598	279,771	7,930,445
Quinnesec	.....	.....	3,147	744	.....	.....	503,647
Saginaw (Perkins)	26,080	38,669	19,994	.....	.....	.....	501,985
Stephenson	.....	.....	.....	.....	.....	.....	39,350
Sturgeon River	.....	.....	.....	.....	.....	.....	19,404
Verona	.....	.....	.....	.....	.....	.....	130,975
Vivian	48,493	10,056	.....	14,827	5,971	28,800	455,010
Vulcan (with Penn Mines)	.....	.....	.....	.....	.....	.....	1,668,654
Walpole	.....	.....	.....	.....	.....	.....	19,089
Total	2,498,784	1,254,110	1,991,108	1,674,447	1,431,840	1,537,546	49,359,537
METROPOLITAN TROUGH.							
Groveland	13,913	9,123	24,933	26,462	33,758	12,468	146,780
Metropolitan	.....	.....	.....	.....	.....	.....	107,027
Northwestern	.....	.....	.....	.....	.....	.....	35,810
Total	13,913	9,123	24,933	26,462	33,758	12,468	289,617
CALUMET TROUGH.							
Calumet	51,646	15,222	.....	.....	.....	35,587	156,941

IRON ORE SHIPMENTS FROM THE GWINN DISTRICT.[1] (GROSS TONS).

	1872.	1873.	1874.	1875.
(Austin) (Princeton) (Swanzy or Chesire)	13,445	9,328	.....	187
Stegmiller (Stephenson)				
Total	13,445	9,328	.....	187
	1876.	1877.	1878.	1879.
(Austin) (Princeton) (Swanzy or Chesire)	225	8,444	16,924	17,985
Stegmiller (Stephenson)				
Total	225	8,444	16,924	17,985
	1880.	1881.	1882.	1883.
(Austin) (Princeton) (Swanzy or Chesire)	13,302	15,011	31,498	13,730
Stegmiller (Stephenson)				
Total	13,302	15,011	31,498	13,730
	1884.	1885.	1886.	1887.
(Austin) (Princeton) (Swanzy or Chesire)	3,557	.....	8,328	2,142
Stegmiller (Stephenson)				
Total	3,557	.....	8,328	2,142
	1888.	1889.	1890.	1891.
(Austin) (Princeton) (Swanzy or Chesire)	.....	.....	.....	7,301
Stegmiller (Stephenson)				
Total	.....	.....	.....	7,301

[1]From Iron Trade Review.

IRON ORE SHIPMENTS FROM THE GWINN DISTRICT. (GROSS TONS)

(Concluded.)

	1892.	1893.	1894.	1895.
(Austin) (Princeton) (Swanzy or Chesire)	29,403	19,096	.....	6,593
Stegmiller (Stephenson)				
Total	29,403	19,096	.....	6,593
	1896.	1897.	1898.	1899.
(Austin) (Princeton) (Swanzy or Chesire)	.....	.....	25,247	55,802
Stegmiller (Stephenson)				
Total	.....	.....	25,247	55,802
	1900.	1901.	1902.	1903.
(Austin) (Princeton) (Swanzy or Chesire)	75,037	67,051	118,048	84,223
Stegmiller (Stephenson)				
Total	75,037	67,051	118,048	84,223
	1904.	1905.	1906.	1907.
(Austin)	.....	.....	.....	195,950
(Princeton) (Swanzy or Chesire)	76,461	129,079	166,894	177,863
Stegmiller (Stephenson)	.....	.....	.....	6,305
Total	76,461	129,079	166,894	380,118

	1908.	1909.	1910.	1911.	1912.	Total.
(Austin)	111,229	125,858	188,588	110,839	102,530	834,994
(Princeton) (Swanzy or Chesire)	36,033	42,934	89,441	54,442	143,519	1,558,573
Stegmiller	.....	39,869	48,842	45,122	50,963	184,796
(Stephenson)	52,588	64,075	225,726	135,474	214,386	698,554
Total	199,850	272,736	552,597	345,877	511,398	3,276,917

LIST OF THE ACTIVE IRON MINES OF MICHIGAN, 1912. WITH LOCATION, OWNERSHIP, SALES AGENTS, ETC.

Name of mine.	Location.				First shipment.	No. of men employed.	Depth 1912.	Operators.	Sales agents.
	County.	Section.	Twp.	Range.					
MARQUETTE RANGE:									
American	Marquette	32	48	28	1880	275	1,300	American Boston Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
Angeline	Marquette	15	47	27	1864	327	615	Pittsburg & Lake Angeline Iron Co.	
Bessie	Marquette	35	46	29	1891	.....	200	John M. Longyear	John M. Longyear, Marquette, Michigan.
Breitung Hematite No. 1	Marquette	8	47	26	1903	94	525	Breitung Hematite Mng. Co.	E. N. Breitung & Co., Cleveland, Ohio.
Breitung Hematite No. 2	Marquette	8	47	26	.....	79	435	Breitung Hematite Mng. Co.	E. N. Breitung & Co., Cleveland, Ohio.
Cambria	Marquette	35	48	27	1875	9	975	Republic Iron & Steel Co	M. A. Hanna & Co., Cleveland, Ohio.
Champion	Marquette	31, 32	48	29	1867	15	2,292	Oliver Iron Mining Co.	
Cliff Shaft	Marquette	9, 10	47	27	1887	265	736	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Empire	Marquette	19	47	26	1907	12	200	Empire Iron Co	Oglebay, Norton & Co., Cleveland, Ohio.
Hartford	Marquette	36	48	27	1889	.....	1,075	Republic Iron & Steel Co	M. A. Hanna & Co., Cleveland, Ohio.
Imperial	Baraga	25	48	31	1890	7	208	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Jackson	Marquette	1	47	27	1846	25	Open pit	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Lake	Marquette	10	47	27	1892	265	573	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Lake Superior (Hard Ore)	Marquette	9, 10	47	27	1858	258	1,070	Oliver Iron Mining Co.	
Lake Superior (Soft Ore)	Marquette	10	47	27	1858	75	820	Oliver Iron Mining Co.	
Lillie	Marquette	35	48	27	1875	27	1,000	Republican Iron & Steel Co	M. A. Hanna & Co., Cleveland, Ohio.
Lloyd	Marquette	6	47	27	1911	130	400	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Lucy	Marquette	6, 7	47	26	1878	.....	281	Cleveland Cliffs Iron Co.	
Maas	Marquette	31	48	26	1907	71	1,100	Cleveland Cliffs Iron Co.	
Mitchell	Marquette	21	47	27	1886	40	768	Pittsburg & Lake Angeline Iron Co.	Jones & Laughlin Ore Co., Pittsburg, Pa.
Maitland	Marquette	30	47	26	.....	.....	508	Volunteer Ore Co.	
Mary Charlotte	Marquette	8	47	26	1903	372	435	Mary Charlotte Mining Co	E. N. Breitung & Co., Cleveland, Ohio.
Morris	Marquette	1	47	28	1912	77	800	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Milwaukee-Davis	Marquette	7	47	26	1879	44	525	Mary Charlotte Mining Co	E. N. Breitung & Co., Cleveland, Ohio.
Moro	Marquette	10	47	27	1881	.....	812	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Negaunee	Marquette	5, 6	47	26	1887	324	986	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Ogden	Marquette	13	47	27	1892	.....	Open pit	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Ohio	Baraga	22	48	31	1882	2	250	Niagara Iron Mining Co	Rogers Brown Iron Co., Buffalo, N. Y.
Portland	Baraga	26	48	31	1896	7	200	Niagara Iron Mining Co	Rogers Brown Iron Co., Buffalo, N. Y.
Queen	Marquette	5	47	26	1888	332	1,010	Oliver Iron Mining Co.	
Republic	Marquette	7	46	29	1872	375	1,950	Republic Iron Co	M. A. Hanna & Co., Cleveland, Ohio.
Richmond	Marquette	28	47	26	1896	38	Open pit	Richmond Iron Co	M. A. Hanna & Co., Cleveland, Ohio.
Rolling Mill	Marquette	7	47	26	1872	160	698	Jones & Laughlin Ore Co.	
Salisbury	Marquette	15	47	27	1872	145	1,107	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Volunteer	Marquette	30	47	26	1871	51	428	Volunteer Ore Co.	
Washington	Marquette	11	47	29	1865	149	572	Washington Iron Co	E. N. Breitung & Co., Cleveland, Ohio.
SWANZY DISTRICT:									
Austin	Marquette	20	45	25	1907	125	350	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Princeton	Marquette	18, 20	45	25	1872	36	782	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Stegmiller	Marquette	17	45	25	1909	64	346	Oliver Iron Mining Co.	
Stephenson	Marquette	20	45	25	1907	273	413	Cleveland Cliffs Iron Co.	
MENOMINEE RANGE:									
Antoine	Dickinson	17, 20	40	30	1895	.....	135	.....	Oglebay, Norton & Co., Cleveland, Ohio.
Aragon	Dickinson	8, 9	39	29	1889	285	1,155	Oliver Iron Mining Co.	
Chapin	Dickinson	25, 30	40	31, 30	1880	526	1,522	Oliver Iron Mining Co.	
Cyclops & Norway	Dickinson	5	39	29	1878	.....	355	Penn Iron Mining Co.	
East Vulcan	Dickinson	10, 11	39	29	1877	.....	1,400	Penn Iron Mining Co.	
Loretto	Dickinson	7	39	28	1893	120	800	Loretto Iron Co	M. A. Hanna & Co., Cleveland, Ohio.
Millie (Hewitt)	Dickinson	31	40	34	1881	2	600	Dessau Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
Munro	Dickinson	6	39	29	1903	15	141	Munro Mining Co	Rogers, Brown Iron Co., Buffalo, N. Y.
Pewabic	Dickinson	32	40	30	1890	328	941	Pewabic Co	Pickands, Mather & Co., Cleveland, Ohio.
Quinnesec	Dickinson	34	40	30	1878	.....	450	Corrigan, McKinney Co	Corrigan, McKinney & Co., Cleveland, Ohio.
Vivian	Dickinson	34	40	30	1902	2	310	Verona Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
West Vulcan, Curry & Brier Hill	Dickinson	9, 10	39	29	1879	775[3]	1,500	Penn Iron Mining Co.	
Clifford and Traders	Dickinson	20	40	30	.....	2	150	Antoine Ore Company.	
METROPOLITAN TROUGH:									
Groveland	Dickinson	31	42	29	1891	25	275	Groveland Mining Co	Lake Erie Ore Co., Cleveland, Ohio.
CALUMET TROUGH:									
Calumet	Dickinson	8	41	23	1882	2	215	Verona Mining Co	Pickands, Mather & Co., Cleveland, Ohio.

[3]Includes Cyclops, Norway and East Vulcan.

LIST OF THE ACTIVE IRON MINES OF MICHIGAN, 1912, WITH LOCATION, OWNERSHIP, SALES AGENTS, ETC.—*Concluded.*

Name of mine.	Location.				First shipment.	No. of men employed.	Depth 1912.	Operators.	Sales agents.
	County.	Section.	Twp.	Range.					
CRYSTAL FALLS DISTRICT:									
Tobin	Iron	30	43	32	1901	222	1,109	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Armenia	Iron	23	43	32	1889	154	690	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Bristol	Iron	19	43	32	1892	208	960	Bristol Mining Co	Oglebay, Norton & Co., Cleveland, Ohio.
Dunn	Iron	1	42	33	1887	130	1,327	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Genesee	Iron	29,30,31	43	32	1902	.....	.....	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Great Western	Iron	21	43	32	1882	38	1,250	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Gibson	Iron	15	44	33	1885	2	.....	Munro Iron Mining Co	Rogers, Brown Iron Co., Buffalo, N. Y.
Hemlock	Iron	4	44	33	1891	157	1,000	Hemlock River Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Hollister	Iron	13	43	33	1890	65	600	Hollister Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
Mansfield	Iron	17, 20	43	31	1890	103	1,450	Oliver Iron Mining Co.	
McDonald	Iron	23	43	32	1909	34	417	McDonald Mining Co	The Lake Erie Ore Co., Cleveland, Ohio.
Michigan	Iron	9	44	33	1893	39	611	Oliver Iron Mining Co.	
Ravenna	Iron	19	43	32	1911	72	350	Hollister Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
IRON RIVER DISTRICT:									
Tully	Iron	36	49	35	1910	45[1]	548	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Baker	Iron	31	43	34	1909	.....	548	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Berkshire	Iron	6	42	34	1908	11	365	Brule Mining Co	Oglebay, Norton & Co., Cleveland, Ohio.
Caspian	Iron	1	42	35	1903	293	292	Verona Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Chatham	Iron	35	43	35	1907	114	700	Brule Mining Co	Oglebay, Norton & Co., Cleveland, Ohio.
Cortland	Iron	34	43	35	1912	64	205	Wickwire Mining Co	Wickwire Steel Co., Buffalo, N. Y.
Davidson No. 1	Iron	23	43	35	.....	66	450	Davidson Ore Mining Co.	
Davidson No. 2	Iron	14	43	35	.....	92	150	Davidson Ore Mining Co.	
Fogarty	Iron	1	42	35	1907	164[2]	265	Verona Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Hiawatha	Iron	35	43	35	1893	103	757	Munro Mining Co	The Rogers, Brown Iron Ore Co., Buffalo, N. Y.
Wauseca	Iron	23	43	35	1910	26	398	Mineral Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Nanaimo	Iron	26	43	35	1886	.....	362	Mineral Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Osana	Iron	23	43	35	1907	75	428	Mineral Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Riverton	Iron	1, 35, 36	42, 43	35	1898	181	802	Oliver Iron Mining Co.	
Virgil	Iron	24	43	35	1912	36	200	Wickwire Mining Co	Wickwire Steel Co., Buffalo, N. Y.
Wickwire	Iron	35	43	35	1911	65	515	Huron Iron Co	The Lake Erie Ore Co., Cleveland, Ohio.
Youngs	Iron	12	42	35	1905	110	165	Wickwire Mining Co	Wickwire Steel Co., Buffalo, N. Y.
Chicagon	Iron	26	43	34	1911	109	500	Munro Mining Co.	
Zimmerman	Iron	7	42	34	1908	350	350	Spring Valley Iron Co.	
Baltic	Iron	7	42	34	1901	164[2]	553	Verona Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
GOGEBIC RANGE:									
Anvil	Gogebic	14	47	46	1887	53	1,750	Newport Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
Asteroid	Gogebic	13	47	46	1906	89	960	Castile Mining Co	Oglebay, Norton & Co., Cleveland, Ohio.
Ashland	Gogebic	22	47	47	1885	.....	1,324	Cleveland Cliffs Iron Co	Cleveland Cliffs Iron Co., Cleveland, Ohio.
Brotherton	Gogebic	9	47	45	1886	149	1,630	Brotherton Iron Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Castile	Gogebic	10	47	45	1906	130	1,350	Castile Mining Co	Oglebay, Norton & Co., Cleveland, Ohio.
Colby	Gogebic	16	47	46	1884	.....	1,300	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Eureka	Gogebic	13	47	46	1890	97	1,350	Castile Mining Co	Oglebay, Norton & Co., Cleveland, Ohio.
Ironton	Gogebic	17	47	46	1886	604[3]	1,350	Corrigan, McKinney Co	Corrigan, McKinney Co., Cleveland, Ohio.
Mikado	Gogebic	18	47	45	1895	39	1,120	Verona Mining Co	Pickands, Mather & Co., Cleveland, Ohio.
Newport	Gogebic	24	47	47	1886	850	2,200	Newport Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
Norrie-Aurora	Gogebic	22, 23	47	47	1884	1,180	1,670	Oliver Iron Mining Co.	
Palms	Gogebic	14	47	46	1912	38	650	Dunn Iron Mining Co	M. A. Hanna & Co., Cleveland, Ohio.
Puritan	Gogebic	17	47	46	1886	184[4]	1,264	Oliver Iron Mining Co.	
Sunday Lake	Gogebic	10	47	45	1885	176	1,688	Sunday Lake Iron Co	Pickands, Mather & Co., Cleveland, Ohio.
Tilden	Gogebic	15	47	46	1891	284	1,550	Oliver Iron Mining Co.	
Yale	Gogebic	16	47	46	1901	119	1,780	Lake Superior Iron & Chemical Co.	Oglebay, Norton & Co., Cleveland, Ohio.

[1]Baker and Tully. [2]Baltic and Fogarty. [3]Colby and Ironton.
[4]Davis, Geneva, Puritan and Royal.