

Bell Signals. It was decided that the duplicate system of bell signals should include at least one pull-wire signal, which should have a lever at each station and a knocker at surface. It is the duty of the ladder inspector to ring this bell from all stations when he makes his weekly inspection of ladders and ladderways.

Second Outlet. Metallic arrows for designating the second outlet were distributed to all mines, but they were found to be too small to attract prompt attention. By nailing them upon a larger wooden arrow they show up much more advantageously, as may be seen by an inspection of the Stephenson, Lake or Salisbury mines.

All mines have a second outlet except the Gwinm mine, and it is very probable that as soon as an adequate pump equipment is installed one will be started by drifting and raising to surface through the adjacent property. All second outlets have been kept in safe condition for exit and were always open with the exception of the Lake mine, which was blocked for several days last spring by an accumulation of water in the bottom of the old shaft, located on the south basin, through which the outlet passes. A drift has been driven into this shaft, at a higher elevation, which excludes the possibility of its occurrence again.

Cages. The first cage to be used in the Princeton mine was installed in No. 2 shaft last summer, and it is needless to add that it met with the hearty approbation of the underground employes. All mines in Marquette County are now equipped with cages having safety catches, bonnets, side casing and doors, which are thoroughly inspected every day by a competent mechanic.

Underground Motors. An accident that frequently occurs to motor brakemen is the squeezing of fingers when coupling cars. A committee was appointed to investigate the advisability of using an automatic coupler, as it had been reported that the Newport Mining Company was using one which had proven practical. This committee has reported progress in its investigations and that it would probably be able to submit a final report early

in the new year. Another device that is being investigated is an automatic alarm, that rings continuously when the motor is in operation. The Lake Shore Engine Works is working on a design, and we have been promised a drawing when it has been perfected.

It was decided that acetyline lamps should not be accepted as a substitute for brakemen's lanterns but in wet mines torches may be used on the rear end of trains instead of red lights. Experiments are being made with acetyline lanterns.

Chutes and Raises. A violation of the rules that call for gratings in chutes and guards around raises is now found only occasionally, whereas when the rules were first adopted there were many workmen, as well as bosses, who maintained that they were not practical and could not be enforced. This is but one evidence of the fact that workmen can be trained and made to accept and do just as much as their foremen demand of them, so far as safety is concerned. It was a strong argument that gratings held up coarse dirt and that guard rails obstructed dumping of cars but these difficulties were more imaginative than real. Gratings and guard rails are now accepted as a part of the structure of a raise when starting off a sub-level and usually there is no delay in installing them.

Explosives. It was found by investigation that the probable cause of so many miss holes, to which reference was made last year, may have been the result of damp fuse, as it was found that workmen were taking a large supply underground at one time because they could not get it as often as they desired. As soon as the attention of the Clerical Department was called to this fact, it was rectified. The number of miss holes since reported have been very few, no more than occurs normally.

A fatal accident occurred by use of explosives because one gang of workmen failed to properly notify another gang working close by. As this was a violation of rules, it was decided to call the attention of all employes to the necessity of a compliance to all rules in order to prevent accidents. Notices were posted in English, Finnish and Italian, describing

the accident and asking for the united co-operation of all employes to prevent the recurrence of similar accidents.

A number of employes have been overcome by gases generated by blasting but these accidents are usually the result of returning too quickly after blasting or failing to blow out the smoke and gas when leaving work. The storage of oxygen at the different mines has been the means of assisting more than one man to recover more rapidly than he would probably have otherwise.

Underground Fire Protection. We have no underground fire protection in any of our mines excepting short hoses in some of the pump stations. It has been recommended that the water columns of the discharge lines to surface be tapped at each station and be connected to the air line. This would mean that water would reach almost all places where fires can originate and would provide a valuable means of fighting them. It is hoped that a reducing valve for transmitting the strong pressure of the water columns in our deeper mines to the resistant strength of the air lines will be found.

A number of fire preventative measures have been enforced, such as the cleaning up of combustible material, safer electric wiring and more careful use of candles.

Sanitation. The air in all mines except the Lake is very good, in fact is almost as pure as the surface atmosphere. The Lake mine air is less pure because of the oxidation of its large timber mat and its relative close proximity to the main workings. Many analyses were made of the air in the Cliffs Shaft, Lake and Salisbury mines, and it was found that the amount of carbon dioxide in the Cliffs Shaft and the Salisbury mines was almost nil but in the Lake it was present in amounts varying from .4% to 2.6%. By direction of the Agent the ventilation has been greatly improved so that while it is not ideal yet there is very little, if any, dissatisfaction expressed by the miners. This was attained by driving a drift into the second outlet from the bottom of the caved area on the Angeline side of the old lake bottom, which lowered the entry of the downcast current about 60 feet.

There are many violations of the rules which were designated to guard the health of employes by the maintenance of underground closets. In many of our mines circulating water is frequently used for drinking regardless of its possible source or territory through which it may have travelled. To what extent the underground atmosphere is contaminated by a disregard of the rules of sanitation is a matter of conjecture but that it increases its impurity so as to effect the health of workmen who spend a large portion of their lives in the mines is a reasonable conclusion. It is very likely that there will be an improvement noted in the next annual report with reference to this subject as the safety inspector purposes to seek the co-operation of all employes in its prevention.

General Mining. There are more accidents by falls of ground than by any other cause and it is almost impossible to differentiate between the preventable and the non-preventable, hence practically all of them have been classified as trade risks. As a means of lessening the risk the inspector recommended that miners should not be permitted to advance in ground unless they could first trim the back, otherwise back laths or spiling should be used. This was the only precaution recommended with respect to general mining.

Table V.

Statement of Charges to Safety Department.

Salaries and Wages.

Safety Inspector	\$2000.00	Mine Rescue Foreman	\$1100.00	Clerk	\$600.00
Foremen Committees	261.20	First Aid Teams	505.50		
Workmen	"	Mine Rescue Teams	604.50		
Total	<u>2378.99</u>		<u>2210.00</u>		<u>600.00</u>

Supplies and Equipment.

Office \$86.50; Safety Cigars \$201.93; Gas Apparatus \$16.70; First Aid \$62.58; Mine Rescue \$948.00.

Table V.(continued)

Travelling Expenses

Railroad Fare \$98.59; Hotel \$137.95; Livery \$197.75; Street Care Fare \$26.45;
Miscellaneous Expenses \$12.15.

S U M M A R Y

Total Salaries and Wages-----\$5188.99
Total Supplies and Equipment----- 1317.71
Total Travelling Expenses----- 472.64
Grand total, \$6979.34

ACCIDENTS.

The number of non-fatal accidents, causing a loss of more than five days, for the past four years is presented in the following table.

Table VI.

Mines	1910	1911	1912	1913	1913 (Received Compensation)
Austin	6	28	18	11	9
Chase	1*	2*	1*	12	7
Cliffs Shaft	27	27	23	43	32
Gwinn	7	4*	0*	1*	1
Lake	47	26**	27**	54	37
Maas	26	1*	8*	23	15
Norris-Lloyd	13	24	27	24	19
Negaunee	39	29	30	36	17
Princeton	16	13	0*	10*	8
Salisbury	17	12	6	12	10
Stephenson	17	26	36	67	37
Misc. Mines	75	46	27	12	9
Totals	291	258	203	305	201
Rates per 1000 Employes	99	93	93	125	85

*Idle or operated less than 12 months. **Operated one shift only.

This table shows that there was an increase of over 25% in the

number of non-fatal accidents and also that 85 employes out of each 1000 employed for 1913 received compensation under the Michigan Workmen's Compensation Law.

The following table shows the number of fatal accidents at all mines during the past three years.

Table VII.

Mines	1911	1912	1913
Ashland	1	0	
Austin	0	0	0
Chase	0	0	0
Cliffs Shaft	2	1	0
Crosby	0	0	3
Gwinn	1	0	0
Lake	0	1	2
Morris-Lloyd	0	1	1
Maas	0	0	1
Negaunee	0	1	2
Princeton	0	0	0
Salisbury	0	0	0
Stephenson	1	0	1
Transmission Line	0	0	1
Total	5	4	11
Rates per 1000 employes	1.81	1.71	4.20

Table VIII.

Showing the classification of the non-fatal accidents for 1912 and 1913, as determined by the Central Safety Committee.

	1912	1913	Total
I Trade Risks (Non-preventable)	156	236	392
II Negligence of Company	5	3	8
III Negligence of Workmen	42	66	108
Total,	203	305	508

Table IX.

Showing the classification of the fatal accidents for 1911, 1912 and 1913, as determined by the Central Safety Committee.

	1911	1912	1913	Total
I Trade Risks (Non-preventable)	1	0	3	4
II Negligence of Company	2	3	1	6
III Negligence of Workmen	2	1	7	10
Total	5	4	11	20

An inspection of the figures in these tables presents one with very interesting statistical data, but, perhaps, at first sight they do not appear very reassuring or as encouraging as may have been anticipated. The safety department was organized for the expressed object of preventing accidents, and if after three years of special safety precautions, involving a large expenditure of money, there is found to be little or no reduction in the number of accidents, an explanation is not only in order but is imperative as well. The safety inspector does not purpose to manipulate or juggle these figures in order to have them show up advantageously for his department, nor is he interested in safety work merely that his present position may be made secure.

The facts are that a three year period in safety work has proven that there has been no reduction in the number of non-fatal accidents but there has been a gratifying reduction in the fatal. Not only is our fatality rate for the past three years much less than it was for the 15 year period prior to 1911 but it is lower than the rates of the coal mines and metal mines during the past three years.

The figures in table VIII indicate that 77% of the non-fatal accidents in 1912 have been classified as trade risks and but 23% as preventable. Coincidentally, the figures for 1913 bear the same ratio. It would seem that if but 23% of our non-fatal accidents of 1913 are preventable there is but slight chance of showing a reduction in the future, because even if all the accidents due to negligence of company and workmen had been eliminated during the year, we still have a rate of 104 per 1000

employees, as compared to 96 for 1910 and 93 for both 1911 and 1912. This class of accidents, however, are gradually being given more serious attention and it is very probable that by closer scrutiny and the additional information, now being received, there will be a less number classified as trade risk accidents than we have classified during the past year. We are anticipating, also, that the educational process of the company will be very productive in lessening accidents, but it will require several years to teach all of our employees and train them to more skillful workmanship.

The safety inspector has always maintained at the sessions of the Central Safety Committee that when there has been a possibility that an accident could have been prevented by the exercise of care we should accept the possibility, even if we may err occasionally, and classify the accident as a preventable one. If there has been a laxity in providing safety on the part of the company, he has been willing to acknowledge it and has been usually the first to recommend its proper classification. Though it may reflect unfavorably upon his department yet if we may profit thereby so as to reduce accidents the responsibility is worth assuming.

It has been stated many times by men who are supposed to be more or less familiar with conditions in our country that half of our accidents are preventable. One would draw the natural inference from such a statement that three years systematic accident prevention will reduce the number of injuries at least 25 to 50%. We have no such favorable record in minor accidents, nor do we stand alone. It has been the history of several countries that the enactment of workmen's compensation laws have been followed by an increase in number of reported accidents. German experts tell us that it requires from 10 to 15 years to get a fair start, that it takes that many years to stop the natural tendency toward increase in percentage of accidents. Their study of the problem brings out the following facts:-

1. Without preventative efforts, industrial accidents grow at a tremendous rate.
2. More and more slight accidents are reported each year.

3. Industrial development grows rapidly resulting in the necessity of employing constantly increasing number of "green" hands.

Our first year's experience under a workman's compensation law is productive of similar results as have proved to exist in Germany and England since those countries enacted compensation laws. The statement is heard very frequently that whereas formerly it was a common occurrence for most employes to lose no time when slight injuries were inflicted and when incapacitated to return to work as soon as they were recovered, now we find that no matter how slight an injury may be it is more frequently accepted as an excuse to leave work and report to a physician and there is also much more reluctance to return to work exhibited on the part of many of those whose injuries have brought them more money than they would have received if they had remained at work. We had several cases last year of injured workmen who refused to return to work long after they were pronounced by physicians as entirely recovered from the slight injuries that they had received. Many of our employes are members of two or more fraternal orders from which they receive weekly cash benefits in case of accident or sickness. A less number carry accident insurance policies, many of whom are our Italian employes on the Gwinn district. The amount of money received from all sources often reaches as high as \$100.00 per month, which is a strong temptation for unscrupulous men to hold fast to as long as possible.

The two following tables are presented to show how directly accidents are related to the output.

Table X.

By falls of ground-----	92
By squeezing finger, hand or foot by car, timber, etc.-----	33
By being struck by glancing dirt, tool or timber-----	21
By squeezing finger between chunks of ore or chunks and car-----	19
By being struck by pick, shovel, hammer, etc.-----	18
By being struck by chunks rolling down pile-----	16
Total,	199

Table XI.

Year	Production Tons	Average number of employees	Daily Production per man
1912	1,931,002	2,335	2.60
1913	2,220,945	2,621	3.00

The fatality record does not appear so unfavorable, but according to our classification we should have less accidents if more safety devices had been provided and workmen had been more careful. When our fatality rate for the past three years shows a reduction of 50% compared to the rate for 15 years prior to 1911, and then we find that 80% of the new rate are preventable accidents, it surely proves that safety efforts are worthwhile and that much time is needed to obtain the best results possible.

The following table gives a three years' comparison of the fatality rate of coal mines, iron mines and our company.

Table XII.

	1911	1912	1913	Average
U. S. Coal Mines	3.73	3.15	3.66*	3.50
Minn. Iron Mines	4.67	3.62		4.14
Mich. " "	4.57	3.02		3.68
Marquette County**	5.42	3.32	2.46	3.71
Cleveland-Cliffs Iron Company***	1.86	1.77	4.20	2.61

*Ten months only. **Exclusive of Cleveland-Cliffs Iron Company.

***All mines in Michigan and Minnesota.

There are a number of discrepancies in these figures which lower the rates for other companies; for instance, the number of men working in quarries, a less hazardous occupation than mining, is included in the data upon which the Marquette County rates are determined. Then, again, there are mining companies that report the maximum number of names carried on a monthly pay roll as their average number of men employed, whereas the average number for the Cleveland-Cliffs Iron Company is based on the total shifts worked for the entire year divided by 300.

Record of Fatal Accidents.

No. 1. Lloyd Mine, April 8, John Wisuri, miner, by fall of ground. Classified as trade risk.

No. 2. Maas Mine, June 10, J. J. McCarthy, miner, by fall of ground. Classified as trade risk.

No. 3. Negaunee Mine, July 10, Waino Tuomi, miner, by fall of ground. Classified as trade risk.

No. 4. Lake Mine, Aug. 3, Eric Kylonen, miner, by blast. Classified as a violation of rules by other workmen.

No. 5. Electric Power System, Sept. 15, Chas. Sackrider, electrician, by contact with live wire. Classified as carelessness.

No. 6. Lake Mine, Sept. 26, Matt Linna, miner, fall of ground. Classified as trade risk.

Nos. 7, 8 and 9. Crosby Mine, Oct. 15, Nick Kocich, Eli Marinich and Chris Maturnovitch, open pit laborers, by fall of ground. Classified as improper method of doing work by other workmen.

No. 10. Negaunee Mine, Oct. 28, Joseph Mallett, oiler, struck by haulage car. Classified as a violation of rules.

No. 11. Stephenson Mine, Dec. 30, John Jones, top lander, struck by haulage car. Classified as failure to provide proper appliances.

Table XIII.

Fatal accident rates per 1000 men employed from 1898 to 1913.

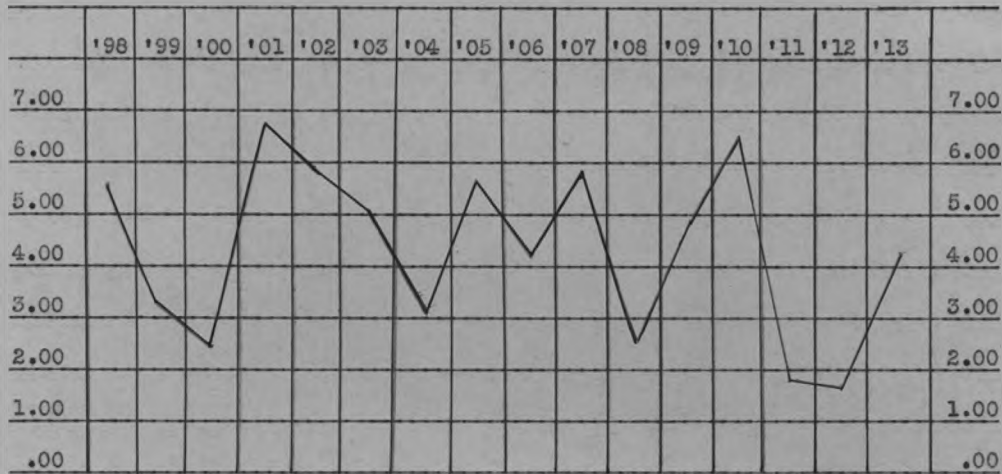


Table XIV.

Number of tons of ore mined per fatal accident.



Table XV.

CLASSIFICATION OF CAUSES OF FATAL ACCIDENTS

FOR 1911, 1912 AND 1913.

	1911	1912	1913
A. <u>Fall of Ground.</u>			
1. By fall from back or side (drift, raise or stope)	1	0	7
B. <u>Shaft Accidents.</u>			
1. By falling down shaft	1	1	0
3. By being caught or struck by cage, skip, bucket or tool	$\frac{0}{1}$	$\frac{1}{2}$	$\frac{0}{0}$
	Total		
C. <u>Use of Explosives.</u>			
1. By explosion of powder at working face	0	0	1
D. <u>Mine and Railroad Cars.</u>			
1. By being run over by haulage car	0	1	2
4. By being run over by railroad car	$\frac{1}{1}$	$\frac{0}{1}$	$\frac{0}{2}$
	Total		
E. <u>Miscellaneous Causes.</u>			
1. By falling from ladder	1	0	0
5. By contact with electric wire	0	0	1
6. By asphyxiation due to mine fire	1	0	0
8. By falling from staging	$\frac{0}{2}$	$\frac{1}{1}$	$\frac{0}{1}$
	Total		
Grand total,	5	4	11

Table XVI.

CLASSIFICATION OF CAUSES OF FATAL ACCIDENTS

FROM DEC. 1ST, 1898 TO JAN. 1ST, 1914.

A. Fall of Ground.		
1. By fall from back or side (drift, raise or stope)		47
2. By fall of chunk from chute		1
3. By fall of stray chunk down raise		1
4. By run of mud or sand		5
	Total	<u>54</u>
B. Shaft Accidents.		
1. By falling down shaft		7
2. By rock or timber falling down shaft		2
3. By being struck or caught by cage, skip, bucket or tool		5
4. By falling from cage, skip or bucket		4
5. By falling from ladder in shaft		6
6. By being carried or pushed into shaft by car		3
7. By attempting to jump on or off cage, skip or bucket		3
8. By being struck by crosshead		5
	Total	<u>35</u>
C. Use of Explosives.		
1. By explosion of powder		13
2. By premature blast		2
3. By fall of ground or timber due to blast		3
4. By being overcome by gas		1
5. By erysipelas resulting from blast		1
	Total	<u>20</u>
D. Mine and Railroad Cars.		
1. By being caught by haulage cars		10
2. By riding or attempting to ride cars		2
3. By falling with car from trestle		3
4. By being run over by railroad car		2
	Total	<u>17</u>
E. Miscellaneous Causes.		
1. By falling down raise		2
2. By falling from ladder		2
3. By falling with machine or tripod		2
4. By being caught under pump rod		2
5. By supposing to have come in contact with trolley wire		2
6. By asphyxiation due to mine fire		1
7. By being pulled into sheave		1
8. By falling from staging		1
9. By being ruptured		1
10. By contact with electric wire		1
	Total	<u>15</u>
	Grand total,	<u>141</u>

Average percent of accidents by causes.

A. 38.35% B. 24.82% C. 14.18% D. 12.12% E. 9.21%

Table XVII.
CLASSIFICATION OF FATAL AND MINOR ACCIDENTS
1912 AND 1913
BY THE CENTRAL SAFETY COMMITTEE.

		1912	1913
I TRADE RISKS, (INCIDENTAL & NON-PREVENTABLE)	Total	156	239
II NEGLIGENCE OF COMPANY			
1 Failure to Use Safety Devices Provided		0	0
2 Failure to Use Proper Tools or Appliances Provided		0	0
3 Violation of Rules		1	0
4 Improper Act or Selection of Improper Method of Doing Work. (By Foreman)		1	0
5 Failure to Instruct Men as to Method of Doing Work and hazards incident thereto.		0	2
6 Failure to Provide Safety Devices		5	0
7 Failure to Provide Proper Tools, Appliances, or Place to Work		1	2
	Total	6	4
III NEGLIGENCE OF WORKMEN:			
	(1 Failed to Use Safety Devices Provided	0	0
	(2 Failed to Use Proper Tools or Appliances Provided	0	5
A INJURED MEN -	(3 Violation of Rules	1	5
	(4 Improper Act or Selection of Improper Method of Doing Work. (By Workman)	31	20
	(5 Carelessness. (By Workman)	4	27
	(1 Failed to Use Safety Devices Provided	0	0
	(2 Failed to Use Proper Tools or Appliances Provided.	0	0
B OTHER WORKMEN -	(3 Violation of Rules	0	1
	(4 Improper Act or Selection of Improper Method of Doing Work. (By Workman)	5	8
	(5 Carelessness. (By Workman)	2	7
	Total	43	73
	Grand total	207	316

Table XVIII.

CLASSIFICATION OF NON-FATAL ACCIDENTS

<u>A. Fall of Ground or Timber.</u>		
1. By fall from back or side (drift, raise or stope)		73
2. By fall of chunk from chute		12
3. By fall of stray chunk or stick down raise or stope		1
5. By lagging, sprag or timber falling from back or side		6
	Total,	<u>92</u>
 <u>B. Shaft Accidents.</u>		
2. By rock or timber falling down shaft		2
3. By being struck or caught by cage, skip bucket or tool		2
	Total,	<u>4</u>
 <u>C. Use of Explosives.</u>		
4. By being overcome by gas	Total,	1
 <u>D. Mine and Railroad Cars.</u>		
1. By being caught between cars or motor and drift or chute		11
2. By riding or attempting to ride cars		1
5. By cars falling back or up		2
6. By falling from car		2
7. By car running over foot		2
8. By being struck by car handle, car rebounding, etc.		1
	Total,	<u>19</u>
 <u>E. Miscellaneous Causes.</u>		
1. By falling down raise, stope or mill		6
2. By falling from ladder, trestle or stage		9
8. By squeezing finger, hand or foot between car and chute, car and drift, timber and drift, pieces of timber, box and truck, etc.		33
9. By squeezing finger, hand or foot between chunks or car and chunk		12
10. By straining or wrenching arm, back or side by lifting, etc.		19
11. By chunk rolling down dirtpile or stockpile		16
12. By being struck by glancing dirt, tool or timber		21
13. By being accidentally struck by pick, shovel, hammer, candle stick, etc.		18
14. By tools or material falling or slipping from hand, staging or platform		12
15. By running nail into hand, foot or leg		4
16. By stumbling or slipping causing a fall		14
17. By catching finger or hand in blocks, gears, brakes, struck by windlass, parts of moving machinery, etc.		8
19. By blood poison or infection from various causes		3
20. By miscellaneous surface accidents		8
21. By miscellaneous underground accidents		6
	Total,	<u>189</u>
	Grand total,	<u>305</u>

William Cowbear

ANNUAL REPORT
OF
THE PENSION DEPARTMENT
FOR THE YEAR 1913.

PENSION SYSTEM.

The fifth year of the operation of the pension system ended on December 31st, 1913. The work of the system through the past year has been very satisfactory in every way.

On account of the Workmen's Compensation Law taking care of the widows and orphans of men dying from injuries received while at work, no new pensioners of this class have been added to the list.

One case has been pending through the year, being that of John Tahtinen, who died as the result of injuries received at the Lake Mine on July 18th, 1910, and to effect settlement, agreement was made while the Widows pension was still in force, that a pension should be paid to the two orphan children living in Finland. The pension will date back to July 1910, the time of the accident. The final settlement was not effected until after January 1st, 1914, so that this case does not appear in the 1913 business.

During the year there have been the following additions to the pension roll:

No. 42	Patrick Kennedy,	Monthly pension	\$ 23.40
No. 43	Micheal Harrington,	" "	\$ 20.09
No. 44	James Trewick,	" "	\$ 17.19
No. 45	John Baer,	" "	\$ 17.25
No. 46	Not approved up to December 31st.		
No. 47	Andrew G. Wallenstein,	Monthly pension	\$ 15.42

The following pensions have ceased during the year:

No. 3 Children of Adolph Bjork, five year period ended.

No. 4 Widow and children of Joseph Pryor, five year period ended.

No. 12 Widow and child of John Ayotte. Mrs. Ayotte remarried.

No. 43 Micheal Harrington, deceased.

On January 1st, 1913 the following number of pensioners were on the pension roll:

Old age	19
Widows and Orphans	<u>19</u>
Total	38

The total number of widows and orphans cared for at that time by the pension system was as follows:

Widows	17
Orphans	<u>39</u>
Total	56

The number of pensioners now on the pension roll is

Old age	23
Widows and Orphans	<u>16</u>
Total	39

The total number of widows and orphans cared for by the pension system is as follows:

Widows	15
Orphans	<u>29</u>
Total	44

The average yearly pension for old age pensioners is now \$ 241.47.

The average yearly pension for widows and orphans is \$ 165.75.

During the year there have been no additions to the pensions paid on account of the Furnace Department; there being one old age pension and one widows and orphans pension on the roll. The latter has been reduced \$1.00 during the year on account of one child reaching the age of sixteen.

Pension payments for the years 1909 to 1913 inclusive, are as follows:

Mining Department

Old Age Pensions

1909	\$	351.92
1910		896.44
1911		1690.37
1912		3865.95
1913		<u>5133.62</u>

Total \$ 11938.30

Widows and Orphans Pensions

1909	\$	464.00
1910		1043.00
1911		2649.00
1912		3113.00
1913		<u>3025.00</u>

Total \$ 10294.00

Total Mining Department \$ 22232.30

Furnace Department:

Old Age Pensions

1910	\$	111.75
1911		268.20
1912		268.20
1913		<u>268.20</u>

Total \$ 916.35

Furnace Department:

Widows and Orphans Pensions

1911	\$	120.00
1912		180.00
1913		<u>180.00</u>

Total \$ 480.00

Total Furnace Department \$ 1396.35

Total amount paid Old Age pensioners 1909-1913 inclusive.

Mining Department \$ 11938.30

Furnace Department 916.35

Total \$ 12854.65

Total amount paid to Widows and Orphans
1909-1913 inclusive.

Mining Department \$ 10294.00

Furnace Department 480.00

\$ 10774.00

Total Pensions Paid \$ 23628.65

The following tables show the comparison between the amounts
paid for pensions during the five years and the estimated possible
amounts for the same period.

Estimate of pensions to be paid.

Mining Department:

Old Age Pensions

Estimate for 1909-1912 \$ 17818.00

Estimate for 1913 6011.00

Total \$ 23829.00

Widows and Orphans Pensions

Estimate for 1909-1912 \$ 4680.00

Estimate for 1913 2790.00

Total \$ 7470.00

Total Estimated \$ 31299.00

Mining Department:

Total amount paid.

Old Age Pensions	‡ 11938.30
Widows and Orphans	<u>10294.00</u>
Total	‡ 22232.30

The pensions paid for Old Age are running somewhat less than the estimated possible amount that might be required for this purpose. This is due to the fact that some who might have been put on the pension list have died and others are still at work.

The pensions paid to widows and orphans still exceeds the estimate on account of the large number that were placed on the roll in 1910 and 1911.

Mining Department

Old Age Pensions Estimated for 1913.	‡ 6011.00
Old Age Pensions Paid - 1913	5133.62
Widows and Orphans Pensions Estimated for 1913	‡ 2790.00
Widows and Orphans Pensions Paid - 1913	3025.00

The amount paid for Old Age pensions was ‡877.38 less than the amount estimated for year.

The amount paid to Widows and Orphans exceeds the estimated amount by ‡235.00

During the year 1914 one widows pension will cease. This is the pension of Mrs. Hilma Mattila, wife of Oscar Mattila, who was employed at the Negaunee Mine. This pension will cease at the end of a five year period on December 31st. The rest of the regular widows and orphans pensions will expire during the years 1915 and 1916. There are five pensions which run for a longer time on account of very young children. One of these expires in 1918 and four in 1920.

VISITING NURSES.

The work of the visiting nurses has continued in the same general way as in previous years, with the following nurses employed,

Miss Brown and Miss Hassler at Ishpeming

Miss Herron and Miss Atkin at Negaunee

Miss Tucker at Gwinn.

Miss Brown began work for us in April, 1910. She was married to Mr. R. J. Cheneour in October, 1913 but continued her work until the end of the year. Miss Hassler, her successor, who had been employed at Northwestern University Settlement, came here on December 22nd, 1913.

Miss Herron, employed at Negaunee since September 1st, 1911, left our employ May 31st, 1913, to take up work in a children's hospital in Detroit. She was succeeded on July 1st by Miss Ina E. Atkin from Petoskey.

Miss Tucker who has been at Gwinn since April 1st, 1911, has continued her work there throughout the year.

The services of the Visiting Nurses are continually demonstrating the value of this form of Welfare Work. While it is impossible to give statistics that will show the value of it in the home, we are constantly hearing from the families about cases in which the services have been very helpful. We are also hearing the same reports from the physicians.

Their reports show that 729 cases have been cared for and 5,237 visits made.

When it is realized that the visits mean that professional work is done in nearly every case, the value is greatly emphasized.

The accompanying statements show the work done during the year.

YEARLY REPORT OF VISITING NURSES.

Ishpeming

Miss Brown)
Miss Hassler) Nurses

Patients continued from last year	25
New cases	213
Total patients cared for during year	248
Number died during year	12
Total number of visits	2175

Classification of new cases for the year:

Number of adults	136	Male	30	Female	106
Number of children	77	Male	44	Female	33

Nationalities of new cases for the year:

American	74	French	11	Norwegian	3
English	35	Irish	5	Swedish	24
Finnish	46	Italian	14	German	1

Diseases and number of cases: New patients for the year:

Appendicitis	8	Abscess	3	Nervousness	2
Bowel Trouble	8	Infants, care of	2	Pul. Tuberculosis	2
Bronchitis	6	Infections	9	Rheumatism	5
Burns	2	Injury	8	Tonsillitis	4
Cold	9	Kidney Trouble	1	Unclassified	33
Gen. Deb.	5	Mal-Nutrition	9	Undiagnosed	3
Heart Trouble	3	Obstetrical	39	Conditions	10
Convulsions	2	Pneumonia	16	Operative	16
Tubercular Hip	2	Post Operative	1	Measles	2
Urenic Poisoning	1	Gall Stones	2		

PENSION DEPARTMENT.

YEARLY REPORT OF VISITING NURSE.

Negaunee. Miss Herron)
Miss Atkin) Nurses.

Patients continued from last year	23
New Cases	276
Total patients cared for during year	299
Number died	8
Total number of visits	2101

Classification of new cases for the year:

Number of adults	167	Male	23	Female	144
Number of children	109	Male	55	Female	54

Nationalities of new cases for the month:

American	48	French	19	Italian	20
English	85	German	3	Swedish	26
Finnish	73	Irish	1	Danish	1

Diseases and number of cases: New patients for the year:

Appendicitis	2	Mastoditis	2
Bowel Trouble	34	Obstetrical	33
Burns	2	Pneumonia	7
Cold	4	Post Operative	1
Enteritis	1	Nervousness	1
Epileptic	1	Pul. Tuberculosis	3
Gen. Deb.	8	Rheumatism	5
Septicemia	1	Senility	1
Gall Stones	1	Stomach Trouble	2
Infants, care of	15	Tonsillitis	6
Injury	6	Unclassified	128
Mal-Nutrition	3	Undiagnosed	8
		Surgical	1

YEARLY REPORT OF VISITING NURSE.

Gwinn	Miss Tucker, Nurse.
Patients continued from last year	0
New cases	240
Total patients cared for during year	240
Number died	5
Total number of visits	961

Classification of new cases for the year:

Number of adults	102	Male	3	Female	99
Number of children	138	Male	67	Female	71

Nationalities of new cases for the year:

American	39	Italian	48
English	18	Norwegian	13
Finnish	64	Swedish	32
French	19	Hungarian	3
German	1	Armenian	1
Irish	2		

Diseases and number of cases: New patients for the year:

Appendicitis	4	Kidney Trouble	2
Bowel Trouble	2	Obstetrical	64
Burns	6	Pleurisy	2
Cold	2	Pneumonia	5
Eczema	3	Post Operative	2
Enteritis	3	Cystitis	1
Gastritis	2	Goitre	1
Heart Trouble	1	Rheumatism	2
Grippe	3	Sore Eyes	1
Skin Conditions	5	Stomach Trouble	1
Convulsions	1	Tonsillitis	5
Infants, care of	79	Unclassified	36
Infections	2	Undiagnosed	3
Injury	1	Hysteria	1

Number of patients attended and calls made by Visiting Nurse

	No. of Patients	Male Adults	Female Adults	Male Children	Female Children	Total No. of Calls
Ishpeming	213	30	106	44	33	2175
Negaunee	276	23	144	55	54	2101
Gwinn	240	3	99	67	71	961
Total	729	56	349	166	158	5237

There were 48 patients continued from 1912, making a total of 777 cared for during the year.

Nationality of Cases.

	American	English	Finnish	French	Irish	Italian
Ishpeming	74	35	46	11	5	14
Negaunee	48	85	73	19	1	20
Gwinn	39	18	64	19	2	48
Total	161	138	183	49	8	82

	Norwegian	Swedish	German	Danish	Hungarian	Armenian
Ishpeming	3	24	1	1		
Negaunee		26	3	1		
Gwinn	13	32	1		3	1
Total	16	82	5	1	3	1

When this work was first introduced there was some question as to how the plan and services of the nurses would be received by the different people. It was at that time deemed advisable for the physicians to tell a patient, who would be benefited by the services of a nurse, that the Company employed a nurse for the employes and their families and she would be sent to them.

It soon became understood and we have only one case reported in which the nurse was not most cordially received. In this case the nurse was told that she was not wanted as this woman wanted the physician to call every day for the treatment of a child who was burned by a gas explosion. She expected to bring suit against the Gas Company, through whose negligence

she thought the explosion had occurred. The nurse, however, later assisted in the care of the family.

The following tables were prepared to show the comparison between the number of employes of different nationalities and the number of cases cared for by the nurses during the year. The number of cases represents the number of distinct sicknesses reported to the nurse and cared for by her. One woman might be sick in January with Tonsillitis and in August with Bowel Trouble, which would be recorded as two cases.

The tables show percentage of cases to number employed.

<u>Ishpeming Group</u>			
Nationality	No. of Men	No. of Cases	Percentage
American	167	74	44.3
German	5	1	20.0
Italian	73	14	19.2
English	211	35	16.6
Irish	33	5	15.1
French	77	11	14.3
Finnish	373	46	12.3
Scandinavian	255	27	10.6
Scotch	8	0	0.0
Miscellaneous	4	0	0.0
	1206	213	

<u>Negaunee Group</u>			
Nationality	No. of Men	No. of Cases	Percentage
American	58	48	82.7
English	110	85	77.3
French	49	19	38.8
Finnish	232	73	31.5
German	11	3	27.3
Italian	84	20	23.8
Scandinavian	120	26	21.6
Irish	12	1	8.3
Miscellaneous	18	1	5.5
Scotch	1	0	0.0
	695	276	

<u>Gwinn Group</u>			
Nationality	No. of Men	No. of Cases	Percentage
Irish	1	2	200.0
American	39	39	100.00
German	1	1	100.0
Scandinavian	63	45	71.4
Finnish	105	64	60.9
French	34	19	55.9
English	37	18	48.6
Italian	227	48	21.1
Austrian & Misc.	27	4	14.8
Scotch	1	0	0.00
	535	240	

Total Employes, Ishpeming, Negaunee and Gwinn Districts.

Nationality	No. of Men	No. of Cases	Percentage of Cases	Percentage of Men Employed
American	264	161	60.9	10.9
English	358	138	38.5	14.7
French	160	49	30.6	6.6
German	17	5	29.5	.7
Finnish	710	183	25.8	29.2
Scandinavian	438	98	22.4	17.9
Italian	384	82	21.4	15.7
Irish	46	8	17.4	1.9
Austrian & Misc.	49	5	10.2	2.0
Scotch	10	0	0.0	.4
	2436	729	29.9	100.0

The following statement shows the expenses of the Visiting Nurses for the year 1913.

	Total for Year	Average Per Month
Ishpeming	\$ 1177.03	\$ 98.09
Negaunee	927.01 (11 Mo.)	84.27
Gwinn	1129.78	94.15
Total	\$ 3233.82	\$276.51

In addition to the regular work of the nurses, an entertainment was given at Christmas at Ishpeming, Negaunee and Gwinn, for the children of the homes in which the nurses had visited. This was enjoyed by the children and a great many of the mothers and a few of the fathers.

The Rest Cottage work was carried on during the year at the two Deer Lake cottages.

One cottage was used for a kitchen, dining room and a few bedrooms, and the other cottage was used as a sitting room, and general sleeping quarters.

The work has been just as satisfactory in every way as in previous years, and the general location is a desirable one. We are somewhat concerned about the question of the water in the storage basin which is now very near the Cottage and we do not know yet whether a settling of the sewage will eventually cause us any difficulty during the warm summer months. During last year there were only one or two days in which any odor was noticeable in the slightest degree. Careful attention will be paid to this, in consultation with the physicians, so that we may run no risk in using the cottages for this purpose.

The following table gives the number of guests and the cost of maintenance of the Rest Cottage work during the last six years.

Year	No. of Guests	Cost of Operation
1908 (The Maples)	21	\$ 89.93
1909 (Deer Lake)	29	305.82
1910 (Deer Lake)	24	403.45
1911 (Deer Lake)	45	482.89
1912 (Deer Lake)	57	270.23
1913 (Deer Lake)	<u>82</u>	<u>358.45</u>
Total	258	\$1910.77

Of the 82 people at the Rest Cottage in 1913, fourteen were from Negaunee.

Statement for 1913.

Number of meals furnished	2482
Total days	827 1/3
People at Rest Cottage	82
Average number of days per person	10.09
Average number people at Cottage per day	12.73
Cost of meals - per meal	14.44

WORKMEN'S COMPENSATION.

The Workmen's Compensation has continued through the year with Mr. Thomas H. Bargh in charge.

Throughout the whole year the working of the Law as it effects our Company has been very satisfactory, and we have had only a very few cases in which there has been any delay in the employes or their families taking the compensation due them. We have had no trouble in any case, and settlement has been effected according to the provisions of the Law without recourse to arbitration.

We have found the Board reasonable in their construction of the Law as far as it concerns our Company.

On October 2nd, at Detroit, I attended a conference of the employers of Michigan who are carrying their own risk, which organized with Mr. Eaton, of the Cadillac Motor Company, as President, and Mr. Robertson of the Ford Motor Company as Secretary and Treasurer. The plan of the organization is to keep in touch with the different employers and thus be advised in regard to any difficulties in settlement or controversies with the Industrial Accident Board, and also to keep in touch with any legislation which may be proposed in modification of the Law.

The general feeling is that the Law is working out satisfactorily but that the Board is somewhat arbitrary in its manner of handling cases brought before it.

Some changes in the Law have been proposed, more especially by the labor men in the southern part of the State.

First: That the compensation payments be on the basis of 65% of a man's wages instead of 50% as at present;

Second: That the waiting period before a man shall receive compensation be reduced from two weeks to one week, and this one week taken up at the end of four weeks instead of the two weeks as the end of eight weeks.

Third: That the period of medical and hospital service should

be extended from three weeks to three months.

The majority of the employers wish to keep the Law as it is, there being only a few things of minor consequence in which they think it could, perhaps, be a little more exact. This has mainly been brought about by the attitude of the Industrial Accident Board in its decisions.

One of the cases referred to is that in which the Board decided that lead poisoning, as contracted in lead manufacturing, came under the provisions of the law, while it has always been considered by all employers that occupational diseases had nothing whatever to do with industrial accidents.

The accompanying statement shows the amount expended at the different mines during the past year, and also the cost of all cases during the year, which includes all deferred payments in those cases which will continue after December 31st.

The payments made on account of compensation are charged against the Suspense Funds to the credit of the different mines.

It has been decided that the Suspense Funds standing to the credit of the different mines of one Company be consolidated into one fund, and that all payments made for accidents at the mines of one Company will be charged against this general account of that Company. This was found necessary on account of some of the funds becoming exhausted. This was true of the Suspense Funds of the North Lake, Lucy and Gardner-Mackinaw Mines.

This new plan of operation becomes effective January 1st, 1914.

The Suspense Funds of the Cleveland-Cliffs Iron Company will probably last less than two years.

Those of the Cleveland Iron Mining Company, which are considerably larger, will last probably from eight to ten years, depending of course on the number of employes.

The funds of the Iron Cliffs Company will last from three to four years.

The funds of the Jackson Iron Company, if the mine is operated, will last perhaps not over one year.

The funds of the Negaunee Mine will be exhausted during the coming year.

A special report will be prepared on this subject having reference to the time in which funds will be exhausted and the desirability of accumulating a compensation fund by setting aside a certain percentage of the payroll.

COMPENSATION - GENERAL.

In connection with the other compensation work the Secretary has kept in close touch with the Railroad, Furnace, Land and Lumbering Departments, and consulted with them in handling the reports and accident cases.

SUSPENSE FUND

Mine	On hand Jan. 1, 1913	Disburse- ments	On hand Dec. 31, 1913
THE CLEVELAND-CLIFFS IRON CO.			
Ashland	1678.67	150.00	1528.67
Crosby	1027.63	285.53	742.10
Iron River	100.98	0.00	100.98
Imperial	2369.60	8.10	2361.50
North Lake	844.56	z 844.56	0.00
Maas	2367.99	1406.67	961.32
Lucy	.71	z .71	0.00
Austin	4137.53	739.16	3398.37
Princeton	1535.13	200.88	1334.25
Stephenson	2192.80	x 1729.96	462.84
Gwinn	559.73	58.30	501.43
Mackinaw-Gardner	11.10	z 11.10	0.00
Northwestern Section 27	13.20	0.00	13.20
General	1872.45	1178.37	694.08
Total	18710.66	6611.92	12098.74
CLEVELAND IRON MINING CO.			
Hard Ore	5391.14	309.58	5081.56
Lake	9851.84	666.41	8185.43
General	885.97	0.00	885.97
Total	16128.95	975.99	14152.96
IRON CLIFFS CO.			
Cliffs Shaft	5959.84	1787.56	4172.98
Salisbury	4267.85	497.59	3770.26
Poster	270.91	0.00	270.91
Total	10498.60	2285.15	8213.45
Jackson Iron Co.	515.16	210.70	304.46
Negaunee Mine	2612.90	1177.87	1435.03
GRAND TOTAL	48466.27	11261.63	37204.64

74210
60618
12592

Diff of 1000.00

	<u>Stephenson</u>
x Disbursements as shown on ledger	1764.98
y Amount overcharged	35.02
Actual payments made year 1913 as shown above	1729.96

y Amount overcharged due to injured men returning to work and mine office failing to report same until after charge was made.

	<u>N. Lake</u>	<u>Lucy</u>	<u>Mack-Gard.</u>
z Disbursements as per ledger	1869.65	1.71	39.60
Amount to credit of fund	844.56	.71	11.10
Transferred from Gen. Fund to meet charge	1025.09	2.42	28.50

PENSION DEPARTMENT.

THE CLEVELAND - CLIFFS IRON COMPANY.

STATEMENT OF COMPENSATION AND BENEFIT PAYMENTS, INCLUDING PENDING AMOUNTS, FROM

JANUARY 1ST, 1913 TO DECEMBER 31ST, 1913.

MINE.	No. of Employees	No. of Fatal Accidents	No. of Non-Fatal Accidents	Per. Fatal Accidents to No. of Employees	Per. Non-Fatal Accidents to No. of Employees	Compensation Payments	Percent of Payroll	Benefit Payments	Percent of Payroll	Medical and Hospital Expenses	No. of Disability Cases Pending	No. of Fatal Cases Pending
Maas	307	1	34	.003	.111	3297.18	.0141	695.83	.00297	368.00	2	1
Austin	119		20		.168	1416.80	.0177	391.07	.00489	131.30	3	
Gwinn	49		4		.082	10.81	.0030			58.30	1	
Stephenson	318	1	123	.003	.387	1471.35	.0062	1022.99	.00430	387.00	4	1
Princeton	84		18		.214	99.98	.0016	99.83	.00157	100.90		
Mackinaw-Gardner	23		2		.087	684.60	.1801	45.83	.00121	7.00	1	
North Lake	264	1	42	.004	.159	872.05	.0044	842.17	.00426	316.90	4	
Chase	79		15		.190	755.71	.0135	57.49	.00103	94.20	3	
Imperial	8		1		.125					7.60		
Jackson	24		3		.125	66.66	.0037	214.67	.00119	28.90	1	
Miscellaneous	6	1	1	.167	.167	2163.00	.1576	25.33	.00184	6.80		1
Moro	52		6		.115	167.69	.0042	142.67	.00358	75.20		
Lake	399	2	80	.005	.201	3484.73	.0112	1145.50	.00367	479.55	2	1
Cliffs Shaft	299		78		.261	2438.52	.0102	709.50	.00296	473.20	7	
Salisbury	155		27		.174	197.94	.0017	270.83	.00227	185.80		
Negaunee	399	2	51	.005	.128	2468.03	.0122	946.81	.00467	479.10	2	1
Athens	15		1		.066	9.55	.0009			17.60		
General Office	93				.000	0.00	.0000			111.90		
Total	2693	8	506	.003	.188	19604.60	.00944	6610.52	.00318	3329.85	30	5

419

NOTE: The pending cases have been estimated at \$ 12089.10, and this amount is included in the above figures.

NOTE:

Compensation payments \$ 19604.60
 Amount paid physicians \$ 3329.85
 \$ 22934.45
 Per-cent of payroll .01104

BENEFIT FUNDS.

The Benefit Funds to the credit of the different mines are being paid out for accidental injury and accidental death benefits to employes who have been employed at any of the mines of the Company previous to August 1st, 1912, and who have contributed to the Benefit Funds. The following statement will show the condition of the Benefit Funds at the beginning of the year, the payments made, and the balance on hand January 1st, 1914.

The Benefit Funds to the credit of the different mines of one Company are also to be united into one general fund with the beginning of the year 1914. This was on account of the funds at certain mines becoming low or exhausted, which was the case at the Gardner-Mackinaw.

Payments are made to the men at the mines at which they are injured even if they had contributed to the Benefit Funds at some other mine, so that it was very desirable that the funds at the different mines of any one Company should be united into one fund to the credit of that Company.

As will be shown from statement following, the Benefit Funds will last for a long time as the new men who go to work and have not previously been employed do not participate, and the men who were employed previous to August 1st, 1912 will become less and less from year to year.

BENEFIT FUND.

Mine	On hand Jan. 1, 1913	Disburse- ments	On hand Dec. 31, 1913
<u>THE CLEVELAND-CLIFFS IRON CO.</u>			
Crosby	1712.74	0.00	1712.74
Iron River	168.27	0.00	168.27
Imperial	3949.18	0.00	3949.18
North Lake	1521.61	x 920.41	601.20
Meas	4283.10	685.03	3598.07
Lucy	161.72	0.00	161.72
Austin	7204.56	345.90	6858.66
Princeton	2555.19	99.83	2455.36
Stephenson	3682.24	x 1010.66	2671.58
Gwinn	935.55	0.00	935.55
Gardner-Mackinaw	18.50	z 18.50	0.00
Northwestern, Section 27	22.00	0.00	22.00
General	3833.18	75.04	3758.14
Total.	<u>30047.84</u>	<u>3155.37</u>	<u>26892.47</u>
<u>CLEVELAND IRON MINING CO.</u>			
Hard Ore	5429.13	267.67	5161.46
Lake	9649.26	1401.83	8247.43
General	895.77	0.00	895.77
Total	<u>15974.16</u>	<u>1669.50</u>	<u>14304.66</u>
<u>IRON CLIFFS CO.</u>			
Cliffs Shaft	5595.76	739.30	4856.46
Salisbury	5865.52	292.50	5573.02
Foster	534.79	0.00	534.79
Total	<u>11996.07</u>	<u>1031.80</u>	<u>10964.27</u>
Jackson Iron Co.	1985.63	194.67	1790.96
Negaunee Mine	4097.04	958.48	3138.56
G GRAND TOTAL	<u>64100.74</u>	<u>7009.82</u>	<u>57090.92</u>
		<u>N. Lake</u>	<u>Stephenson</u>
x			
Disbursements as shown on ledger		924.66	1013.16
y Amounts overcharged and unclaimed		4.25	2.50
Actual payments made year 1913 as above		<u>920.41</u>	<u>1010.66</u>
y North Lake amount unclaimed.			
Stephenson amount overcharged due to injured man returning to work and mine office failing to report same until after charge was made.			
z Disbursements Mackinaw-Gardner as per ledger			20.83
Amount to credit of fund			<u>18.50</u>
Transferred from General fund to meet charge			2.33

PENSION DEPARTMENT.

GWINN CLUB.

Mr. Austin has remained as secretary during the year and the work has continued in a satisfactory manner. The Club statements show the following:

Average daily attendance at the building

Men	62
Women	15
Boys	19
Girls	<u>30</u>

Total 126

Average attendance in gymnasium and athletic work

Men	29
Boys	18
Girls	<u>23</u>

Total 72

Number of baths taken

Men	1502
Women & Girls	700
Boys	<u>240</u>

Total 2442

Public Gatherings:

January	Four basket ball games with out of town teams.
February	Wrestling Match. One basket ball game with out of town players
March	Wrestling Match. One basket ball game with out of town team.
April	One general entertainment with lunch for members. Concert given by the Outing Club of the Association.
May	Dance for the Gwinn Fire Department.
June	Dance given by the Baseball Association.
July	Dance by the Club Orchestra.
August	Concert by the Methodist Episcopal Church.
September	Concert by the Orchestra Troubador Troupe, followed by a dance.
November	Dance given by the Club Orchestra on Thanksgiving Eve.

The tennis grounds were used very extensively during the summer and in the winter they were turned into a skating rink, which has been

patronized continually.

Some plans were made during the year to provide a summer camp at Baas Lake, at which a small camp building is being erected for the use of the members of the Association during the coming summer. This will be a very good addition to the work of the Club.

Basket Ball has continued very popular, and is a drawing attraction for the men as well as for the younger people. Attached is the annual statement of the Club work, and the financial statement for the year.

Statement showing returns from
games and privileges

	Cash	Coupon Books	Total	Expen- ditures	Excess of Receipts over Expen- ditures
Bowling Alleys	133.20	46.67	179.87	82.99	96.88
Pool and Billiards	77.60	27.95	105.55	4.85	100.70
Locker	34.50		34.50		34.50
Buffet	136.95	51.35	188.30	274.76	86.46
Towels and Soap	26.00	14.00	40.00		40.00
Totals	408.25	139.97	548.22	362.60	185.62

FINANCIAL STATEMENT FOR YEAR 1913.

Balance January 1st, 1913	\$ 195.84	
Total Receipts	<u>2627.36</u>	
Total		\$ 2823.20
Total Expenditures		<u>2593.41</u>
Balance December 31st, 1913		\$ 229.79

RECEIPTS

Membership Fees - Men	\$ 1560.40
Membership Fees - Boys	21.00
Coupon Books Returned to Date	132.00
Bowling Alleys	133.20
Pool and Billiards	77.60
Lockers	34.50
Buffet	136.95
Towels and Soap	26.00
Contributions	486.16
Miscellaneous	<u>19.55</u>
Total	\$ 2627.36

EXPENDITURES.

Building - Maintenance	\$ 127.75
Building - Improvement	513.15
Equipment	9.14
Equipment - Maintenance	3.63
Grounds, Care of	88.01
Lighting	395.61
Heating	378.87
Water	76.86
Bowling Alleys	82.99
Pool Room	4.85
Buffet	274.76
Stationery and Printing	83.50
Entertainments	36.19
Laundry	44.41
Salaries	212.40
Reading Room	84.70
Gymnasium	39.73
Power	11.62
Miscellaneous	<u>125.24</u>
Total	\$ 2593.41

ISHPEMING Y. M. C. A.

This Department has continued its co-operation with the Association.

The Board of Directors, in going over the work of the Association, decided that a reduction should be made in the running expenses, and the physical director was released on October 1st, this work to be taken care of by the other officers. Following this a special committee was appointed from the mining companies to investigate the financial condition and report has been made to the three mining companies contributing to the support of the Y. M. C. A. When funds are secured to meet its indebtedness the work will be in much better shape than it has ever been.

The present paid up membership is as follows:

Mining Companies	121
City	178
Boys	153
Merchants	<u>36</u>
Total	488

From the Annual Report of the Association we have the following data:

Average daily attendance	183
Number on committees	147
Number of social events	35
Number of paid entertainments in addition to basket ball games	1
Enrolled in gymnasium classes	200
On athletic teams	200
Matched games with outside teams	37
Leaders in gymnasium classes	31
Physical examinations	86
In educational classes	79
Teachers	3
Educational lectures and talks	9
Average attendance - Sunday afternoon social hour	117

The building is open every day of the year. On Sundays the general rooms are open only in the afternoon.

During the fall, winter and spring, special social meetings are held each Sunday afternoon at which there is special music, addresses talks and readings.

These social afternoons have become very popular and are very well attended.

The camp on Lake Michigamme has proved a very satisfactory Association help. A considerable number of miners and their families have been to camp and it is going to be a very attractive place for an outing to people who can be away from home only for a short time and at little expense.

The Boy's Conference of the Upper Peninsula was held in March with 200 boys in attendance and it proved a very satisfactory meeting.

Mr. Krantz, in charge of the boys work, left at the end of March to take up further studies and he was succeeded by Mr. Sigmund Adler, of Richmond, Virginia. Under Mr. Adler's instruction the work for the boys is growing considerably and is becoming an important factor in the lives of the young men of the city.

HOME GARDENING.

Regular prizes were given as usual for gardening at the different cities and locations and the competition was very satisfactory. The interest was as great as ever and many very attractive home grounds were kept in the best of condition throughout the season.

The awards were as follows:

Ishpeming

Best Kept Premises	\$ 111.00
Window Boxes	22.00
Vine Planting	28.00
Vegetable Gardens	29.00
Special Prize - Previous Winner	10.00
	<hr/>
	\$ 200.00

Negaunee

Best Kept Premises	\$ 42.00
Vine Planting	12.50
Window Boxes	12.50
Vegetable Gardens	26.00
	<hr/>
	\$ 93.00 ✓

Gwinn, Austin and Princeton

Best Kept Premises	\$ 38.00
Vine Planting	12.50
Window Boxes	12.50
Vegetable Gardens	30.00
Special Prize	7.00
	<hr/>
	\$ 100.00 ✓

North Lake

Best Kept Premises	\$ 34.00
Vine Planting	12.50
Window Boxes	12.50
Vegetable Gardens	41.00
	<hr/>
	\$ 100.00 ✓

Railroad Department

\$ 25.00

Gladstone

Best Kept Premises	\$ 18.50
Window Boxes	7.00
Vine Planting	7.50
Vegetable Gardens	17.00
	<hr/>
	\$ 50.00

PENSION DEPARTMENT.

NEGAUNEE

I have consulted with Mr. Townsend and the members of the school board and other citizens in the desirability of the wider use of the school buildings for social center work.

In the building of the new manual training building the school board had not thought that the extra expense should be put into a building to provide for a hall, and the citizens so decided. The matter will be considered by the board and it is hoped that the three cities of Ishpeming, Marquette and Negaunee may arrange on some definite form of work of this kind. It is expected that a conference will be held early in 1914 which will consider the matter.

MUNISING Y. M. C. A.

Mr. King has continued during the year but is planning to go to the State of Washington the first of March.

Considerable attention has been given to the need of a new building as they have outgrown the present building, which can be very satisfactorily continued for dormitory and lunch club purposes.

From Mr. King's report it was shown that the Association was self supporting during the year with the assistance of the local people and its other friends.

EDUCATIONAL WORK.

The educational work for the year 1913 was more or less interrupted. Mr. Swent, who had charge of the work, left on the first of June to go to Sudbury, Canada, in an engineering capacity. Mr. Lewis, who had been working with Mr. Swent, was left in charge of the work.

At this time classes were being held at Negaunee and North Lake. The work at Ishpeming and Gwinn was postponed until the other classes had finished the preliminary studies. During the latter part of the winter the men of the Gwinn District took up certain branches of common school work in the High School building, where they were taught at night when they were on the day shift.

Mr. Lewis left the latter part of September to take up engineering work in Santa Rita, New Mexico.

In October we arranged for the services of Mr. C. S. Stevenson who at that time was with the United States Bureau of Mines. Mr. Stevenson is a graduate of the Ohio State University, had been connected with the mines in Alabama, and had assisted Professor Stoek in the organization of the Mining Department of the University of Illinois.

Mr. Stevenson arrived on November 17th and during the remainder of the year spent his time in the preparation of papers and in the investigation of our mining methods so that work could be started on January 1st, 1914.

The plan arranged for was that classes be started at Ishpeming and Negaunee and when satisfactory work had been done at these places it could be enlarged upon to take in North Lake and the Gwinn District.

Men were selected to enter the school work from those who had applied and some others who might possibly be capable of becoming shift bosses, and the enrollment on the first of the year numbered 39.

In April Mr. Swent and I visited the Illinois Central Railroad and met Mr. D. C. Beuhl, who was in charge of the educational work with branches at Omaha. The educational work of the Union Pacific was also under his direction. We visited the shops of the company at Washburn and saw the work which was being done with the apprentices in an old passenger coach. With the exception of this work at Washburn, and the training of station agents, the work has all been done by correspondence and it is considered by them very successful.

Our own work, as outlined by Mr. Stevenson, is of such a character as to interest the men, and shows great promise of success in what we have attempted.

EMPLOYEES RECORDS.

During the year we have been at work securing a complete record of the employes at all the mines, giving a history of their work for the

PENSION DEPARTMENT.

Company, previous employers, and their dependents. These cards are to be used in connection with the compensation work in case of injury. The records are getting in shape and are found to be of considerable use and benefit.

SAFETY WORK.

This Department has co-operated with the Safety Department in the matter of the work of the Central Safety Committee, report of this work being covered by Mr. Conibear.

We have also co-operated in the work of the United States Bureau of Mines Rescue Car at Ishpeming, Negaunee, and at Gwinn.

While Mr. Higgins, of the Bureau of Mines, was here, a safety organization was formed made up of the different mining men of the Marquette Range. Several meetings have been held and it is thought possible that quite an organization could be maintained by the employes of the different mining companies and one that may be made very useful in the matter of the safety of the mines on this Range.

NATIONAL CIVIC FEDERATION.

I attended a meeting of the Federation held in New York in January. The principal subject for consideration was a Model State Mediation Act for the settlement and adjustment of labor disputes. The rest of the session was given to the subject of minimum wages. Special report of the meeting was made in the report for February.

The Federation is going to spend a good deal of study on the subject of mediation acts, including the United States Law in reference to railroads and the Canada Law, and the laws now in effect in other countries; hoping to be able to present some form of mediation that may largely tend to settlement of industrial disputes without recourse to strikes.

IMPROVEMENT WORK.

We have co-operated and assisted in the work of Mr. Manning, Mr. Taylor and Mr. Cotter throughout the year.

PENSION DEPARTMENT.

ADVANCEMENT ASSOCIATION

The Advancement Association, which is composed of the larger number of the business and professional men of the City, is proving a live organization and is doing some good work. It was through its efforts that the skating rink was established and a committee is at work on the subject of public playgrounds.

OUT OF DOOR SPORTS

The Department co-operated with the officials in the matter of handling the ski tournament which, on account of a severe blizzard on February 22nd was postponed and run off on Sunday the 23rd. In spite of the storm it was a successful meet.

I presented the medals given by Mr. Mather to the amateur winners at the banquet held in the evening following the tournament.

The City Council appropriated \$500.00 for the maintenance of an ice rink on the Cleveland Field on Division Street, and it is apparently going to be as popular this year as last.

RED CROSS SEALS

In December we co-operated with the State Association for the Prevention of Tuberculosis in the sale of Red Cross Seals.

The work was put in charge of the Visiting Nurse Association which is made up of our visiting nurses, the nurse of the Oliver Iron Mining Company, the Metropolitan Life Insurance Company's nurse, and the head nurse of the Ishpeming Hospital, Mrs. McKereghan, who is President of the Association. The following were the receipts from the different places for the sale of stamps.

Mrs. Chenneour, Ishpeming	\$ 121.08
Miss Atkin, Negaunee	48.00
Miss Tucker, Gwinn	8.00
Office Sales	1.25
Iron Mountain	<u>2.66</u>
Total	\$ 181.21

This is the first year in which the seals have been sold in the regular way in Isipeming, two of the stores being formerly supplied from Marquette.

One third of the amount of the sales goes to the State and National work and two thirds is retained by the Visiting Nurse Association for work in the county.

Respectfully submitted,

M. M. Manton

STATEMENT OF EXPENSES OF PENSION DEPARTMENT

FOR SIX YEAR PERIOD FROM JANUARY 1ST, 1908 TO DECEMBER 31ST, 1913.

ACCT. NO.		1908	1909	1910	1911	1912	1913
A-1	Salaries of Superintendent of Pension Department and assistants	2382 00	2877 68	3020 61	3646 50	3409 19	3754 70
b.	Prizes to tenants and employes for Best Kept Premises, gardens, etc.	x 1095 63	519 00	525 00	774 00	894 40	609 38
c.	All expenses of Supt. of Pension Department, including travelling expenses and livery	456 58	507 83	788 66	577 56	312 65	517 37
d.	Salary and expenses of Visiting Nurse - Ishpeming	785 90	1290 37	1206 80	1143 94	1143 04	1177 03
	Rest Cottage - Deer Lake		305 82	403 45	482 89	270 23	358 45
	Salary and expenses of Visiting Nurse - Negaunee				362 50	1033 60	927 01
	Salary and expenses of Visiting Nurse - Gwinn			268 06	752 80	1068 14	1129 78
e.	Apparatus, Express and Freight	130 63	61 94	43 85	113 35	43 22	30 33
f.	Miscellaneous Expenses						
	Gwinn Hotel	2 25					
	Mumising Hospital		130 98				
	Tina Lehtinen, care at Gwinn Hospital			126 50	150 00		
	Photographs, apparatus, cuts, magazines, etc.	91 35	45 80	310 05	218 21	51 62	11 38
	Leader of Gwinn Band					103 33	
	Peter A. Anderson, Assistance previous to pension				45 00		
	Land Department Account, Auto for W. H. Manning				5 00	5 00	
	Expenses of Housing Committee			61 76	541 23		
	Mr. Belden's expenses, National Civic Fed. Meeting. N. Y. Jan. 12-24/11				17 80		
	Incidental Expenses - Mining Department			109 52	20 06	48 25	16 67
	Incidental Expenses - To Treasurer	39 54	127 78		88 00	75 50	60 00
	Ice Rink - Negaunee	146 63					
	Cleveland Field Playground	222 04	136 69				
	Donations to Incapacitated Employes						712 75
	Other donations						60 00
g.	Employes' Clubs						
	Bowling Alley and Club Work	26 45	100 00	85 40	40 60	50 70	42 45
	Tennis Courts -- Ishpeming, Negaunee and Gwinn District	333 79	575 22	45 36	78 77	48 89	42 97
	Phonograph, 200 records, making record case - Club at Ishpeming					107 96	
	Superintendent's lunches and incidentals			62 22	83 50	13 30	17 40
	Gwinn Club House	164 81	155 85	2480 58	3677 48	3327 29	3267 19
	Ishpeming Y. M. C. A.				1680 00	1680 00	1680 00
h.	Office Expense						
	Stationery, Office Supplies and Expenses - To Treasurer	151 40	130 32	82 77	132 06	91 60	115 31
	Stationery, Office Supplies and Expenses - Mining Department			20 61			118 50
	Office Furniture and Equipment	80 53	162 42			129 58	58 55
	Postage	26 00	36 00	66 50	55 00	54 50	68 00
	Pension System Stationery and Pension Booklets		98 50			127 43	
	<u>SCHOOL OF INSTRUCTION</u>						
I-1	Salary of Instructor					800 00	1587 12
I-2	Travelling expenses, livery, printing, stationery, etc					691 60	329 04
	TOTAL	6115 53	7312 20	9707 90	14686 27	15581 02	16691 38
	DISTRIBUTION						
	Mining Department	5352 80	3036 77	2584 86	5420 29	6870 90	7666 77
	General Expense - To Treasurer		3988 60	4312 64	4830 70	4167 86	4615 64
	Land Department	608 86	130 98	61 76	5 00	5 00	12 00
	Furnace Department	74 33					
	Railroad Department	51 37					
	Mumising Paper Company	28 15					
	Gwinn Club House		155 85				
	Gwinn District Office Expense			2748 64	4430 28	4537 26	4396 97
	TOTAL	6115 53	7312 20	9707 90	14686 27	15581 02	16691 38

x Includes Prize Awards \$583.63, Authorized in 1907 and paid in 1908.

Gwinn Club House included in Gwinn District Office Expense after 1909.

THE CLEVELAND-CLIFFS IRON CO.

LAND DEPARTMENT

COMPARATIVE STATEMENT OF GENERAL WELFARE

EXPENSES FOR THE YEARS 1908 TO 1913 INCLUSIVE.

	1908	1909	1910	1911	1912	1913
General Welfare Account #11						
A-2 Prop. charged by Treas.					157 13	154 40
" general welfare work	55 14					
" general office expense	68 87					
b. Prizes to tenants, etc.						
Negaunee	106 25					
Negaunee for 1907	66 25					
Munising	40 00					
c. Travelling Expenses						
Housing Committee				204 71		
d. Rest Cottage						12 00
e. Apparatus						
f. Miscellaneous Expenses	78 96					
g. Clubs						
Equipment					30 00	
$\frac{1}{2}$ expenses of rink and tennis court	103 85					
Munising General Welfare	43 95					
Donations						
Churches		16 00			50 00	
Fire Department	30 00	15 00	5 00	15 00	15 00	15 00
Societies	5 00	15 00			75 00	10 00
Celebrations		25 00			10 00	10 00
Munising Township	50 00	50 00				
Munising Hospital	18 77		112 50	125 00	160 00	160 00
Munising Y. M. C. A.	1033 09	900 00	900 00	900 00	900 00	900 00
Play Ground - Negaunee					10 00	10 00
Play Ground - Munising	300 00					
Pensions						
Office Expense						
Pensions Paid						
Safety Work						
Office Expense						
Charges for Safety Work and Equipment				27 41	27 41	
Compensation						
Office Expense						
Compensation Paid						451 00
Medical Attendance						311 90
TOTALS	2000 13	1021 00	1017 50	1272 12	1434 54	2043 30

THE CLEVELAND-CLIFFS IRON CO.

PIONEER IRON CO.

FURNACE DEPT.

COMPARATIVE STATEMENT OF GENERAL WELFARE

EXPENSES FOR THE YEARS 1908 TO 1913 INCLUSIVE

	1908	1909	1910	1911	1912	1913
General Welfare Acct. #11						
A-2 Prop. charged by Treasurer					586.00	534 59
b. Prizes to tenants, etc.		98 00	45 00	50 00	50 00	50 00
d. Visiting Nurse	25 00	110 00	310 00	300 00	300 00	300 00
e. Apparatus						
f. Miscellaneous Expenses	67 27	24 75	5 00	50 00		
Gladstone Club						
Total Cost of Operation	(3991 45	4603 60	3918 36	3405 79	3857 96	4587 49)
Net Loss or Gain	247 39	608 51	470 50	602 23	111 98	122 30
Donations						
Churches	77 03	25 00	25 00		25 00	40 00
Fire Department	200 00	10 00		20 00	60 00	10 00
Societies	25 00	57 93	10 00	215 00	65 00	39 00
Celebrations	200 00	10 00		70 00	41 00	
Persons	165 45	83 38			254 50	21 00
Miscellaneous		100 00				
Pensions						
Pensions Paid			111 75	388 20	448 20	448 20
Safety Work						
Office Expense						
Charges for safety work and equipment				524 26	1245 23	502 40
Compensation						
Office Expense						
Compensation Paid					13 20	96 96
TOTALS	1007 14	1127 57	977 25	2219 71	3200 11	1919 85

PENSION DEPARTMENT.

THE CLEVELAND-CLIFFS IRON CO.

RAILROAD DEPARTMENT

COMPARATIVE STATEMENT OF GENERAL WELFARE

EXPENSES FOR THE YEARS 1908 to 1913 INCLUSIVE

	1908		1909		1910		1911		1912		1913	
Prizes to tenants							24	00	24	00	25	00
Donations												
Fire Departments	91	50	30	00	25	00	25	00	35	00	35	00
Societies	64	67	60	00	62	84			15	00	23	00
Celebrations and Entertainments	165	83	100	10			45	16	91	00	132	45
Visiting Nurse - Marquette			120	00	120	00	120	00	120	00	120	00
Munising Hospital											150	00
Safety Work												
Equipment and work							2718	36	775	51	197	24
Compensation												
Compensation Paid									550	38	3143	15
Hospital and Medical Service									156	03	1293	31
Totals	322	00	310	10	207	84	2932	52	1766	92	5119	15

THE CLEVELAND-CLIFFS IRON CO.

LUMBERING DEPARTMENT

COMPARATIVE STATEMENT OF GENERAL WELFARE

EXPENSES FOR THE YEARS 1909 to 1913 INCLUSIVE

	1909	1910	1911	1912	1913
General Welfare Acct. #11					
Proportion charged by Treasurer				363 85	491 73
Miscellaneous Expenses			30 05		
Visiting Nurse at Marquette			15 92		
Donations					
Churches and Charitable Organizations			5 00		
Various Societies		10 00	1 00		15 00
St. Lukes Hospital			25 00		
Celebrations and Entertainments of organizations	2 00		10 00		
Persons	29 97	7 35			7 20
Y. M. C. A. Munising				10 00	
Hospital at Munising		175 00	350 00	350 00	350 00
Salvation Army	4 00		12 00		
Christmas presents	7 66				
Safety Work					
Equipment			91 46		
Compensation					
Medical and Hospital				34 70	730 84
Payments					573 28
Totals	43 63	192 35	540 43	758 55	2168 05

LABOR CONDITIONS: Labor conditions during the past year have been far from good. When the number of shifts at the different properties was increased early in the year it was impossible to secure sufficient men to work full-handed, and those who were employed were very inefficient. The new men coming into this district are practically all Finns with socialistic tendencies and little experience. This class of labor is very undesirable, but we were forced to employ them in order to get out the product. The Steel Corporation and other large mining interests are discriminating against this nationality, and in my judgment it would be very desirable to replace them if it were possible. We are now endeavoring to increase the Italians and Austrians, but have not yet been able to secure any large number. In the last annual report I referred to the possibility of trouble with the Western Federation. This undoubtedly would have occurred had it not been for the strike in the Copper Country. This has occupied the entire attention of the organization so that very little effort has been made to increase the membership on this range. From the best information that I can secure there are between four and five hundred members in the Negaunee Lodge and about one hundred fifty in the Ishpeming Lodge, most of them Finns, who also belong to the Socialistic Society. There seems to be no immediate cause for apprehending a strike, but it will be necessary to keep in close touch with the situation and be prepared in case of trouble.

MEETINGS: Monthly meetings of the Central Safety Committee, which is composed of the Superintendents, the Auditor, Master Mechanic, Safety Inspector, and Secretary of the Pension Department, have been held, and minutes have been furnished you regularly so that it is unnecessary to make any further reference to their work.

TAXES: The Tax Commission revalued all the iron mines during the past year. The tentative valuations were furnished each company, and a hearing was held

on the different ranges. You will note from the attached statement that there has been a very gratifying reduction in the valuation of the Company's properties as compared with 1912, and that at the hearing held in Negaunee September 25th we were able in some instances to get a reduction from the tentative valuations. The Tax Committee appointed at the conference of the mining companies in Chicago on September 13th presented a brief to the Tax Commission at the hearing in Negaunee, calling attention to the factors used by the Commission in arriving at the value of the mines and setting forth their objections thereto and also to the method used in assessing stockpiles. This resulted in an invitation from the Commission to meet them in Lansing on December 16th to discuss the points raised in this brief. The result of this conference was that they adopted our suggestions in regard to the valuation of stockpiles, viz, that they be returned on the basis of the value of the ore in the ground rather than at their actual cash value as fixed by the market price. They were not willing, however, to change the interest rate, although this question is not closed, as they stated that they would give the matter further study.

THE CLEVELAND-CLIFFS IRON COMPANY.

MINING DEPARTMENT.

VALUATIONS - MINE REALTY.

MINE	AS ASSESSED 1 9 1 2	TENTATIVE VAL. OF TAX COMM. 1 9 1 3.	FINAL VAL. BY TAX COMM. 1 9 1 3.
Negaunee	5,355,000	5,036,000	4,555,000
Maas	4,505,000	3,262,000	2,987,000
Lake	2,925,000	2,677,500	2,677,500
Princeton No. 1	63,000	24,400	24,400
" No. 2	472,500	565,000	565,000
Austin	382,500	280,000	280,000
Stephenson	321,300	228,000	228,000
Lloyd	222,000	90,000	90,000
Morris	180,000	154,500	154,500
Chase	90,000	40,000	40,000
Barnes & Hecker Exp.	2,520	51,000	51,000
C. & N. W. Explor. 19-45-25	8,500	10,000	10,000
" " " 21-45-25	85,000	20,000	20,000
" " " 29-45-25	42,500	20,000	20,000
Francis	42,500	42,500	42,500
Jopling	85,000	100,000	100,000
Gwinn	204,000	195,500	195,500
Gardner	76,500	70,000	70,000
Mackinaw	119,000	70,000	70,000
Athens	565,000	829,500	750,000
Salisbury	149,850	117,000	117,000
Cliffs Shaft	2,316,600	1,961,000	1,961,000
Jackson	225,000	250,000	250,000
Exploration - 6-47-27		311,000	311,000
Imperial	20,000	95,000	95,000
Total,	\$18,458,270	\$16,499,900	\$14,617,700

STATEMENT OF RATE OF TAXATION PER \$100.00

	1913	1912	1911
City of Ishpeming	1.69	1.76	1.86
" Negaunee	1.36	1.32	1.86
" Ironwood		1.07	1.16
" Marquette	2.13	1.78	2.75
Tilden Twp.	1.25	1.21	1.22
Spurr "	1.59	2.49	2.57
Forsyth "	1.68	1.81	1.91
Montreal "		1.26	6.41
Knight "	2.10	1.90	4.77
Richmond "	2.07	2.07	1.87
Ely "	1.47	1.80	2.31
Ishpeming "	2.04	1.33	2.88
Crystal Falls"	1.85		
Bates "	1.35	1.25	1.48
Mastodon "	1.18	1.07	
Negaunee "	3.38	5.53	5.55
Sands "	1.48	3.50	4.30
Marquette "	1.30	1.93	2.77
Au Train "	4.41	4.45	4.15
Itasca Co.Minn.	4.72	3.77	3.16

ANALYSIS OF RATE PER \$100.00

	Ishpeming	Negaunee
State Tax	.31	.31
County Tax	.23	.23
School Tax	.52	.36
Highway Tax	.22	.20
City Contingent	.16	.10
Fire Tax	.05	.04
Library	.04	
Sewer Tax	.07	
County Road Tax	.08	.08
Cemetery Tax	.01	
Special		.04
Total	1.69	1.36

CONCLUSION: I again take pleasure in calling your attention to the excellent work done by the heads of the different departments, and desire to express my appreciation of their loyal support and co-operation in all matters pertaining to the welfare of the Company.

Respectfully submitted,



Agent.



CLEVELAND IRON MINING COMPANY

MINING DEPARTMENT.

AGENT'S ANNUAL REPORT,

FOR

YEAR ENDING DECEMBER 31ST, 1913.

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CLEVELAND IRON MINING COMPANY.

Ishpeming, Michigan,

January 1, 1914.

Mr. Wm. G. Mather, Pres.,

Cleveland, Ohio.

Dear Sir:-

I beg to submit the following report of the operation and present condition of the mines of this Company. The statements, inventories, and maps have been sent you.

ANNUAL REPORT

OF THE (1913)
MORO MINE.

PRODUCTION AND SHIPMENTS.

The Moro Mine was closed throughout the year 1913. During the summer 72,924 tons of Scotch and 1,532 tons of silica ore were shipped from the stock-pile.

SURFACE.

Both "J" and "K" shaft-houses and the trestle at "J" shaft have been torn down, and both shafts have been sealed off at the ledge with plugs of reinforced concrete three feet thick, and filled to surface. The ground around the old collars has been graded and seeded, so that there is now nothing to indicate the presence of the old shafts.

On account of its instability the brick stack at No. 4 engine-house was blasted down.

NEW CONSTRUCTION.

E. and A. No. 270. NEW BARN.

When the Barnum Barn on West Division street was burned on May 10, temporary stalls were built in No. 5 engine-house to accommodate those horses that were left. The diamond-drill machinery etc. that had been stored in No. 5 engine-house was moved to the Moro dry and to No. 4 engine-house near "J" shaft.

The new quarters were so satisfactory that it was decided to make No. 5 engine-house over into a permanent stable and to move the carriage shed from West Division street. The boilers and the foundations of the old machinery in the engine-house were torn out, a new floor laid, and stalls for 22 horses erected. Ample storage for hay and feed was arranged for on the second floor. The temporary stalls and loft were taken down and rebuilt in a more substantial manner. The carriage shed and Agent's garage were torn down, moved and rebuilt about 100 feet south of No. 5 en-

gine-house on the east side of Seventh Street opposite Ridge Street. The carriage shed was bought from the Iron Cliffs Co., for \$500.00 as it stood.

The expenditures are shown in the following table:-

E. and A. No. 270. New Barn.

No.	Account	Total Expense	Estimate
1	Changes in Building	\$3340.62	\$2500.00
2	Moving and Setting up carriage-shed	1998.52	2000.00
3	Cost of carriage-shed	500.00	500.00
4	Miscellaneous	627.47	
	Total	6466.61	5000.00
	Add 10% for contingencies		500.00
	Grand total	6466.61	5500.00

The excess of expense over estimate in account No. 1 is due to changes in plans for the east end of the building, which necessitated the removal of addition foundations and the rebuilding of the temporary stalls and loft. Account No. 4 includes moving and enlarging the Agent's garage.

E. and A. No. 265. General Storehouse.

No. 3 engine-house, commonly called "The Brownstone Engine-house", has been made over into a warehouse, except such room as is necessary for the electric sub-station equipment and for the heating plant.

The old machinery and foundations in the engine room have been torn out, and a concrete floor laid throughout the building, except in the boiler room, which has been separated from the rest of the building by a brick partition. An office, bins, racks and shelving, a platform scale, etc., have been put in, and the supplies moved from the old warehouse on the corner of Cleveland Avenue and Seventh street.

The expenditures are shown in the following table:-

E. and A. No. 265. General Storehouse.

No.	Account	Total Expense \$	Estimate \$
1	Partition-wall of brick	594.78	500.00
2	Changing doors and windows	626.38	270.00
3	Concrete floor including filling	1420.27	1400.00
4	Taking down foundation	280.83	200.00
5	Second floor and stairway	308.84	481.00
6	Loading platform		387.50
7	50 concrete piers	.53	100.00
8	Office complete	340.78	100.00
9	Elevator		200.00
10	Racks, bins and shelving	636.59	300.00
11	Miscellaneous	930.46	
	Total	5139.46	3938.50
	Add 10% for contingencies		393.85
	Grand total	5139.46	4332.35

Lucien Eaton

MORO MINE.

AVERAGE ANALYSIS ON STRAIGHT CARGOES

GRADE	Mine		Lake Erie	
	IRON	PHOS.	IRON	PHOS.
Fine Scotch	55.22	.123	50.14	
Scotch Silica	All Mixed			

ORE STATEMENT - DECEMBER 31, 1913.

	SCOTCH	SCOTCH SILICA	TOTAL	TOTAL LAST YEAR
On hand Jan. 1, 1913	114,108	88,407	202,515	191,417
Out put for year	0	0	0	18,960
Total	114,108	88,407	202,515	210,377
Shipments	73,980	1,532	75,512	7,862
Balance on hand	40,128	86,875	127,003	202,515
Decrease in Ore on hand			75,512	

SHIPMENTS FOR 1913.

	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Scotch	0	73,980	73,980	7,862
Scotch Silica	0	1,532	1,532	
Total	0	75,512	75,512	7,862
Total last year	0	7,862	7,862	
Increase 860%			67,650	

MORO MINE.

M O R O M I N E .

COMPARATIVE MINING COST FOR YEAR.

	1 9 1 3	1 9 1 2	INCREASE	DECREASE
<u>PRODUCT</u>		18,960		
General Expense		.095		
Maintenance		.022		
Mining Expense		1.031		
<u>Cost of production</u>		1.148		
<u>DEPRECIATION</u>				
Inventory (supply)		.002		
Equipment		.002		
Miscellaneous		.025		
<u>Total depreciation</u>		.025		
Taxes		.154		
Central Office		.114		
<u>COST ON STOCKPILE</u>		1.441		
Loading and shipping		.085		
<u>Total cost on cars</u>		1.526		
Number days operating		75		
Number shifts and hours		2-10hr 2-8hr		
<u>Average daily product</u>		253		
<u>COST OF PRODUCTION</u>				
Labor		.916		
Supplies		.232		
<u>Total</u>		1.148		

M O R O M I N E .

STATEMENT OF COMPARATIVE WAGES.

	1 9 1 3	1 9 1 2 3 Months	INCREASE	DECREASE
<u>SURFACE</u>				
Total number of days		2,157		
Average rate		2.10		
<u>Amount</u>		4,536.87		
<u>UNDERGROUND</u>				
Total number of days		5,074-3/4		
Average rate		2.58		
<u>Amount</u>		13,075.03		
Total days		7,231-3/4		
Average rate		2.44		
<u>Total amount</u>		17,611.90		
Labor cost per ton		.925		

No shifts and hours
2-10hr
2-8hr

This mine was closed permanently March 30, 1912.
There were 75,512 tons loaded from stockpile, of which 73,980 tons were crushed.

M O R O MINE.

COMPARATIVE AVERAGE WAGES AND PRODUCT.

PRODUCT '13 None Tons	SURFACE		UNDERGROUND		TOTAL .	
	1913	1912	1913	1912	1913	1912
PRODUCT '12 18,960 Tons						
Avg. number men working		20		50		70
Avg.wages per day		2.10		2.58		2.44
Avg.wages per month 25 days		52.50		64.50		61.00
Avg.product per man per day		8.79		3.74		2.62
Labor cost per ton		.239		.686		.925
Diff. in labor cost per ton		+0.046		-.099		-.053
Avg.product breakg.& trammg.				4.59		
Avg.wages for miners contr.				Mch. 2.63		
Avg.wages for trammers contr.				2.56		
Total avg.wages for contract				2.62		

M O R O M I N E .

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE .

KIND	QUANTITY	AVERAGE PRICES	AMOUNT 1 9 1 3	AMOUNT 1 9 1 2
50% Powder				1,385.20
Total powder				1,385.20
Fuse				71.81
Caps				25.57
Total fuse, etc.				97.38
Grand total				1,482.58
Product				18,960
Pounds powder per ton ore				.746
Cost per ton for powder				.073
Cost per ton for fuse, caps, etc.				.005
Cost per ton all explosives				.078
Avg. price per lb. for powder				.098

ANNUAL REPORT

(1913)

OF THE
LAKE MINEPRODUCTION.

The Lake Mine worked on double-shift for the first eleven months of 1913, and returned to single shift on December first. The mine worked 276 days on double-shift and produced 443,716 tons of ore, an average of 1,608 tons per day for eleven months. The product for December was 25,332 tons, an average of 1,013 tons per day. During the entire year the mine worked 301 days, and produced 469,048 tons, an average of 1,558 tons per day. The average tons per man per day was 4.28.

The following table shows the amount of ore in stock at mine and at Presque Isle.

Table I.

Stock- pile	Balance on hand Jan.1 1913 Tons	Stocked 1913 Tons	Total Tons	Shipped from stock-pile 1913 Tons	Stock-pile shortage 1913 Tons	Balance on hand Jan.1 1914 Tons
At Mine	78,015	148,736	226,751	187,746	5,606	33,399
Presque Isle	103,947	17,880	121,827	19,600		102,227
Total	181,962	166,616	348,578	207,346	5,606	135,626

Table II.SHIPMENTS.

From Pocket-----	290,111 Tons
From Stock-pile at Mine-----	187,746 "
From Stock-pile at Presque Isle-----	19,600 "
Total-----	497,457 "

Table III.

Distribution of Production by Levels.

Above Third Level	Ore Tons	Rock Tons	Total Tons
325 foot sub-level	19,789	278	20,067
335 " "	17,588	970	18,558
Third Level	29,565	1,757	31,322
Total	66,942	3,005	69,947
 Between 3rd and 4th Levels			
364 foot sub-level	61,455	4,169	65,624
383 " "	112,547	4,962	117,509
398 " "	168,390	3,945	172,335
415 " "	61,922	2,222	64,144
Fourth Level	416		416
Total	404,730	15,298	420,028
Fifth Level	2,982	1,539	4,521
Total Production	474,654	19,842	494,496
Stock-pile shortage	5,606		5,606
Net total	469,048	19,842	488,890

Table IV.

Distribution of Production by Months.

Month	Number of Shifts	Number of Days	Ore Per Day	- T O N S -			Total Ore and Rock
				Total Ore	Total Rock		
January	2	26	1,690	43,951	2,050	46,001	
February	2	23	1,727	39,723	2,030	41,753	
March	2	25	1,728	43,211	2,295	45,506	
April	2	25	1,700	42,496	1,830	44,326	
May	2	26	1,555	40,445	1,945	42,390	
June	2	24	1,611	38,661	800	39,461	
July	2	25	1,582	39,550	1,530	41,080	

Table IV. (continued)

Month	Number of Shifts	Number of Days	Ore Per Day	- T O N S -		Total Ore and Rock
				Total Ore	Total Rock	
August	2	26	1,569	40,800	1,302	42,102
September	2	25	1,603	40,066	1,580	41,646
October	2	27	1,629	43,995	1,340	45,335
November	2	24	1,518	36,424	1,725	38,149
December	1	25	1,056	25,332	1,415	26,747
Total		301	1,577	474,654	19,842	494,496
Stock-pile shortage			19	5,606		5,606
Net total		301	1,558	469,048	19,842	488,890

Table V.

Statement of Rock Drifting.

Level	Total Rock Drift Feet	Remarks
Surface tunnel	143	Drift for ventilation.
325 sub.	88	Incident to mining.
335 sub.	307	" " "
Third	556	65 ft. timber drift and A raise. Balance incidental.
Total	1,094	
364 sub.	1,319	82 ft. main timber-roads. Balance incidental.
383 sub.	1,570	77 ft. main North-west timber road. Balance incidental.
398 sub.	1,248	Incident to mining.
415 sub.	593 $\frac{1}{2}$	58 feet drift for second outlet. Balance incidental.
Fourth	109 $\frac{1}{2}$	Raises ND, NF, and NI.
Total between 3rd and 4th	4,840	
Fifth	487	Development drifts and raises.
Grand Total	6,421	

Table VI.

Statement of Delays.

Date	Hours	Tons Lost	Cause	Cost of Repairs \$
Jan. 31	1	100	Repairs to pulley-stand on surface	3.66
Feb. 28		75	Compressor valve jammed. Idle 4½ hours.	9.51
" 28	½	75	No current. Short circuit on Main line.	
March 14	1½	175	No current. Main line trouble.	
" 15	½	50	" " " " "	
June 6	¾	50	" " " " "	
" 27	6	400	" " " " " Lightning struck main line and burned out oil-switch at the mine.	17.55
July 19	1½	400	Transformer at mine out of order	114.06
Aug. 6	1½	200	No railroad cars. Train tore up track.	
" 7	4	300	" " " " " " "	
" 7	2½	200	No current. Main line trouble at night.	
" 9	4	600	Eric Kylonen's funeral.	
Sept. 27	2	400	Fatal accident to Matt Linna.	
" 30	4	700	Funeral of Matt Linna.	
Nov. 1	5	700	Skip tore out shaft guides.	32.01
Total	34 ¾	4,425		\$176.79

Table VII.

Statement of Delays caused by lack of Electric Current,

Due to Trouble on the Main Line.

Date	Hours	Tons Lost	Remarks.
Feb. 28	½	75	Short circuit on main-line.
March 14	1½	175	Blizzard.
" 15	½	50	"
June 6	¾	50	Thunderstorm.
" 27	6	400	Lightning struck line and burned out oil-switch at mine.
Aug. 7	2½	200	Thunderstorm at night.
Total	11 ¾	950	

Table VIII.

Estimate of Ore Reserves.

Level	Tons
335 foot sub-level	24,000
Third Level	33,000
Total above Third Level	57,000
364 foot sub-level	75,000
383 foot sub-level	144,000
398 foot sub-level	197,000
415 foot sub-level	267,000
Fourth Level	616,000
Total between Third and Fourth Levels	1,299,000
Total Fully Developed	1,356,000
Between Fourth and Fifth levels, partly developed	1,300,000
Total Ore	2,656,000
Less 10% for Loss in Mining	266,000
Net total Reserves	2,390,000

The estimate of last year has been reduced by the amount of the 1913 production, and in addition a further reduction of 115,000 tons above the fourth level and 97,000 tons below the fourth level, on account of changes made by the geological department in the probable ore and rock areas on the fourth level. A factor of 10 cu. ft. per ton was used above the fourth level for fully developed ore, and of 11 cu. ft. per ton below the fourth level for partly developed ore. Ore and rock areas were measured separately, and 10% was subtracted from the ore tonnage for incidental rock.

FATAL ACCIDENTS.

Eric Kylonen.

At 11:30 P. M. Aug. 5, 1913, Eric Kylonen, a Finnish miner, working in No. 16 contract on the 383 foot sub-level, walked into a blast in No. 22 contract, near No. 16, and was fatally injured, dying early the

following morning. Kylonen was 26 years old and unmarried, and lived at the Barnum House. He had worked at the mine only three weeks.

Matt Linna.

At 9 P. M. Friday, September 26th, 1913, Matt Linna, a Finnish miner, working in No. 10 contract on the 398 foot sub-level, was killed by a fall of ground, which crushed the stope in which he was working. The body was not recovered until 1 A. M. Sunday, the 28th. The inquest was held on the morning of the 30th and the funeral in the afternoon. The mine was idle on the afternoon of the funeral.

Linna was a married man, 38 years old, and leaves a widow and eight children.

GENERAL.

There was a scarcity of good miners during nearly all the year, due to the mine's going on double shift Dec. 1, 1912, and to poor ventilation. The mine went back to single shift again on Dec. 1, and about 120 men were laid off. Those that were desirable were taken on at North Lake and at the Negaunee and Maas Mines. The ventilation of the mine was impaired by the reduction in the air current, due to the cooling of the hoisting shaft, which is upcast, following the replacement of the steam-pump by electric pumps, and to the reduction of the effective cross-section of the air shaft, which is also the second outlet, and is down-cast, by sollar built in compliance with the recommendations of Safety Inspection committees. In order to increase the air current a tunnel was driven from the bottom of the cave on the South Side to the air shaft, at an elevation of 50 feet below the timber tunnel, and all the sollar were taken out of the ladder-road. The result has been noticeable, especially since the colder weather came.

Wages were raised approximately 10 cents a day on February first.

SURFACE.

Repairs to Machinery.

The economizer was out of commission more than half the year, and the repairs were very expensive. It was repaired once in March and April,

but was in service only one month, and had to be torn down again and sent to the factory, where nearly all the sections were replaced. It was rebuilt in September, but has given trouble again in December.

The cooling-tower for the condenser water is rotten, and was temporarily repaired in June. It will have to be thoroughly repaired or replaced before another year is over.

An iron runway was built along the main steam pipe in the boiler house.

Repairs to Launderers.

The big launder was repaired and braced near No. 3 shaft, and 150 feet of corrugated iron launder laid east of the discharge from the electric pumps to handle the surface water from the East End Mine of the P. & L. A. I. Co. That part of the launder passing under the shops and yards of the P. & L. A. I. Co. was cleaned and repaired in October and November.

The launder carrying the discharge from the mine pumps has been entirely covered over to prevent it from being filled with snow, while the pumps are idle. Pumping is done on only one shift at present.

Repairs to Buildings.

The coal-dock was repaired in May and June, many new caps and legs being put in.

The timber tunnel was retimbered for 50 feet, where it broke down in October.

New roofing was put on the dry in August and September.

Destruction of Old Buildings.

No. 1 shaft-house was blasted down in October and the rubbish cleared away. The stone pillar about 50 feet west of the shaft, is being torn down, and the material used to raise the tracks where they cross the old shaft. The removal of this obstruction will facilitate steam shovel loading from the east stock-pile.

New Construction.

A salt-shed was built on L. S. I. Co.'s land by the railroad tracks just west of the mine, material from the old shaft-house being used.

Presque Isle Stocking Plant.

Off grade ore discarded from all-rail shipments to charcoal furnaces was stocked at Presque Isle until the dock began receiving ore in April. It was operated again from Nov.17th, to Dec.15th, but was shut down, after the mine went on one shift.

Stock-piles.

All the ore in stock at the mine was loaded and shipped during the summer. Owing to an error in the estimate of ore remaining in the stock-pile east of No. 1 shaft in 1912, there was a shortage of 5,606 tons from the Lake Mine stock-piles in 1913. The overrun taken up in 1912 was 61,000 tons.

The trestles for the west stock-pile and for that between No. 1 and No. 4 shafts have been erected, but no ore has been dumped east of No. 4 shaft. The west trestle is now about half full.

UNDERGROUND

GENERAL.

Work was concentrated during the year on the sub-levels at both east and west ends of the deposit, the best policy being to work out these parts of the mine first, leaving that part south of the shaft for the last. In pursuance of this policy, and to make it possible to maintain timber-roads and roads of escape to the second outlet, a pillar has been reserved 200 feet long for the full width of the ore body, following as a center line the line between No. 4 shaft and the second outlet. No ore will be mined here below the 398 foot sub-level, except in maintaining passageways, until the ore on either side has been mined down to a lower elevation.

The ore left at the south end of the crosscut to No. 4 shaft above

the third level has been mined on the 325 foot sub-level, and work has been started on the 335 foot sub-level. All the ore on the rest of the 335 foot sub-level has been finished, except a few small pillars near raises from the straight drift on the third level.

In the same way as was done last year, in order to facilitate the description of the work above the third level, the raises from the drift east of the crosscut to No. 4 shaft have been lettered. Assuming that there will be an interval of 50 feet between raises, where no raises have yet been put up the letters that will correspond to these raises have not been used, the first raise east of the crosscut to No. 4 shaft being lettered A, the next B, and so forth, the last raise in the straight drift being lettered O. Where a raise has been put up at a shorter interval than 50 feet it is sub-lettered, - thus the raise 25 feet east of raise B is called B₁. All the raises from the fourth level were lettered in 1911, and the same system has been maintained. Beginning at the raise farthest west in the north drift on the fourth level and going east the raises have been lettered, NA, NB, NC, etc. Where an interval has been left without a raise, the proper letter has been reserved for it. When a raise crushes, or when for any other reason another raise has to be put up, the new raise is sub-lettered; - e. g. if the raise NC crushes the new raise is called NC₁.

On the third level the ore on the north side of the straight drift has been mined from the Y drift east for 150 feet and about 40 feet wide. On the south side the ore south of the drift has been mined for 125 feet west from raise O for a width of 100 feet, and 150 feet further west for a width of 50 feet along the hanging-wall, leaving a pillar along the main drift approximately 450 feet long and 50 to 60 feet wide.

On the 364 foot sub-level, the first sub-level below the third level all the ore remaining east of raise NQ, except the small pillars protecting the drift between raises NQ and NR, has been mined, and a

slice roughly 50 feet wide and 450 feet long has been mined along the hanging-wall, pillars being left only to protect the timber roads south of NP and north^{of}/NJ. The ore left along both sides of the timber-road in north-west has been mined for a length of over 200 feet, and is now exhausted up to a point 100 feet west of raise NH. It has been necessary to drive a long timber drift near the footwall east of the crosscut to No. 4 shaft from raise NP to the crosscut north of raise NJ. The pillar remaining on this sub-level lies on the footwall, and is roughly 600 feet long and 100 feet wide.

On the 383 foot sub-level, the third sub-level below the third level, work has been concentrated almost entirely at the east and west ends. At the east end all the ore east of raise NR on the North and raise SR on the South, was mined during the year, the area covered being approximately 350 feet long and 200 feet wide. At the west end of the level the ore for 200 feet east of raise NE in North-west, and from 50 feet west of raise SE to raise NJ, a distance of nearly 400 feet, has been nearly all mined for a width of 50 to 150 feet, a few pillars remaining unfinished. The territory east of raise NJ is now being opened out. The pillar left on this sub-level is practically all in North-East, and is roughly 800 feet long and 150 feet wide.

On the 398 foot sub-level, which is the third below the third level, little work was done in North-East, most of the ore stoped being in North-West, west of raise NF, and in South-West and South-East from raise SA to raise SQ, a distance of 1100 feet, the width being from 100 to 150 feet. During the latter part of the year the east end of the sub-level has been opened up and stoping started.

On the 415 foot sub-level most of the ore on the north and south footwall for 300 feet east of the west boundary has been mined, connection has been made from this territory to the second outlet and air-shaft, and the territory east of the air-shaft is being opened up. A pillar will be left here for 100 feet east and 100 feet west of the air-shaft for the full

width of the ore body, so as to maintain timber roads and exits.

Both the east and west ends of the fourth level have been crushing badly, and have required extensive repairs.

On the fifth level the west drift has been advanced 30 feet in rock and the east drift 25 feet in ore, and a Y drift has been driven 150 feet in ore between the two. Three raises have been put up to the fourth level, one in rock 275 feet west of the crosscut, and two in ore 90 and 140 feet east of the crosscut.

Details by Contracts.

325 Foot sub-level.

This sub-level in the pillar at the south end of the crosscut to No. 4 shaft on the third level was opened in March, and was finished at the end of the year.

No. 51 put up A raise from the third level at the end of February, and opened out on the 325 foot sub-level in March. No. 52 joined them, No. 51 drifting west and No. 52 east. No. 56 put up C raise from the third level in May, and holed to No. 52's drift. These three contracts mined the ore remaining on the footwall for a length of 230 feet and a width of 100 feet. No. 56 went to the 335 foot sub-level in October, and No. 52 in December. No. 51 finished the ore around A raise at the end of the year.

335 Foot sub-level.

At the beginning of the year there were nine contracts working on this sub-level west of No. 1 shaft pillar. They worked for about three months, and then, as the grade of the ore fell off rapidly, they were shifted to other parts of the mine. The only ore left was in a few small pillars over the main drift on the third level, and these were being mined at the end of the year.

No. 58 and No. 62 finished the pillars around K raise in January. No. 28 mined the pillar left north of K raise, and went to the 364 foot sub-level in January.

No. 51 and No. 52 finished the pillars north and south of the

drift between J and K raises in February. No. 51 went to the third level to put up A raise and No. 52 went to A raise on the 325 foot sub-level in March.

No. 66 stoped south of I raise for three months, mining the ore as far east as Dike D. They left two small pillars near I raise. These are being mined by No. 8, who came back to this place in October and put up a small raise from the third level.

No. 35 stoped the ore on the east side of the crosscut south of H raise as far as No. 66's workings. Nos. 66 and 35 were stoped in March.

No. 4 and No. 71 mined the ore south of G raise for three months, and were then stoped, leaving a small pillar at the head of the raise.

No. 21 put up E raise 230 feet east of the crosscut to No. 4 shaft in May, and crosscut north on the 335 foot sub-level to the footwall in June. They mined the ore left on this sub-level from Dike C on the west to No. 4's old stope on the east, finishing in October. In November they put up B₁ raise, crosscut to No. 56's drift, and crosscut south from the raise to the old workings, where they are now opening a stope.

No. 56 came down from the 325 foot sub-level in raise C in October, and crosscut north to the footwall. They drifted east and west on the contact, and are now stoping 85 feet north-east of the raise on the west side of dike C.

No. 52 came down from the 325 foot sub-level, put up B raise from the third level in December, and are now drifting west.

No. 62 started in December, and crosscut south from C raise 15 feet to rock, and turned west towards No. 21.

Third Level.

No. 15 drifted east in rock in June from the top of the timber raise 30 feet in rock to the main crosscut at the foot of raise A.

No. 1 crosscut north from raise NR to the old workings, and mined the pillar north of the motor drift. They repaired the motor drift in April, and in May and June stoped south of raise NQ with No. 41. They went to the 364 foot sub-level in August.

No. 39 crosscut south 110 feet from raise NR, and mined the ore north of dike E for five months, going to the 364 foot sub-level in June.

No. 41 drifted north-east from raise NQ to the dike, and stoped back. They repaired the old motor barn in February, and drifted west to No. 27, 25 feet south of raise NP. In March they crosscut south to the dike, and with No. 1 stoped the ore between dikes D and E south of the main drift. They finished in August, and went to the 364 foot sub-level.

No. 27 came up from the 364 foot sub-level in January and crosscut south from raise NP through dike D for 80 feet to dike E, where they opened a stope on the west side. They stoped here until May, then drifted south-west from raise NP on the north side of dike D, and stoped the ore south of the drift between raises NO and NP. They have a small pillar left south-west of the raise at the end of the year.

No. 8 crosscut north from raise NN to the motor drift, and then mined the pillars left south of the drift between raises NO and NN. They drifted west through the pillar from the crosscut 30 feet north of raise NO to that north of raise NN, and then mined the ore south of this drift. They put up raise I from the main drift in October, and moved to the 335 foot sub-level.

No. 21 stoped along the old workings at the south end of their crosscut south of the main drift between D and E raises in January and went to the 364 foot sub-level in February. They put up E raise in April on the third level, and moved to the 335 foot sub-level.

No. 58 started stoping on the east side of the crosscut north of raise NP in December.

No. 4 put up raise NI in September from the fourth level, and crosscut north to the motor drift on the third level in September. They went to the 364 foot sub-level in October, but returned to the third level in October, and drifted north-west from the crosscut north of raise NI to the old workings north of dike B, where they are now stoping.

No. 63 drifted 10 feet east of raise NI in December.

364 Foot sub-level.

At the beginning the year there were 14 contracts on this sub-level. In December there were 12.

North-East.

No. 11 came up from the 398 foot sub-level in October, and drove the crosscut north of raise NJ north 100 feet, and are now raising in the footwall.

No. 65 mined the ore west of the crosscut 40 feet west of raise NJ, for three months, and drifted 50 feet east and west from the end of the crosscut 100 feet north of raise NJ, holing to the timber raise on the west. Then they drifted west and north-west through the pillar west of this crosscut, 60 feet north of NJ, until they holed to the timber raise 55 feet east of raise NH. They repaired the timber drift, and went back to their old stope north-west of raise NJ. They finished here in September, and worked with No. 77 mining the pillars along the timber drift south of NJ.

No. 77 stoped the pillar north of the main drift between raises NG and NJ for six months, and then moved to the old timber crosscut south of raise NJ, where they mined the pillars left on both sides. They finished in November.

No. 48 repaired the drift between raises NJ and NK, and mined the pillars north of raise NK. They went to the 383 foot sub-level in March and drifted from raise NK to raise NL. They returned to the 364 foot sub-level, finished the pillars near the raise, and went to the 383 foot sub-level in June.

No. 60 drifted west from the crosscut 60 feet north of raise NL to dike C, and stoped the ore on the west side of the crosscut. They went to the 383 foot sub-level in March, and drifted from raise NL to raise NM, returned to the 364 foot sub-level in June, and resumed their stoping. They did not do very well, and were laid off in August, No. 59 taking their place, and finishing the pillar.

No. 46 mined the ore between the crosscuts north of raise NM and NL

for 60 feet, and are now drifting east 20 feet north of raise NM. They came up from the 383 foot sub-level in July.

No. 59 mined the ore over an area approximately 50 feet square on the east side of the crosscut south of raise NN, and mined part of the pillar north-west of raise NL, as previously noted. They also crosscut north from raise NN to the footwall drift, and drifted west through the pillar to raise NM. At the end of the year they were stoping 40 feet south-east of raise NN.

No. 21 repaired the drift between raises NL and NN in February and March, and went to the third level.

No. 28 came to the 364 foot sub-level in February, and drifted north-west and west along the footwall to make a timber road from the end of the timber drift at raise NP to the end of No. 65's drift 50 feet east of the crosscut 100 feet north of raise NJ. They are now drifting west from this drift 40 feet north-west of raise NP, and are in 40 feet.

No. 26 came to this sub-level in August, repaired the crosscut south of raise NP, and have been stoping ever since on the east side between dike D and dike E.

No. 41 came down from the third level in September, crosscut north 60 feet from raise NQ, and mined the ore on the south side of the dike, leaving a 20 foot pillar north of the raise. They crosscut south 75 feet to the old workings, and are stoping the pillar on the west side of the crosscut.

No. 39 came down from the third level in June, repaired the crosscut north of raise NR to the footwall, and mined the ore on the west side of the crosscut between the dike and the footwall. They mined the ore on the west side of the crosscut north of the raise, leaving a pillar to protect the drift between raises NR and NQ, and are now stoping south of No. 41 and north of dike E.

No. 1 came down from the third level in July, and mined the ore east of the crosscut north of raise NR. They crosscut south from the

raise along dike E, and drifted north-west 25 feet to No. 39's drift. They are now stoping on dike E 60 feet south-west of the raise.

No. 29 crosscut south from No. 39's old footwall drift to No. 49's drift, 50 feet north of raise NS, and stoped the ore north of dike E from No. 1's stope on the west to the dike on the east, and went to the 383 foot sub-level in April.

No. 49 crosscut north from raise NS to No. 29, and mined the ore remaining on the south side of the raise. They went to the 383 foot sub-level in April.

No. 33 finished the ore east of raise NU in January, and went to the 383 foot sub-level.

No. 56 reopened the drift west of raise NU, and went to the 383 foot sub-level in January.

South-East.

No. 14 mined the pillars south of raise SW, and went to the 383 foot sub-level in January.

No. 17 finished the pillars north-west of raise SW, and went to the 383 foot sub-level in February.

North-West.

No. 16 stoped the ore between the timber drift and dike B from 25 to 100 feet east of raise NF, and mined the pillars south of NF. They went to the 383 foot sub-level in June.

No. 15 stoped the ore along the north side of dike B south-west of raise NH, and drifted west 90 feet from raise NH to the timber-road. They went to the 383 foot sub-level in March, but returned to the 364 foot sub-level in July, stoped the ore on the footwall north of the timber-road 100 feet north-west of raise NH for two months, and then mined the pillars along the south side of the timber road for 60 feet north-east of raise NF.

No. 70 stoped the pillars north and south of raise NF, and went to the 383 foot sub-level in April.

No. 25 came up from the 383 foot sub-level in March, and stoped.

the pillars on the north side of the timber drift for 100 feet north-east of the raise.

No. 35 started on the 364 foot sub-level in September, and have stoped the pillars left along the timber road west of raise NH until the end of the year.

No. 67 started in November, crosscut north from the timber-road 40 feet north-east of raise NH to the footwall, and are now drifting west along the contact.

383 Foot sub-level.

At the beginning of the year there were 19 contracts working on this sub-level, and in December only 8.

North-East.

No. 48 came down from the 364 foot sub-level in March and drifted from raise NK to raise NL. They went back to the 364 foot sub-level, but returned to the 383 foot sub-level in June, crosscut north 50 feet from the drift 10 feet east of raise NK, drifted west 60 feet through dike C, and raised to the 364 foot sub-level for a timber-road. They drifted 60 feet south-west of raise NK, and mined the ore south of the raise from the dike C on the west to the old stopes on the east.

No. 60 came down from the 364 foot sub-level in April, drifted east from raise NL to raise NM, and repaired raise NL. They went back to the 364 foot sub-level in June. In December they started again on the 383 foot sub-level, and crosscut south from raise NL to the old workings in South-East.

No. 40 started in December to drift east from raise NM.

No. 26 crosscut north from the timber raise 120 feet to raise NO.

No. 49 came down from the 364 foot sub-level in May, crosscut north from raise NS through dike E to the footwall, and mined the ore between the dike and the footwall.

In July they drifted west from the raise, following the contact with the dike to the south, until they reached the timber-raise. They

stoped south of the timber drift for one month, and went down to the 398 foot sub-level. They returned in October, and mined the pillars along the north side of the timber-road 60 feet south-west of raise NS.

No. 29 came down from the 364 foot sub-level in April, stoped north of raise NS with No. 49 for one month, and then drifted east from the raise for 60 feet along the old stope, and mined the ore remaining south and east of raise NS. They went down to the 398 foot sub-level in October.

No. 33 came down from the 364 foot sub-level in January, and drifted east from raise NU to the footwall. They followed the contact south until they holed to No. 75, and then mined the ore east of the raise as far north as dike E. They also mined the ore west of NU up to the dike, crosscut north through the dike, and mined a small body of ore on the footwall. They went to the 398 foot sub-level in September.

No. 75 drifted west 115 feet from NV for a timber-road, and mined the ore east and south-east of raise NV to the footwall. They went to the 398 foot sub-level in September.

South-East.

No. 14 came down from the 364 foot sub-level in February, crosscut north from raise SW for a timber-road, and drifted east in ore along the north side of the old water drift for 70 feet. They stoped west of raise SW for two months, and then drifted east again on the south side of the old water drift, crossing dike F, and started stoping on the south side of the dike; but they were unable to keep their drift open, and went down to the 398 foot sub-level in October, after mining the pillars left near the raise.

No. 17 came down from the 364 foot sub-level in March, drove a new timber drift north-west of raise SW, and mined the ore east of the raise. They mined the pillars left around raise SW with No. 14, and went down to the 398 foot sub-level in October.

No. 32 drifted east from raise SV along the south side of dike F, and holed to No. 17's drift. They also drifted south-east along the south footwall 30 feet south of raise SV, but were cut off by rock. They were

unable to hold the long drift south-east open, and went to the 398 foot sub-level in September.

No. 2 drove three drifts west from raise SV and from the crosscut south of raise SW, to keep a timber-road open, and drifted east from No. 32's drift 100 feet south-east of raise SV, holing to No. 17's drift, and opening a stope on the footwall; but they were unable to keep this long drift open, and moved to the 398 foot sub-level in September.

No. 44 and No. 57 mined the ore between dike E and dike F north of raises ST and SU, finished the pillars around the raises, and went to the 398 foot sub-level in April and June.

No. 13 finished the pillar south of SR in January, and went to the 398 foot sub-level. They returned in June and mined the ore on the north side of dike E for 120 feet east of the crosscut. They are still here.

No. 24 drifted north 100 feet on the east side of the crosscut north from SU to meet No. 32, mined the pillars south and west of SV, drifted west in rock from SU to ST to make another outlet for the contracts in this part of the mine, and went to the 398 foot sub-level in March.

No. 26 repaired the crosscut north of raise SS for three months, and mined the ore remaining on the east side of the crosscut south of dike E.

No. 10 stoped the pillars south of raise SR, drifted east along the north side of dike E from the crosscut 30 feet north of raise SQ to the crosscut north of raise SR, and went to the 398 foot sub-level in March.

No. 19 mined the pillars left north-west of raise SJ, and went to the 398 foot sub-level in February.

No. 5 mined the pillars remaining south and west of raise SQ south of dike C, and went to the 398 foot sub-level in March.

No. 23 mined the pillars along the timber road along the south side of dike C east of raise SQ, and went to the 398 foot sub-level in March.

South-West.

No. 31 and No. 30 finished the big pillar south of the drift between

raises SE and SF on the north side of dike C, and went down to the 398 foot sub-level in June and August.

North-West.

No. 16 came down from the 364 foot sub-level in June, crosscut north 15 feet from raise SF and drifted east to the main drift. They continued their crosscut north through dike B, and drifted east to the timber road. They stoped the ore west of this crosscut, and drifted north-east from the timber-road along the south side of dike B, holing into No. 22's stope in October 60 feet north of raise NG. They have continued stoping here until the end of the year.

No. 22 crosscut north-west from the drift 30 feet west of raise NG to the north-west timber-drift. They crosscut north again, 20 feet east of raise NG for 125 feet, and raised to the 364 foot sub-level for a timber road. They drove a new drift along the north side of the timber drift on the north side of dike C, 80 feet east of raise NG, and mined most of the ore between this drift and their new crosscut. In October and November they stoped with No. 16 on the south side of dike B 80 feet north of raise NG. In December they drifted east 40 feet from the crosscut 80 feet north-east of NG.

No. 6 mined the pillars remaining north and south of raise NE, and went to the 398 foot sub-level in June.

No. 43 drifted north-east from raise NF to the timber-road, mined the ore on the east side of the crosscut north of the drift between raises NE and NF, and went down to the 398 foot sub-level in August.

No. 25 repaired the drift east of raise SF in January, and in February drifted north-east in rock for the new timber-road north of NH. They went to the 364 foot sub-level in March, but returned in September, and stoped the pillars along the north side of the drift between raises NE and NF for three months. They went to the 398 foot sub-level in December.

No. 15 took No. 25's place in the rock drift north of raise NH in March. They crosscut south to raise NH in April, and then raised to the

third level in rock at the end of the north drift.

No. 63 mined the pillars left south of raise NG for six months and were discontinued in June.

No. 18 came up from the 398 foot sub-level in September, stoped a small pillar south of raise NF₁ and repaired the timber-road between raise NF₁ and raise NH. They are now stoping 70 feet north-west of raise NF₁.

No. 70 came down from the 364 foot sub-level in April, and cross-cut 60 feet through the pillar north-east of raise NF. They stoped towards the east along the east side of the old workings north-east of raise NF and south of No. 25's stope, and went to the 398 foot sub-level in November.

No. 23 came up from the 398 foot sub-level in September, and drifted north-west through the pillar from raise NF₁ to No. 70's old stope north of raise NF. Then they crosscut north from the timber drift 60 feet north of raise SF, and turned west until they holed into the new timber-road. They are now repairing.

398 Foot sub-level.

There were 16 contract on this sub-level at the beginning of the year and 22 in December. Forty contracts in all worked here during the year.

North-East.

No. 7 came up from the 415 foot sub-level in October and drifted east from the timber crosscut by raise NJ to raises NK and NL, and are now drifting east from raise NL.

No. 49 came down from the 383 foot sub-level in September, and crosscut 55 feet south-west of raise NS, returning to the 383 foot sub-level at the end of the month.

No. 29 came down from the 383 foot sub-level in October, and drifted north-west from the south end of No. 49's crosscut 55 feet south-west of raise NS. They have drifted north-west 180 feet, and put up two raises to the timber-drift on the 383 foot sub-level.

No. 33 came down from the 383 foot sub-level in September, drifted

west from raise NU to No. 49's crosscut south of raise NS, and then crosscut north to raise NT. They mined the ore on the footwall north and east of raise NT, and are now drifting west 15 feet south of the raise.

South-East.

No. 75 came down from the 383 foot sub-level in September, and drifted north from raise NV to raise NU and south to raise SW. They drifted 190 feet south-east of raise SW to the footwall, stoped back 20 feet between the footwall and a dike, and crosscut south 60 feet under the old water raise to the ore south of dike F.

No. 17 came down from the 383 foot sub-level in November, and drifted north-west 100 feet from the drift 10 feet north of raise SW to the timber-road.

No. 14 came down from the 383 foot sub-level in November, and drifted 100 feet south-east of raise SW. No. 17 doubled up with them in December.

No. 2 came down from the 383 foot sub-level in September, drifted north-east 50 feet from raise SV, and raised to the 383 foot sub-level. They then crosscut north-west 160 feet from this drift 35 feet north-east of raise SV to the timber-road. In November they drove a new drift along the south side of the old one from raise SV to raise SU, and are now re-timbering the timber-road.

No. 32 came down from the 383 foot sub-level in September, crosscut south from raise SV to the footwall, and drifted east along the contact for 100 feet, but their drift broke down, and they are now drifting around the cave on the north side.

No. 24 came down from the 383 foot sub-level in April, drifted east from raise SU to raise SV, crosscut north 150 feet from raise SU, and raised to the 383 foot sub-level for a timber-road. They crosscut south from raise SU to the footwall, and mined a small amount of ore on the footwall. They repaired the timber-road north of raise SU for two months, drifted south-west from raise SU to the crosscut south of raise ST, and

drove a side drift north of raise SU through dike F to keep the timber-drift open.

No. 44 came down from the 383 foot sub-level in April, drifted west from raise ST to the crosscut south of raise SR, and crosscut north from raise ST for 135 feet. 50 feet north of raise ST on the north side of dike F they drifted west 50 feet, and raised to the 383 foot sub-level. During the remainder of the year they stoped on both sides of the crosscut north of raise ST from 135 to 60 feet north of the raise.

No. 57 came down from the 383 foot sub-level in June, crosscut south from raise ST to the footwall, and mined the ore on both sides of the crosscut. They are now 30 feet south of the raise.

No. 13 came down from the 383 foot sub-level in February, crosscut south from raise SR to the footwall, and mined the ore on the west side of the crosscut. They went to the 383 foot sub-level in June.

No. 10 came down from the 383 foot sub-level in March, retimbered the crosscut north of raise SR, and mined the ore on the east side of the crosscut south of raise SR as far as No. 57's stope on the east, spending about one third of their time keeping the timber-road open north of the raise.

No. 34 drifted east along the south side of the drift from raise SP to raise SQ, and stoped the ore on both sides of the crosscut south of raise SQ. In August they drove the crosscut north of raise SQ ahead to a point 120 feet north of the raise, and mined the ore on the west side of the crosscut north of dike D. During the last two months they have been mining the ore on the east side of the crosscut between dikes D and E 75 feet north of the raise.

No. 12 stoped the ore east and west of the crosscut north of raise SP for seven months, crosscut south through dike E to the footwall, and mined the ore between the dike and the footwall. They went to the 415 foot sub-level in November.

No. 64 stoped the ore on both sides of the crosscut north of raise SO for eight months, and went down to the 415 foot sub-level in September.

No. 20 stoped ore on both sides of the crosscut north of raise SM for ten months, and went to the 415 foot sub-level in November.

No. 42 mined the ore on both sides of the crosscut north of raise SM for three and a half months, and went down to the 415 foot sub-level in April. They returned to the 398 foot sub-level in September, stoped for one month along the foot-wall south-east of raise SM, and then started to mine the pillars along the timber-road north-west of raise SM. They were stoping here at the end of the year.

No. 36 finished the ore south of raise SL, repaired the timber-road, north of raise SM, and mined the ore on both sides of their crosscut north of raise SL, leaving pillars to protect the timber-road. They went to the 415 foot sub-level in October.

No. 19 came down from the 383 foot sub-level in February, and joining No. 11, mined the pillars left north of raises SK and SJ. They went to the 415 foot sub-level in September.

No. 11 finished the pillars north of raises SJ and SK, working with No. 19, and went to the 364 foot sub-level in September.

No. 23 came down from the 383 foot sub-level in March, drifted west to No. 7's stope from the crosscut to No. 3 shaft, and mined the ore south-west of raise SG. They went to the 383 foot sub-level in September.

No. 7 stoped south and south-west of raise SG for five months, and went to the 415 foot sub-level in June.

No. 5 came from South-west in May, stoped along the south side of dike C, both east and west of raise SG for three months, and crosscut north-west of raise SG to the north-west timber-road in August, September and October. They stoped south of raise SG for two months, mining the pillars left on both sides of the crosscut to No. 3 shaft, and drifted west on the north side of dike C 25 feet north of the raise in December.

No. 31 and No. 30 came down from the 383 foot sub-level in June and August, and are stoping south and east of raise SE.

South-West.

No. 5 came down from the 383 foot sub-level in March, repaired the drift between raises SF and SG, and crosscut north-west from this drift to the north-west timber-road 25 feet east of raise NF. They went to South-East on this sub-level in May.

No. 18 drifted north-west 40 feet from the drift 10 feet west of raise SE to the main timber-drift in South-West, and then mined the ore remaining on the west side of dike A on the east side of their south crosscut 40 feet east of raise SC. They went to the 415 foot sub-level in August.

No. 55 stopped the ore remaining south and south-east of raise SC for five months and went to the 415 foot sub-level.

No. 50 mined the ore remaining south and south-east of raise SB for seven months and went to the 415 foot sub-level.

No. 37 mined the ore remaining south of raise SA for five and a half months and went to the 415 foot sub-level in June.

No. 9 stopped south of raise SB for two months, finishing the pillar, and went down to the 415 foot sub-level in March.

North-West.

No. 3 finished the pillar on the north side of raise NC in January, and went down to the 415 foot sub-level.

No. 38 drifted west between raises ND and NC, and mined the ore between this drift and the footwall. They went to the 415 foot sub-level in August.

No. 54 mined the pillar north of the drift between raises ND and NE, and went to the 415 foot sub-level in August.

No. 46 drifted east from the crosscut 10 feet north of raise NE to raise NF for a new timber-road, and were stopped in February.

No. 6 came down from the 383 foot sub-level in June, and crosscut 75 feet north-east from raise NE to the footwall, following the end of No. 54's stope. They crosscut north from the drift 40 feet east of raise NE

to the footwall, and are now stopping on the west side along the footwall.

No. 43 came down from the 398 foot sub-level in September crosscut south from the drift 30 feet east of raise NE across the main drift to dike B, which they have followed east to the south-west timber-drift.

No. 70 came down from the 383 foot sub-level in November, drifted east 30 feet from raise NF, and crosscut south to the timber-road. They are now crosscutting 40 feet north-east of raise NF.

No. 25 came down from the 383 foot sub-level in December, and crosscut north-east 25 feet east of raise NF.

No. 53 started in December, and crosscut north-west 30 feet from raise SF to the timber-road.

415 Foot sub-level.

There was only one contract working on this sub-level in the first part of January, but in December there were 13.

South-East.

No. 42 came down from the 398 foot sub-level in April, drifted west from raise SN to raise SL, crosscut 145 feet north from this drift, 10 feet west of raise SM, and raised to the 398 foot sub-level for a timber-road. They drifted east from raise SM to raise SN, and went back to the 398 foot sub-level in August.

No. 19 came down from the 398 foot sub-level in September, drifted west 60 feet from raise SJ, crosscut south 30 feet in rock, and raised to the second outlet drift on the 398 foot sub-level. They drifted west from the north end of this cross^{cut} to dike C, turned north-west parallel to dike A, and holed to No. 54 in December. This is the ventilation drift and second outlet for the contracts in the west half of this sub-level.

No. 20 came down from the 398 foot sub-level in November, crosscut south 30 feet from raise SL to the footwall, and followed the contact west for 15 feet. They are now crosscutting 40 feet north of raise SN.

No. 64 came down from the 398 foot sub-level in September, drifted

west in rock from raise SO to the end of the drift east of raise SM, and are now drifting east from raise SO following the north side of dike E. They are in 120 feet.

No. 12 came down from the 398 foot sub-level in December, crosscut north through dike E to No. 64's drift, and are now crosscutting south.

No. 36 came down from the 398 foot sub-level, repaired the drift east of raise SM, and are now crosscutting 40 feet north of raise SL.

South-West.

No. 18 came down from the 398 foot sub-level in August, drifted east from raise SC through dike A, and went to the 383 foot sub-level.

No. 15 came down from the 398 foot sub-level in June, drifted east from raise SB to raise SC, and crosscut south 90 feet from this drift 20 feet west of raise SC to the footwall, where they followed the contact west. They have mined the ore on both sides of this crosscut back to within 25 feet of the drift between the raises.

No. 50 came down from the 398 foot sub-level in August, drifted east on the footwall from the south end of No. 55's crosscut south of raise SC for 60 feet, and then crosscut south from the drift 30 feet east of raise SC. They have stoped the ore on both sides of this crosscut for 25 feet back from the footwall from dike A on the east to No. 55's stope on the west.

No. 37 came down from the 398 foot sub-level in June, crosscut south from raise SA to the footwall, and drifted north-west 75 feet. They mined the ore between this drift and the footwall, and are now stoping on the east side of the crosscut south of raise SA near the footwall.

No. 9 came down from the 398 foot sub-level, drifted east on the south side of the main drift 25 feet north of raise SA for 50 feet, and drifted east from raise SA to raise SB. They crosscut south from raise SB to the footwall, and mined the ore on both sides of this crosscut, leaving a 15 foot pillar south of the raise. In November and December they mined the pillars along the main drift north of raise SA and SB.

North-West.

No. 47 drifted east from raise NB to raise NC, and west to raise NA.

In February they put up raise NF₁ from the fourth level, and repaired on the 415 foot sub-level.

In March they crosscut 45 feet from the drift 35 feet east of raise NA, and crosscut north from the drift 20 feet east of raise NB to dike A, where they mined the ore on the footwall for three months. For the past four months they have been stoping south of the raise.

No. 3 came down from the 398 foot sub-level in January, crosscut south from raise NC to the main drift, and mined the ore on both sides of this crosscut from dike A on the east to No. 47's stope on the west. They crosscut north from raise NC through dike A to the footwall and drifted east along the contact. They mined the ore between the dike and the footwall, and are now stoping 30 feet south-west of the raise.

No. 38 came down from the 398 foot sub-level in August, and stoped the ore on the footwall north-west of raise ND as far as No. 3's stope. They drifted south from the raise along the east side of dike A, and opened a stope. In October they put up raise ND₁ from the fourth level 25 feet east of raise ND, and sliced back the pillar north of raise ND. They are working here now.

No. 54 came down from the 398 foot sub-level in August, drifted east from raise ND, and raised to the 398 foot sub-level 20 feet south-east of raise NE. They drifted east on the footwall north of raise ND for 50 feet, and stoped back to the raise two sets wide. In December they crosscut south 70 feet from the timber-raise 20 feet south-east of raise NE to the end of No. 19's drift.

Fourth Level.

North-East.

No. 4 put up raise NI to the third level in June, July and August.

South-East.

No. 45 raised twice from the fifth level to the fourth in November

and December, and crosscut south from the first raise 45 feet to the south drift 15 feet west of raise SK. They are now crosscutting south from the second raise.

South-West.

No. 45 put up a raise from the fifth level, and crosscut south to the south drift 25 feet east of raise SC in May.

North-West.

No. 47 put up raise NF₂ in February to the 398 foot sub-level.

No. 38 put up raise ND₁ to the 415 foot sub-level in October.

Fifth Level.

No. 45 drifted west 30 feet in rock and east 25 feet in ore in January, and enlarged the pump-house on the north side. They drove a Y-drift between the east and west drifts in ore, put up a raise to the fourth level in rock from the west drift 275 feet west of the crosscut, and two raises in ore to the fourth level from the east drift 90 and 140 feet east of the crosscut.

E. and A. No. 259. Electric Pumps.

A centrifugal pump, and a geared plunger pump, both electrically driven and with a capacity of 500 gallons per minute against 650 feet head, were installed on the fifth level, and were put in commission in May. The pump-house cut last year had to be enlarged to accommodate the plunger pump. Since the installation pumping has been done only on night shift.

The expenditures on this E. and A. are shown in the following table:-

E. and A. No. 259.

No.	Account	Total Expense	Estimate
1	Centrifugal pump and motor	1808.88	2069.00
2	Plunger pump and motor	3762.49	4355.00
3	Wire in shaft	871.36	600.00
4			
5	Extension of water column and station piping	1004.25	800.00
6	Foundation and erecting	1321.02	500.00
	Total	8768.00	8324.00
	Add 10% for contingencies		832.40
	Grand total	8768.00	9156.40

The excess of expenditures over estimate in account No. 6 was due partly to the expensive foundation, which was judged to be cheaper than additional excavation in the pump-house. The pump-house was cut for a steam-pump, and the sump extended so far back in the floor that in order to make a secure foundation for the geared pump, concrete had to be built up in one corner of the sump.

ANNUAL REPORT
(1913)
OF THE
LAKE MINE.

COMPARISON OF COST SHEETS FOR 1912 AND 1913.

PRODUCTION

	Total	Per Day
Year 1912	335,830 Tons	1,123 Tons
Year 1913	<u>469,048</u> "	<u>1,558</u> "
Increase	133,218 "	435 "

Year 1913 includes 5,606 tons stock-pile shortage. In 1912 the mine worked 11 months on single shift and one month double shift, and in 1913 it worked 11 month double shift and one month single shift.

LABOR.

	1912	1913
Average number of men	254	351
Average rate	\$2.74	\$2.86
<u>Tons Per Man Per Day.</u>		
Surface	18.75	21.74
Underground	5.73	5.32
Total	4.39	4.28

Cost of Production.

Labor	.623	.667
Supplies	<u>.230</u>	<u>.204</u>
Total,	.853	.871

GENERAL EXPENSE.

Account No. 26	Year	Total	Per Ton
Insurance	1912	\$205.00	\$.001
	1913	208.67	.000

The decrease in cost per ton is on account of the larger production in 1913.