

LEGEND

Note: Small Contract with Ford Motor Company requires the conveyance of Surface only and such mineral rights as The Cleveland-Cliffs Iron Company may have.

"Atkinson Title" - (Small Contract) - 1,374.27 acres.
 C. C. I. Co.'s interest consists of title to 2/3 Surface and 1/6 minerals and Tax Titles against outstanding interest.
 Outstanding title vested 1/3 Fee in heirs of Henry M. Atkinson, deceased.
 Mr. Berg recommended amicable acquisition of Wilkinson Title.

"Jones & Porter Title" - (Small Contract) - 120.00 acres.
 C. C. I. Co.'s interest consists of title to 3/5 surface.
 Outstanding title vested 1/5 surface in Nelson B. Jones
 1/5 surface in Wm. H. & Edward S. Porter.
 Tax title for taxes of 1892 in heirs of Arthur Hill.
 Mr. Berg recommends as above acquisition of outstanding title.

"Nester Title" - (Small Contract) - 522.25 acres.
 C. C. I. Co.'s interest consists of 2/3 surface and 1/6 minerals.
 Outstanding title consists of 1/3 Fee Heirs of Timothy Nester
 Mr. Berg recommends acquiring this outstanding title (as above) by peaceful negotiation rather than by partition proceedings

"Phelan Title" - (Large Contract) - 1,291.13 acres.
 C. C. I. Co. owns entire Fee subject to determination of heirs of Patrick Phelan. Proceedings were started in Marquette County Probate Court to determine such heirs and same were pending January 1st, 1927.

Note: SE $\frac{1}{4}$ of Section 15-50-30 is also included in "Small Contract". Mr Berg under date of 1/7/1927 writes in reference thereto "from further investigation conducted by us we have now reached the conclusion that our Company has good title to the surface".

THE CLEVELAND-CLIFFS IRON COMPANY
LAND DEPARTMENT

ALGER COUNTY
COMPARATIVE ASSESSED VALUATIONS

	Acres	1917		1918		1919		1920		1921		1922		1923		1924		1925		1926	
			%		%		%		%		%		%		%		%		%		%
AuTrain Township	91,793.40	1,293,160	.147	1,629,095	.111	1,569,498	.109	1,611,308	.112	1,625,836	.113	1,493,985	.113	1,480,495	.112	1,492,875	.113	1,290,850	.101	1,232,560	.101
Burt "	137,016.63	936,415	.106	1,501,270	.102	1,498,810	.105	1,498,315	.104	1,494,136	.110	1,467,385	.110	1,495,095	.113	1,549,900	.118	1,565,890	.123	1,544,855	.127
Grand Island Twp.	13,821.05	151,720	.017	386,020	.027	336,520	.024	317,270	.022	312,770	.023	302,770	.023	266,270	.020	264,870	.020	264,870	.020	266,595	.022
Mathias Township	45,472.45	691,645	.079	742,685	.051	719,975	.050	738,140	.051	734,675	.055	753,320	.057	765,650	.058	740,565	.056	601,650	.047	841,545	.059
Limestone "	47,799.82	975,900	.111	1,123,415	.077	1,062,945	.074	1,092,323	.076	1,030,325	.076	1,022,093	.077	1,062,748	.080	1,038,450	.080	1,041,530	.082	653,365	.053
Munising "	125,214.91	1,030,830	.117	2,115,625	.145	2,083,475	.146	2,111,676	.147	1,884,031	.139	1,823,145	.138	1,725,245	.130	1,657,599	.126	1,547,133	.129	1,525,300	.125
Onota "	55,293.79	419,275	.047	1,223,495	.083	1,220,600	.085	1,411,725	.098	1,207,385	.089	1,241,780	.094	1,212,910	.092	1,214,110	.092	1,192,400	.093	1,128,875	.092
Rock River "	50,527.33	1,407,050	.160	1,371,735	.093	1,336,215	.093	1,192,905	.083	1,351,840	.100	1,283,790	.097	1,347,240	.102	1,226,030	.093	1,125,230	.089	1,004,150	.082
Munising City	1,907,130	216	4,553,875	.311	4,500,735	.314	4,423,425	.307	4,007,505	.295	3,856,650	.291	3,875,335	.293	3,967,535	.302	4,027,810	.316	4,012,870	.329	
	8,813,125	1.00	14,547,215	1.00	14,328,773	1.00	14,397,087	1.00	13,548,502	1.00	13,244,918	1.00	13,233,989	1.00	13,142,094	1.00	12,757,363	1.00	12,212,115	1.00	

COMPARATIVE EQUALIZED VALUATION

AuTrain Township	91,793.40	751,277	.127	1,629,095	.111	1,569,498	.109	1,611,306	.112	1,534,406	.113	1,493,985	.116	1,551,890	.123	1,582,875	.125	1,390,850	.113	986,098	.110
Burt "	137,016.63	807,261	.140	1,501,270	.102	1,498,810	.105	1,498,315	.104	1,502,756	.112	1,467,385	.116	1,435,713	.114	1,549,900	.123	1,565,890	.123	1,162,629	.129
Grand Island Twp.	13,821.05	118,446	.021	386,020	.027	336,520	.024	317,270	.022	314,221	.023	302,770	.024	309,795	.033	414,870	.033	414,870	.034	263,103	.029
Mathias Township	45,472.45	432,905	.075	742,685	.051	719,975	.050	738,140	.051	735,670	.055	753,320	.059	735,952	.058	740,565	.059	601,650	.049	860,264	.062
Limestone "	47,799.82	453,672	.079	1,123,415	.077	1,062,945	.074	1,092,323	.076	1,038,027	.076	877,093	.069	845,731	.068	868,450	.070	891,530	.073	463,190	.052
Munising "	125,214.91	866,059	.160	2,115,625	.145	2,083,475	.146	2,111,676	.147	1,894,191	.140	1,823,145	.143	1,755,212	.139	1,657,599	.131	1,547,133	.134	1,011,421	.113
Onota "	55,293.79	364,300	.063	1,223,495	.083	1,220,600	.085	1,411,725	.098	1,214,281	.089	1,241,780	.098	1,199,892	.095	1,214,110	.096	1,192,400	.097	849,657	.095
Rock River "	50,527.33	647,565	.112	1,371,735	.093	1,336,215	.093	1,192,905	.083	1,291,840	.095	1,068,790	.084	1,034,190	.082	926,030	.073	825,230	.067	576,603	.063
Munising City	1,843,465	233	4,553,875	.311	4,500,735	.314	4,423,425	.307	4,022,210	.297	3,681,650	.289	3,603,339	.287	3,672,635	.290	3,732,810	.305	3,122,198	.247	
	5,764,930	1.00	14,547,215	1.00	14,328,773	1.00	14,397,087	1.00	13,548,502	1.00	12,709,818	1.00	12,674,315	1.00	12,647,094	1.00	12,266,363	1.00	8,996,863	1.00	

THE CLEVELAND - CLIFFS IRON COMPANY

LAND DEPARTMENT

ALGER COUNTY

COMPARATIVE TAX STATEMENT

1925 AND 1926 TAXES

Township	STATE TAX		COUNTY TAX		TOWNSHIP & CITY TAXES		TOTAL TAXES	
	1925	1926	1925	1926	1925	1926	1925	1926
AuTrain	\$3,182.85	2,916.88	14,281.85	9,680.15	15,500.00	17,000.00	32,964.70	29,597.03
Burt	3,583.86	3,439.05	16,081.24	11,413.03	46,358.90	48,648.56	66,024.00	63,500.64
Grand Island	949.35	778.27	4,259.87	2,582.80	4,970.00	2,400.00	10,179.22	5,761.07
Limestone	2,040.42	1,657.27	9,155.64	5,499.93	40,125.00	37,125.00	51,321.06	44,282.20
Mathias	1,376.75	1,370.12	6,177.64	4,546.95	25,900.00	26,700.23	33,454.39	32,617.30
Munising	3,769.36	2,991.79	16,913.57	9,928.73	59,800.00	51,319.30	80,482.93	64,239.82
Onota	2,728.80	2,513.87	12,244.46	8,342.70	53,840.00	53,500.00	68,813.26	64,356.57
Rock River	1,888.60	1,705.61	8,474.42	5,660.37	35,439.23	37,031.12	45,802.25	44,397.10
Munising City	8,542.51	9,235.46	38,331.31	30,649.34	165,199.20	171,680.70	212,073.02	211,565.50
Total Taxes	28,062.50	26,608.32	125,920.00	88,304.00	447,132.33	445,404.91	601,114.83	560,317.23

OMC:CN:2.
1/28/27.

CITY OF MUNISING TAXES

	1925	1926
Assessed Valuation	\$4,027,810.00	\$4,012,870.00
State Taxes	8,542.51	9,235.46
County Taxes	38,331.31	30,649.34
City Taxes	165,199.20	171,680.70
Total Taxes	212,073.02	211,565.50
1926 Decrease		507.52
Tax Rate	5.27	5.27

ALGER COUNTY TAXES

Assessed Valuation	\$12,757,363.00	\$12,212,115.00
State Taxes	28,062.50	26,608.33
County Taxes	125,920.00	88,304.00
Township & City Taxes	447,132.33	439,104.91
Total Taxes	601,114.83	534,017.24
Rate % on County Taxes only	.99	.72
1926 Decrease in County Taxes		36,616.00
1926 Decrease in all taxes entire County		67,097.59

OMC:CN:2.
1/26/27.

THE CLEVELAND - CLIFFS IRON COMPANY

LAND DEPARTMENT

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
C.C.I.Co. Grand Island														
Acres	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,726.89	12,836.94	12,836.94	12,836.94
Valuation	73,790.00	72,015.00	72,015.00	72,015.00	134,270.00	248,720.00	242,720.00	236,020.00	233,820.00	235,920.00	236,020.00	233,920.00	233,920.00	233,920.00
Total Taxes Paid	3,718.51	2,869.52	3,534.17	4,514.53	4,555.21	5,227.72	5,354.97	5,373.11	5,023.60	5,714.64	6,344.14	12,405.96	9,096.79	5,055.77
C.C.I.Co. Wood Island														
Acres	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09	188.09
Valuation	950.00	950.00	950.00	950.00	1,825.00	1,850.00	1,850.00	1,900.00	1,900.00	1,900.00	1,900.00	1,900.00	1,900.00	1,900.00
Total Taxes Paid	49.04	37.83	47.94	50.95	53.40	38.97	45.75	53.88	48.96	45.01	68.28	100.90	73.88	41.34
C.C.I.Co. Williams Island														
Acres	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80	32.80
Valuation	200.00	200.00	200.00	200.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00
Total Taxes Paid	10.32	7.95	10.11	12.82	13.87	8.45	10.53	11.34	10.30	9.70	14.35	21.24	15.55	8.72
C.C.I.Co. Main Land														
Acres	114.35	114.35	114.35	114.35	114.35	114.35	114.35	114.35	114.35	119.97	119.97	119.97	119.97	119.97
Valuation	625.00	625.00	625.00	625.00	1,050.00	950.00	950.00	1,000.00	1,000.00	1,075.00	1,075.00	1,075.00	1,075.00	1,250.00
Total Taxes Paid	32.25	24.81	31.59	40.03	36.44	20.01	25.02	28.35	25.77	26.05	35.54	57.05	41.51	27.23
C.C.I.Co. Grand Island Personal Valuation														
Personal Valuation	2,050.00	2,050.00	2,550.00	2,550.00	3,300.00	104,500.00	53,500.00	57,000.00	52,500.00	42,500.00	11,500.00	7,000.00	7,000.00	7,000.00
Total Taxes Paid	105.84	81.60	133.53	169.82	114.57	2,184.28	1,658.40	1,609.59	1,352.74	1,029.78	412.75	371.35	271.24	151.85
Grand Total Taxes Grand Island Twp. Paid by The C.C.I. Company	3,915.97	3,021.72	3,857.64	4,898.45	4,894.49	7,479.43	8,107.68	8,376.38	7,461.37	6,826.19	8,878.18	12,956.52	9,499.27	5,294.92
Others Grand Island														
Acres	309.49	309.49	309.49	309.49	309.49	309.49	309.49	309.49	309.49	309.49	309.49	199.44	199.44	199.44
Valuation	300.00	300.00	525.00	525.00	975.00	1,700.00	2,100.00	2,100.00	2,100.00	2,100.00	2,100.00	2,100.00	2,100.00	2,100.00
Taxes	15.48	11.95	26.51	33.68	32.65	44.13	55.09	59.38	54.13	50.90	75.43	111.43	81.66	45.54
Others Grand Island Twp. Personal Property Taxes														
Personal Property Taxes	2,850.00	4,450.00	4,450.00	4,500.00	5,450.00	7,150.00	13,200.00	11,150.00	11,150.00	11,150.00	11,150.00	11,150.00	11,150.00	15,150.00
Taxes	147.12	177.19	224.50	288.37	189.22	150.26	424.62	315.00	297.32	270.28	400.26	591.72	428.54	326.99
Others Main Land														
Acres	628.54									622.97		622.97	622.97	622.97
Valuation	1,750.00	2,500.00	2,500.00	2,500.00	4,350.00	8,250.00	8,250.00	8,250.00	8,250.00	8,175.00	8,175.00	7,325.00	7,000.00	6,875.00
Taxes	90.35	99.49	126.33	160.28	150.97	173.45	216.55	233.37	212.61	198.16	248.32	368.74	271.24	149.29
Total Val. Grand Isl. - Real Estate Personal Total	74,090.00 4,750.00 78,990.00	72,315.00 5,350.00 78,555.00	72,540.00 6,950.00 89,490.00	72,540.00 7,000.00 79,540.00	135,245.00 8,500.00 143,845.00	250,420.00 111,500.00 361,920.00	244,820.00 79,550.00 324,370.00	238,120.00 68,000.00 306,120.00	235,920.00 53,500.00 299,420.00	238,020.00 52,500.00 291,520.00	238,120.00 18,000.00 256,120.00	235,020.00 18,000.00 254,020.00	236,020.00 18,000.00 254,020.00	236,020.00 22,000.00 258,020.00
Total Taxes Grand Isl. - Real Estate Personal Total	3,733.99 245.30 3,979.29	2,861.47 252.66 3,134.35	3,560.68 350.82 4,011.50	4,548.51 445.50 5,094.01	4,599.06 298.53 4,997.59	5,271.85 2,331.47 7,603.32	5,420.05 2,079.09 8,499.14	6,732.49 1,920.47 8,652.96	6,077.73 1,326.23 7,713.96	5,755.54 807.58 7,062.00	8,419.57 955.17 13,472.56	12,517.41 955.17 9,887.56	9,187.53 594.03 9,887.56	5,125.17 477.73 5,602.90

Sheet No. 2.

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Total Valuation Wood Island	950.00	950.00	950.00	950.00	1,825.00	1,850.00	1,850.00	1,900.00	1,900.00	1,900.00	1,900.00	1,900.00	1,900.00	1,900.00
Total Taxes " "	49.04	37.83	47.94	60.95	63.40	38.97	48.76	53.86	48.96	46.01	68.28	100.90	72.88	41.34
Total Valuation Williams Island	200.00	200.00	200.00	200.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00
Total Taxes " "	10.32	7.96	10.11	12.82	13.87	8.45	10.53	11.84	10.30	9.70	14.56	21.24	15.55	8.72
Total Val. Main Land - Real Estate	2,375.00	3,125.00	3,125.00	3,125.00	5,400.00	9,200.00	9,200.00	9,200.00	9,250.00	9,250.00	9,250.00	8,400.00	8,400.00	8,275.00
Personal	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Total	2,525.00	3,275.00	3,275.00	3,275.00	5,550.00	9,350.00	9,350.00	9,350.00	9,400.00	9,400.00	9,400.00	8,550.00	8,550.00	8,425.00
Total Taxes Main Land - Real Estate	122.61	124.30	157.92	200.31	187.41	193.46	241.65	251.73	238.38	244.22	286.95	445.79	307.63	179.69
Personal	7.66	5.91	7.51	12.69	5.16	3.07	3.94	4.22	3.83	3.60	5.34	7.90	5.85	3.30
Total	130.27	130.21	165.43	213.00	192.57	196.53	245.59	255.95	242.21	227.82	292.30	453.69	313.48	182.99
Total Acres Grand Island Twp. - 14,000.16														
Total Val. " " "	77,615.00	78,590.00	78,815.00	78,815.00	142,870.00	261,870.00	256,270.00	249,570.00	247,470.00	249,570.00	249,570.00	246,720.00	246,720.00	246,445.00
Personal	4,900.00	6,500.00	7,100.00	7,150.00	8,750.00	11,550.00	79,700.00	68,150.00	53,550.00	53,550.00	22,550.00	16,150.00	16,150.00	22,150.00
Total	82,515.00	85,090.00	85,915.00	85,965.00	151,620.00	373,520.00	335,970.00	317,820.00	311,120.00	303,220.00	272,320.00	264,870.00	264,870.00	268,595.00
Total Taxes Grand Island Twp. - R. Est.	3,915.96	3,051.56	3,876.65	4,922.59	4,953.74	5,512.73	6,721.00	7,059.44	6,375.37	6,045.47	6,789.17	13,085.34	9,581.13	5,337.69
Personal	252.96	256.79	358.33	458.19	305.79	2,334.54	2,083.02	1,324.69	1,540.06	1,300.06	813.02	955.07	699.88	484.15
Total	4,168.92	3,310.35	4,234.98	5,380.78	5,259.53	7,847.27	8,804.02	8,384.13	8,015.43	7,345.53	9,602.19	14,040.41	10,281.01	5,822.04

Note: These tax items include a collection fee of 1%.

CMC:CM:3.
1/25/27.

THE CLEVELAND-CLIFFS IRON COMPANY

LAND DEPARTMENT

VALUATIONS OF MANUFACTURING SITES
CITY OF MUNISING

1923	1924	1925	1913	1914	1915	1916	1917	1918 Tax Commission	1919	1920	1921	1922	1923	1924	1925	1926
The Munising Paper Company																
Site			\$250,000.00	240,000.00	350,000.00	350,000.00	500,000.00	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00	1,000,000.00
Personal			40,000.00	50,000.00	75,000.00	75,000.00	100,000.00	500,000.00	550,000.00	350,000.00	400,000.00	304,000.00	320,000.00	345,000.00	260,000.00	340,000.00
The Cleveland-Cliffs Iron Co. Sawmill																
Site			12,000.00	12,000.00	20,000.00	20,000.00	30,000.00	65,000.00	65,000.00	65,000.00	65,000.00	75,000.00	75,000.00	75,000.00	65,000.00	65,000.00
Personal			15,000.00	17,500.00	30,000.00	30,000.00	80,000.00	313,300.00	275,000.00	350,000.00	350,000.00	294,000.00	330,000.00	330,000.00	330,000.00	320,000.00
The Munising Woodenware Co.																
Site			17,000.00	22,000.00	28,000.00	28,000.00	34,000.00	145,500.00	145,500.00	145,500.00	145,500.00	145,500.00	145,500.00	145,500.00	145,500.00	145,000.00
Personal			5,000.00	13,800.00	16,300.00	16,300.00	16,000.00	135,000.00	90,000.00	90,000.00	110,000.00	84,000.00	87,000.00	71,000.00	80,000.00	53,000.00
Jackson & Tindle																
Site			20,000.00	23,000.00	23,000.00	10,000.00	41,000.00	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00
Personal			20,000.00	26,500.00	30,000.00	10,000.00	29,000.00	194,250.00	150,000.00	175,000.00	135,000.00	165,000.00	130,000.00	117,000.00	125,000.00	130,000.00
Michigan Tanning & Extract Co.																
Site			40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	140,000.00	140,000.00	140,000.00	75,000.00	50,000.00	45,000.00	35,000.00	M11	
Personal			45,000.00	45,000.00	25,000.00	25,000.00	80,000.00	500,000.00	500,000.00	450,000.00						
First National Bank																
Site														25,000.00	29,000.00	25,000.00
Personal														165,000.00	180,000.00	180,000.00
Peoples State Bank																
Site														5,500.00	9,500.00	9,500.00
Personal														22,500.00	27,500.00	27,500.00
Electric Light & Power Co.																
Site														40,000.00	40,000.00	40,000.00
Personal														20,000.00	20,000.00	22,800.00
TOTAL SITES			339,000.00	337,000.00	461,000.00	448,000.00	645,000.00	1,425,500.00	1,422,500.00	1,422,500.00	1,361,500.00	1,346,500.00	1,341,500.00	1,410,000.00	1,354,500.00	1,563,500.00
PERSONAL			126,000.00	152,800.00	175,300.00	156,300.00	275,000.00	1,642,590.00	1,565,000.00	1,415,000.00	1,005,000.00	823,000.00	817,000.00	1,070,500.00	1,122,500.00	1,083,500.00
Total Valuation City of Munising																
Real			1,487,356.00	1,544,800.00	1,108,800.00	1,107,460.00	1,452,460.00	2,575,440.00	2,554,440.00	2,609,970.00	2,523,600.00	2,555,330.00	2,581,335.00	2,621,235.00	2,643,210.00	2,577,930.00
Personal			352,470.00	408,390.00	352,770.00	322,695.00	454,350.00	1,977,435.00	1,916,235.00	1,813,455.00	1,433,905.00	1,300,270.00	1,234,000.00	1,346,300.00	1,394,600.00	1,335,180.00
Total			1,849,836.00	1,953,190.00	1,461,570.00	1,430,155.00	1,907,130.00	4,553,875.00	4,500,735.00	4,423,425.00	4,007,505.00	3,856,600.00	3,815,335.00	3,967,535.00	4,027,810.00	4,012,870.00
Taxes - State			9,252.77	4,947.15	4,522.00	3,239.20	4,713.65	5,966.98	15,016.95	15,427.22	12,338.28	10,305.05	9,273.13	6,972.79	6,542.51	9,235.46
County			32,778.05	33,183.00	24,427.00	36,731.60	39,001.03	44,417.48	50,647.35	53,109.12	57,709.14	47,217.37	49,086.98	48,229.80	39,331.31	30,649.34
City					29,231.00	29,603.10	27,597.95	57,360.94	59,052.00	69,000.00	50,000.00	51,000.00	38,000.00	33,000.00	75,000.00	75,000.00
School			25,000.00	35,000.00	25,423.00	25,310.15	25,965.00	30,800.12	34,178.25	48,057.55	76,864.80	81,005.08	95,492.15	113,950.60	90,199.20	95,680.70
Twp. Liability			2,500.00	2,900.00												
" Contingent			1,000.00	2,500.00												
Highway Repair			2,000.00	1,500.00												
" Improvement			1,000.00	4,000.00												
Bridge				500.00												
Village			17,298.95	27,645.79												
Total			90,839.77#	112,175.94#	83,603.00	93,934.05	96,282.63	139,545.50	159,704.55	185,663.30	206,912.22	189,529.50	241,852.32	250,163.18	212,073.02	211,555.50

VALUATIONS OF MANUFACTURERS SITES
CITY OF MUNISING

Sheet No. 2.

	1913	1914	1915	1916	1917	1918 Tax Commission	1919	1920	1921	1922	1923	1924	1925	1926
Tax Rate per \$100.00 Valuation	Twp. 3.98 Village 1.50	Twp. 4.34 Village 2.25	City 5.73	6.58	5.10	3.05	3.55	4.21	5.18	4.94	6.25	6.33	5.28	5.265
Amount Paid by Above Industries	25,482.00	32,277.82	35,517.28	39,762.94	46,920.00	93,604.50	106,196.25	119,627.15	122,584.70	111,420.30	134,906.25	156,767.60	151,485.27	129,000.00
Do. Others	65,357.77	79,898.12	47,085.71	54,171.11	49,362.63	44,941.00	53,506.30	56,036.75	84,327.52	79,108.20	106,946.07	93,396.58	80,587.75	82,565.50
Percent Paid by Above Industries	25%	25%	44%	42%	48%	66%	66%	64%	59%	57%	56%	63%	62%	61%
Do. Others	75%	75%	56%	58%	52%	32%	34%	36%	42%	43%	44%	37%	38%	39%
# Munising Township (City of Munising was incorporated in 1915). Includes both Village and Township.														
The Munising Paper Co.	.157	.148	.201	.297	.215	.329	.344	.305	.349	.338	.341	.339	.337	.334
The C.C.I.Co. Sawmill	.015	.015	.034	.035	.057	.093	.075	.094	.106	.096	.097	.102	.099	.095
The Munising Woodware Co.	.012	.018	.030	.031	.026	.052	.052	.054	.064	.054	.055	.055	.055	.052
Jackson & Tindle	.022	.025	.036	.014	.035	.059	.050	.057	.052	.053	.053	.048	.050	.051
Michigan Tanning & Extract Co.	.046	.044	.044	.045	.047	.141	.142	.133	.019	.013	.012	.009	.000	.000
First National Bank												.049	.052	.052
Peoples State Bank												.006	.009	.009
Electric Light & Power Co.												.015	.014	.015
	.252	.250	.435	.422	.481	.674	.668	.643	.582	.564	.556	.625	.616	.610

ONG:GN:2.
1/27/27.

THE CLEVELAND-CLIFFS IRON COMPANY

LAND DEPARTMENT

ALGER COUNTY TAXES

<u>AUTRAIN TOWNSHIP</u>	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
State	\$2,457.00	1,868.30	2,568.48	2,134.62	5,515.65	5,409.81	4,678.43	3,992.10	3,993.22	3,005.31	3,162.65	2,916.68
County	13,209.00	20,863.59	20,664.92	15,889.83	17,661.80	18,539.49	21,982.15	18,298.68	21,137.84	19,925.35	14,281.85	9,680.15
Township	2,400.00	2,000.00	2,000.00	4,000.00	4,000.00	3,000.00	2,500.00	2,500.00	2,500.00	3,000.00	3,000.00	4,000.00
Road Repair	2,243.38	2,827.33	2,827.23	3,000.00	2,000.00	1,500.00	1,500.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00
Highway Improvement	2,243.38	2,827.33	2,827.23	3,500.00	2,500.00	5,000.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	4,000.00
Bridge	1,000.00	1,000.00	500.00	100.00								
School	4,500.00	4,500.00	5,500.00	6,000.00	5,000.00	7,000.00	8,500.00	9,000.00	10,000.00	8,000.00	8,000.00	7,000.00
Total	28,052.76	35,866.55	36,907.66	34,624.45	36,677.45	39,949.30	41,560.58	38,290.98	42,131.06	36,430.66	32,964.70	29,597.03
Total Township Taxes Only	12,366.76	13,154.66	13,654.46	16,600.00	13,500.00	16,000.00	15,000.00	16,000.00	17,000.00	15,500.00	15,500.00	17,000.00
<u>BURT TOWNSHIP</u>												
State	2,935.00	2,327.70	2,835.55	1,967.12	5,267.60	5,249.26	4,580.55	3,921.31	3,696.85	2,942.64	3,583.66	3,439.05
County	15,855.00	25,993.60	22,834.21	14,643.06	16,867.50	17,989.31	21,424.34	17,965.57	19,569.03	19,509.84	16,081.24	11,413.03
Township	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	1,000.00
Road Repair	3,921.80	4,001.75	4,354.93	4,682.07	7,506.35	7,494.05	7,513.78	7,336.92	7,475.47	7,749.50	7,829.45	7,724.28
Highway Improvement	3,921.80	4,001.75	4,354.93	4,682.07	7,506.35	7,494.05	7,513.78	7,336.92	7,475.47	7,749.50	7,829.45	7,724.28
Indebtedness	2,000.00	3,000.00	3,000.00	3,000.00	5,000.00	5,000.00						6,000.00
Bridge	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	500.00	1,000.00	2,000.00	2,000.00	2,000.00
School	10,000.00	12,000.00	14,000.00	15,000.00	17,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	20,000.00	20,000.00
Bond	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00		
Forest Fire			200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	1,200.00	1,200.00
Emergency	200.00		200.00	200.00	200.00	200.00	3,000.00	2,000.00	3,000.00	3,000.00	4,500.00	3,000.00
Total	43,333.60	55,824.80	56,079.42	48,674.32	63,847.80	73,926.67	74,732.45	68,760.72	71,916.62	72,651.48	66,024.00	63,500.64
Total Township Taxes Only	24,543.60	27,503.50	30,409.86	32,064.14	41,712.70	50,688.10	48,727.56	46,873.64	48,650.94	50,199.00	46,358.90	48,646.56
<u>GRAND ISLAND TOWNSHIP</u>												
State	435.00	320.70	416.02	505.77	1,182.55	1,111.54	920.98	809.11	1,054.44	787.59	949.35	778.27
County	2,354.00	3,693.58	3,350.37	3,765.16	3,786.90	3,809.25	4,307.66	3,706.95	5,581.61	5,221.73	4,259.87	2,582.80
Township	500.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	400.00	400.00	450.00	500.00
Highway Improvement	500.00	250.00	500.00	2,000.00	2,000.00	2,000.00	1,000.00	1,000.00	1,000.00	6,000.00	3,020.00	500.00
School	400.00	800.00	700.00	1,000.00	1,500.00	1,700.00	1,500.00	1,500.00	1,500.00	1,450.00	1,450.00	1,350.00
Library									50.00	50.00	50.00	50.00
Total	4,189.00	5,314.28	5,216.39	7,520.93	8,719.45	8,870.79	7,978.64	7,266.06	9,536.05	13,909.32	10,179.22	5,761.07
Total Township Taxes Only	1,400.00	1,300.00	1,450.00	3,250.00	3,750.00	3,950.00	2,750.00	2,750.00	2,900.00	7,900.00	4,970.00	2,400.00

ALGER COUNTY TAXES

SHEET NO. 2

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
LIMESTONE TOWNSHIP												
State	\$1,600.34	1,205.62	1,593.44	1,472.02	3,735.45	3,826.90	3,143.73	2,751.36	2,179.77	1,686.93	2,040.42	1,657.27
County	6,646.00	13,465.46	12,832.58	10,957.53	11,961.45	13,114.83	14,704.00	12,513.79	11,533.15	11,183.73	9,155.64	5,499.93
Township	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	3,000.00	3,000.00	3,000.00
Highway Improvement	2,804.00	3,260.40	3,414.37	4,879.50	5,617.08	5,461.62	5,461.62	5,151.62	5,111.00	5,300.00	5,000.00	4,000.00
Highway Repair	2,804.00	3,260.40	3,414.37	4,879.50	5,617.08	5,461.62	5,461.62	1,000.00	5,111.00	5,300.00	5,000.00	5,000.00
Bridge	1,500.00	1,000.00	1,000.00	1,000.00	500.00	500.00	500.00	1,000.00	1,500.00	1,000.00	1,000.00	500.00
Additional Highway		5,000.00	2,000.00									
Indebtedness	1,500.00	3,300.00										1,000.00
Bond & Interest	4,000.00	4,000.00	4,400.00	4,200.00	4,200.00	4,200.00	4,000.00	3,000.00	3,000.00	3,000.00		
School	6,968.00	7,890.00	8,500.00	9,908.89	11,190.00	12,700.00	13,825.00	14,025.00	17,800.00	27,985.00	24,625.00	19,625.00
Buildings & Repairs	1,400.00	2,050.00	500.00	500.00	300.00	300.00	500.00	500.00	750.00	1,500.00	1,500.00	500.00
Fire Protection	500.00	1,000.00	500.00	500.00	500.00	500.00	500.00	500.00	750.00	750.00		
Road Grader			800.00	1,250.00								
Gravel				500.00								
School Bond										4,000.00		3,500.00
County Fair	750.00											
Total	34,472.34	47,432.08	40,954.76	42,045.44	45,621.06	42,603.35	50,095.97	42,421.77	49,733.92	64,705.56	51,321.06	44,282.20
Total Township Taxes Only	24,226.00	32,760.80	26,528.74	29,615.89	29,924.16	25,661.62	32,248.24	27,176.62	36,022.00	51,935.00	40,125.00	37,125.00
MATHIAS TOWNSHIP												
State	1,380.00	1,094.50	1,520.50	973.14	2,530.15	2,586.03	2,227.70	2,013.21	1,893.72	1,406.13	1,376.75	1,370.12
County	7,460.00	12,223.01	12,245.16	7,243.98	8,102.00	8,862.36	10,419.52	9,223.59	10,024.28	9,332.69	6,177.64	4,546.95
Contingent	1,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	1,800.00	2,000.00	1,800.00
Highway Improvement	1,484.75	1,812.22	2,030.80	3,458.22	2,599.24	3,599.87	1,845.35	2,000.00	3,000.00	1,000.00	1,000.00	1,633.41
Highway Repair	1,484.75	1,812.22	2,030.80	3,458.22	2,599.24	3,599.87	1,845.35	2,000.00	3,000.00	3,703.12	3,000.00	3,266.82
School	5,000.00	8,500.00	14,000.00	12,000.00	15,000.00	20,000.00	20,000.00	19,500.00	18,000.00	19,000.00	19,000.00	20,000.00
Indebtedness	1,000.00		1,000.00									
Bridge	500.00				100.00	500.00	700.00	200.00	200.00		600.00	
Drain						800.00					300.00	
Forest Fire						300.00						
Total	19,309.50	27,441.95	34,827.26	29,133.56	32,930.63	42,248.13	37,192.57	36,936.80	38,118.00	36,231.94	33,454.39	32,617.30
Total Township Taxes Only	10,469.50	14,124.44	21,061.60	20,916.44	22,298.48	30,799.74	25,545.35	25,700.00	26,200.00	25,503.12	25,900.00	26,700.23
CITY OF MUNISING												
State	4,522.00	3,829.20	4,718.65	5,966.98	15,816.95	15,497.22	12,338.28	10,306.05	9,273.18	6,972.78	8,542.51	9,235.46
County	24,427.00	38,731.60	38,001.03	44,417.46	50,647.35	53,109.12	57,709.14	47,217.37	49,086.98	46,229.80	38,331.31	30,649.34
City	29,277.35	28,635.35	27,597.95	57,360.94	59,062.00	69,000.00	60,000.00	51,000.00	88,000.00	83,000.00	75,000.00	75,000.00
School	25,452.53	25,343.79	25,965.00	30,800.12	34,178.25	48,057.56	76,864.80	81,005.08	95,492.16	113,960.60	90,199.20	96,680.70
Total	83,678.88	94,539.94	96,282.63	138,545.50	159,704.55	185,663.90	206,912.22	189,528.50	241,852.32	250,163.18	212,073.02	211,565.50
Total City Taxes Only	54,729.98	53,979.14	53,562.95	88,161.06	93,240.25	117,057.56	136,864.80	132,005.08	183,492.16	196,960.60	165,199.20	171,680.70

ALGER COUNTY TAXES

Sheet No. 3

MUNISING TOWNSHIP	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
State	\$3,244.00	2,366.80	3,041.87	2,772.12	7,321.92	7,396.13	5,786.08	4,871.99	4,516.40	3,147.22	3,769.36	2,991.79
County	17,525.00	26,429.77	24,497.37	20,635.34	23,445.80	25,353.54	27,062.93	22,321.15	23,907.23	20,866.21	16,913.57	9,928.73
Township	2,000.00	2,000.00	2,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	4,000.00	4,000.00
Highway Improvement	3,000.00	4,182.17	4,000.00	3,600.00	9,000.00	9,000.00	9,000.00	9,400.00	8,000.00	7,000.00	8,000.00	8,000.00
Road Repair	3,000.00	4,182.17	4,000.00	1,400.00	6,000.00	6,000.00	6,000.00	9,400.00	8,000.00	7,000.00	8,000.00	8,000.00
School	14,605.90	14,690.13	14,035.00	14,199.88	15,821.75	22,942.44	36,135.14	38,293.92	46,507.84	51,439.40	39,800.00	31,319.30
Forest Fire								1,000.00	2,000.00	1,000.00		
Total	43,374.90	53,651.04	51,574.24	45,607.34	64,589.47	73,694.11	86,984.15	88,287.06	95,931.47	93,452.83	80,482.93	64,239.82
Total Township Taxes Only	22,605.90	25,054.47	24,035.00	22,199.88	33,821.75	40,942.44	54,135.14	61,093.92	67,507.84	69,439.40	59,800.00	51,319.30
ONOTA TOWNSHIP												
State	1,355.00	1,027.70	1,279.53	1,603.16	4,289.85	4,179.27	3,692.60	3,318.19	3,087.29	2,305.13	2,728.80	2,513.87
County	7,321.00	11,476.88	10,504.60	11,933.68	13,735.60	14,322.43	17,271.21	15,202.38	16,342.35	15,293.10	12,244.46	8,342.70
Township	2,000.00	1,000.00	4,000.00	3,500.00	1,000.00	3,500.00	3,000.00	3,000.00	3,500.00	4,500.00	4,000.00	4,000.00
Highway Improvement	4,000.00	1,000.00			6,500.00	6,000.00	6,500.00	6,500.00	6,500.00	6,500.00	6,500.00	6,000.00
Highway Repair	2,117.25	2,059.97		1,000.00	6,500.00	6,000.00	6,500.00	6,500.00	6,500.00	6,500.00	6,500.00	6,000.00
School	3,000.00	4,500.00	3,500.00	7,000.00	5,500.00	5,500.00	5,000.00	5,500.00	15,000.00	13,500.00	20,840.00	25,000.00
Bridge	1,000.00	1,000.00	500.00	500.00	1,000.00	500.00		1,000.00	4,000.00	6,000.00	6,000.00	3,500.00
Agricultural Society		500.00										
Bond			2,000.00	2,000.00	2,000.00	2,000.00	2,000.00					
Bond & Interest			150.00	1,000.00	1,000.00	500.00	1,000.00	5,900.00	10,500.00	10,500.00	10,000.00	9,000.00
Building				3,000.00			1,000.00					
Fire Fund							500.00	500.00	500.00	500.00		
School Building							500.00					
Total	20,793.25	22,564.55	21,734.13	31,536.84	42,025.45	42,501.70	46,963.81	47,420.57	65,929.64	65,588.23	68,813.26	64,356.57
Total Township Taxes Only	12,117.25	10,059.97	10,150.00	18,000.00	24,000.00	24,000.00	26,000.00	28,900.00	46,500.00	48,000.00	53,840.00	53,500.00
ROCK RIVER TOWNSHIP												
State	2,444.00	1,704.60	2,274.41	1,797.39	4,695.80	4,945.90	3,931.32	3,430.75	2,660.85	1,758.14	1,898.60	1,705.62
County	13,203.00	19,035.04	18,316.76	13,379.59	15,036.60	16,949.67	18,397.73	15,718.05	14,085.04	11,656.55	8,474.42	5,660.37
Township	2,000.00	2,000.00	1,500.00	2,000.00	1,000.00	1,000.00	2,000.00	1,500.00	2,000.00	2,000.00	1,500.00	2,000.00
Highway Improvement	5,374.50	5,000.00	4,650.00	7,000.00	3,429.00	3,429.00	5,549.20	6,417.70	6,418.95	6,130.15	2,913.08	2,510.37
Road Repair	5,374.50	5,000.00	4,650.00	7,000.00	3,429.00	3,429.00	3,229.60	6,417.70	6,418.95	6,130.15	5,626.15	5,020.75
School Bond & Interest	5,000.00	6,000.00	6,000.00				2,600.00	2,600.00	5,000.00			
Highway Bond & Interest	5,000.00	3,500.00	3,500.00	3,500.00								
School	20,050.00	12,000.00	15,000.00	19,000.00	20,000.00	20,000.00	20,000.00	20,000.00	22,500.00	25,000.00	25,000.00	27,000.00
Cemetery	1,000.00		500.00	500.00								
Bridge	1,000.00		500.00	500.00								
Exigency			500.00	500.00	1,000.00	1,000.00	2,000.00	1,000.00	1,500.00	1,000.00	500.00	500.00
Indebtedness				500.00			3,000.00					
Total	60,446.00	54,239.64	56,891.17	55,176.98	48,590.40	53,753.57	57,697.85	57,084.20	60,583.79	53,674.99	45,802.25	44,397.11
Total Township Taxes Only	44,799.00	33,500.00	36,300.00	40,000.00	28,858.00	31,858.00	35,378.80	37,935.40	43,837.90	40,260.30	35,439.23	37,031.12
Grand Total Alger Co.	337,650.23	397,094.83	400,467.86	432,865.36	502,706.26	563,211.52	610,118.24	575,996.66	675,733.07	688,908.18	601,114.83	560,317.24

THE CLEVELAND-CLIFFS IRON COMPANY

LAND DEPARTMENT

ALGER COUNTY TAXES

City or Township	1917			1920			1921			1922		
	Valuation	Tax	Rate %	Valuation	Tax	Rate %	Valuation	Tax	Rate %	Valuation	Tax	Rate %
AuTrain	1,293,160	36,907.66	2.86	1,611,308	39,949.30	2.48	1,525,836	41,560.58	2.73	1,493,885	38,281.98	2.58
Burt	936,415	56,079.42	5.99	1,498,315	73,926.67	4.61	1,494,135	74,732.45	5.02	1,467,385	68,760.72	4.69
Grand Island	151,720	5,216.39	3.43	317,270	8,870.79	2.80	312,770	7,978.64	2.56	302,770	6,266.05	2.40
Mathias	691,645	34,827.26	5.06	738,140	42,248.13	5.73	734,675	37,192.57	5.31	753,320	36,936.80	4.91
Limestone	975,900	40,954.76	4.22	1,092,323	42,603.35	3.91	1,030,325	50,095.97	4.85	1,022,093	42,421.77	4.62
Munising	1,030,830	51,574.24	5.01	2,111,676	73,694.11	3.52	1,884,031	86,984.15	4.62	1,823,145	87,487.06	4.85
Onota	419,275	21,734.13	5.42	1,411,725	42,501.70	3.49	1,207,385	46,963.81	3.90	1,241,780	47,420.37	3.83
Rock River	1,407,050	56,891.17	4.06	1,192,905	53,753.57	3.81	1,351,840	57,697.85	4.37	1,283,790	57,084.20	4.46
Munising City	1,907,130	96,282.63	5.11	4,423,425	185,663.90	4.21	4,007,505	206,912.22	5.18	3,856,650	189,528.50	4.93
TOTAL	8,813,125	400,467.86	4.65	14,397,087	563,211.52	3.91	13,548,502	610,118.24	4.34	13,244,818	574,187.45	4.34
Marquette	58,983,798	1,269,064.80	2.15	64,099,012	1,960,037.11	3.06	66,177,466	2,033,885.95	3.07	67,081,717	2,024,503.95	3.02
Baraga	5,412,068	181,038.62	3.35	7,078,091	299,400.68	4.23	7,062,773	315,695.56	4.47	7,132,968	350,701.05	4.91
Luce	6,177,086	178,645.68	2.89	10,173,525	261,800.12	2.57	9,588,560	266,683.59	2.78	9,229,765	239,836.34	2.60
City or Township	1923			1924			1925			1926		
	Valuation	Tax	Rate %	Valuation	Tax	Rate %	Valuation	Tax	Rate %	Valuation	Tax	Rate %
AuTrain	1,480,495	42,131.06	2.85	1,482,875	36,430.66	2.59	1,290,850	32,964.70	2.56	1,232,560	29,597.03	2.40
Burt	1,495,095	71,916.82	4.81	1,549,900	72,651.48	4.69	1,565,890	66,024.00	4.22	1,544,855	63,500.64	4.12
Grand Island	268,270	9,536.05	3.56	264,870	13,909.32	5.26	264,870	10,179.22	3.85	268,595	5,671.07	2.15
Mathias	765,650	38,118.00	4.98	740,625	36,231.94	4.93	601,650	33,454.39	5.56	841,545	44,282.20	4.99
Limestone	1,062,748	49,733.92	4.68	1,038,450	64,705.56	6.26	1,041,530	51,321.06	4.93	653,665	32,617.30	5.26
Munising	1,726,246	95,931.47	5.56	1,657,699	93,452.83	5.64	1,647,133	80,482.93	4.89	1,525,300	64,239.82	4.25
Onota	1,212,910	65,929.64	5.44	1,214,110	65,588.23	5.43	1,192,400	68,813.26	5.78	1,128,875	64,356.57	5.70
Rock River	1,347,240	60,583.79	4.53	1,226,030	53,674.99	4.39	1,125,230	45,802.25	4.07	1,004,150	44,397.10	4.42
Munising City	3,875,335	241,852.32	6.25	3,967,535	250,162.58	6.32	4,027,810	212,073.02	5.27	4,012,870	211,565.50	5.26½
TOTAL	13,233,989	675,733.07	4.81	13,142,094	688,807.59	5.24	12,757,363	601,114.83	4.71	12,212,115	560,317.33	4.59
Marquette	67,194,824	2,111,346.35	3.14	67,471,807	2,124,830.28	3.15	66,022,699	2,132,159.16	3.23	63,758,595	2,208,296.25	3.46
Baraga	7,108,272	368,572.91	5.47	7,752,615	393,358.45	5.07	8,845,310	395,445.80	4.47	8,935,130	419,167.34	4.69
Luce	9,150,930	233,010.82	2.55	9,101,982	249,203.85	2.74	8,659,075	238,712.15	2.76	8,659,075	287,407.91	3.32

BOARD OF EDUCATION

City of Munising

Comparison of Munising Board of Education Budget

	1922	1923	1924	1925	1926
Retirement Bonds	\$20,000.00	34,600.00	33,400.00	32,200.00)
Interest on Bonds	15,800.00)	-	-	-	31,000.00)
Primary	35,000.00	37,500.00	40,000.00	41,145.00	46,360.00
Janitors	5,500.00	6,000.00	8,500.00	7,500.00	9,560.00
Water, Light, Fuel	6,500.00	-	-	-	-
Transportation	5,500.00	5,000.00	5,500.00	5,000.00	5,000.00
General	31,700.00	-	20,000.00	-	-
Library	-	250.00	500.00	-	2,000.00
Books & Supplies	-	1,000.00	3,500.00	4,000.00	4,150.00
Bldg. & Repairs	-	2,650.00	4,000.00	755.00	4,200.00
Furniture & Fixtures	-	1,500.00	1,100.00	1,200.00	2,300.00
Cleaning Schools	-	400.00	600.00	500.00	1,000.00
Sundries	-	2,100.00	4,000.00	9,000.00	# 13,730.00
Loans at Bank	-	43,000.00	30,000.00	-	-
Light	-	-	1,500.00	1,500.00	1,800.00
Fuel	-	8,000.00	7,500.00	4,500.00	5,000.00
Freight - Drayage - Exp.	-	-	300.00	500.00	-
Yards & Grounds	-	-	5,000.00	-	1,000.00
Water	-	-	-	500.00	900.00
Washington School	-	-	-	21,700.00	-
	120,000.00	142,000.00	165,400.00	130,000.00	128,000.00

Includes \$5,000.00 for insurance premiums.

OMC:CN:2.
1/26/27.

REPORT OF MR. R. A. BROTHERTON FOR YEAR 1926.

I herewith hand you my report for the fiscal year ending December 31, 1926.

SURVEYS

Surveys were made of numerous lots and parcels of land in Negaunee, Ishpeming, Marquette, Three Lakes, Michigamme and Munising to get the required description and acreage required for to make up the necessary deeds or leases. Lines were run and iron corners set around the land deeded to the Government for the new Forest Experimental Station also lines were checked on the various log jobs and the Forest Lake to Au Train Road definitely located. In the office it was necessary for the proper carrying on of our land work to make numerous maps and following is a summary of the number of maps, blueprints, etc., made.

	<u>Blue and White Prints</u>		<u>Negatives</u>		<u>Plates</u>	<u>Cloth</u>	
	<u>Maps Made</u>	<u>Yds. Used</u>	<u>Maps Made</u>	<u>Yds. Used</u>	<u>14 x 17</u>	<u>Maps</u>	<u>Yds.</u>
Jan.	80	60	20	20	50	5	6
Feb.	85	70	18	19	300	3	4
Mar.	264	132	37	34	32	10	12
Apr.	137	81	41	20 $\frac{1}{2}$	72		
May	68	51	30	20	13		
June	72	86	2	2	60		
July	170	58	8	7	9		
Aug.	126	63	4	6	92		
Sept.	39	85	7	9	200		
Oct.	91	108 $\frac{1}{2}$	6	8	19		
Nov.	58	54 $\frac{1}{2}$	67	43	79		
Dec.	43	30 $\frac{1}{2}$	2	1	109		
	<u>1233</u>	<u>879$\frac{1}{2}$</u>	<u>242</u>	<u>189$\frac{1}{2}$</u>	<u>1035</u>	<u>18</u>	<u>22</u>

CONSTRUCTION

No construction was done during the year except the raising of the electric cable from Powell's Point to Grand Island which after being tested was found short circuited as to render it unfit to be used under water. A new cable has been ordered and will be installed early in the Spring and the old cable was shipped to the General Supply House at Ishpeming where we are allowed a salvage of .406 per foot on 2000' or a total of \$812.00.

LOG PURCHASE

No logs were purchased this fall owing to the burning of our mill on Aug. 15th, 1926.

LOGGING OPERATION

Careful inspections of all log jobs operated by the Lumbering Department were made during the year and a progress map of each job is attached to this report. These maps show the standing timber in green and the cut area in yellow.

DEDICATION OF THE FOREST EXPERIMENT STATION AT DUKES, MICHIGAN, SEPTEMBER 8, 1926.

The dedication was held in the virgin forest on the land deeded to the United States Government for a forest experiment station. George E. Bishop, Manager of the Upper Peninsula Development Bureau, presided at the dedication exercises. John M. Bush, Land Agent of The Cleveland-Cliffs Iron Company, formally presented the deed of the land to Chief Forester Greeley, who accepted it on behalf of the United States Forest Service.

In accepting the deed, Colonel Greeley dwelt upon the fact that the establishment of the station was a step forward toward the establishment of a real forestry science in the United States to meet the special forestry problems of the United States. He pointed out that in the past the foresters of this country have been obliged to draw on the scientific forestry methods developed in Europe and have sought to adapt their practice to the much different conditions existing in the United States.

"The establishment of this station is proof that we are really getting under way developing a science of American Forestry on American soil in an American way to meet American conditions." He then went on to comment upon the degree of interest the forest industries were taking in the work of scientific forestry, and said that twenty-five years ago it would have been impossible to secure the interest and cooperation of forest land owners in a project such as the field experiment station.

It is expected at this station problems will be worked out and demonstrations will be made that will help to put forestry on a new basis in the remaining three and one-half million acres of virgin timber left in the Upper Peninsula. It is the aim of the station to show lumbermen that they can harvest their forests with profit through selective cutting and at the same time preserve them for future cutting.

After accepting the deed, Colonel Greeley put the customary mark with an ax upon the first of all the trees which will be cut in the selective logging operation to begin in the fall.

All members of the party then examined the various charts summarizing the findings of the forest service experts along the lines that the station is seeking to demonstrate in a practical way. The chart which impressed all members of the party most showed that the logging of small diameter trees was very costly to the operations - following is a copy of same.

<u>Log top Diameter Inches</u>	<u>Logging</u>	<u>Milling Cost</u>	<u>Total</u>	<u>Value Lumber</u>	<u>Profit or Loss</u>
8	\$ 14.10	\$ 22.10	\$ 36.20	\$ 22.10	-\$ 14.10
9	13.10	19.70	32.80	23.60	- 9.20
10	12.10	17.60	29.70	25.40	- 4.30
11	11.40	15.70	27.10	27.30	- .20
12	10.80	14.70	25.50	29.40	- 3.90
14	9.80	13.70	23.50	33.50	- 10.00
16	9.10	13.10	22.20	37.20	- 15.00
18	8.80	12.80	21.60	40.00	- 18.40
20	8.60	12.60	21.20	41.40	- 20.20

Dr. Raphael Zon, Director of the Lake States Forest Experiment Station, gave an interesting talk on the work of the station and stated that other studies besides those involved in selective logging are being made. They are also making a test that swamp timber will grow better if excess water is drained off by ditching, and in the case of tamarack are able to show that a tree 46 years old that had reached a height of only 10 feet with a diameter of 11 inches while growing in a very wet spot, leaped to a height of 20 feet and gained a diameter of 26 inches in a period of 7 years after the excess water had been drained away.

The volume increased from .037 cubic feet to 379 cubic feet. As 25 per cent of the Upper Peninsula is swamp, the importance of this study can be readily seen. Larry F. Livingston gave a demonstration of ditching the swamp area by dynamite for the benefit of Colonel Greeley and his party.

Mr. F. W. Hyde then invited the entire party to lunch at Camp 7 on the AuTrain Road where an excellent camp meal was found awaiting us, after which the trip was continued to Munising.

At Munising the party inspected the various industries, after which the Ottawa took them to the Pictured Rocks and returning, landed them at Grand Island.

After dinner at Hotel Williams, many interesting talks were given by the notable men present, the meeting being presided over by John M. Bush.

The personnel of the party was as follows:

Prof. E. V. Jotler, University of Michigan, Ann Arbor, Michigan.
Edward A. Hamer, Mgr. Holt Lbr. Co. Chassell, Michigan.
Prof. Henry Schmitz, University of Minnesota, St. Paul, Minnesota.
Larry Livingston, Agriculture Engineer, Marquette, Michigan.
G. E. Bishop, Mgr. U.P. Development Bureau, Marquette, Michigan.
Arthur Stace, Grand Rapids Press, Grand Rapids, Michigan.
Prof. A. K. Chittenden, Mich. State College, Lansing, Mich.
Wilson Masters, Soc, Michigan.
O. T. Swan, Mgr. Northern Hemlock Ass'n., Oshkosh, Wis.
D. C. Everest, Mgr. Marathon Paper Co., Wausau, Wis.
Prof. D. A. Crocker, New York.
C. H. Woruth, Chicago, Ill.
W. A. Munro, Munising Paper Co., Munising, Mich.
Crosby A. Hoar, Federal Fire Inspector, Duluth, Minnesota.
F. A. Kelley, Mgr. U. S. Mills, Cloquet, Minn.
M. J. Fox, Mgr. Von Platen-Fox Co., Iron Mountain, Mich.
Dr. Raphael Zon, Director Lake States Ex. Station, St. Paul, Minn.
Dr. John N. Lowe, Northern State Normal, Marquette, Mich.
B. C. Nagel, Detroit News, Detroit, Michigan.
Arthur D. Wood, Editor Munising News, Munising, Mich.
L. H. Finkbeiner, Sales Manager, Munising Saw Mill, Munising, Mich.
W. H. Acker, Supt. Munising Saw Mill, Munising, Mich.
E. O. Erickson, Mgr. Munising Woodenware Co., Munising, Mich.
P. S. Lovejoy, State Conservative Dept., Lansing, Mich.
A. E. Wackerman, Forester Lake States Ex. Station, Minneapolis, Minn.
O. C. Davidson, Iron Mountain, Michigan.
Dean H. L. Russel, University of Wisconsin, Madison, Wis.
O. E. Brown, Cashier, 1st National Bank, Munising, Mich.

T. G. Sullivan, Mayor, City of Munising, Munising, Mich.
 Albert Stohl, Detroit News, Detroit, Mich.
 Roy O. Woodruff, Co-Author of Woodruff, Bay City, Mich.
 G. W. Putnam, Director Chatham State Ex. Station, Chatham, Mich.
 E. G. Amos, Agriculture Engineer, Marquette, Mich.
 E. P. Strong, Sec. Mun. Paper Company, Munising, Mich.
 Col. W. B. Greeley, Chief Forester U. S., Washington, D. C.
 R. G. Schreck, Supervisor, Michigan National Forest, Lansing, Mich.
 A. L. Martin, Forester, Dunbar School, McCarron.
 Col. A. S. Peck, Chief Division Forester, U. S., Denver, Colo.
 Thos. F. Marston, Mich. State Conservation Dept., Lansing, Mich.
 Herman Lundeen, Mich. State Conservation Dept., Lansing, Mich.
 John M. Bush, Land Agent, The C. C. I. Co., Negaunee, Mich.
 C. D. Mason, Sec., The C. C. I. Co., Cleveland, Ohio.
 E. J. Hudson, Manager, Pioneer Furnace, Marquette, Mich.
 Wm. L. Norton, Munising, Mich.
 Dean John R. Effinge, University of Michigan, Ann Arbor, Mich.
 Dean W. C. Coffey, University of Minnesota, St. Paul, Minn.
 H. J. Cox, U. S. Weather Bureau, Chicago, Ill.
 Prof. C. P. Winslow, University of Wisconsin, Madison, Wis.
 D. A. Crika, Columbia University, New York.
 Thomas Collins, Mayor, City of Negaunee, Negaunee, Mich.
 F. W. Hyde, Supt., The C. C. I. Co. Lumbering Dept., Marquette, Mich.
 Steve Lowney, Land Looker, The C. C. I. Co., Marquette, Mich.
 R. A. Brotherton, Engineer, The C. C. I. Co., Negaunee, Mich.

I attach to this report a map which shows a classification of the timber area together with estimates of the timber made by Lowney, Howie and the Government men. On it is also indicated where the selective logging was done in October 1926. 301 logs were cut averaging 6.6 logs per M and amounting to 45 M feet also 78 cords of wood. Following is a complete report of this operation by Raphael Zon, Director of the Lake States Experimental Station:

Raphael Zon's Report on Selective Logging.

1. The 20 acres of hardwood timber, which were logged selectively during the winter of 1926, are located in east half of SE of the NE of Section 35, T 46, R 23, as shown on the attached map. A complete cruise of the entire 20 acres showed a total stand of 127,000 board feet, net Scribner scale. Under the plan of removing about one-third of the stand, some 45,000 feet of logs, Scriber scale, were marked for cutting, or 2,250 feet from a total stand of 6,350 feet per acre, or 35 per cent of the total stand by volume. The actual scale of the timber cut proved to be 45,127 board feet, and in addition 78 cords of chemical wood.

2. The average number of trees per acre was 193, ranging from 3 inches to 36 inches and over in diameter breast high. No trees below 22 inches in diameter were cut, except where their removal was considered beneficial to the remaining stand. In all, 169 trees were cut on the 20 acres. In addition, 89 trees were broken down in felling the larger trees and had to be cut up into chemical wood. On an average per acre, 8 trees were cut and in addition 4 trees were destroyed in logging, the latter ranging between 3 and 15 inches in diameter. Only 3 trees above 12 inches in diameter on the entire 20 acres were broken in logging and had to be cut into chemical wood. Out of an average stand of 193 trees per acre, there have been removed, therefore, in actual cutting and destroyed in logging 12 trees per acre, leaving 181 trees to the acre. Of these, there were 41 trees 12 inches and over in diameter. The loss through breakage in logging the larger trees was remarkably low, about 2.2 per cent of the number of trees remaining, but an insignificant per cent of their volume. If this loss is compared to the ordinary loss of small trees in logging, where 68 per cent of all the trees between 3 inches and 6 inches are destroyed and 38 per cent of all the trees between 6 and 12 inches are destroyed, this is a remarkable showing, and proves that selective logging does not involve great damage to the remaining trees, even when no unusual precautions are taken in felling.

3. A most striking result of the selective logging is the high quality of the product obtained. This made possible the removal of two-thirds of the value and only one-third of the volume of the stand. The average value of hardwood logs cut in ordinary logging operations during this winter is about \$23 a thousand feet on the cars and in some localities even lower. The logs cut under selective logging brought the following price: Veneer Birch 45.00, Veneer Maple 30.00, Bowl Birch 45.00, Bowl Maple 35.00, Wooden Birch 16.00, Wooden Maple 16.00. Since there was cut 6,125 feet of Birch logs and 39,048 feet of maple, the average value of the logs cut in the 20 acres was 31.62 a thousand. Had the entire stand been cut, the value of the logs at 23.00 a thousand would have brought \$146 per acre. By taking only 35 per cent of the volume

from the largest trees the value of the logs was 71.42 per acre.

The chemical wood, produced from the tops and defective portions of the trees and from smaller defective trees, will aggregate about 250 cords. At 50 cents a cord stumpage for this material, the chemical wood it is expected will bring in an additional \$125, or \$6.25 per acre. Only 78 cords chemical wood has been taken, the balance remains on the land and will be taken off in spring of 1927.

An account of the actual use made of the logs cut selectively is of interest.

<u>Log Grades Produced in Selective Logging</u>									
	<u>Veneer</u>		<u>Bowl Logs</u>			<u>Woodenware</u>			
	<u>Bd.</u>	<u>Ft.</u>	<u>Per cent</u>	<u>Bd.</u>	<u>Ft.</u>	<u>Per cent</u>	<u>Bd.</u>	<u>Ft.</u>	<u>Per cent</u>
Maple	12,531		32.1	18,991		48.8	7,526		19.1
Birch	3,005		49.0	1,917		31.3	1,203		19.7

4. Another significant feature of last year's selective logging was the logging cost. It compared favorably with the logging costs over large areas and on an average was even a trifle lower. The contract was awarded to a local settler who charged \$10.50 a thousand feet for felling, skidding, hauling, and loading the logs on the cars, plus \$1.55 overhead, making a total of \$12.05 per M feet, and \$4.00 per cord of chemical wood, including splitting, hauling, and loading on cars. The proceeds and the logging costs on the 20 acres are as follows:

<u>Receipts from Selective Logging</u>	
45.173 M ft. logs @ 31.62	1428.53
Cost of logging @ 12.05	<u>544.29</u>
Receipts from logs after deducting logging cost	884.24
Receipts from 78 cords chemical wood @ 50 cents stumpage	<u>39.00</u>
Total receipts from 20 acres	923.24
Receipts per acre	46.16

This, of course, does not include charges on the investment or any other carrying charges.

5. Another feature of selective logging was the fire-proof condition in which the forest was left. By cutting only trees over 22 inches in diameter and by utilizing the tops down to 3 inches for chemical wood, there was very little slashing left on the ground. The small amount of slashing left on the ground will remain moist in the shade and will soon rot. Except for the scattered stumps, there is little to indicate that two-thirds of the value of the stand was removed from the 20 acres. The stand has the appearance of a virgin hardwood forest. Since the forest conditions were left intact, it means that the air will constantly be moister here than if it were cut clear, that the surface soil will remain cooler and damper throughout the critical spring and fall fire season, as well as through the entire summer.

6. Another fact of importance is that the logging was done by a local settler, to whom the winter work was a source of income and afforded him the opportunity to develop his farm during the summer with the assurance that he will remain a permanent settler.

7. In another 20 years the 41 trees between 12 and 22 inches in diameter left per acre under selective logging will grow from 2 to 4 inches in diameter. The amount of growth will more than make up for the 2,250 feet removed in the selective logging. In 20 years the growth of the trees left now will bring the stand back to its original volume, and it should be possible to make another selection cut at that time of as high quality timber and get at least a similar income. With selective logging, then, the forest will be continuously productive, bringing in according to this example \$46.16 an acre every 20 years, or \$2.30 net per acre every year, not counting carrying charges.

8. Last year's selective cutting, although not by any means conclusive because of only one year's cut, opened, however, perspectives and possibilities worth while considering. Many lumber companies, laying out their logging operations, leave the tracts nearest to the mill and accessible to the means of transportation toward the end of their

operations. This is especially true of the Cleveland-Cliffs Iron holdings, where many accessible forest areas are left at present untouched. These tracts may not be cut for another 25 or 30 years. Meanwhile, there are taxes, protection, interest on the investment, and other carrying charges to pay. At present the net growth on these old stands is nil, the growth being offset by the natural decay. If these tracts should be cut over selectively, like the experimental tract last year, the bulk of the investment could be removed and yet two-thirds of the stand left in a good growing condition, producing from 125 to 200 board feet per acre per year. At the time when these tracts are to be cut, that means within the next 25 or 30 years, the stand will be fully as much as it is today and the likelihood is that the timber will be of better quality.

There is another consideration in that these accessible tracts are surrounded, here and there, by settlers who are trying to make a living on the land. It is these settlers who would be engaged in the selective logging of these accessible tracts continuously, and whose position would be strengthened as permanent settlers and farmers.

At present, there is a double waste. At one hand, logging at the end of the logging road, miles away, is wasteful and destructive to the future of the forest. On the other, there is the waste caused by the loss of growth in the old stands accessible to transportation and towns. This double form of waste could be greatly reduced by the adoption of selective logging, as illustrated by the cutting of last year."

FOREST FIRE

Owing to a very wet spring and summer we were not troubled with many forest fires. We were only called to four fires which started from the railroad and burned over pine plains land and were stopped before they got to our land. The total rainfall for this year as will be noted from the attached chart, was 35.81 inches as compared with 19.48 inches during 1925.

From our records of forest fire which occurred on or near our lands during the period 1915 to 1926 we have compiled charts which are attached and give in a graphic manner the principal causes of fires, the most dangerous months, the number of fires and the loss caused the company. The loss shown does not show the entire loss to small growing trees and standing timber.

FOREST FIRE TRAIN

Through the efforts of Larry Livingston, Agriculture Engineer, and sponsored by the Upper Michigan Development Bureau "The Forest Fire Fighting Flyer" was run through Lower and Upper Michigan. The Train was made up of three coaches, a lecture car, and exhibit car and dining and sleeping car, and with the many able speaking personnel that were with the train spread the message of fire prevention to many thousands.

I joined them on April 9 and was with them through Marquette and Alger Counties until April 14th, assisting them in every manner within my ability.

The train was very well received in every town, and everyone expressed keen interest in the exhibits, and I think it did a world of good in keeping before the public mind the fact that during the dangerous fire season we should all be careful not to start any fires, and put out or report any that are seen. The mechanical picture of a real forest fire near the entrance of the car created possibly the greatest interest and always had a large number of people before it. The model of a National Forest showing fire towers, fire lanes, roads, cabins and planting seemed to make a hit with the school children, while the land clearing exhibit caused a great many questions to be asked by the farmers together with many requests for blueprint copies of the various tools shown. The many charts and pictures furnished by the Michigan Forestry Department and the U. S. Government were very fine and one could get considerable valuable information from them. The Cleveland-Cliffs Iron Company's pump and equipment loaned to the car created considerable interest at all times and by the way, was the only real piece of forest fire fighting machinery in the entire exhibit.

The attendance during the time I was with them were as follows:

	<u>Visited Car</u>	<u>Attended Meeting</u>
Republic	500	400
Ishpeming	1500	1000
Marquette	2500	1200
Skandia	300	
Gwinn	800	400
Chatham	600	
Munising	900	400

In Skandia and Chatham moving pictures and speeches were made in the extra car provided for this purpose as there was no hall to hold a general meeting. The seating capacity of the car was about 100 and pictures and talks were given as long as the crowd lasted.

I think that the train will help a great deal to bring before the people the great need of the suppression of forest fires; and the various models and pictures will remain in their memory long after the literature passed out is destroyed and forgotten. The talk given before the students at the Normal should have far-reaching results as most of these students become teachers and if we can keep them interested by giving them an interesting talk each year with the facts of the fire situation, they will be able to carry on the good work through the schools and instill in the minds of the children while they are young, the importance of not starting any fires and putting out the ones they see, if possible.

The greatest means of stopping the forest fires is to see that none are started and this can only be done by publicity and continually warning people against the fire danger, that most of them exercise diligent care against anything that will be the means of starting a forest fire. The most effective means is through the use of slides and talks given in schools and churches. Catch the children while they are young, attract their attention by pictures of actual facts and it will instill into their young minds the need of being careful and will put over the fire prevention messages.

I would recommend that we do as much of this work as possible and would like to be authorized to spend at least \$50.00 in additional equipment and slides. During the past year, I have given a number of lantern talks to Boy Scouts, schools, church clubs and sportsmen's clubs and have always made it a point to bring the fire prevention question before them.

WIND STORM

On July 16th a very heavy wind and rain struck Grand Island from the west and in passing over did considerable damage to the timber. The attached photos show the terrific force of the wind, which uprooted large maple, pine and hemlock and broke tops from large trees carrying them considerable distance. It is a coincident that a year ago on July 15th a similar storm struck the Island and did considerable damage. The greatest damage to the timber extended over an area of 2,240 acres and blowing down an estimated amount of 2,500 M of log timber. To log and recover all of this down timber would be very expensive and no doubt will cost more than its commercial value. A considerable amount of the pine, hemlock and hardwood near the Lodge and Echo Lake we are endeavoring to recover at a reasonable cost. The down timber on the East road and in the central portion of the Island might be logged at a reasonable cost if all of the timber were cut, but taking only the down timber together with the long haul and water transportation on scows will make the cost prohibitive. On the attached map of the Island, I have indicated the storm of July 15th, 1925 in red and the storm of July 16, 1926 in yellow, and on another map of Upper Michigan I have indicated the direction of the wind showing in solid color where we have found evidence of its course.

SECTION 10-47-17.

This Section was hit very hard by the storm and very little of its area is untouched. Large maple trees, 16 to 22 inches on the stump, were uprooted and now lie upon the ground. Most of the large pines that stood above the other timber are down and many badly broken and splintered. Many of the smaller trees were broken off and are now only fit to make chemical logs. It is a most difficult task to get through this timber owing to the many windfalls. All through the section are small islands of timber undamaged,

but taking the Section as a whole, I should judge that at least 40 to 45% of the timber is down or an estimated amount of 1625 M Ft. Underhill is now operating this section and we will no doubt recover all of the down timber at a reasonable cost. On Section 2-47-17 there is an estimated amount of 325 M Ft. and on Section 14-47-17 about 575 M Ft. all of which Underhill will recover.

MUNISING SAW MILL

The Company's Mill at Munising burned August 15th, 1926, catching fire from unknown cause about 11:45 A. M. and by two o'clock was a total loss. After all details of the fire such as insurance, etc., were settled, the question of rebuilding at once came up and estimates and plans have been sent to Cleveland, Preliminary to making estimates, we looked over several mills that have been built within the last five years and examined the plans of other mills also a number of second hand mills were offered to us and we investigated them.

THE BAY DE NOC LUMBER COMPANY MILL AT NAHMA, MICHIGAN.

This mill is wood construction 60 x 180 x 32, motor driven, operating two 9' bands, one horizontal and one vertical resaw with a file room, 50 x 60 x 12 and cost without boiler house, trams, pond, etc., \$266,000.00 three years ago.

The average output is 70 to 75 M feet hardwood or 100 to 125 M feet softwood each 10 hours. The total men employed about the plant is 100. 29 men being in the mill. They claim their cost of lumber in piles including depreciation and overhead is 7.44 per M. Their logging is all done from three sets of camps of portable construction costing about \$4,700.00 per set for 80 to 90 men in each. They walk their men two miles, dinnering out.

They claim to have timber enough ahead to run for 25 years all of which when cut is brought from the woods to the mill on their own railroad and most of the lumber is shipped out by water.

The town of Nahma is owned by them and contains 82-residences, church, school, hotel, club house, two large boarding houses and store. The Company pays 90% of the taxes in the township and are able to control politics.

SOO-CADILLAC LUMBER COMPANY, SAULT STE. MARIE, MICHIGAN.

This mill is motor driven and operates two 9 ft. bands, one horizontal and one vertical resaw giving an output of 70 to 80 M feet per 10 hour day and 80 to 110 cords of wood.

All forest material are logged to a 6" top and come from the woods unsorted - Chemical Softwood and Hardwood logs loaded together - the sorting all being done on the log deck in the mill at the top of the slide. Chemical wood going to a wood saw operated by one man at the right ahead of the band. One band at the right took all hardwood saw logs, and softwood logs going to the left. All wood from the slab resaw being picked out of the conveyors that would make hardwood squares, flooring stock and lath. It is interesting to note that one-third of all forest material received by weight in lumber, one-third wood and one-third is fuel or hog feed. The wood buggies hold $2\frac{1}{2}$ cords of wood which is equal to about 2 cords of wood piled and makes as much chemical from 2 cords of mill wood as they do from $2\frac{1}{2}$ cords of wood from the woods.

Their wood cut in the woods cost as follows:

Cutting	\$ 2.00
Hauling & loading on cars	1.00
Freight	.75
Overhead	.25
Stumpage	.50
Cost per cord delivered (at mill)	\$4.50

The mill is built of concrete lower floor, upper floor and file room of steel, covered with Robertson sheet metal. The total cost of mill and machinery not including boiler house, mill pond or trams, etc., was \$400,000 and was built about 6 years ago.

The building is depreciated at $2\frac{1}{2}\%$ per year and machinery at 4% and their total monthly overhead charges are:

Interest	\$ 3,850.00
Taxes including timber	6,000.00
Depreciation timber	10,800.00
Depreciation Plant	<u>3,200.00</u>
	\$23,850.00

All costs at saw mill and woods are carried on lumber scale. All logs being counted in the woods at the three camps, no logs are scaled. After going through the mill the lumber scale resulting is worked back to the camps and logging cost is therefore on a lumber tally and not a log scale. This develops higher timber stand per acre as follows:

Camp 7 - 33	8.39 M per acre
Camp 10	10.42 " " "
Camp 35	<u>15.97 " " "</u>
	11.18 Average per acre

20% of which is hemlock.

In figuring costs, a credit of \$2.50 for each cord of wood produced at mill is allowed.

They operate 3 camps of 75 men each, portable construction and walk their men $1\frac{1}{2}$ miles, dinnering out.

Chemical wood cost per cord \$10.77 and its value is \$12.54.

The chemical wood is dried by exhaust steam and takes 48 hours instead of the usual 72. The charcoal when taken from the retorts is run in cooling sheds and takes 72 hours before loaded for shipment to Cadillac.

WILWIN MILL

Together with Mr. Acker and Mr. Finkbeiner, I made an examination of the Wilwin Mill which had been offered to us and following is a report of conditions as they appear to me.

Location. The mill is located in the northwest corner of the NE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Section 13-44-7 and a track leads Northeast to Wilwin Station on the D. S. S. & A. Ry. located near the center of the North $\frac{1}{2}$ of Section 7-44-6. It is 100 miles by road from Munising over M-25, M-84 and M-12 lying 8 miles east and 4.5 miles north of Rexton.

Building. The main mill building is 40 x 150 frame, all timbers being in excellent condition, covered with sheet iron some of which might be saved. All framing is 12 x 12 timber, - Pine, Hemlock, Tamarack and some Spruce set upon concrete posts all of which can be moved and re-erected. The boiler house is concrete 34 x 44 containing 3 - 72" x 18' boilers and by wrecking one side the boiler can be rolled directly upon car as a side track runs along that side of the building. The engine room of frame construction 25 x 34 contains a Corless Engine, the counter shaft bearing of same seems to have been cracked as they have placed a heavy steel band around same. A complete lighting system and a large fire pump.

Machine Mill Floor.

Band Mill. Made by the Marinette Iron Works, West Duluth, Minnesota, Number 285, Class 3 - 8 foot, and Acker says the machine is in good condition.

Carriage. Made by Wicks Bros., Saginaw, Michigan, 42" block and in good condition, hand set.

Resaw. Vertical Type, 7 foot. Number 2EM44 made by M. Garland Company, Bay City, Michigan, and is in excellent shape - looked as though it was not used very much.

Edger. Made by D. J. Murray, Wausau. 3 saws but there is room enough on the arbor to mount more saws.

Trimmer - Slasher. Rolls and conveyors all in good condition lumber chain runs out from the building 78 feet.

Nigger and Steam Feed. Made by Hill and Company, Kalamazoo, Michigan.

Lath Mill. Complete and of ample size.

Machine Shop. In separate building and contains a 6 $\frac{1}{2}$ foot lathe and shaper, together with a small engine and boiler to drive same.

Stack. Looks to be in very good condition and has been painted not long ago. We will have to get a 60 foot gin pole to take same down.

File Room. Over band mill 38' x 40' and complete set of tools for same.

Moving Building. It will take a crew of about 16 men to wreck this mill and load it on cars. There is a small building next to the boarding house where we can sleep and feed the men. There is a stove and some steel bunks but we will have to provide mattresses, blankets, dishes, cooking outfit and cook. There are four washouts on the railroad into the mill and the steel is light and I doubt very much if the D. S. S. & A. Ry. will run their big engine in there so I thought we could rent an engine from the Fiborn Quarry people to switch the flat cars necessary to load the entire outfit and when same is loaded come after them. I think \$200 or \$300 would repair the track in shape to get over with a light engine.

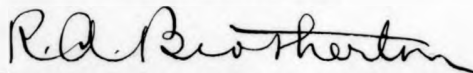
REBUILDING THE MILL

Looking at the location and construction the new saw mill from an engineering point of view presents the following: If the mill is located at Munising, it should be a two band mill, electric driven and if the location is to be made to cut all of our remaining standing timber, the building should be of steel and concrete construction, which would eliminate all fire hazards and insurance on the building and contents. It should also be constructed contemplating the future building of dry kilns and flooring plant.

If the mill is located at Marquette, it should be a three band mill with a cut off saw located ahead of the third band to take care of about 25% of the logs which are too rough or crooked to handle economically on the band carriage. A mill of this kind would take care of all our requirements and all lumber of commercial value would be saved and the balance going to the retorts meeting the furnace requirements. Such a mill can be operated with very few men more than are employed at the present mill now operating at the Furnace.

The mill to be constructed, having in view the future building of dry kilns and flooring plant.

Respectfully submitted,



R. A. Brotherton, Engineer.



Uprooted Pine on road to Echo Lake showing few roots entering the ground to any depth.



Maple, Beech and Hemlock down northwest of the south end of Echo Lake.



Clearing windfalls from East road after the windstorm.



Spruce and Hemlock lying across East Road.

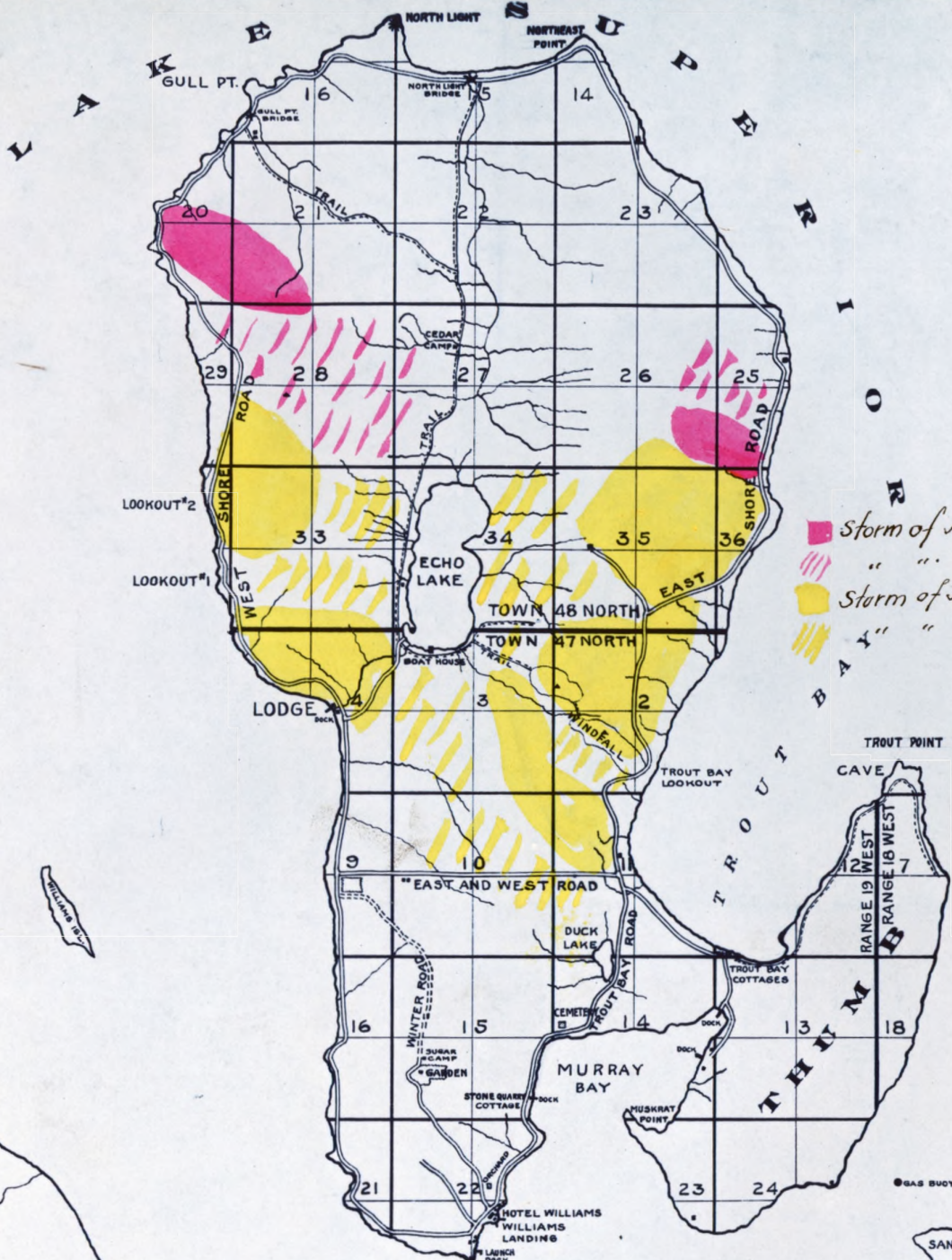


Broken timber and windfall on East side of Grand Island.



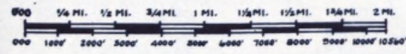
Windfall and down timber on Section 10-47-17.





Storm of July 15-1925 Heavy
 " " " " Light
 Storm of July 16-1926 Heavy
 " " " " Light.

MAP OF GRAND ISLAND MUNISING MICH.



MUNISING

30 MI. TO MARQUETTE TO WETMORE 4 MI.

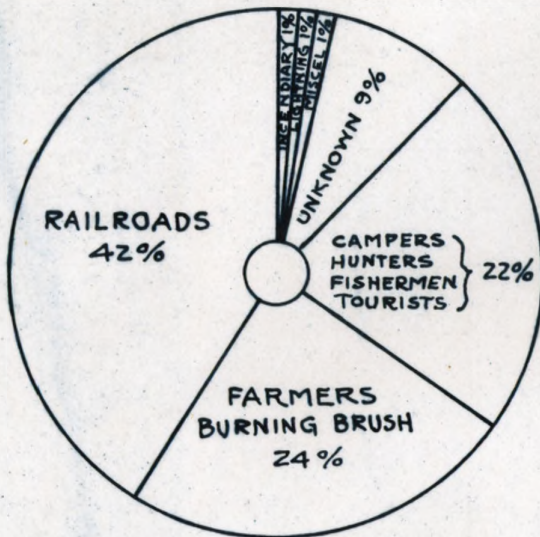


CHART SHOWING CAUSE OF FIRES ON C.C.I.CO. LANDS 1915-1926

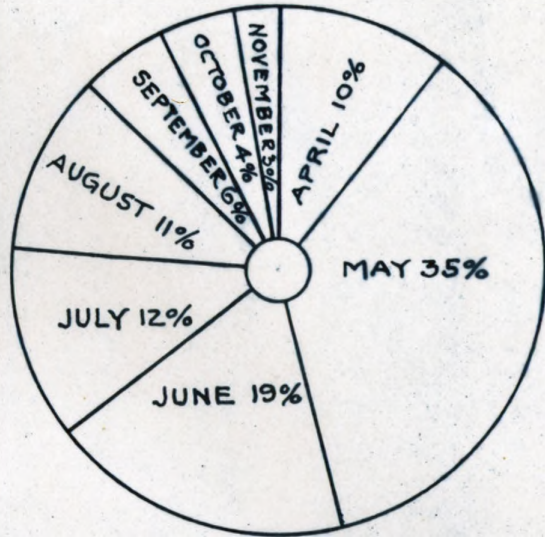


CHART SHOWING THE MONTHS WHICH ARE THE MOST DANGEROUS COMPILED FROM DATA FROM A 12 YEAR PERIOD-1915-1926 FROM FIRES WHICH OCCURED ON C.C.I.CO. LANDS.

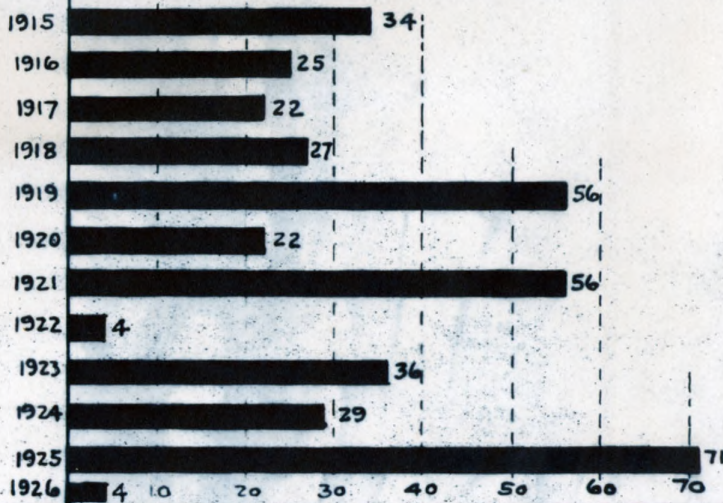


CHART SHOWING THE NUMBER OF FIRES THAT OCCURED ON C.C.I.CO. LANDS FOR YEARS 1915-1926

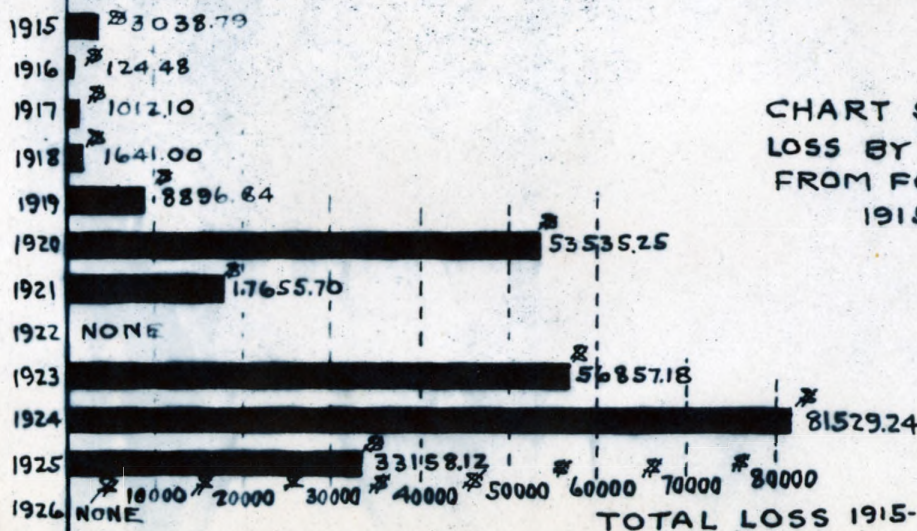


CHART SHOWING THE LOSS BY THE C.C.I.CO. FROM FOREST FIRES 1915-1926

COMPILED BY RABROTHERTON.

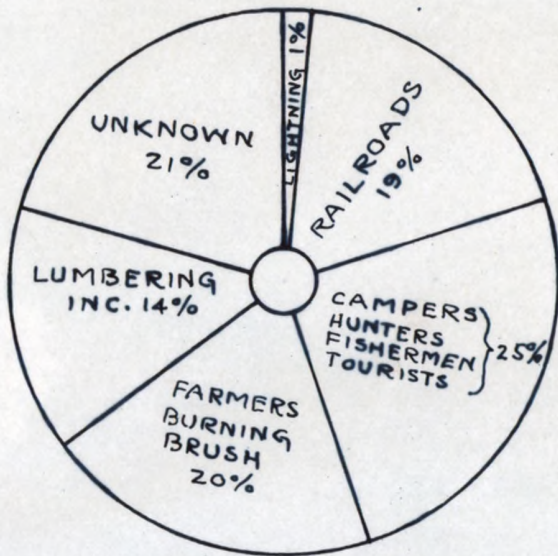


CHART SHOWING CAUSE OF FIRES
IN UPPER MICHIGAN 1915-1926.

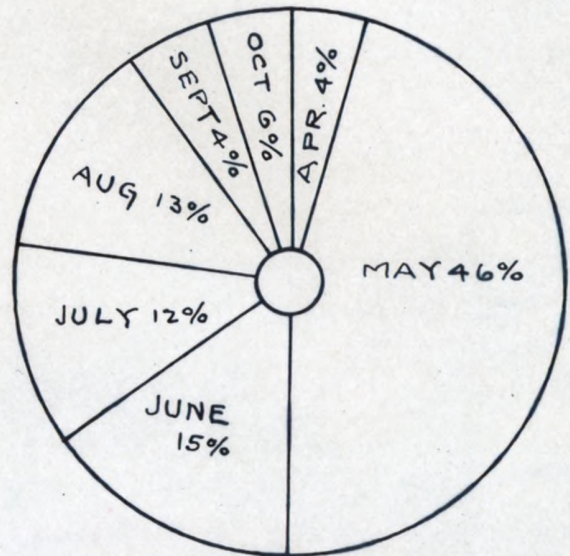
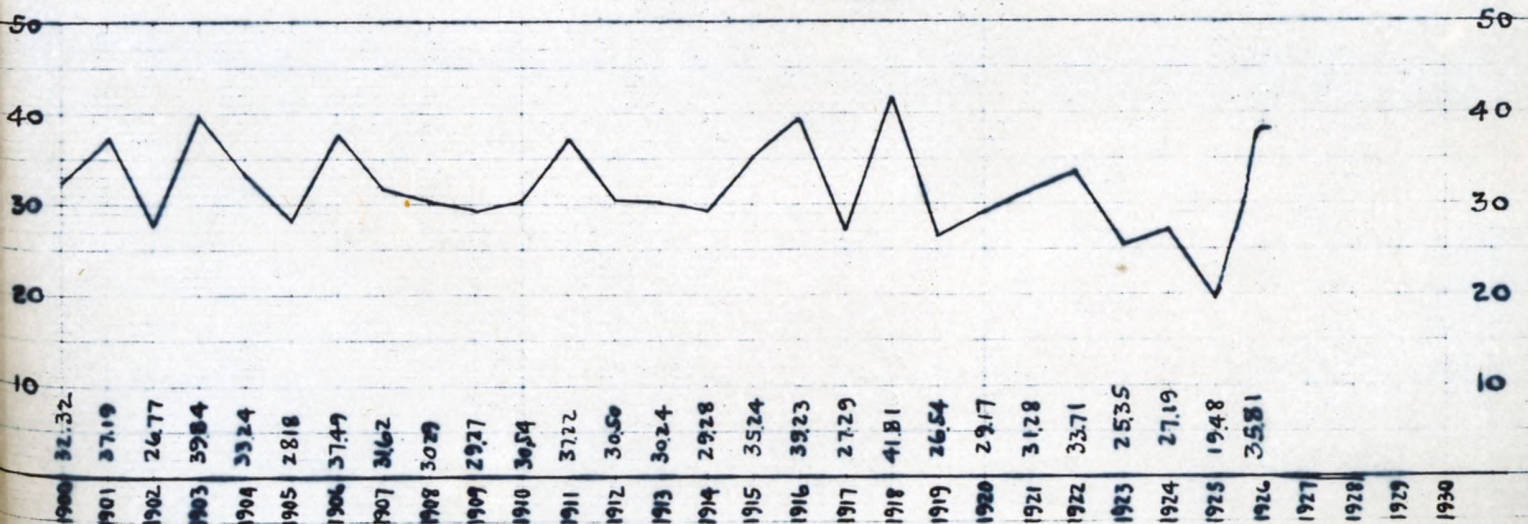


CHART SHOWING % OF FIRES
BY MONTHS - 1915-1926
UPPER MICHIGAN.

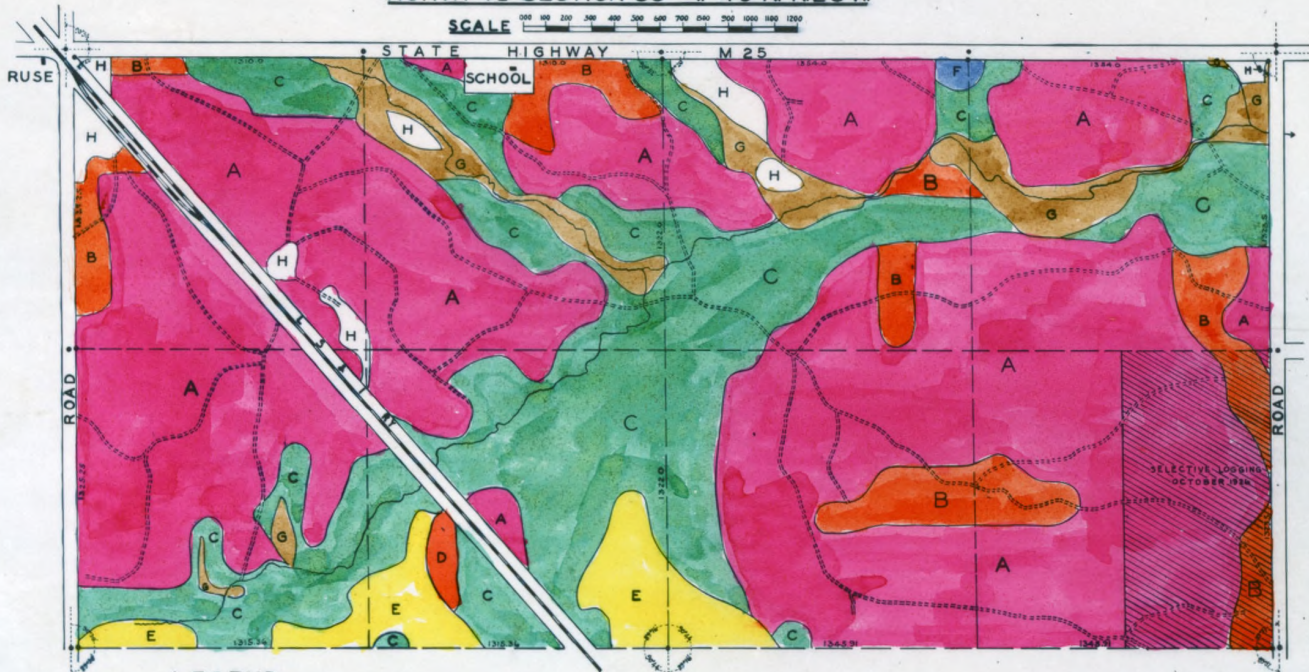
YEARLY RAINFALL FOR UPPER MICHIGAN 1900 TO 1926



COMPILED BY
R.A. BROTHERTON,
Negaunee, Mich.

EXPERIMENTAL FOREST
LAKE STATES FOREST EXPERIMENT STATION RUSE MICH
NORTH 1/2 SECTION 35 T. 46 N. R. 23 W

SCALE 0 100 200 300 400 500 600 700 800 900 1000 1100 1200



LEGEND

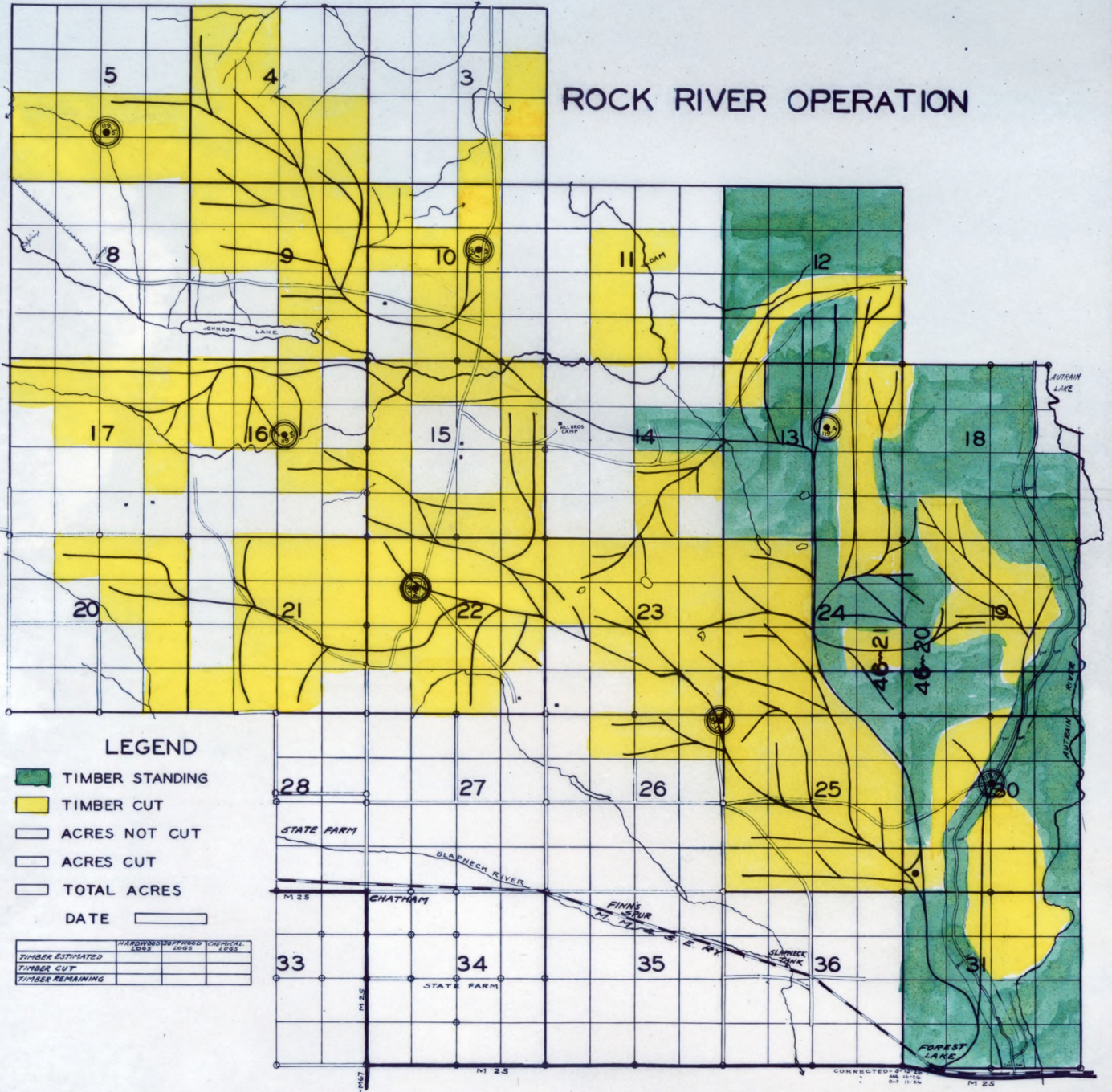
HARDWOODS	HARDWOOD CONIFERS	HEMLOCK HARDWOODS	CONIFEROUS SWAMP	SECOND-GROWTH HARDWOODS	ALDER SWAMP	OPEN	SELECTIVE LOGGING
HEAVY A	LIGHT B	C	D	E	F	G	H
AVERAGE STAND PER ACRE 13.2 M	5.3 M	8.1 M	16.3 M	6.2 M	0.6	14.0	4.0
AREA - ACRES 17.9	28.0	75.0	1.0	12.0			

ESTIMATE OF TIMBER

	HARDWOOD				SOFTWOOD						PULPWOOD			MISCELLANEOUS				TOTAL	TOTAL VALUE
	BIRCH	PINE	SPRUE	WAX	ASH	HEMLOCK	PINE	SPRUE	SALBAM	LEGAL	SPRUCE	ALDER	SWAMP	SWAMP	SWAMP	SWAMP	SWAMP		
HOWIE 1913	255,000	1635,000			58,000	13,000	14,000	11,000		130,000		200	15	5,900	5,900	8000	512	2,110,000	6.91+
LOWNEY 1926	175,000	1835,000	5000		7,000	10,000	15,000	7,000	5000	55,000	2,000	75	30	4,500	2,000	1,700	360	2,109,000	6.85+
GOV'T 1926	413,400	2,011,800	PLUM	500	36,900					43,000	26,100	231,200						2,661,700	8.94+

JANUARY 1927
 RA. BROTHERTON

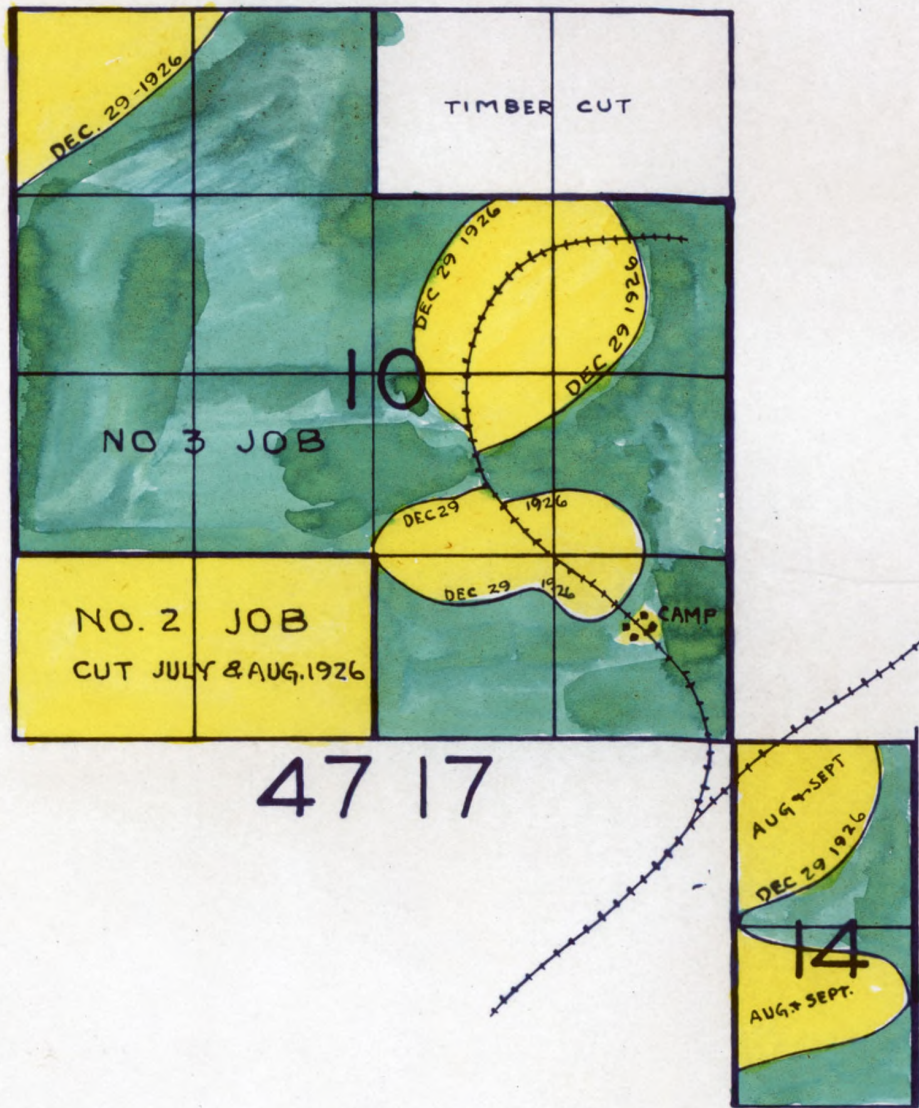
ROCK RIVER OPERATION



LEGEND

- TIMBER STANDING
- TIMBER CUT
- ACRES NOT CUT
- ACRES CUT
- TOTAL ACRES
- DATE

	NARROW	MEDIUM	WIDE	CHECKED	ACRES	ACRES	ACRES
TIMBER ESTIMATED							
TIMBER CUT							
TIMBER REMAINING							

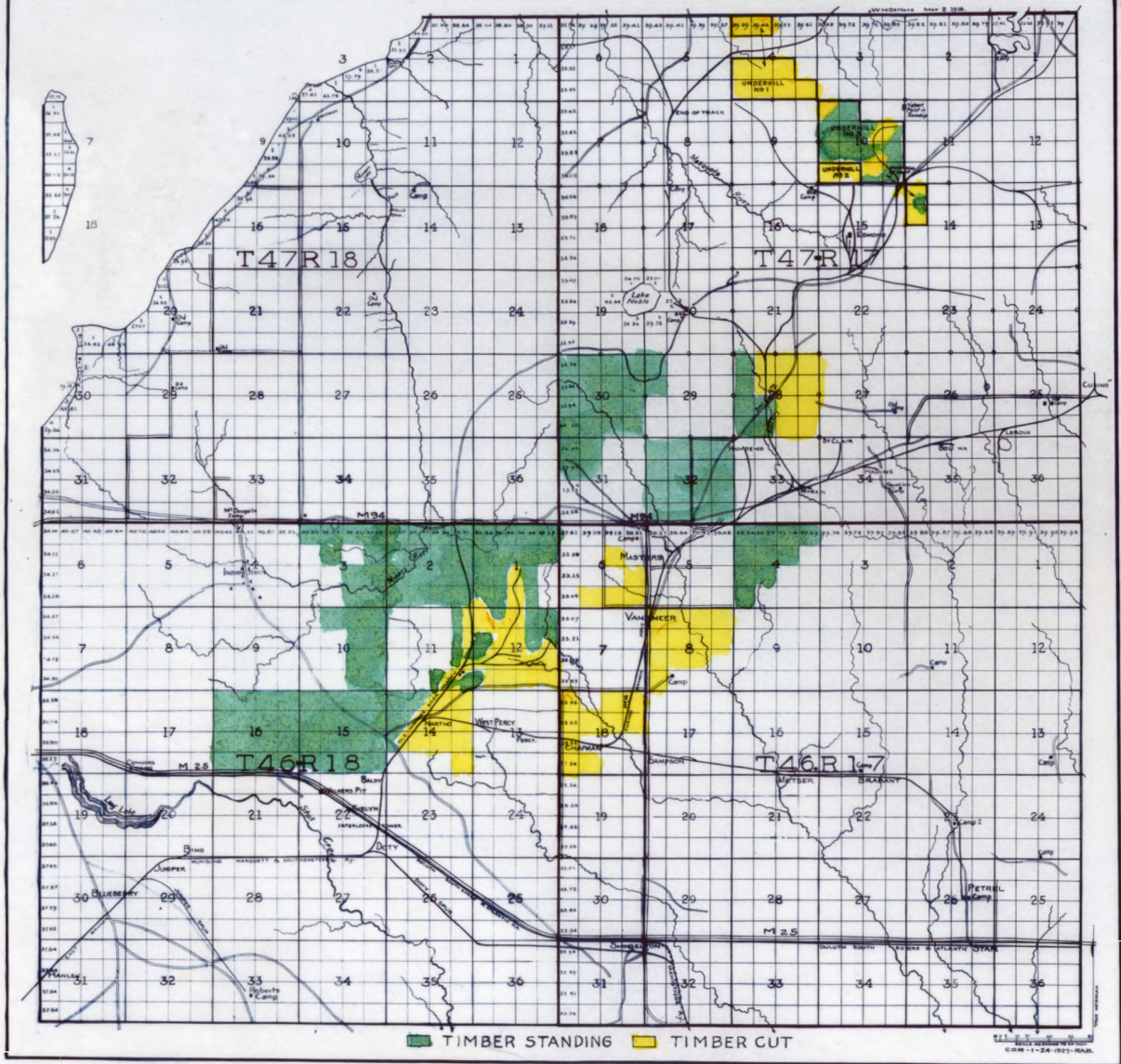


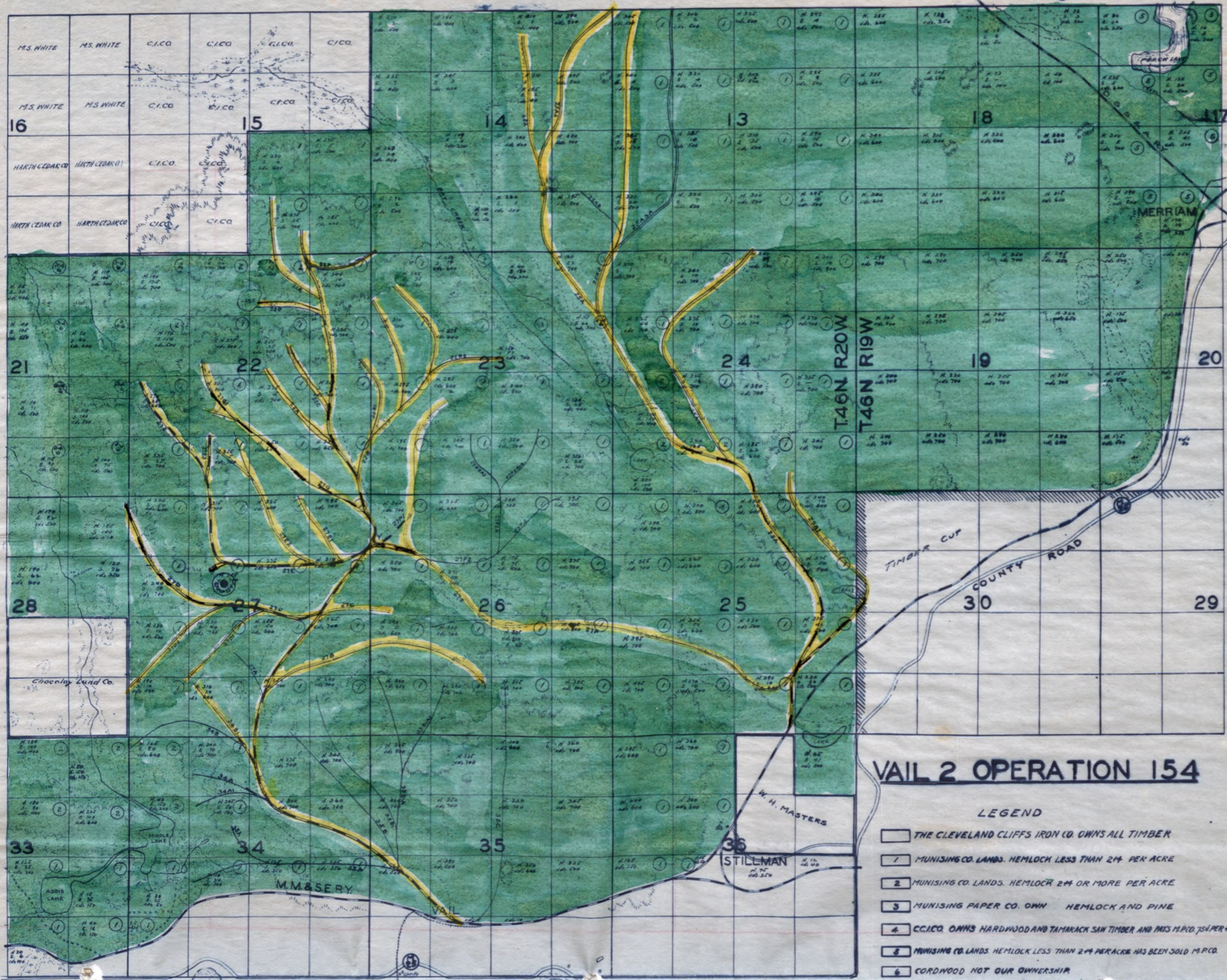
UNDERHILL LOG JOB

TIMBER STANDING
 " CUT
 DATE

R.A. BROTHERTON, C.E.

MUNISING WOODENWARE CO. OPERATIONS
 TOWNS 46 & 47 RANGES 17&18.
 ALGER COUNTY MICHIGAN





VAIL 2 OPERATION 154

LEGEND

- 1 THE CLEVELAND CLIFFS IRON CO. OWNS ALL TIMBER
- 2 MUNISING CO. LANDS. HEMLOCK LESS THAN 2M PER ACRE
- 3 MUNISING CO. LANDS. HEMLOCK 2M OR MORE PER ACRE
- 4 MUNISING PAPER CO. OWN HEMLOCK AND PINE
- 5 C.I.CO. OWNS HARDWOOD AND TAMPACK SAW TIMBER AND HAS 1/2 AC. PER A.
- 6 MUNISING CO. LANDS. HEMLOCK LESS THAN 2M PER ACRE. HAS BEEN SOLD TO P.CO.
- 7 CORDWOOD NOT OUR OWNERSHIP
- 8 R.Y. SURVEYED
- 9 R.Y. GRANDED
- 10 T.Y. STEEL LAMB
- 11 T.Y. STEEL LAMB

THE CLEVELAND-CLIFFS IRON COMPANY

LAND DEPARTMENT

STATEMENT OF FOREST FIRES OCCURRING DURING THE YEAR 1926 AS REPORTED BY THE VARIOUS DEPARTMENTS OF THE CLEVELAND-CLIFFS IRON COMPANY.

REPORT NO.	DATE 1926	LOCATION	OWNER OF LAND			C A U S E			PREVENTABLE OR NOT	ATTRIBUTABLE TO PRACTICES OF		QUANTITIES & KINDS	L O S S			LOSS VALUE TO OUTSIDE PARTIES
			CO.	LAND SOLD	OTHER PARTIES	SPARKS FROM ENGINE	FARMERS BURNING BRUSH	MISOL.		TO COMPANY	TO OUTSIDE PARTIES		LAND DEPT.	LABOR DEPT.	RY. DEPT.	
1	May 1	3/4 mile west of mill switch at Little Lake				1			Yes		Dry grass and stubs				10 hrs. labor	
2	May 8	3/4 mile west of Spur 28 at Camp 17						Match or) (Cigarette)	"		Log shack				21 " "	
3	May 14	Between main line and Munising Jct. Siding				1			"		Dry grass				20 min. "	
4	May 15	1/4 mile east of Big Bay					1		"	1	1 telephone pole			1		
5	May 13	1/4 mile west of "W" (probably Myren)				1			"		Weeds, dry grass and brush				3 hrs. labor	
6	May 17	1/4 mile east of Mile Post No. 12				1			"		Dry grass				10 min. labor	
7	May 16	5/8 mile west of Antlers						Unknown	"		22 ties - 1 telephone pole			1	24 hrs. "	
8	May 18	1/5 mile east of Firms Spur				1			"	1	Dry grass, brush, old log				5 " "	
9	May 15	1 mile west of Myren					1		"		No property destroyed					
10	May 19	1,000 feet east of Barnum switch	1			1			"	1	No property destroyed					
11	May 25	1 1/2 mile west of Myren switch					1		"		No property destroyed					
12	May 28	At foot of Dead River Bridge				1			"		Weeds, grass, and brush				9 " "	
13	June 4	200 feet west of Mile Post 6				1			"		Brush - no property destroyed					
14	June 5	Holyoke				1			"		Weeds and dry grass				1 " "	
15	May 5	Van Iderstine Crossing				1			"		Dry grass and leaves				12 " "	
16	June 8	500 feet west of Princeton ore siding				1			"		No property destroyed					
17	June 10	1 1/2 mile east of Dixon Siding				1			"		Dry grass				3 " "	
18	June 12	1/4 mile west of Tail Siding				1			"		No property destroyed					
19	June 15	200 feet east of Antlers				1			"		Brush and leaves				6 " "	
20	June 19	South side of load storage track at Finnegan				1			"		Grass				12 " "	
21	Oct. 31	Metsar						Match or) (Cigarette)	"	1	Fence Posts				8 " "	

CY-3.
1/14/27.

REPORT OF STEPHEN LOWNY, SR., LAND LOOKER,
FOR YEAR 1926.

Following is a report of the work in general done on Company's lands during the year 1926:

During the year the Company had two crews comprising four men continuously engaged.

One was in charge of S. Lowney, Jr., with his compassman, Toivo Pelto, and our own party consisting of my compassman, T. Billings, and myself.

During the year S. Lowney, Jr., examined 27,280 acres of land and also found trespasses and in addition spent considerable time patrolling the lands to prevent trespassing, forest fires, etc.

18 of these trespasses found by him comprised saw logs and pulpwood, and the balance of them comprised mostly firewood, cut by parties living at Palmer, Eagle Mills, Ishpening, etc.

Our own party examined 23,000 acres of land and found and reported 61 trespasses.

56 of these trespasses comprised saw logs in quantities ranging from 2 M feet to 70 M feet.

3 was for having buildings or camps on The C.C.I.Co. lands.

1 was for having their fences over and onto The C.C.I.Co. lands.

1 was for tapping trees, cutting fire wood, making syrup, etc. on The C.C.I.Co. lands.

The finding of so many trespasses last year have had and will have a very wholesome effect on operators who are careless in not properly running their lines and also on those, who knowingly take other people's timber without permit or pay and expect to get away with it without being caught. Most of the logging operations are conducted during the winter months and for this reason this is the time to get after and keep after these parties to protect the Company's property from trespassers. In addition to examining these lands and trespasses spent considerable time patrolling the lands to prevent trespass and forest fires. Also spent considerable time examining township and state roads under construction to prevent them from cutting any timber that was not absolutely necessary and also to see and insist

that they do the work in a manner that does not increase the fire hazard. Also took various prospective purchasers over the lands, also working on records in the Negaunee office, also hunting for the lost Game Wardens and also on numerous other projects for the betterment and protection of Company's lands.

Some time ago a start was made to examine the Company's lands in their entirety. This work has been completed with the exception of about 28,000 acres.

about 14,000 acres of these lands are on Grand Island, and about 14,000 acres of them are in the vicinity of Marquette in Townships 46-23, 46-24, 47-25, 48-25 and 47-26.

Acting upon instructions we will proceed to examine these lands immediately after running around Company's lands to see if any trespassing is being done on them.

FOREST FIRES

We have had practically no forest fires during the year 1926 due largely to the very late cold spring and then to the unusually large amount of rainy weather. However, past experience teach us that exceptionally dry summer seasons are those that predominate, this feature together with the much broken condition of the forests with their numerous slashings makes it imperative that every one of us be on the job continuously watching and be prepared and ready to stomp out every and all fires at their inception.

WINDSTORMS

On about July 16th of 1926 a windstorm coming almost directly from the West and unusually severe for this region, started on Lake Superior and struck Township 47-25 about at the center of the west side and then traversed in almost a direct Easterly direction, blowing down the timber in spots, but not in its entirety for a width of about one tally or 330 feet and so far as known extended East to Township 47-15, a distance in all of about 60 miles.

It is difficult without examining to form any kind of an accurate estimate of the quantity of timber blown down by this storm, but an idea, which is not bad can be obtained by taking the area above mentioned that is 60 miles in length multiplied by 330 feet or one tally wide equals an area comprising 2,400 acres. Then multiply this 2,400 acres by 8 M feet to the acre gives an approximate total

of about 20 million feet. Only a portion of this blown down was on The Cleveland-Cliffs Iron Company lands. The timber recently cut on Grand Island and also a portion of that now being cut by Mr. Underhill on Section 10 in 47-17 is a part of this windfall.

NEW PROJECTS

On about September 1st, 1926, a firm named Eklund Brothers of Duluth obtained some kind of an agreement from the Sterns-Culver Company and others to start work to cut and remove the timber from about 14,000 acres near Walsh Siding in Townships 46 and 47 North of Ranges 15 and 16 West. Since that time they have been continuously at work building camps, also a standard gauge logging railroad, also a tie sawmill, etc.

They now have operating one company camp employing about 130 men and four jobber camps with all the camps employing a total of about 300 men.

Their saw mill which is really a tie mill is located near the SW corner of Section 27 in 46-15. It is about completed and will start cutting ties and short lumber in about a week. They say they will get about ninety cents flat for their hardwood ties on cars.

Their railroad starts at the D. S. S. & A. Railroad near the NW corner of Section 35 in 46-15 and extends in a generally north direction to their large camp on the NE $\frac{1}{4}$ of Section 28 in 47-15 and runs, as shown, largely through lands owned by The Cleveland-Cliffs Iron Company.

From their camp on Section 28, they say, they intend next spring extending their railroad in a generally westerly direction about eight miles which will take it into Township 47-16.

Their section foreman tells me that operating their railroad is very expensive as he has twenty-seven men continuously engaged shoveling snow and shoving logs and poles, etc., under the track for ballast.

Up till the present time, they have only shipped in all about 150 M feet of logs being mostly birch veneer. The birch predominates through this entire district and is generally small but is cutting generally sound and good.

The balance of the timber on these lands is Beech, Soft Maple, and Hemlock. The Beech and Soft Maple are generally defective and they intend cutting all they can of it into railroad ties.

The Charcoal Iron Company has contracted to take all of their hardwood slabs and their short lumber, they say, they can dispose of easily.

The mill when started will cut 1,500 ties in ten hours.

They will convert all the hemlock then can into ties also and for them they get about seventy-five cents each.

This entire region is level, dry, sandy, and no stones and the chances to log during the summer months, as should be done, is unusually favorable.

These operations are now being conducted in a crude, unnecessarily expensive and likely unprofitable manner, for the reason that they are trying to skid in three feet of snow and have to shovel to every tree, whereas if they did entirely summer logging and summer sawing it would eliminate all of this snow shoveling also the costly upkeep of the railroad and also frozen timber, features which would reduce their operating cost to about one-half of its present price.

The Cleveland-Cliffs Iron Company owns a large acreage adjacent to and surrounded by the lands these parties are now cutting. These new choppings together with their railroad and spurs conducted in practically a virgin forest creates a fire hazard which is likely to prove very injurious to The Cleveland-Cliffs Iron Company's timber lands unless the utmost care is taken to prevent fires.

The Buckeye Company are starting new operations in Townships 43 and 44 North of Ranges 20 and 21 West and are building a railroad from the Eben Branch of the Soo Line into this region. This improvement will increase the attractiveness and value of The Cleveland-Cliffs Iron Company lands near here.

WASTE LANDS

In Luce and Alger Counties the Company has a very large acreage of lands having little or no timber of commercial value they being either wet open marshes or burnt plains from which the Pine was cut and removed between thirty and forty years ago, and from a timber and agricultural standpoint they are not worth paying taxes on.

INSECT PESTS

Several months ago you told me that it was reported by Wisconsin Foresters that a fly or insect was killing much of the hemlock timber in that state and region, and instructed me to look carefully as I went through the woods for any indication of this insect. Since then I've watched carefully and so far am pleased to say see no signs of these insects invading this region or injuring any hemlock timber.

In traveling over the various districts, notice in the aggregate considerable hemlock dying or dead which occur from general customary and natural causes, but see none hurt or killed by these insects.

SAWMILL

I wish to respectfully suggest that before definitely deciding on the location to replace the Company's Munising Saw Mill that was destroyed by fire to get much advice from competent responsible and some disinterested parties as to what effect and what advantages or disadvantages the location of the mill will have on Company's profits or losses five or ten years hence. Everybody admits that the Company owns Munising and most of its industries there.

The great bulk of its timber lands are naturally tributary to Munising and in addition there is a gang down there continuously fighting even when you make every effort to please and better their condition. This being true what may these people not attempt to do by way of increasing taxation in case the mill is not built there.

T I M B E R

S U M M A R Y
O F T H E R E S U L T S

C O N F I D E N T I A L

February 20, 1926.

The Effect of Size of Timber
on Output and Cost of Logging.

By
Lake States Forest Experiment Station
and
Forest Products Laboratory
at
Cleveland Cliffs Iron Company,
Lumbering Department
Marquette, Michigan
1925

The field data on this study was obtained in August and September of 1925 at Rock River operation of the Company near Forest Lake, Michigan. The records were taken in Sec. 16 and 17, T. 46, R. 21, logged from Camp No. 5.

T A B L E 1.

Taper Measurements, merchantable length, and
gross merchantable volume. Maple.

D.I.B.	Total merch. length feet from ground	T O P		D. I. B. ¹		Total Gross Merch- antable Volume Bd. Ft. Scribner	
		Stump of 1st log, if 16' 2' from ground	if 16' long 18' from ground	of 2nd log if 16' long, 34' from ground	of 3rd log, if 16' long, 50' from ground		of Merch. Bole ²
Inch	Inch	Inch	Inch	Inch	Inch		
10	30	9.9	7.8			6.8	47
11	36	11.0	8.7	7.1		6.9	65
12	41	12.0	9.5	7.9		7.1	87
13	44	13.0	10.4	8.7		7.4	111
14	47	14.0	11.2	9.5		7.7	138
15	49	15.0	12.1	10.2		8.0	165
16	51	16.0	12.9	11.0	8.5	8.3	195
17	52	17.0	13.7	11.7	9.2	8.7	233
18	54	18.0	14.4	12.3	9.8	9.0	270
19	55	19.0	15.1	13.0	10.4	9.3	306
20	57	20.0	15.8	13.7	11.0	9.5	347
21	58	21.0	16.4	14.2	11.6	9.6	390
22	59	22.0	17.0	14.8	12.2	9.7	430
23	60	23.0	17.6	15.4	12.7	9.8	470
24	62	24.0	18.3	16.0	13.1	9.8	515
25	63	25.0	18.8	16.5	13.6	9.9	555
26	64	26.0	19.4	17.0	14.1	9.9	600
27	64	27.0	19.9	17.5	14.5	10.0	645
28	65	28.0	20.5	18.0	15.0	10.0	690
29	66	29.0	21.0	18.5	15.4	10.0	737
30	67	30.0	21.6	19.0	15.8	10.1	785

Merchantable length and scale are based on log measurements of trees but cordwood was not considered in this table.

¹Top D. I. B. - Top

²At the distance from the ground equal to total merchantable length.

T A B L E 2.

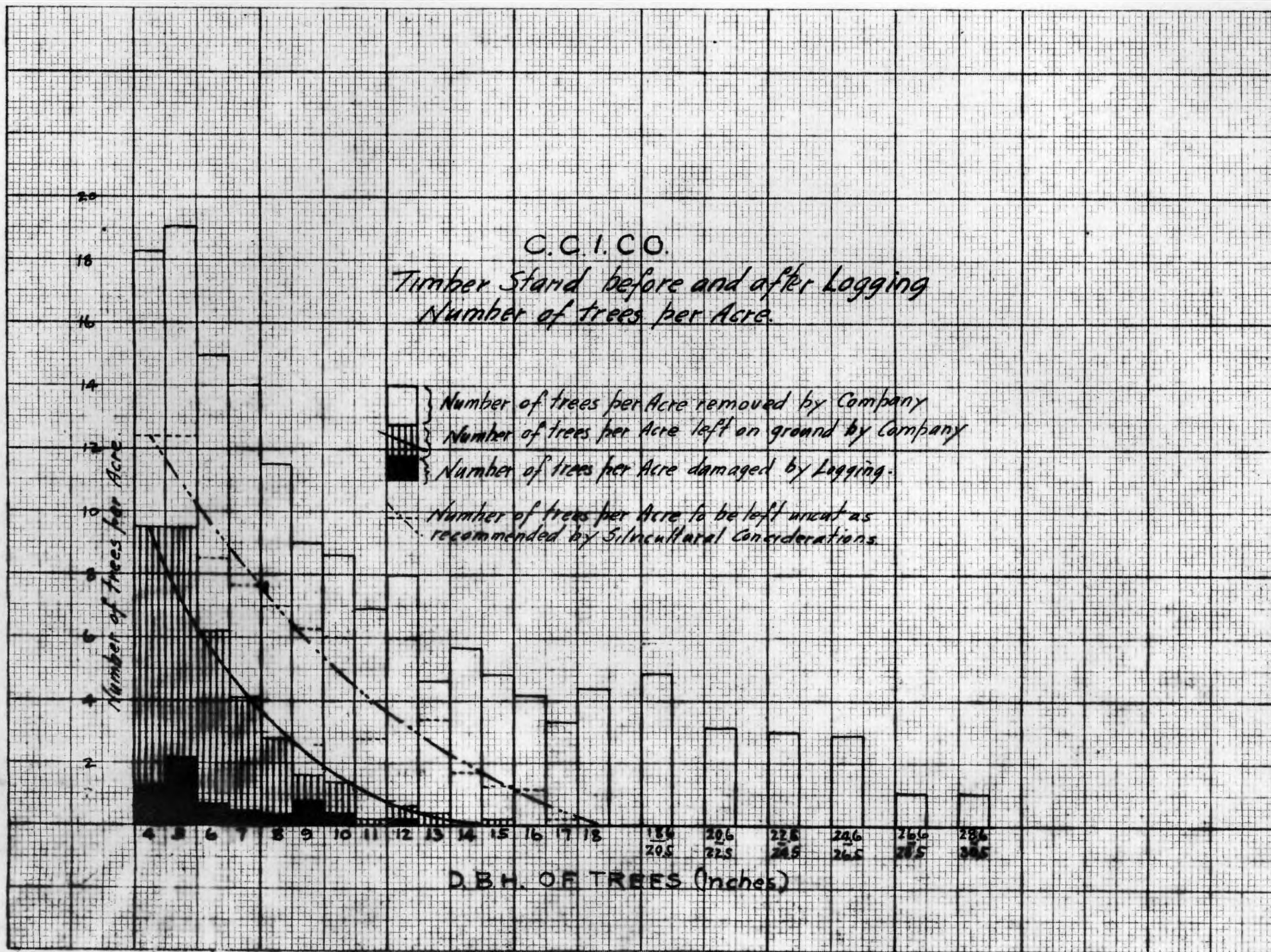
The distribution of trees from 4 inches D.B.H. up by diameter classes. Based on 5 acre sample plots tallied before and after cutting.

Trees D.B.H. Inches	Number of Trees per Acre		Gross Scale Cu.Ft. per acre	
	Before Cutting	Cut	Before Cutting	Cut
4	18.28	8.7		
5	19.14	9.6		
6	14.94	8.0		
7	13.98	9.9		
8	11.34	8.4		
9	8.94	7.2		
10	8.72	7.18	409.2	337
11	6.88	6.66	445.5	433
12	8.06	7.40	700.6	644
13	4.66	4.22	517.2	468
14	5.78	5.78	797.3	798
15	4.86	4.86	767.4	802
16	4.20	4.00	818.	780
17	3.38	3.38	787.	787
18	4.42	4.42	1189.5	1193
18.6-20.5	4.92	4.92	1707	1707
20.6-22.5	3.14	3.14	1350.	1350
22.6-24.5	3.14	3.14	1617	1617
24.6-26.5	2.94	2.94	1764	1764
26.6-28.5	1.12	1.12	773.	773.
28.6-20.5	1.12	1.12	879.	879
9.6-30.5	153.94	116.1	14520	14332

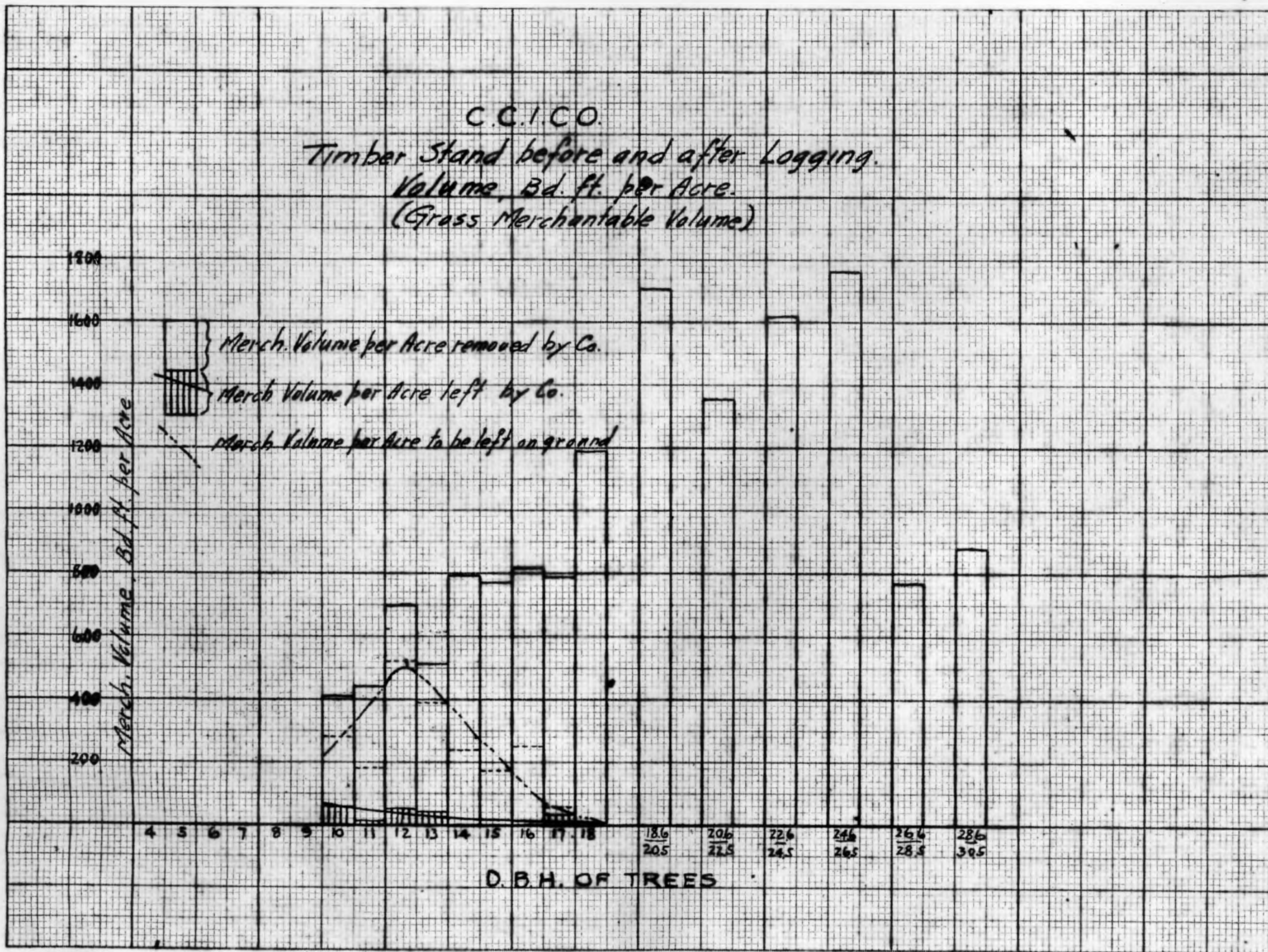
T A B L E 3.

The distribution of species on the
sample plot.

Species	Maple	Birch	Beech	Elm	Bass- wood	Ironwood Balsam Ash	Total
Gross mer- chantable scale, cu. ft. Scribner	12619 87%	1176.4 8.1%	261.6 1.8%	219.6 1.5%	132.- .9%	110.4 .7%	14519 100%
Number of Trees 4" D.B.H. and up.	123.1 80%	5.06 3.3%	3.96 2.6%	5.30 3.5%	2.20 1.4%	14.32 9.6%	153.94 100%



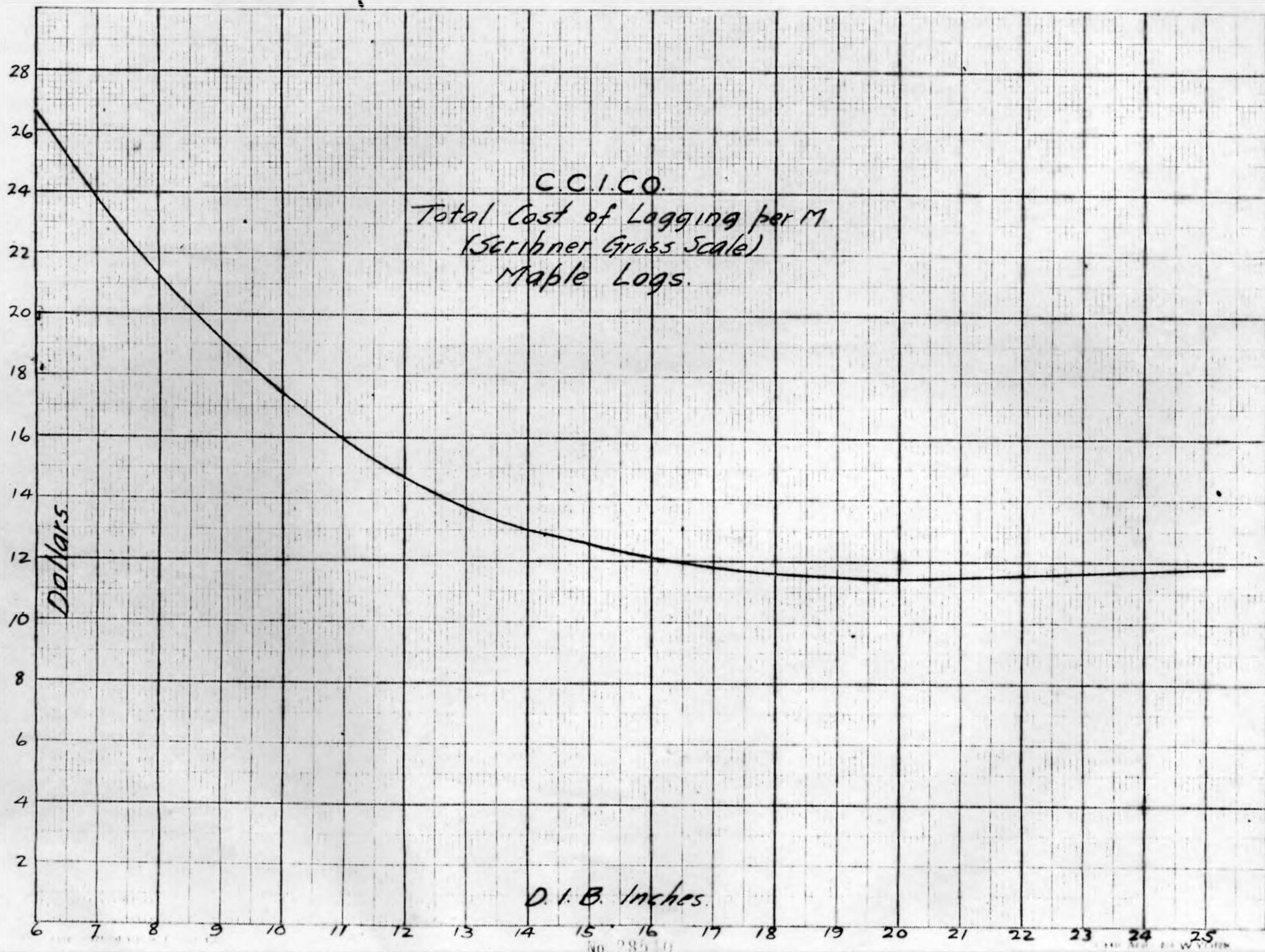
C.C.I. CO.
 Timber Stand before and after Logging.
 Volume, Bd. ft. per Acre.
 (Gross Merchantable Volume)



T A B L E 4.

Total cost of logging, \$ per M board
feet, gross log scale, Scribner.

Log top D.I.B.	Sawing	Skidding	Loading	R. R. Transpor- tation	Un- load- ing	Over- head	Total
	D O L L A R S P E R M.						
6	3.91	7.25	2.94	7.30	1.36	3.87	26.63
7	3.20	6.32	2.41	7.26	1.05	3.44	23.68
8	2.85	5.45	1.97	7.21	.82	3.11	21.41
9	2.55	4.59	1.61	7.15	.66	2.82	19.38
10	2.33	3.80	1.33	7.02	.53	2.55	17.56
11	2.13	3.10	1.08	6.79	.42	2.30	15.82
12	2.01	2.57	.90	6.65	.36	2.12	14.61
13	1.88	2.14	.78	6.52	.30	1.97	13.59
14	1.83	1.85	.67	6.40	.26	1.87	12.88
15	1.73	1.70	.58	6.34	.23	1.80	12.38
16	1.69	1.62	.52	6.26	.20	1.75	12.04
17	1.65	1.60	.47	6.20	.19	1.72	11.83
18	1.64	1.63	.43	6.14	.17	1.70	11.71
19	1.62	1.67	.41	6.06	.16	1.69	11.61
20	1.59	1.75	.40	5.99	.15	1.68	11.56
21	1.58	1.82	.38	5.97	.14	1.68	11.57
22	1.57	1.91	.37	5.93	.13	1.68	11.58
23	1.56	1.98	.36	5.88	.12	1.68	11.59
24	1.55	2.06	.35	5.85	.12	1.69	11.62
Log Run	1.98	2.62	.92	6.65	.36	2.13	14.66



T A B L E 5.

T r e e s

Total Cost of Logging per M board feet, Scribner.

Tree D.B.H.	Sawing	Skidding	Loading	R.R. Transpor- tation	Un- load- ing	Over- head	Total Cost
8	3.40	6.60	2.56	7.28	1.20	3.56	24.62
9	3.23	6.50	2.50	7.27	1.12	3.51	24.13
10	3.03	6.30	2.41	7.26	1.00	3.40	23.40
11	2.91	5.80	2.19	7.24	.88	3.23	22.25
12	2.74	5.00	1.81	7.20	.76	2.98	20.49
13	2.58	4.45	1.60	7.14	.65	2.79	19.21
14	2.44	3.90	1.37	7.04	.56	2.60	17.91
15	2.29	3.50	1.22	6.92	.48	2.46	16.94
16	2.17	3.10	1.09	6.80	.42	2.31	15.89
17	2.07	2.75	.97	6.70	.38	2.19	15.06
18	2.00	2.50	.88	6.62	.35	2.10	14.45
19	1.93	2.30	.80	6.56	.32	2.02	13.93
20	1.87	2.10	.75	6.50	.29	1.96	13.47
21	1.83	1.95	.70	6.45	.28	1.90	13.11
22	1.80	1.85	.66	6.40	.26	1.86	12.83
23	1.78	1.75	.61	6.36	.25	1.83	12.58
24	1.76	1.70	.58	6.33	.24	1.80	12.41
25	1.75	1.67	.56	6.30	.23	1.79	12.30
26	1.74	1.63	.54	6.27	.22	1.77	12.17
27	1.73	1.60	.52	6.24	.21	1.75	12.05
28	1.71	1.56	.50	6.22	.20	1.73	11.92
29	1.69	1.54	.48	6.20	.19	1.72	11.82
30	1.68	1.52	.46	6.18	.18	1.70	11.72
Log Run	1.98	2.62	.92	6.65	.36	2.13	14.66

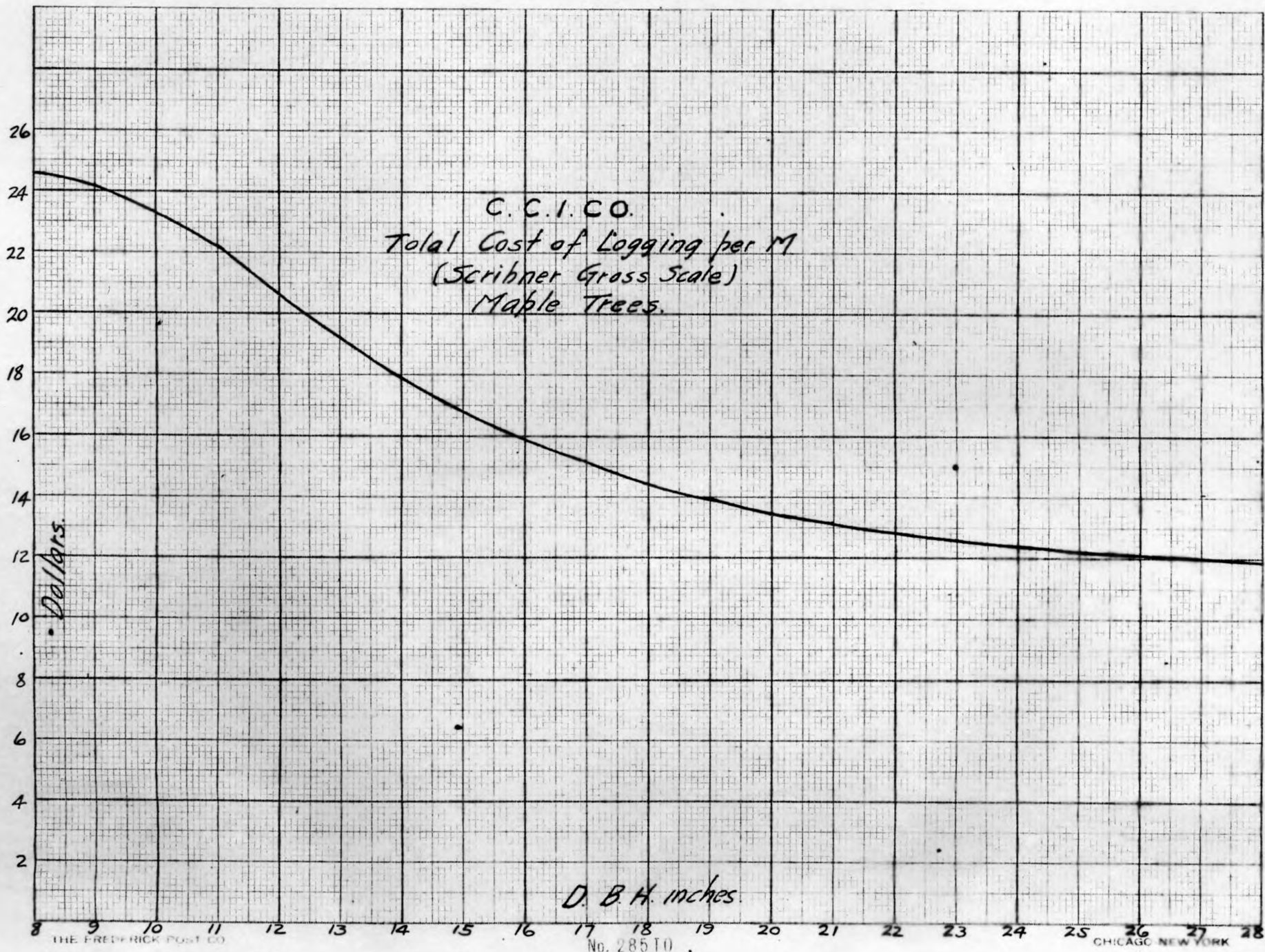


TABLE 6.

LOGS

Output and cost of skidding timber (Felling and logmaking.)

LOG	Cost of sawing based on line- ar foot payment \$ per M, gross scale.	Working time man minutes per log	Output M board foot gross scale per man 8 $\frac{1}{2}$ hr. work day	Cost of saw- ing based on average daily earnings of sawyers and av. daily output. \$ per M gross scale
D. I. B.		Itemized Cost of Logging:		
6	8.05	6.5 Sawing	1.57	3.91
7	5.22	5.8 Skidding	1.92	3.30
8	4.45	7.5 Loading	2.15	2.85
9	3.77	8.5 Railroad transportation	2.41	2.35
10	3.10	8.8 Unloading	2.63	2.33
11	2.55	11.4	2.66	2.13
12	2.08	13.2	3.06	2.01
13	1.70	15.1	3.27	1.69
14	1.40	17.3	3.36	1.53
15	1.16	19.7	3.54	1.73
16	1.02	22.6	3.64	1.69
17	.90	26.0	3.72	1.64
18	.80	29.2	3.75	1.64
19	.70	32.6	3.78	1.62
20	.64	36.4	3.86	1.63
21	.56	40.2	3.89	1.58
22	.50	44.0	3.92	1.57
23	.45	48.8	3.94	1.56
24	.40	52.2	3.95	1.55
LOG run	1.98		5.10	1.98

Average gross earning of a Sawyer per working day is \$6.14.

TABLE 6.

L o g s

Output and cost of sawing timber (felling and logmaking.)

Log Top	Cost of sawing based on line- ar foot payment \$ per M, gross scale.	Working time man minutes per log	Output M board feet gross scale per man $8\frac{1}{2}$ hr. work day	Cost of saw- ing based on average daily earnings of sawyers and av. daily output. \$ per M gross scale
D. I. B.				
6	6.05	6.5	1.57	3.91
7	5.22	6.8	1.92	3.20
8	4.45	7.6	2.15	2.85
9	3.77	8.5	2.41	2.35
10	3.10	9.8	2.63	2.33
11	2.55	11.4	2.88	2.13
12	2.08	13.2	3.06	2.01
13	1.70	15.1	3.27	1.88
14	1.40	17.3	3.36	1.83
15	1.18	19.7	3.54	1.73
16	1.02	22.6	3.64	1.69
17	.90	26.0	3.72	1.65
18	.80	29.2	3.75	1.64
19	.70	32.8	3.78	1.62
20	.64	36.4	3.86	1.59
21	.56	40.2	3.89	1.58
22	.50	44.0	3.92	1.57
23	.45	48.8	3.94	1.56
24	.40	52.2	3.95	1.55
Log run	1.98		3.10	1.98

Average gross earning of a sawyer per working day is \$6.14.

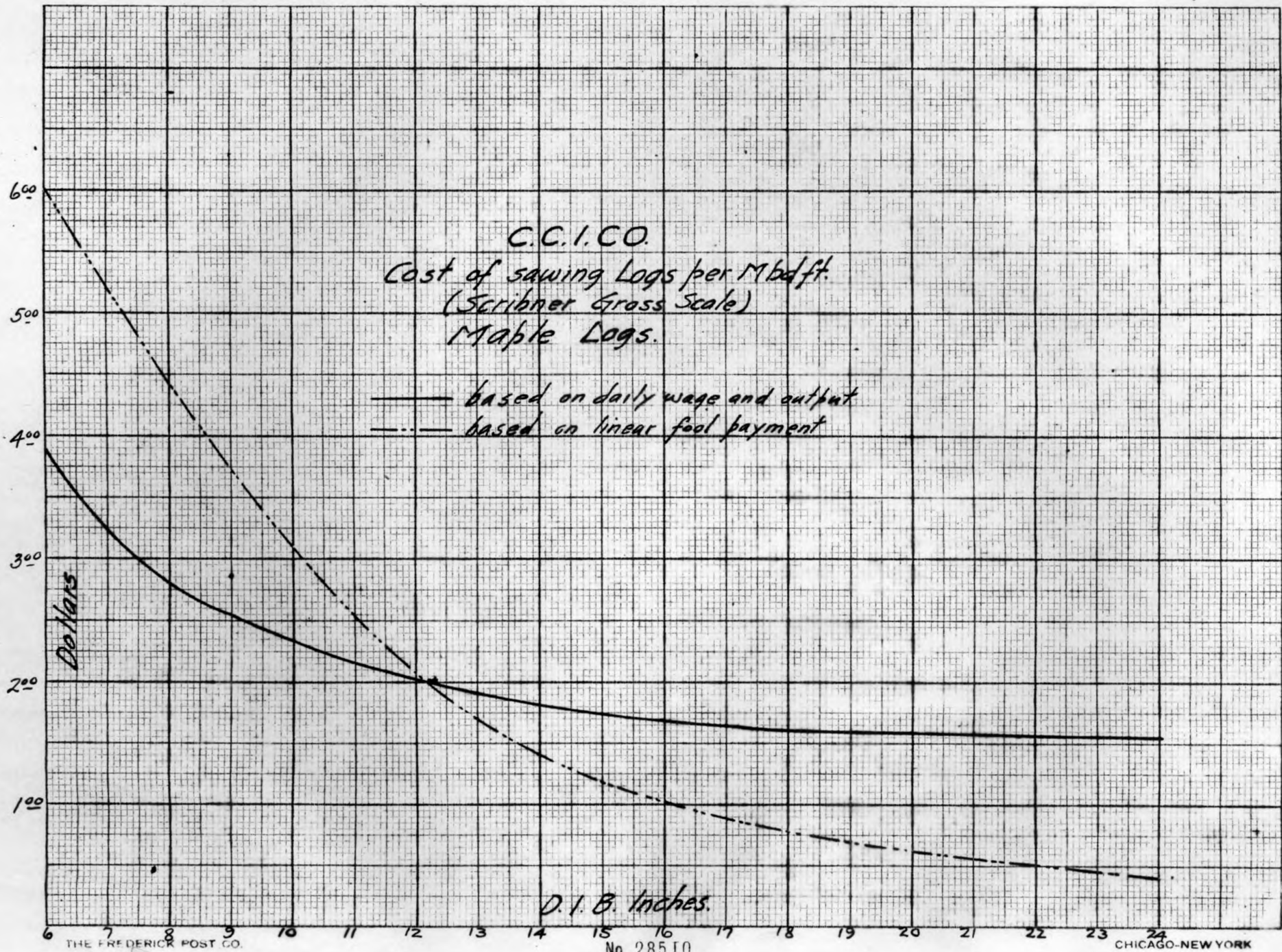


TABLE 7.

T r e e s

Output and cost of sawing timber (felling and logmaking)

Log top D. I. B.	Cost of sawing based on linear foot payment. \$ per M. gross scale.	Working time man minutes per log	Output M board feet gross scale per man 8½ hours working day.	Cost of saw- ing based on average daily earnings of sawyers and average daily output. \$ per M gross scale
9	5.12	8.30	1.9	3.23
10	4.94	12.30	2.02	3.03
11	4.60	15.90	2.11	2.91
12	4.09	19.80	2.24	2.74
13	3.53	24.00	2.38	2.58
14	3.11	27.60	2.52	2.44
15	2.76	31.50	2.68	2.29
16	2.44	35.50	2.83	2.17
17	2.16	40.00	2.96	2.07
18	1.95	44.50	3.07	2.00
19	1.77	49.25	3.18	1.93
20	1.60	54.00	3.27	1.87
21	1.48	59.00	3.34	1.83
22	1.37	64.30	3.40	1.80
23	1.27	69.30	3.44	1.78
24	1.19	75.00	3.47	1.76
25	1.10	81.50	3.50	1.75
26	1.05	86.30	3.52	1.74
27	.98	92.00	3.56	1.73
28	.94	97.75	3.59	1.71
29	.89	103.75	3.62	1.69
30	.85	109.50	3.65	1.68
Log run	1.98		3.10	1.98

Four hundred feet is an average skidding distance when a) railroad spurs are $\frac{1}{4}$ of a mile apart; b) all logs are skidded directly to the railroad; c) timber is evenly distributed over an area; d) skidding trails are 20 per cent longer than a straight route.

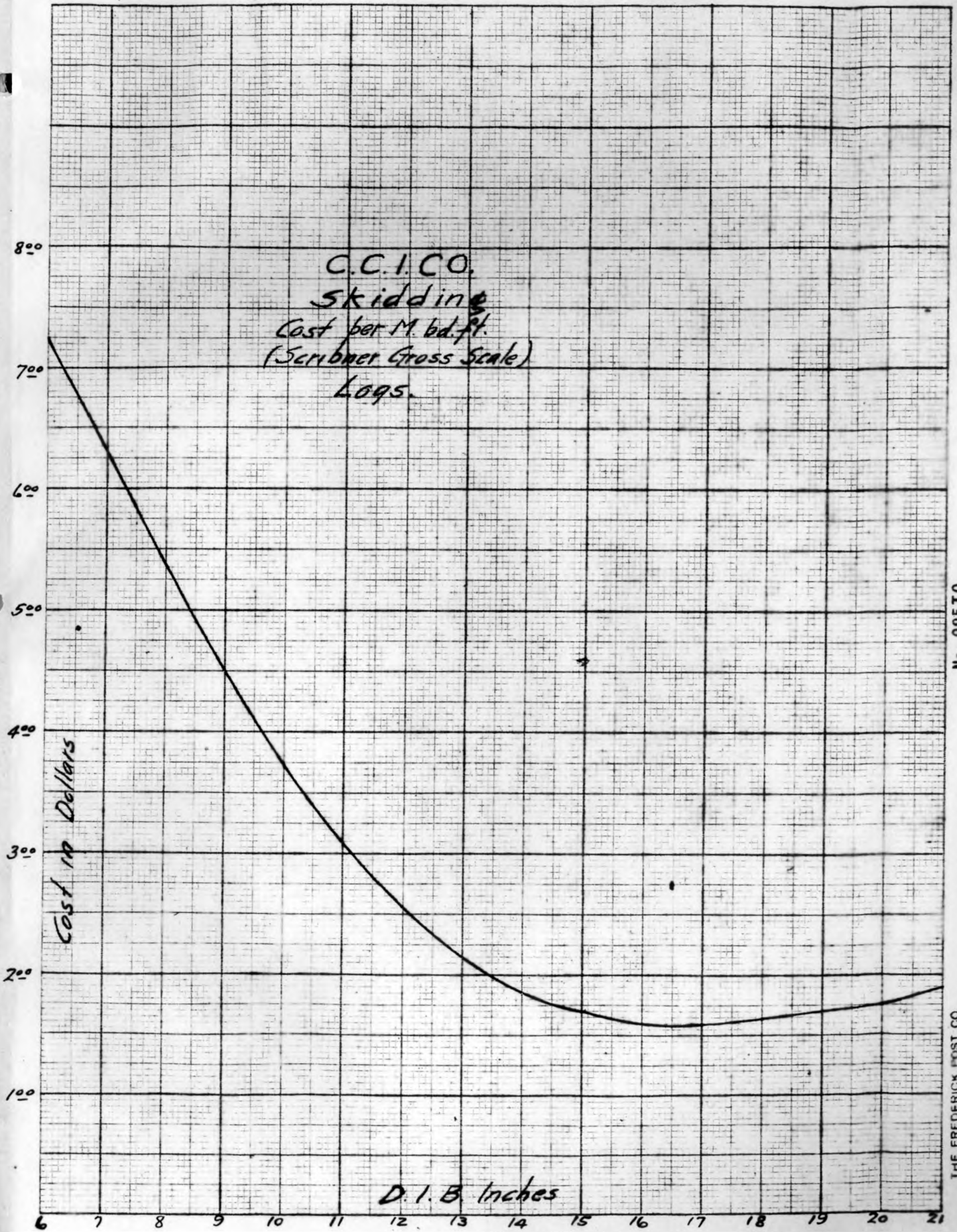
Eight hours on the job per working day; lost time comprises 21 per cent, and delays 6 per cent of the time on the job.

Labor cost; teamsters \$45 per month and board; swampers \$40 per month and board; team \$5.25 per working day. Total labor cost \$.0225 per working minute. Average output per day, log run, 4130 board feet, gross scale. Rather low output is due to considerable proportion of small sized logs and to the fact that some skidding was done under very adverse topographic conditions.

TABLE 8.

Cost of skidding timber an average
distance of 400 feet.

L o g s			T r e e s	
D. I. B.	Time re- quired for skidding teams, min- utes per M gross scale	Cost of skidding \$ per M gross scale	D. B. H.	Cost of skidding \$ per M gross scale
6	325	7.25	8	6.60
7	283	6.32	9	6.50
8	244	5.45	10	6.30
9	203	4.59	11	5.80
10	167	3.80	12	5.00
11	135	3.10	13	4.45
12	112	2.57	14	3.90
13	95	2.14	15	3.50
14	83	1.85	16	3.10
15	75	1.70	17	2.75
16	70	1.62	18	2.50
17	69	1.60	19	2.30
18	71	1.63	20	2.10
19	73	1.67	21	1.95
20	75	1.75	22	1.85
21	80	1.82	23	1.75
22	85	1.91	24	1.70
23		1.98	26	1.60
			28	1.57
24		2.06	30	1.50
Log run		2.62		2.62



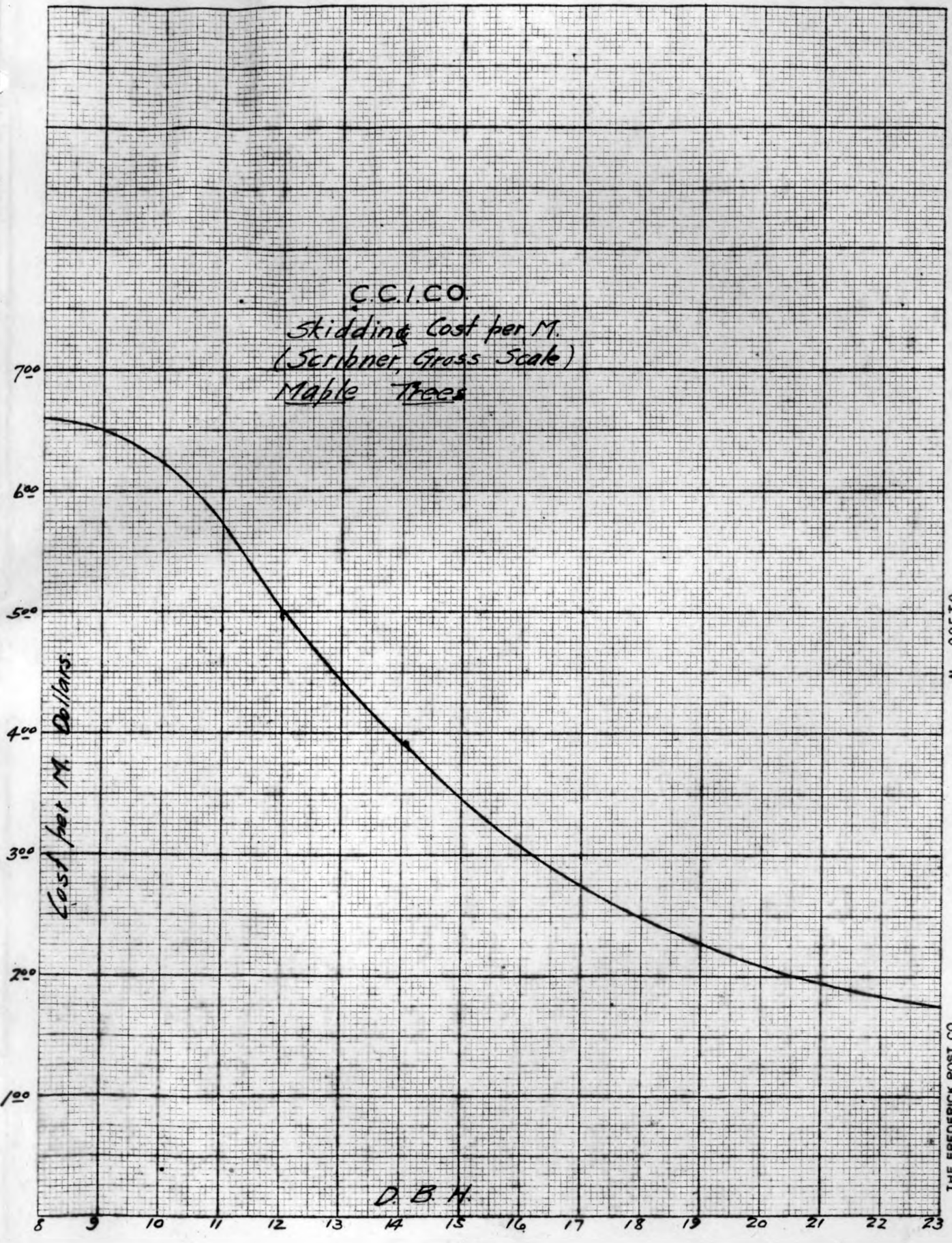


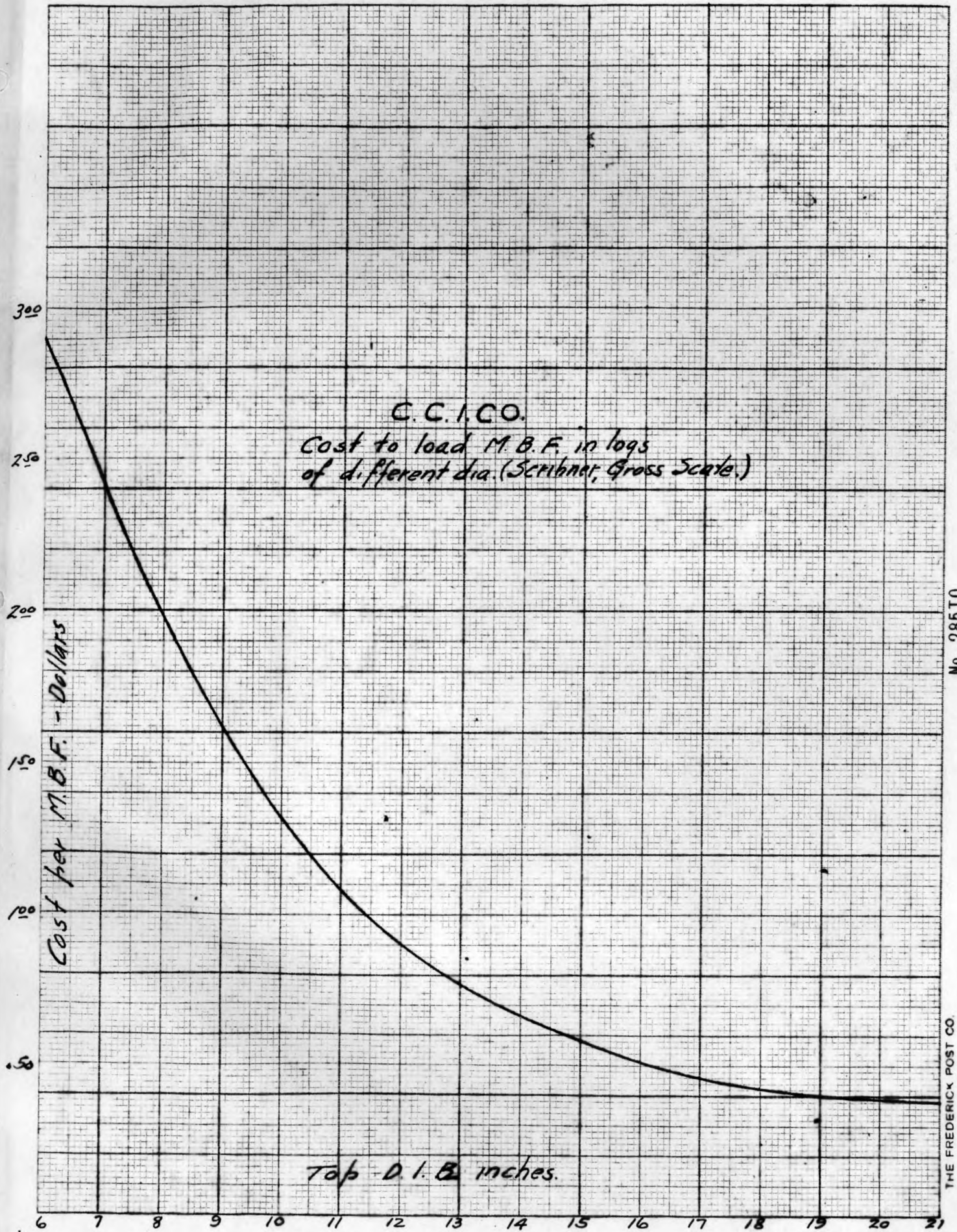
TABLE 9.

Cost of loading timber on cars.

L o g s			T r e e s	
D. I. B.	Time required per M. gross scale, minutes for the crew	Cost of loading \$ per M gross scale	D. I. B.	Cost of loading \$ per M gross scale
6	54.2	2.94	8	2.56
7	44.5	2.44	9	2.50
8	36.3	1.97	10	2.41
9	29.7	1.61	11	2.19
10	24.5	1.33	12	1.81
11	20.0	1.08	13	1.60
12	16.7	.90	14	1.57
13	14.4	.78	15	1.22
14	12.3	.67	16	1.09
15	10.7	.58	17	.97
16	9.7	.52	18	.88
17	8.7	.47	19	.80
18	8.0	.43	20	.75
19	7.7	.41	21	.70
20	7.3	.40	22	.66
21	7.0	.38	23	.61
22	6.8	.37	24	.58
23	6.7	.36	25	.56
			26	.54
			28	.50
			30	.46
Log run		.92	Log run	.92

Loading was done with an American "slide" loader by a crew of 6 men, at a total cost of \$26 per working day of 8 hours on the job.

An average daily output for a two-month period was 5.96 carloads, averaging 5.2 M gross scale, or about 31 M gross scale, per working day.



No. 285T0

THE FREDERICK POST CO

C.C.I.CO.
Time to load M.B.F. in logs of
different sizes per crew.
(Scribner, Gross Scale)

3000
2500
2000
1500
1000
500

Time per M - seconds

TOP D.I.B. Inches

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

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