

## RIGHTS OF THE PUBLIC.

In view of the above, therefore, we believe that the time has come when this organization, whose every purpose is thus being destroyed, should rise up and demand that violence, rioting, and bloodshed must cease in this community, and that the rights of the thousands of people who are not directly involved in this strike must be recognized and respected.

We believe that the Copper Country Commercial Club should, through a committee of its members, conduct an investigation to ascertain the facts and truth as to wages, hours of labor, and working conditions in general in the copper country, and when the truth has been ascertained should publish it to the people of this county, of this State, and of the Nation.

## OFFER TO MEDIATE.

We believe that inasmuch as every attempt to bring about a cessation of strike conditions has failed, this organization should, through such committee, offer its services to both employer and employee, so that order may be restored and a resumption of work brought about: It is therefore

*Resolved*, That the chairman of this meeting be authorized to appoint a committee of three members of the commercial club, which committee is hereby instructed to take every means to carry out the purposes herein mentioned with all possible speed.

That such committee may employ clerical help and incur such expense in connection with their work as may be necessary.

That such committee report the result of its work, and that it be authorized to make such report public by publishing the same in the press of this community and of the State.

## THE MEN APPOINTED.

This resolution was adopted by unanimous vote of the executive committee and the following committee was chosen: Henry L. Baer, of Hancock; Edward Ulseth, of Calumet; and John W. Black, of Houghton. This committee will meet to-morrow and take up its work without delay.

It is the intention of the committee to consult with the men and with the mine managers and with all other persons interested in the unfortunate labor situation.

There is every reason for the belief that the committee will be able to use its good offices for the purposes of securing concessions from the mining companies for the men and to influence all parties to the controversy with the end in view of settling the differences and securing a more general resumption of mining operations than is now in vogue.

The executive committee of the commercial club appointed a committee to investigate the strike. It was composed of Henry L. Baer, a wholesale meat merchant of Hancock; Edward Ulseth, a contractor and coal dealer of Calumet; and John W. Black, a contractor of Houghton. This committee opened an office in Calumet and sought information from both the mine managers and the men who were on strike.

The officials of the Western Federation of Miners refused to cooperate with this committee or to furnish it with information, because they considered that the investigation by the commercial club was made on the suggestion of the mining companies and in their interests.

The report of the committee to Gov. Ferris was dated October 8, 1913, approved by the Copper Country Commercial Club on October 10, published in the Houghton and Calumet Daily Mining Gazette of October 14, and republished in an illustrated pamphlet of 85 pages. Sections of the report were republished as an advertisement in the Boston Globe of October 20, making a full page, and

in other Boston newspapers. Following are some of the conclusions which the committee reached, quoted from its report:

*Attitude toward organized labor.*—During the time that mining operations have been carried on in this district the industry has been singularly free from strike troubles. The entire district has been carried on on the open-shop principle, as nearly as the committee has been able to ascertain. At no time has any part of the district been thoroughly unionized, and at no time during the history of the district has any mining company treated directly with any labor organization. At the same time, men have been employed by the various companies without discrimination on account of union affiliations. At the present time there are employed by the various mining companies on surface, machinists, molders, railway engineers, brakemen, and others who belong to the various unions or labor organizations of their particular crafts. Up to the time of the present strike men were not discriminated against because of their membership in the Western Federation of Miners or any other miners' union, and many men undoubtedly were at work in the district underground who belonged to the Western Federation of Miners. Since the beginning of the present strike, however, every one of the managers of the mining companies operating in the district has announced that hereafter no member of the Western Federation will be employed, and it may be stated at this point that each of the managers of the various companies has also stated, both to this committee and to representatives of the Federal Department of Labor and the governor of the State, that they will under no circumstances recognize in any manner that particular organization.

When requested by this committee to give their reasons for this arbitrary attitude, the mining managers stated as their reason the record of the Western Federation, as they understood it, in other camps previous to the trouble in this district. They pointed out in particular the record of the federation in the strike carried on by it in the Cœur d'Alene district in Idaho in 1894, the strike carried on by it in the Cripple Creek and other mining districts of Colorado from 1894 to 1904, and took the stand that in their refusal to recognize or treat with the federation they were justified by the fact, as stated by them, that every labor dispute in which the Western Federation had taken a part was accompanied by bloodshed and violence. \* \* \*

*Blacklists.*—The committee has investigated as thoroughly as was possible the question as to whether or not the mining companies in the Michigan district or the mine operators had formed any combination or had acted with any concerted plan previous to the present strike, and from such investigation the committee is convinced that, previous to the present strike, there has been no concerted action or combination among the mine managers or operators at any time until after the strike had commenced. Since the strike has been in progress the committee finds that the mine operators have adopted a uniform policy in regard to the recognition of the Western Federation of Miners and the reemployment of members of that organization.

The committee has also investigated thoroughly the question as to whether or not there existed in the copper district of Michigan a "blacklist" of any kind, and whether discharge from one company would affect the possibility of obtaining reemployment with some other company. On this point the committee finds that, beyond any question, there has never existed, in recent years at least, any agreement of any kind between the various companies, nor has there existed any blacklist of employees. The committee has found, as a matter of fact, that employees discharged by one company have found ready employment with the other companies, and in one instance found that an employee discharged by a mining captain in one shaft of a mine, within a few days was reemployed by a captain of another shaft of the same mine. \* \* \*

*Reemployment of labor.*—As the district for some time previous to the strike was suffering a shortage of labor, the committee is informed that it will be necessary, in order to bring the number of employees up to the normal force, to give employment to considerable more men than were working on the day before the strike. A few of the companies are at the present time taking into their employment outside labor which is coming into the district. This, however, to a limited extent. For some time previous to the strike there existed a shortage of labor in the copper country. It is estimated from figures obtained at the various mines that they were operating with about 1,500 men short of normal force. In addition to this, it is estimated that when the strike commenced 2,000 men left the district, and therefore as nearly as the com-

mittee can ascertain from the various mine managers, if the men on strike desire to go back to work, there will be plenty of opportunity for them to obtain their old positions. This statement is made with the reservation, however, that the various managers declare that they will not reemploy certain of their old employees who have taken part in any violence or criminal action during the days of the strike. \* \* \*

*The one-man drill.* It is claimed by the Western Federation of Miners and its members that the one-man drill, so-called, has placed a burden upon the miners in the copper mines of Michigan which is not commensurate with the wages paid. In this connection, in order to clarify the situation, it may be stated that drilling originally was done by hand. The purpose of the drill in mining work is to drill holes into which the powder is afterwards charged for blasting. In the early days of mining this work was done by two or more men, one of the men holding the drill while other men acted as strikers. As the mining industry developed, a power drill was introduced which was operated by two men. The introduction of the first power drill operated by two men met with the same resistance which is now being offered to the one-man drill. The claim was made that it would put a great many men out of employment, which same claim is also made at the present time in reference to the one-man drill.

It may be stated generally that in the Lake Superior copper district the average copper contents of the rock decreases with depth. This has been the history of the district, and the cost of mining increases proportionately with depth. As has been shown briefly in this report by tables, the Michigan copper mines are operating with rock carrying lower copper contents than the other copper-mining districts of the United States, and the Michigan copper mines are operating at greater depth and consequently at greater cost than the other copper mines of the United States. In order to compete with the other copper districts of the United States, the above facts have made it absolutely imperative that the mines of Michigan should be operated with the closest economy. \* \* \*

This committee, in order to understand the drill and its workings, inspected the drill at work underground in four of the mines. The members of the committee talked to men operating it. They operated it themselves, they saw the drill taken down and set up. The committee talked to a number of miners who were operating the one-man drill, and in no case found any specific objection to its use. In a few instances the men claimed that it was difficult to set up in some places, but the committee found that it is a practice among the miners for one man to help another whenever necessary. The one-man drill operators interviewed invariably admitted that they are making more money on the one-man drill than they were on the two-man drill, and not in a single instance did the committee find a man that would give up his one-man drill to go back to the two-man drill. The committee found in some cases men who said that two men should be on the drill, but when requested for their reasons and asked of what assistance the second man would be in operating the drill, they were unable to give any, except that the assistance would be given to set up the drill in the morning and to take it out of the way before blasting. The committee on one of its trips underground saw one man set up his drill in nine minutes, but from what the committee has been able to ascertain, the average time required by miners to make their places of work safe by barring down loose rock, preparing the place for the drill, and setting up the drill seems to be about one and one-half hours.

The claim has also been made to the committee that a great many men would be thrown out of work by the adoption of this drill, but mining men and engineers in this particular district claim that the installation of this one-man drill will permit mining companies to work poorer ground than has ever before been handled in the district and that instead of throwing miners out of employment it will create a demand for more miners.

On its trips underground the committee took occasion to ascertain whether or not the mining companies were operating in accordance with the law passed at the recent session of the legislature in reference to the one-man drill, namely, the act providing that men operating these machines should not be stationed more than 150 feet from the place where other employees were at work, and the committee found, as a matter of fact, that the mining companies generally were operating in accordance with this act.

From its investigation the committee has concluded that the one-man drill in this district is an economic necessity and that the mining companies operating in the district will insist on continuing its use. \* \* \*

*Minimum wage.*—From the tables and information given in the earlier part of this report, showing the varying conditions at the different mines, the contrast in the copper content per ton of rock mined by the different companies, the costs of mining in the different mines, it is apparent that a general minimum scale of wages applied to all of the mines of the Michigan copper district can not be put into effect without working injustice both to the operator and to the employee. The injustice to the operator comes in the fact, as demonstrated, that those companies which are now operating at a loss and those companies which will operate at a loss at the average price of copper will either have to be able to operate at a greater loss or close down their mines. Several of the companies now operating, if the minimum wage demanded by the Western Federation of Miners went into effect, would have to go out of business and cause, of course, the throwing out of employment of a great many men. On the other hand, a uniform scale of wages, doing away with the contract system among the miners and trammers, would work hardship upon a large body of the employees who now earn wages in excess of the scale advocated by the Western Federation of Miners.

The real question, of course, is whether or not the men working in the copper industry of Michigan are being paid an adequate wage for the work which they perform. If a company can not operate and pay its employees a living wage, that company should cease operations.

*The contract system.*—The contract system which is in vogue in the copper country has existed for a great many years. The chief objection to it is the objection made by some of the men that under the system there are months when they do not obtain enough pay to afford them a living. The committee investigated this feature as fully as it was able to do without having the specific complaints of all of the men before it. The committee investigated all cases presented to it of men who claimed to have worked an entire month on contract without having made adequate wages because of poor ground or hard luck, and found that in some instances the docket or pay check for one month would seem to bear out their claim, but, on taking an average of six months or twelve months, it was invariably found that the average pay made was considerably higher than the one month submitted to the committee. Contracts are let for periods of two or three months by the mines, and whereas in some instances during the first month the pay made by the men was comparatively small, when the three months are taken together and averaged the pay amounts to a considerably higher figure. The advantages of the contract system, as claimed by the mine operators and by many of the men, are that it affords the efficient miner or trammer an opportunity to make good pay and gives him a chance to increase his own efficiency and increase his compensation in proportion thereto.

In examining the pay rolls of the various companies and tabulating the same, the committee found that there was a wide discrepancy in the wages paid to the various classes of labor in the various mines. The wages paid by some of the companies average considerably higher than the wages paid at some of the other mines, one of the reasons for this, of course, being the fact that, as before stated, the richer mines in the district can afford to pay higher wages. Other reasons are the facts that in some of the mines the work is carried on at a greater depth and, in some instances, under more unfavorable conditions than at some of the more shallow mines. The fact that this discrepancy exists also seems to bear out the statement that there has been no combination or concerted action among the various mine managers of the district, and the committee is informed that previous to this report there have been no comparative tables made of the wages paid by the various companies. \* \* \*

*Tramming.*—The conditions under which trammers work in the various mines differ to a great extent. In some mines where a large amount of rock is to be taken out from one level, it has been possible to install electric tramming, which means that the work of the trammer consists in loading the cars, which are then hauled to the shaft by electric motors. In other mines where only a limited amount of rock is taken out at each level it has been impracticable to establish power tramming and the cars are pushed to the shaft by the trammers. The problem of lightening the work of loading and pushing tram cars has been one that has caused considerable trouble. The average car trammed by two men holds 2½ tons of rock. The distance which it is required that trammers push the car varies, at different levels in the various mines, from 50 feet to distances of fifteen or sixteen hundred feet. The cars are of various types and trammers can be found who insist that each particular kind of car is the best.

All the cars run on steel rails and the levels and the tracks are graded with a down grade toward the shaft in favor of the loaded car. The number of cars required to be taken out by men who work on day's pay varies with the varying conditions and the distances to be trammed.

Loading conditions also vary. In some cases the tram cars are loaded by shoveling from the floor of the drift, in some places they are loaded from chutes, and wherever possible a loading platform or sollar is constructed level with the top of the car so that the work of loading is minimized. In some instances the men push the cars a short distance, from which point the cars are hauled by electric or cable haulage. The tramping is done in many cases by contract, and a comparison of the pay made by trammers working on day's pay with those working on contract shows that contract trammers make by far the biggest wages. At the same time they accomplish more work, and it has been found that the contract trammer who makes the biggest pay is also the best man for the operator. Contract trammers in the mines from which the committee has been able to obtain statistics tram on an average of 21 tons, while trammers working on company account or day's pay average from 12 to 14 tons. \* \* \*

*The demand for an eight-hour shift.*—The problem of working hours for underground employees in the mines of Michigan seems to be one of the hardest to solve. In other industries where work is performed on surface and is not complicated by the necessity for conveying the men to and from their work the eight-hour proposition is in most instances merely one of dollars and cents. When applied to work underground many complications and problems creep in which make it hard to establish a uniform rule. It is conceded, even by the men who are now out on strike, that underground employees of the mines in Michigan do not actually work more than 8 hours a shift, but it is claimed that the hours from the time the men leave the surface until they are returned to the surface amounts to 10 or more hours out of the day.

In other mining districts where operations are conducted nearer the surface and under totally different conditions it has been found practicable to put into effect a so-called eight-hour shift. In many of these mines the copper deposits lie in the shape of a blanket deposit, and men are lowered to a certain depth in the mine, from which all operations are carried on.

In the Michigan mines the copper deposits lie in a vein dipping from the surface, and operations are carried on at many different levels, necessitating the lowering of men to different distances in the mine and, of course, returning them from different levels. Added to this is the immense depth of Michigan mines as compared to other mines, all of which makes the time of lowering the men to their work and bringing them back to surface probably longer than in any other mining district. There also enters into this problem the necessity for keeping skips, or cars by which rock is hoisted out of the mine, in operation for a long enough period to hoist the rock broken by the miners; in other words, the time taken up in hoisting and lowering men deducts just that much time from the period during which rock can be hoisted.

As a matter of safety, men are lowered in the mine at certain fixed hours in the beginning of the shift and are brought back to surface at certain fixed hours at the end of the shift. During these hours no rock is hoisted. Every precaution is taken by the companies in the hoisting and lowering of men. Special cages are put on for their use, and in some of the mines special cables are used. The cages containing the men, which carry only a limited number (the most lowered at one time being about 30), are run at a moderate rate of speed, which is made necessary by the immense depth of the mines. It should be borne in mind that at some of the deeper workings of the Calumet & Hecla mine the men are lowered on an incline shaft for a distance of a mile and one-half. The length of these shafts makes it imperative that great care should be taken in their upkeep and maintenance, and as an illustration of their care it may be stated that in the Calumet & Hecla mine some 300 men are employed solely on shaft work in keeping the shafts in repair and in working condition. \* \* \*

It must be borne in mind that in the deeper mines, although the men quit work underground at about the same time, a great number of them are hoisted to surface at the same shaft and with the same cage, and consequently it is necessary that some of the men wait their turn to get on the cage and be taken to surface, which means that considerable time elapses between the time they stop work and reach the surface over and above the actual time taken to hoist them. Under the system used by most of the mines the men who are lowered

first in the beginning of the shift are given the privilege of coming out first at the end of the shift. \* \* \*

*Three shifts.*—It is impracticable in the mines of the copper district of Michigan to work three eight-hour shifts this for various reasons, one reason being the fact that it takes so much time to lower the men to work and to bring them back to surface, another reason being that at the end of the day's work when the miners blast their holes, a period of from one to two hours must elapse before men can work in the same place again because of the gases which are generated by the explosions.

In some of the mining districts of the United States, notably the Butte district, the men work an eight-hour shift, going to their work on their own time, but being brought to the surface on the company's time. In the mines in Michigan no attempt has heretofore been made to inaugurate any kind of an eight-hour shift. \* \* \*

*Treatment of men by petty bosses.*—In regard to the complaint that was made by some of the men of the treatment by petty bosses, it may be said that this complaint is a general complaint which is bound to exist in any industry which requires the number of petty bosses that are required in the mining industry. It may be taken for granted that no mine manager wants his underbosses to mistreat his men, and the solution of this problem lies in providing an adequate method by which men can present their grievances to the management. It is claimed by some of the men that they dare not make complaints against a petty boss without incurring the displeasure of that boss and running the chance of losing their jobs. It is undoubtedly true that some of the bosses who are promoted from the ranks are not competent to handle the men under them. It is undoubtedly also true that many of the complaints that are now heard against underbosses arise out of feelings of jealousy and personal grudge, and can not be adjusted in a general way, but can only be taken up in individual cases and sifted to find the truth. The committee believes that all of the mine managers of the copper district would willingly adjust any legitimate complaint against any of the minor bosses if brought to their attention.

*Access to management.*—As to the presentation of grievances, the committee finds the fact to be that many of the men feel they have no way of getting to the men in authority who could adjust their grievances. This problem is one largely of reassuring men of the fact that they may go freely to their employers and present their grievances and troubles without incurring discrimination. Heretofore in the district this has been accomplished at times by committees in the case of general grievances, and at times by the individual making a personal visit to the man in authority. The committee has tried to ascertain whether or not any mining company has discriminated against any man or has discharged him for making complaints, and has been unable to find one case where that has been done. Nevertheless, the fact remains that many of the men do not feel free to go to their employers with their grievances. The committee also has been unable to find a single case where any employer, mine manager, or person in authority has refused to meet with any man or with any committee of the men to discuss the grievances and problems arising during the course of the work. If some method could be adopted by which the men could be assured that they might come freely to their employers and tell their troubles and present their grievances without incurring any displeasure or discrimination, the problem of presentation of grievances would be solved.

*Conclusion.*—Undoubtedly, by withholding this report for some future time, the committee would be enabled to embody much valuable information and data which is not at hand at the present, but it is felt that the publication of the report at this time, giving the facts as the committee has found them, may help to clear away many of the false issues that have been raised and may do something toward bringing to a termination the unfortunate state of affairs existing in the copper country.

The committee has come to the conclusion that:

1. The mine managers will not recognize the Western Federation of Miners.
2. No minimum wage applicable to all mines in the district can be established with justice to all parties concerned.
3. The one-man drill has come to stay.

The committee has also concluded:

1. That the question of establishing some kind of an eight-hour working day ought to receive the serious consideration of both men and operators.
2. That some attempt ought to be made to provide an adequate method by which the employee can obtain and have perfectly free access to the manage-

ment for the purpose of presenting grievances without fear of discrimination or discharge.

With these conclusions in mind, the committee decided to meet the managers of the various mining companies and put before them its findings relative to an eight-hour shift and the presentation of grievances, with the hope that something might be done to adjust those matters.

At the meeting which was held there were present managers or other representatives of each of the companies mentioned in the report, and the following statement was made to the committee and agreed to by each representative:

1. That, as previously stated, the mining companies had under favorable consideration for some time previous to the strike the establishment of an eight-hour working day for underground employees; that the different conditions at the various mines render it impossible to work out an absolutely uniform working-day for all underground employees at all of the mines; that each management will work the problem out with reference to its own peculiar conditions; that this could not be done in a short time; but that each management will establish and have in operation an eight-hour working-day for underground employees on or before January 1, 1914.

2. That the adjustment of grievances ultimately rests with the general manager, superintendent, or man highest in authority at the mine; that, therefore, the solution of the grievance problem lies in providing and maintaining a method of free access between the men and the general manager or official highest in authority at the mine; that, therefore, each manager will set aside a certain fixed day or half day in each week as a day for hearing complaints and grievances; that he will devote such day exclusively to meeting men and hearing complaints; that he will investigate every complaint presented to him and will adjust every legitimate grievance with all possible speed; that he will see to it that no man is discriminated or militated against because of presenting complaints; that he will prepare a notice embodying the above and will distribute it among his employees.

The committee feels that with the inauguration of the above plans there must necessarily come closer acquaintance between employer and employee, from which will result untold good to both parties.

On October 30 the various mining companies issued a public statement to the Copper Country Commercial Club, which reported the agreement for an eight-hour day by January 1, and the plans for hearing grievances, as previously given publicity in the report of the club, and added the following statement:

That on condition of withdrawal from the Western Federation of Miners all former employees will be reemployed without discrimination because of having been a member of that organization, or because of nationality, reserving the right to exercise discretion as to the reemployment of those known to have engaged in lawlessness, intimidation, or inciting thereto. This offer will not be continued for long.

The commercial club, in giving this statement to the public, said:

The Copper Country Commercial Club desires in this way to make known to all interested the present willingness of the companies to take back substantially all of their old employees on these terms. If acted upon quickly the strikers will now have an opportunity for reemployment. All citizens of the community are urged to assist, through this present opportunity, in bringing an end to the strike.

#### DISCRIMINATION AND ADJUSTMENT OF GRIEVANCES.

Before the strike of 1913 employees of the copper mining companies were seldom asked whether or not they belonged to the Western Federation of Miners, and instances of discrimination against members of the federation were not common. The mine workers made little complaint about such discrimination.

The schedule of inquiries which the companies involved in the strike were requested to answer contained the following inquiries:

1. Have officers or captains of the company ever questioned employees as to whether or not they were members of the Western Federation of Miners?
2. Have employees been discharged or discriminated against because of membership in the federation? If so, state the circumstances.
3. In employing men since the strike began, are they asked whether or not they are members of the federation; and if they are members (*a*) are they re-employed, and (*b*) are they required to withdraw from the federation?
4. How were employees before the strike able to present grievances without incurring discrimination or prejudice?

The answers of the various companies, which follow, were made during August and September, 1913.

#### RELATIONS WITH EMPLOYEES.

##### NO. 1. CALUMET & HECLA MINING CO.

1. Yes; in individual cases.
2. Only a few cases of men who have been agitating while in the mine or were openly opposing the Calumet & Hecla Mining Co.
3. We have employed no men since the strike commenced, except men who we knew did not belong to the Western Federation of Miners, and when time comes will insist that applicants, if members, withdraw from the Western Federation of Miners.
4. Our employees have at all times been able to present their grievances as individuals, and have had the right to go to the president of the company if necessary. There is a distinct understanding that an employee who has taken a grievance higher than his immediate superior shall not be discriminated against. In cases where the differences are of a personal nature we have transferred the man to another department.

##### NOS. 2, 3, AND 4. OSCEOLA CONSOLIDATED MINING CO., NORTH KEARSARGE MINE, AND SOUTH KEARSARGE MINE.

1. No official questioning of employees as to membership in the Western Federation of Miners has been done. Doubtless there have been cases where a foreman has asked men the question to satisfy his own curiosity—not for the purpose of making a record of it.
2. No.
3. Yes. (*a*) Men working for the company before the strike began will be reemployed if they have been guilty of no violent or vicious acts, but (*b*) they will be required to withdraw from the Western Federation of Miners.
4. Individual employees or committees of employees are always at liberty to call upon the officer of this company to present grievances or to make requests; in no case within the knowledge of the writer has any discrimination or prejudice been incurred thereby.

##### NO. 5. ISLE ROYALE COPPER CO.

1. No; there has never been any question as to membership in the federation.
2. No; they have not.
3. Nonstrikers were not out of our employ, and therefore not asked. (*a*) Yes. (*b*) Yes; they are required to withdraw from the federation.
4. Our employees came to office in person or their committee, or by mail, and have not been discriminated against.

##### NO. 6. AIMEEK MINING CO.

1. Have never made a practice of asking the men whether or not they were members of the Western Federation of Miners.
2. Have never discriminated against any employee on account of membership in federation.

3. Have not hired anybody since the strike started. When we resume operations we intend to ask every one of whom we are at all doubtful whether they belong or not, and we also will require them to withdraw from the federation.

4. All employees have been told that if they were not satisfied with adjustment from their immediate foreman they could always take it up with the superintendent, who would take it up with the general manager, and no one was ever discriminated or prejudiced against.

## NO. 7. TAMARACK MINING CO.

1. Yes.
2. No.
3. (a) Yes; (b) yes.
4. By personal interviews with superintendent or general manager.

## NO. 8. ALLOUEZ MINING CO.

1. No.
2. No.
3. When actual mining operations are resumed, all applicants for work will be asked if they belong to the Western Federation of Miners Union, and if so, required to withdraw from said organization before they are hired.
4. Employees have been repeatedly told that if they had any grievance, real or imaginary, they could take it up with the captain; if his solution of the difficulty was not satisfactory, then to the superintendent, and if still unsatisfactory, to the general superintendent or general manager, and in no case would discrimination or prejudice be shown.

## NO. 9. SUPERIOR COPPER CO.

1. No; with the exception of one case where I questioned a man with whom I have been on very good terms.
2. No.
3. Yes. (a) —. (b) No; unless they withdraw from the Western Federation of Miners.
4. I have known of no case of discrimination on this account. Minor grievances, such as contract prices, bad conditions underground, incompetent partners, individual cases of injustice, are continually being presented to trammer bosses, shift bosses, and the captain, and any such grievances not satisfactorily adjusted were brought to me as superintendent. The employee still dissatisfied has always had the right to go over my head and lay his case before the general superintendent or the general manager.

## NO. 10. CENTENNIAL COPPER MINING CO.

1. No.
2. No.
3. When actual mining operations are resumed, all applicants for work will be asked if they belong to the Western Federation of Miners Union, and if so, required to withdraw from said organization before they can obtain work.
4. Employees have been told that if they had a grievance, real or imaginary, and were not satisfied with the captain's decision, they could bring it before the superintendent, and if still unsatisfactory, to the general superintendent or general manager, and in no case would prejudice or discrimination be shown.

## NO. 11. LA SALLE COPPER CO.

1. The superintendent and the captains have occasionally asked employees as to whether or not they were members of the Western Federation of Miners
2. No.
3. Men are asked whether or not they are members of the federation when they apply for work since the strike began. If members, they may be reemployed if they are considered desirable, provided that they withdraw from the federation.
4. Employees have always been able to present grievances without incurring discrimination or prejudice by doing so in any honorable way.

## NO. 12. LAUBIUM MINING CO.

1. Employees have sometimes been questioned as to whether or not they were members of the Western Federation of Miners.
2. No employees have been discharged or discriminated against because of membership in the federation.
3. Applicants for work since the strike began are asked whether or not they are members of the federation. Members may be employed if they are considered desirable, but only on condition that they withdraw from the federation.
4. Employees have always been able to present grievances without incurring discrimination or prejudice by doing so in any honorable way.

## NOS. 13, 14, AND 15. BALTIC MINING CO., TREMOUNTAIN MINING CO., CHAMPION COPPER CO.

1. The only time questions were asked was after notice from the local of the Western Federation of Miners was received, a full account of which was furnished you in my letter of the 18th instant.
2. Any known organizers of the Western Federation of Miners were discharged when identified. Only four or five such cases occurred previous to the strike.
3. Yes; and they are not employed unless they state that they are no longer members of the Western Federation of Miners and do not propose to have anything more to do with it.
4. Only by speaking of their grievances to their bosses or to the general manager, or by striking.

## NO. 16. QUINCY MINING CO.

1. No.
2. No.
3. No. The great majority of strikers are Finns, Austrians, and Italians who can not speak English.
4. In any manner they choose.

## NO. 17. MOHAWK MINING CO.

1. In conversation with the men the question may have been asked.
2. No.
3. No men have been employed since the strike.
4. By consulting the superintendent.

## NO. 18. WOLVERINE COPPER MINING CO.

1. In conversation with the men the question may have been asked.
2. No.
3. None have been employed since the strike.
4. By consulting the superintendent.

## NO. 19. FRANKLIN MINING CO.

1. Not to our knowledge.
2. No.
3. No men hired since strike.
4. Each employee has a pay book on which is printed the following: "Communications and complaints must be made to the foreman of your department."

## NOS. 20 AND 21. WINONA COPPER CO. AND HOUGHTON COPPER CO.

1. No.
2. No.
3. We have so far not reemployed any men at either the Winona or the Houghton. The watchmen, pumpmen, etc., now employed we do not believe are members of the federation.
4. By bringing their grievances either directly to their foreman or to the superintendent.

## NO. 22. MASS CONSOLIDATED MINING CO.

1. Not to our knowledge. If they have done so, it is without our knowledge or orders.
2. No.
3. No men have been employed since the strike began.
4. Personally or by means of a committee of their own number.

## NO. 23. HANCOCK CONSOLIDATED MINING CO.

1. No.
2. No.
3. Have not employed any new men since strike began. (a) Old employees will be reemployed as required, provided they withdraw from federation. (b) Yes.
4. As far as we know, employees had no grievances; if they had any, they did not make them known to the officials of the company. The company is now and always has been ever ready to meet its employees relative to any grievances, but as noted, if the employees had any grievances, they did not make them known to the proper officers of the company. If employees had any grievances, they could have in the past and will in the future be able to present them to the proper officers of this company without incurring discrimination or prejudice.

## NO. 24. ONECO COPPER MINING CO.

1. No.
2. No.
3. Have not employed any new men since strike began. (a) Old employees will be reemployed as required, provided they withdraw from federation. (b) Yes.
4. As far as we know, employees had no grievances; if they had any, they did not make them known to the officials of the company. The company is now and always has been ever ready to meet its employees relative to any grievances, but as noted, if the employees had any grievances, they did not make them known to the proper officers of the company. If employees had any grievances they could have in the past, and will in the future, be able to present them to the officials of this company without incurring discrimination or prejudice.

## NO. 25. LAKE COPPER CO.

1. Very rarely.
2. In a very few cases, when men appeared to be trouble makers.
3. None have been employed since the strike.
4. Employees have always had the opportunity of presenting a grievance either singly or in a body to either the foremen or the manager without incurring discrimination.

During the strike all of the companies decided not to reemploy men who were members of the Western Federation of Miners unless they should withdraw from that organization, and all men employed or reemployed were required to promise that they would have no connection with it.

In spite of the replies of the companies that employees before the strike had full opportunities to present their grievances to the higher company officials, it is a fact that many of the mine workers felt that they were unjustly treated by the petty bosses and that it would be useless for them to appeal to the higher officials. Many felt that if they went over the heads of the petty bosses the latter would be prejudiced against them and would give them harder tasks. The petty bosses usually belong to the races whose representatives have been engaged longest in mining in this district. The other mine workers are largely of races whose representatives have more recently come to the district. It is commonly asserted by the mine workers that in assigning working places and fixing wage and contract rates the bosses favor men of their respective races. Probably one reason

why many mine workers who considered that they had a grievance did not appeal to the higher officials was that they could not speak English or could speak it only imperfectly.

The report of the committee appointed by the executive committee of the Copper Country Commercial Club to investigate the strike, approved by the club on October 10, 1913, stated that at a meeting of the managers or representatives of the mining companies each of them had agreed that he would set aside a certain day or half day in each week exclusively for hearing grievances, that he would adjust legitimate grievances as speedily as possible, that he would not discriminate against anyone who might present a grievance, and that he would distribute a notice to this effect among his employees.<sup>1</sup>

## CONCESSIONS THE COMPANIES WOULD MAKE.

Miners on day shift work five full shifts from Monday to Friday, inclusive, and half a shift on Saturday, or five and one-half shifts a week. Miners on day shift one week, change to night shift the next week, and those on night shift change to day shift. Miners on night shift work only five shifts a week, from Monday night to Friday night. The shifts of miners, day or night, from Monday to Friday are from 9 to 10 hours, according to the facilities provided for lowering men into or bringing men up from the shaft. On Saturday miners work half a day shift.

Trammers on either day or night shift work five full shifts from Monday to Friday, inclusive, the hours being the same as for miners, but on Saturday the day and night shifts of trammers are from seven to eight hours.

The hours here given for both miners and trammers include the time required to go down and come up, but does not include one hour allowed for luncheon.

Several mine managers have intimated that they would be willing to operate their mines on an eight-hour working basis—that is, eight hours per day for six days a week. R. R. Seeber, superintendent of the Winona Copper Co. and the Houghton Copper Co., stated to an agent of the Bureau of Labor Statistics that he would be glad for miners to work on a schedule of eight hours, and would allow them to go down into the mine or return to the surface on the company's time; that is, one way of the trip being made on the company's time and the other way on the miners' time, as is allowed in Butte, Mont., under contracts that the Western Federation of Miners have with the mine managers there.

F. W. Denton, general manager of the Copper Range Consolidated Co., stated to an agent of the Bureau of Labor Statistics that he believed that the mining companies could afford to make some concessions on working hours, and that he had "always regarded it as ridiculous that hours for all men working underground were not the same."

The reply of the mine managers to Mr. Moffitt, representing the United States Department of Labor, and their reply to Judge Murphy, representing the governor, stated that for some time prior to the inception of the strike the mining companies had considered the

<sup>1</sup> See extract from report of the committee under "Arbitration proposals unavailing," p. 96.

question of reducing the working hours to eight for underground men, as far as the change would be found to be practicable.

The report of the committee appointed by the executive committee of the Copper Country Commercial Club to investigate the strike, approved by the club on October 10, 1913, says that at a meeting of the managers or other representatives of the mining companies each of them had agreed to put in operation an eight-hour working-day for underground employees on or before January 1, 1914, and that each would set aside one day or half a day each week exclusively for hearing grievances.<sup>1</sup>

If the working hours were reduced to eight, the shifts of miners would be but little shortened. This is illustrated by the following table showing the hours a miner works during a fortnight at present, compared with the time he would work on an eight-hour basis:

*Hours of miners at present.*

	Hrs. min.
5 days, 9½ hours a day, including time required to descend and ascend, but not including 1 hour for luncheon.....	47 30
Saturday, including time required to descend and ascend.....	5 30
5 nights, 9½ hours a night, including time required to go down and come up, but not including 1 hour for luncheon.....	47 30
Total for 2 weeks.....	100 30

*Hours of miners on 8-hour basis.*

	Hrs. min.
6 days, 8½ hours a day, including time required either to descend or ascend, but not including 1 hour for luncheon.....	49 30
6 nights, same.....	49 30
Total for 2 weeks.....	99 00

If the working hours were reduced to 8, the shifts of trammers would be shortened about 11 hours in 12 days, as shown by the following table:

*Hours of trammers at present.*

	Hrs. min.
5 days, 9½ hours a day, including time required to descend and ascend, but not including 1 hour for luncheon.....	47 30
5 nights, same.....	47 30
1 day, Saturday, including time required to descend and ascend, but not including 1 hour for luncheon.....	7 30
1 night, Saturday, same.....	7 30
Total for 2 weeks.....	110 00

*Hours of trammers on 8-hour basis.*

	Hrs. Min.
6 days, 8½ hours a day, including time required either to descend or ascend, but not including 1 hour for luncheon.....	49 30
6 nights, same.....	49 30
Total for 2 weeks.....	99 00

In the first part of each of these tables an allowance of 30 minutes is made for the trip going down and coming up. In the second part of the tables allowance of 15 minutes is made for the trip one way, as in Butte, where the 8-hour system prevails, the miners make the trip one way on the company's time and one way on their own time.

<sup>1</sup> See extract from report of the committee under "Arbitration proposals unavailing," p. 96.

For two reasons it would be impracticable for the mines to be operated on the basis of three eight-hour shifts a day. One reason is that considerable time is required for the man cages to carry the men down into the shafts (the shafts in Michigan being very deep) and to bring them to the surface. The other reason is that there must be an interval between men ascending and others descending to permit the fumes of powder resulting from the blasting to clear away.

While several of the mine managers who were interviewed by the agent of the Bureau of Labor Statistics said that some concessions might be made as to working hours, they did not talk as if any other concessions could be granted. As a rule the mining companies that pay dividends to their stockholders pay larger wages to their employees than do the nondividend-paying mines. The claim is made by the managers of nondividend-paying mines that they can not afford to pay wages equal to those paid by the dividend-paying mines. This argument was used by James MacNaughton, general manager of the Calumet & Hecla Mining Co., which company pays the highest wages paid to mine workers in the district. The answer of the men is that all of the mining companies should pay fair wages or quit mining. Mining is a business of much uncertainty as to production, and developing a "prospect" is in the nature of a gambling operation. But those who are gambling in "prospects" should themselves stand the expense, and not require their employees to stand part of it by paying them low wages. They would not expect to buy mine machinery and materials for any less than the market rates because their mines are still in the development stage, and there is no better reason why they should expect to employ labor for less wages than are paid by the producing mines. If the "prospects" turn out to be big producers as hoped for, the profits will not be divided with employees in the past, but will go to the owners in the form of dividends. F. W. Denton, general manager of the Copper Range Consolidated Co., stated to an agent of the Bureau that in his opinion mining companies should pay fair wages or quit the business, and he instanced one mine of another company which he said ought to be closed up.

**UNDERGROUND CONDITIONS.**

The mines in the Michigan copper district are entered by shafts, either incline or vertical. At the top of each shaft is a shaft house which contains a powerful engine. This engine operates a drum on which is wound the cable that is used for lowering empty skips or cars into the mine and for drawing skips loaded with copper-bearing rock to the surface. In the same way, man cages conveying the underground workers are lowered into the mine and hoisted to the surface.

An inclined shaft follows the pitch of the copper lode. At the depth of every 100 or 125 feet drifts or levels are dug from the shaft along the lode in either direction, and from these levels stopes are dug upward from one level to the next one above. A stope is a section of the lode from which the ore is being taken out. Along the levels are laid tracks on which tramcars are pushed by men or drawn by motors or mules. The tramcars are loaded at the stopes

with the copper-bearing rock, and when they reach the shaft the rock is dumped into the skip.

Cutting a drift is called "drifting," and cutting a stope is called "stopping," but the first cut that is made above the drift is called "drift stopping." All of these operations are done by drilling and blasting.

In the Michigan copper district the ore is in either conglomerate or amygdaloid rock. Most of the mines are amygdaloid, and the only conglomerate mines are operated by the Calumet & Hecla Mining Co. A conglomerate mine is one in which the rock consists of rounded and water-worn débris of rock or pebbles, united into a compact mass containing mineral deposits. Amygdaloid means almond shaped, and it is an igneous rock containing almond-shaped nodules in which mineral has been deposited.

In the conglomerate mines it is necessary to use a great deal of heavy timber, which is placed between the floor and roof in the drifts and stopes to prevent the roof from falling in. Amygdaloid is a much stronger rock, and in amygdaloid mines but little timbering is used, and the roof is supported by pillars or sections of the rock which are left undisturbed. In some mines rock walls are built along the sides of the drift. Timbers called "stulls" are placed across the drift on top of the walls, and other timbers called "lagging" are placed lengthwise on the stulls to form the roof.

Following is a brief description of the work that is done by underground men:

*Miner.*—Bars down loose rock; operates drill machines; charges and fires blasts. The last work done on a shift is blasting. After an interval of two hours a new shift comes on and the first work done by the miner in that shift is to loosen the broken rock resulting from the blast, using a bar for that purpose. Miners work singly or in pairs, according as they use one-man or two-man machines.

*Trammer.*—Loads tramcars and pushes them to the shaft. Usually there are two men to a car, sometimes three. In some mines the trammers dump the rock from the cars into the skip in which it is hoisted up the shaft to the crusher in the shaft house on the surface. In some mines there are other men who do the dumping, and in some mines the cars are dumped by mechanical tipplers.

*Timberman.*—Places timbers in shaft, drifts, and stopes to support the roof of the mine.

*Laborer.*—Drags or picks down the rock from the stopes to the drifts; builds rock walls and fills stopes with poor rock; helps timbermen.

*Trackman.*—Builds and repairs tramcar tracks.

*Boy.*—Carries drills; operates small hoists that raise dirt from the bottom of new shafts.

The following table, compiled from data furnished by the mining companies, shows the pitch of the copper-bearing lodes or veins, in degrees with the horizon, the average thickness of the veins, the depths of the shafts, the distances from the shafts to the stopes, and the grades of the drifts or levels:

Mine.	Pitch of vein.	Average thickness of vein.	Depth of shaft.		Distance from shaft to stopes.		Grade of levels.
			On incline.	Vertical.	Shortest.	Longest.	
	<i>Degrees.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Inches per 100 feet.</i>
Ahmeek.....	41½	12	2,506	1,723	100	1,045	7½
	41½	12	2,683	1,814			
	35½	12	2,152	1,740			
	35½	12	2,170	1,751			
Allouez.....	40-41	12	3,486	2,641	427	2,235	10
			3,407½	2,937			
Baltic.....	70-72	30-35	2,230	2,103	50	1,400	3
			2,630	2,470			
			2,550	2,397			
			1,620	1,520			
Calumet & Hecla.....	37-38	15	200-8,100	120-4,900	15	1,200	4
		12			75	1,900	6-10
		12			75	1,900	6-10
Centennial.....	38-39	12-13	3,821	2,383	736	1,653	10
			4,293	2,592			
Champion.....	70-72	30-35	2,530	2,387	100	2,600	3
			2,495	2,354			
			2,108	1,989			
			2,384	2,249			
Franklin.....	45	9	3,600	2,546	90	1,200	12
Hancock.....	38-54	6-7	1,428	1,166	50	1,000	10
				4,000			
Houghton.....	52	20	620	(1)	(1)	(1)	(1)
Isle Royale.....	56	8	3,162	2,620	100	1,500	10
			1,939½	1,607			
			1,158½	960			
			1,549	1,284			
Lake.....	35	40-50	1,666	950	100	650	5
La Salle.....	44	10	2,146	1,453	75	300	8½
			1,770	1,220			
Laurium.....	43	10	1,650	1,115	(2)	(2)	8½
Mass.....	43	10	1,741	1,136	(1)	(1)	5
			1,656	1,131	400	700	
			1,104	753	200	1,400	
Mohawk.....	35-40	14	2,379	(1)	50	1,500	5
			2,364	(1)			
			1,476	(1)			
			1,963	(1)			
			1,383	(1)			
			898	(1)			
North Kearsarge.....	40	12	3,873½	(1)	100	1,600	9
			3,276½	(1)			
			1,449	(1)			
Oneco.....	35	14	1,250	717	(2)	(2)	10
Osceola.....	40	10	4,263	(1)	150	2,030	9
			4,609	(1)			
Quincy.....	52	6	6,597	4,731	(1)	3,000	12
South Kearsarge.....	40	12	2,820½		110	900	9
			1,992½				
Superior.....	53	20	1,978	1,600	100	1,100	10
Tamarack.....	37½	20		3,409	1,100	2,500	10
				4,355			
				3,253			
				4,450			
				5,308			
Trimountain.....	70-72	30-35	2,815	2,656	100	1,100	3
			2,335	2,203			
			2,315	2,184			
Winona.....	68	20	1,272		50	800	7½
			1,406				
Wolverine.....	40	12	1,700		50	1,400	10
			3,995				
			3,872				

<sup>1</sup> Not reported.

<sup>2</sup> No stopping has been done.

<sup>3</sup> From the 5,223½-foot level an incline shaft extends to an additional depth of 495 feet.

Most of the shafts are inclined and follow the pitch of the vein, which varies from 35° to 72°. There are only a few vertical shafts. As will be seen, there are great differences in the depths of the shafts, and the greatest differences are in the shafts of the Calumet & Hecla Mining Co., which vary from 200 to 8,100 feet on an incline, from 120



to 4,900 feet vertically. Some of the shafts in the Conglomerate lode of the Calumet & Hecla Mining Co. are the deepest shafts in the world.<sup>1</sup>

The distances from the shafts to the stopes vary from 15 feet in one of the Calumet & Hecla shafts to 3,000 feet in one of the Quincy shafts. The grades of the drifts vary from 3 inches in 100 feet in the Baltic, Champion, and Trimountain mines to 12 inches in Franklin and Quincy mines. The grade of the drift is a matter to be considered in connection with the heavy work of tramming by hand-pushed cars. Some of the best mining engineers consider that a grade of 5 inches in 100 feet is best, and that a steeper grade makes too hard the work of pushing the empty tram cars up grade back from the shaft to the stopes.

The following table, compiled from data furnished by the companies, shows the depths of the various shafts, the number of men employed underground, the means of ventilation in the mines, and the sanitary provisions:

Mine.	Depth of shaft on incline.	Number of men underground.	Ventilation of mine.	Sanitary regulations underground.
Ahmeek.....	<i>Fect.</i> 2,506 2,683 2,152 2,170	424	Natural.....	Men used old workings and sumps as closets, which places are disinfected whenever necessary.
Allouez.....	3,486 3,407½	305	do.....	The men being so widely distributed, use is made of stopes, drifts, or abandoned workings; same receive a sprinkling of lime occasionally.
Calumet & Hecla....	8,100	2,783	do.....	Boxes are kept which are either sent to surface or buried in caving stopes.
Centennial.....	3,821 4,293	148	do.....	The men being so widely distributed, use is made of old stopes, drifts, or abandoned workings; same occasionally receive a sprinkling of lime.
Copper Range.....	2,230 2,630 2,550 1,620 2,815 2,335 2,315 2,530 2,495 2,108 2,384	2,207	Natural ventilation regulated by doors and stoppages where draft is too strong or where it is desired to force circulation to other points.	There are no sanitary regulations beyond requiring levels to be cleaned up from time to time.
Franklin.....	3,600	283	Connections between shafts, raises, and compressed air.	All waste goes into dirt to be hoisted.

<sup>1</sup> *Deep mining.*—There has been much speculation as to the depth to which it will be practicable to push the work of mining. The special difficulties which attend deep mining, in addition to the problems of hoisting ore and raising water from great depths, are the increase of temperature of the rocks and the pressure of the overlying strata. The deepest mine in the world is No. 3 shaft of the Tamarack mine in Houghton County, Mich., which has reached a vertical depth of about 5,200 feet. Three other shafts of the Tamarack Co., and three of the neighboring Calumet & Hecla mine have depths of between 4,000 and 5,000 feet vertical. The Quincy mine, also in Houghton County, has reached a vertical depth of nearly 4,000 feet. In England are several collieries over 3,000 feet, and in Belgium two are nearly 4,000 feet deep. In Austria three shafts in the silver mines at Prizbram have reached the depth of over 1,000 meters. At Bendigo, in Australia, are several shafts between 3,000 and 4,000, and one, the Victoria Quartz mine, 4,300 feet deep. In the Transvaal gold region (South Africa) a number of shafts have been sunk to strike the reef at about 4,000 feet. (Encyclopedia Britannica, eleventh edition, 1911, Vol. XVIII, p. 539.)

Mine.	Depth of shaft on incline.	Number of men underground.	Ventilation of mine.	Sanitary regulations underground.
Hancock.....	<i>Fect.</i> 1,428	117	Natural draft through 2 shafts connected in upper levels and a brattice in the vertical shaft at lower levels. Air drills are used and air blown at the face after each blast. Blasting is done only at end of shift, the period between shifts allowing ample time to clear away practically all fumes and gases.	Small boxes are provided that can be removed frequently, dirt being used to continuously cover contents of box.
Houghton.....	620	.....	Natural, by connections between shafts and through raises from level to level, also a few other connections to surface.	Excrement is deposited in powder or candle boxes, covered with dirt, and hoisted.
Isle Royale.....	3,162 1,939½ 1,158½ 1,549	541	Natural.....	The use of old stopes and boxes, using lime for disinfectant.
Lake.....	1,666	159	do.....	Only such regulations as ordinary common sense would indicate as necessary.
La Salle.....	2,146 1,770	.....	Natural and artificial. The 2 shafts being connected by a drift on the twelfth level, gives good ventilation. The exhaust from the air-driven drills and pumps is more than sufficient for good conditions. After blasting, powder smoke is blown out by opening valves in the compressed air line.	Empty powder boxes are used as latrines. Lime is furnished, and the fine dirt of the mine is used to dilute and cover the contents of the boxes, which are brought to the surface when filled.
Laurium.....	1,650	.....	Furnished by exhaust from air-driven drills and pumps.	Do.
Mass.....	1,741 1,656 1,104	282	Natural, by connections between shafts and through raises from level to level; also a few other connections to surface.	Receptacles are furnished for use of men, and same are brought to surface as necessary.
Mohawk.....	2,379 2,364 1,476 1,963 1,383 898	608	Natural. Upcast and downcast shaft; shafts all connected.	Pump sumps and abandoned out of the way stopes are used for closets.
North Kearsarge....	3,873 3,276½ 1,449	272	Each mine has 2 shafts; 1 shaft, by reason of location or on account of having steam pipes at the collar, is maintained as an "upcast" shaft, and the other shafts are "downcast." Ventilation is thus natural and effective.	The old workings are commonly used by the men. At intervals quicklime is scattered in these places. Water-closets are provided adjoining the change houses on surface.
Oneco.....	1,250	17	Natural, assisted by air from machine drills; air being blown at face of drift after each blast, the 2-hour period between shifts allowing sufficient time to clear out practically all fumes.	Men come to surface when necessary.
Osceola.....	4,263 4,609	242	Each mine has 2 shafts; 1 shaft, by reason of location or on account of having steam pipes at the collar, is maintained as an "upcast" shaft, and the other shafts are "downcast." Ventilation is thus natural and effective.	The old workings are commonly used by men. At intervals quicklime is scattered in these places. Water-closets are provided adjoining the change houses on surface.

Mine.	Depth of shaft on incline.	Number of men underground.	Ventilation of mine.	Sanitary regulations underground.
Quincy .....	<i>Feet.</i> 6,597	1,456	Natural.....	Use of quicklime.
South Kearsarge.....	2,820 <sup>1</sup> 1,992 <sup>2</sup>	272	Each mine has 2 shafts; 1 shaft, by reason of location or on account of having steam pipes at the collar, is maintained as an "upcast" shaft, and the other shafts are "downcast." Ventilation is thus natural and effective.	The old workings are commonly used by the men. At intervals quicklime is scattered in these places. Water-closets are provided adjoining the change-houses on surface.
Superior.....	1,978	182	2 shafts connected underground by a level. The main working shaft is upcast. There are valves in the compressed air line at all working places, and free use is made of the compressed air to blow out the gas in addition to that exhausted by machines. Compresses are continually working between shifts for the purpose of blowing out foul air and gas.	The men go into old workings, or in places where men are bunched. Boxes and lime are furnished.
Tamarack.....	13,409 14,355 (2) 15,253 14,450 15,308	476	Natural.....	Barrels are provided as closets, with lime to disinfect.
Winona.....	1,272 1,406	296	Natural. Some ventilating doors are placed in various levels to regulate the air flow to a certain extent.	Excrement is deposited in powder or candle boxes, covered with dirt, and hoisted.
Wolverine.....	1,700 3,995 3,872	361	Natural, due to difference in elevation of shaft collars, and exhaust air from drills and pumps.	Pump sumps and abandoned out of the way stopes are used for closets.

<sup>1</sup> Depth of shaft, vertical feet.

<sup>2</sup> From the 5,223-foot level an incline shaft extends to an additional depth of 495 feet.

The mine managers seem to consider that the mines are sufficiently ventilated, but the mine workers allege the contrary and complain about the poor air they are compelled to breathe from 10 to 11 hours a day. The oxygen is consumed not only by the lungs, but by the open lights which underground men carry. Air enters the mine by the shaft, and if there are two or more shafts and they are connected on some levels, the air is supposed to form a current from one to the other. In some mines also there are raises, or openings, between the levels, to give additional circulation to the air.

There are no fans for blowing fresh air into the mines, as there are in coal mines, and the managers allege that fans are not necessary, as there are no gases in copper mines. Though the shafts are in many cases half a mile deep on incline—in some cases a mile deep, and in one case a mile and a half—there is no means of artificial ventilation except the leakage from the compressed air piped from the surface to operate the drills and the pumps, though at the end of a blast the valves of the compressed-air pipes are opened to blow away the powder smoke.

The sanitary arrangements are nearly as crude as they possibly could be. In some mines powder or candle boxes are used as latrines,

and when filled they are taken to the surface. In some mines dirt is used to cover the contents of the boxes, and in other mines lime is provided for that purpose. In some mines the matter goes into the dirt that is hoisted. In some mines the men are supposed to go to abandoned workings, but often they do not do this on account of the distance. In some mines there are no sanitary regulations beyond requiring levels to be cleaned up occasionally.

A paper on "Mine sanitation," by E. B. Wilson, was distributed in printed form at the annual meeting of the Lake Superior Mining Institute, held at Houghton, Mich., in 1912, and was reprinted in the proceedings of the institute.<sup>1</sup> From this paper the following is quoted:

Dr. B. W. Jones,<sup>2</sup> in his paper on the "Importance of the ordinary prevention of water-borne diseases in mines," showed that typhoid fever, tapeworm, and hookworm could be contracted by drinking impure water in mines. Germs of disease and the infectious parasites are transmitted from one person to another in many ways, but chiefly through the air and through water. In every metal mine employing over 25 men arrangements should be made for evacuation. Latrines should be provided, but if they are not kept clean the conditions may become almost as bad as if there were none. Sheet-iron cans or boxes should be arranged for receivers, and into these dry sawdust and ashes should be sprinkled to act as deodorizers. Chloride of lime is not considered a suitable deodorizer for underground. These cans and boxes should be provided with covers, taken to the surface, cleaned, and returned daily. The roof and sides of the places should be kept fresh with whitewash, the floor cemented and sloped, so that it may be washed and not collect any filth. For privacy, portable screens might be arranged.

\* \* \* \* \*

The hookworm is present in the Cornish tin mines in the Camborne district, England, and has been for some years. It is becoming almost general in the southern coal mines of the United States, and it is almost sure to enter our deep northern ore mines unless each operator uses great care to prevent it. Mines which become infected require the most drastic and expensive measures for universal extermination of the pest. In fact, complete eradication does not yet appear to have ever been accomplished.

All of the amygdaloid mines are comfortably cool, with temperatures varying from 50 to 75° F. The amygdaloid rock is much cooler than the conglomerate rock, and the rock in many amygdaloid mines is damp from water seepage. The only high temperatures are in the conglomerate lodes of the Calumet & Hecla Mining Co. The company reports the highest temperature in the deepest of these lodes to be 85° F. The miners, however, claim that on the lower levels of the mines, one of which is 8,100 feet deep on the incline, the temperature is always above 90°, and that on account of the heat their trousers are the only garments they can wear with any degree of comfort. As no work was done during the strike on the lower levels, these statements could not be verified.

In the Franklin and Quincy mines underground men are furnished with drinking water from water mains. In the Lake mine drinking water is caught from small streams in the rock. In the Calumet & Hecla, Tamarack, Allouez, Isle Royale, Hancock, and Oneco mines the men are furnished with water that is brought underground in cans, jugs, or kegs. In all the other mines there is no provision for supplying underground men with water, and the mine managers seem to think that no water is needed by the men except what they can carry in the bottoms of their dinner pails. Many of the men bring tea or coffee instead of water in the pails.

<sup>1</sup> Vol. XVII of the Proceedings, pp. 117-126.

<sup>2</sup> Lake Superior Mining Institute Proceedings, Vol. XII, p. 105.

## ACCIDENTS IN AND ABOUT THE MINES.

A bulletin on "Metal-Mine Accidents in the United States during the Calendar Year 1911," by Albert H. Fay, shows that in 1911 the number of men killed in and about the metal mines averaged 4.19 per 1,000 men employed. It also shows that the fatalities averaged more in copper mines than in any other kind of metal mines. The fatalities averaged 5.33 per 1,000 men employed in or about copper mines, 4.29 in iron mines, 3.43 in lead and zinc mines, 3.95 in gold and miscellaneous metal mines, 1.66 in miscellaneous mineral mines.<sup>1</sup>

The number of men killed in or about the copper mines of Michigan averaged 4.94 per 1,000 employed in or about the mines, a lower average than in any State except California. The average number of men seriously injured in Michigan copper mines was 54.88 per 1,000 men, or larger than in any State except a number of eastern and southern States that are grouped together. The causes of death or injury as shown by the same bulletin (pp. 17-21) were as follows:

Table showing number of men killed or injured in and about copper mines in Michigan, 1911.

[U. S. Bureau of Mines: Metal-Mine Accidents in the United States during Calendar Year 1911. Washington, 1913. Technical Paper 40.]

Cause of injury or death.	Number killed.	Number seriously injured.	Number slightly injured.	Total.
<b>Underground:</b>				
1. By fall of rock or ore from roof or wall.....	28	236	979	1,243
2. By timber or hand tools.....	3	32	297	332
3. By explosives.....	5	4	22	31
4. By haulage accidents.....	2	193	1,146	1,341
5. By falling down chute, winze, raise, or stope.....	1	22	254	277
6. By run of ore from chute or pocket.....	4	27	359	390
7. By drilling accidents.....	1	75	331	406
8. By electricity (shock or burns).....	1		2	3
9. By machinery (other than mine locomotives or machine drills).....	3	27	229	259
10. By mine fires.....				
11. By suffocation from natural gas.....				
12. By inrush of water.....		27	317	344
13. By other causes.....				
<b>Total underground.....</b>	<b>47</b>	<b>643</b>	<b>3,936</b>	<b>4,626</b>
<b>Shaft:</b>				
1. By falling down shaft.....	9	5	3	17
2. By objects falling down shaft.....	1	4	15	20
3. By breaking of cables.....		1	3	4
4. By overwinding.....				
5. By other causes.....	2	3	17	22
<b>Total shaft accidents.....</b>	<b>12</b>	<b>13</b>	<b>38</b>	<b>63</b>

<sup>1</sup> P. 13. This bulletin is Technical Paper 40, issued by the Bureau of Mines, Department of the Interior. It apparently shows that during 1911 there were in proportion to the number of employees in and about the mines more fatal accidents in metal mines than in coal mines in the United States, in spite of the fact that "in the metal mines there is an entire absence of the gas or dust explosions" which occur in coal mines. The number of men killed in and about the coal mines during 1911, as stated in this bulletin (p. 5), averaged 3.73 per 1,000 men employed as against 4.19 in metal mines. But this may be explained by the fact that the metal mines are operated many more days during a year than are coal mines. This bulletin shows the average number of days that the different kinds of metal mines in the United States were operated during 1911—copper mines, 308 days (p. 21); iron mines, 277 (p. 26); lead and zinc mines, 256 (p. 29); gold and miscellaneous metal mines, 276 (p. 36); all metal and miscellaneous mineral mines, 282 (p. 50). The Production of Coal in 1912, by Edward W. Parker, a bulletin issued by the U. S. Geological Survey, shows (p. 37) that the average number of days that coal mines were operated in 1911 was 220. If the fatal accident rate of coal mines be calculated on the basis of their working 308 instead of 220 days, the rate per 1,000 would be increased from 3.73 to 5.22 as against 5.33, the rate of copper-mine workers working 308 days.

Table showing number of men killed or injured in or about copper mines in Michigan, 1911—Concluded.

Cause of injury or death.	Number killed.	Number seriously injured.	Number slightly injured.	Total.
<b>Surface:</b>				
1. By mine cars and locomotives.....			3	3
2. By railway cars and locomotives.....	1	2	2	5
3. By run or fall of ore in or from ore bins.....		8	46	54
4. By boiler explosions.....				
5. By electricity (shock or burns).....			14	14
6. By machinery.....		4	28	32
7. By other causes.....	3	9	193	205
<b>Total surface.....</b>	<b>4</b>	<b>23</b>	<b>286</b>	<b>313</b>
<b>Grand total.....</b>	<b>63</b>	<b>679</b>	<b>4,260</b>	<b>5,002</b>

Of the 59 fatal accidents underground, including those that occurred in the shaft, 28 were caused by the fall of rock or ore from the roof or wall. Also the number of persons who were seriously injured and the number who were slightly injured from this cause were very large. Accidents of this kind are largely due to the neglect of miners to bar down all of the rock that is loosened by the blasts before beginning work again in the stopes. Inexperienced miners are often careless about this matter, and, without making a thorough examination of the rock, they begin drilling into it again, with the result sometimes that tons of rock come tumbling down upon them. The danger from falling rock is great in the Michigan copper district on account of the steepness of the stopes, which follow the pitch of the lodes, and which vary from 35 to 72 degrees. In the Copper Range Consolidated mines and other mines that have very steep stopes, the danger is not so great, because as the stopes are dug upward they are filled below with refuse rock, leaving only room enough for the miners to work.

Of the 12 deaths from accidents that occurred in shafts, 9 were from falling down the shaft. The State mining law requires that there shall be railings around the shaft at each level, but on many levels in some mines only chains are hung across the level at the edge of the shaft and they afford inadequate protection.

There is a large number of haulage accidents, but most of them cause but slight injuries, such as bruises, and result from loading, pushing, and dumping tram cars.

In the following table the number of mine workers killed or injured is shown with the average per 1,000 employed:

Number of men employed, days worked, and number of men killed and injured per 1,000 employed in and about copper mines in Michigan, 1911.

[Bureau of Mines: Metal-Mine Accidents in the United States during Calendar Year 1911. Washington, 1913. Technical Paper 40.]

Number of operators reporting.....	30
<b>Employees:</b>	
Underground.....	11,953
Surface.....	4,351
<b>Total.....</b>	<b>16,304</b>

Number of days worked.....	5,012,196
Average days worked.....	307
Number of employees:	
Killed—	
Underground <sup>1</sup> .....	59
Per 1,000 employed.....	4.94
Surface.....	4
Per 1,000 employed.....	0.92
Total killed.....	63
Per 1,000 employed.....	3.80
Seriously injured—	
Underground <sup>1</sup> .....	656
Per 1,000 employed.....	54.88
Surface.....	23
Per 1,000 employed.....	5.26
Total seriously injured.....	679
Per 1,000 employed.....	41.65
Slightly injured—	
Underground <sup>1</sup> .....	3,974
Per 1,000 employed.....	332.47
Surface.....	286
Per 1,000 employed.....	65.96
Total slightly injured.....	4,260
Per 1,000 employed.....	261.28
Widows.....	31
Orphans.....	77

The workmen's compensation law of Michigan went into effect on September 1, 1912. All of the mining companies have elected to accept its terms and to pay the prescribed compensation for death or injuries in order to avoid suits for damages. In case of death by accident, the dependents of the deceased person are paid a weekly rate of compensation for 300 weeks, this weekly rate depending on the earnings of the person before death. The following table, which shows the compensation paid by the Calumet & Hecla Mining Co. to dependents of employees who were killed from September 1, 1912, to August 31, 1913, may be examined with interest:

Compensation paid by the Calumet & Hecla Mining Co., under employers' liability act on account of fatal injuries during the year ending August 31, 1913.

Name of employee.	Occupation.	Date of injury.	Date of death.	Weekly rate of compensation.	Total compensation to be paid during 300 weeks.
1. Borchgrevink, Ole.....	Painter.....	Sept. 18, 1912	Sept. 18, 1912	\$7.62	\$2,286
2. Sikanen, Albin.....	do.....	do.....	do.....	7.36	2,208
3. Destefani, John.....	Watchman.....	Oct. 23, 1912	Oct. 23, 1912	( <sup>2</sup> )	( <sup>2</sup> )
4. Blitz, Frank.....	Sprinkler.....	Nov. 7, 1912	Nov. 7, 1912	7.35	2,205
5. Krogh, Christian N.....	Watchman.....	Jan. 10, 1913	Jan. 10, 1913	7.73	2,319
6. Bradovic, John.....	Trammer.....	Jan. 23, 1913	Jan. 23, 1913	7.88	2,364
7. Vidosch, Matt.....	Miner.....	Jan. 29, 1913	Jan. 31, 1913	7.54	2,262
8. Krizmanic, Stephen.....	Company accountant.....	Apr. 2, 1913	Apr. 2, 1913	7.53	2,259
9. Rom, John.....	Roller man.....	Apr. 11, 1913	Apr. 11, 1913	8.14	2,442
10. Orsolano, Anton.....	Company accountant.....	Apr. 29, 1913	Apr. 29, 1913	7.24	2,172
11. Bartle, Franklin.....	do.....	June 16, 1913	June 16, 1913	7.86	2,358
12. Endahl, Chas. V.....	do.....	June 20, 1913	June 20, 1913	10.00	3,000
13. Coppo, Antony.....	do.....	June 22, 1913	June 22, 1913	7.19	2,157
14. O'Connor, Martin.....	Miner.....	July 3, 1913	July 4, 1913	10.00	3,000
15. Yuntunen, Henry.....	do.....	July 19, 1913	July 19, 1913	7.95	2,385

<sup>1</sup> Includes shaft accidents.

<sup>2</sup> No dependents. Paid \$200 funeral expense.

HOUSES OCCUPIED BY MINE WORKERS.

All of the Michigan copper-mining companies have built houses to accommodate the mine workers at all of their mines except some small "prospect" mines. At some mines there are not enough houses for all of the employees, and some are obliged to live in houses rented from other owners than the mining companies. At none of the mines are any of the employees compelled to live in company houses.

The dwelling houses owned by the companies are usually substantially built frame houses, and they are usually kept in good repair. The lots on which the houses stand are usually 50 by 100 feet. At only one mine are the lots as narrow as 25 feet. At several mines the lots are 60 or 75 feet wide, and in some cases 100. Some lots are 125 feet deep and some 150 feet.

The following table shows the number of frame houses owned by the various companies and the monthly rental of these houses according to the number of rooms that they contain:

Company.	Number and monthly rental of houses of—												Total number of houses.		
	3 rooms.		4 rooms.		5 rooms.		6 rooms.		7 rooms.		8 rooms.			9 rooms and over.	
	No.	Rent.	No.	Rent.	No.	Rent.	No.	Rent.	No.	Rent.	No.	Rent.		No.	Rent.
Ahmeek.....			2	\$3.50	20	\$5.00			1	\$4.00					58
Allouez.....			7	4.00	2	4.00	2	\$5.00	28	6.00	2	7.00			66
			8	5.00	18	5.00	2	6.00	26	7.50					
Calumet & Hecla.....			7	4.00	15	5.00	11	5.00	1	7.00					1764
Centennial.....							9	6.00							44
							1	6.50							
Copper Range.....															2607
Franklin.....	2	\$3.00	12	3.00	13	4.00	2	4.00			2	\$5.00			50
							19	5.00							
Houghton.....									1	7.00	1	12.00			2
Isle Royale.....	10	3.00	3	3.00	3	3.00	8	6.00	2	4.00	1	3.00	1	\$10.00	107
			8	4.00	5	4.00			2	5.00	1	5.00			
					22	5.00			26	6.00	2	10.00			
					13	6.00									
Lake.....															343
La Salle.....			2	3.00			3	6.00			1	5.00			6
Mass.....			1	4.00	1	2.00	1	2.00	1	5.00	1	8.00	2	5.00	35
			1	5.00	17	5.00	1	5.00					1	8.00	
					7	6.00	1	6.00							
Mohawk.....															4179
North Kearsarge.....															( <sup>5</sup> )
Oneco.....					7	4.00					1	5.00			8
Osceola.....	3	3.00	29	4.00	129	( <sup>6</sup> )	65	5.00	41	6.00					7267
Quincy.....			50	( <sup>9</sup> )	60	( <sup>8</sup> )	185	( <sup>8</sup> )	126	( <sup>8</sup> )	10	( <sup>8</sup> )	12	( <sup>8</sup> )	443
South Kearsarge.....															( <sup>5</sup> )
Superior.....					2	6.00	2	5.00	12	6.00					16
Tamarack.....			32	4.00	109	5.00	169	6.00	17	7.00					327
Winona.....	38	3.30	9	3.90	11	4.00	45	5.95	9	7.45	3	15.00			115
Wolverine.....	1	3.50	2	3.50	4	4.00	3	4.00	2	5.00					87
	4	4.00	1	4.00	1	4.50	1	4.50	1	6.00					
	1	4.50	1	4.50	14	5.00	3	5.00	3	7.00					
	1	5.00	6	5.00	5	6.00	25	6.00							
							1	6.50							
							5	7.00							
							1	7.50							
	60	3.32	136	3.98	291	4.92	380	5.70	175	6.37	13	8.69	4	7.00	3,045

<sup>1</sup> None less than 4 rooms. Average rent, \$6.74 per month.

<sup>2</sup> Houses of different sizes ranging from 2 to 12 rooms, rented from \$1.50 to \$15 per month.

<sup>3</sup> From 3 to 8 rooms, number of each not reported, renting from \$2 to \$8 per month.

<sup>4</sup> Fifty-three single with 5 and 6 rooms and barn at \$5.50 and 63 double with 10 rooms and barn at \$5.50 each side.

<sup>5</sup> Included with Osceola.

<sup>6</sup> Rent for \$4 and \$5.

<sup>7</sup> Including North Kearsarge and South Kearsarge.

As shown by the table, the average monthly rental of the frame houses was—for the three-room houses, \$3.32; for the four-room houses, \$3.98; for the five-room houses, \$4.92; for the six-room houses, \$5.70; for the seven-room houses, \$6.37; for the eight-room houses, \$8.69; and for houses with nine rooms and over, \$7. The average monthly rental per room was—for the three-room houses, \$1.10; for the four-room houses, \$1; for the five-room houses, \$0.98; for the six-room houses, \$0.95; for the seven-room houses, \$0.91; for the eight-room houses, \$1.09; and for the houses of nine rooms and over, \$0.80.

The following table shows the number of frame houses, owned by the companies, that are supplied with water and sewerage connections:

Company.	Frame dwelling houses owned by companies.			
	Number of frame houses.	Number with faucets in house.	Number with sewerage connections.	Charges for water.
Ahmeek.....	58	None.	None.	No charge.
Allouez.....	66	None.	None.	Do.
Calumet & Hecla.....	764	764	325	Do.
Centennial.....	44	3	3	Do.
Copper Range.....	607	607	None.	Do.
Franklin.....	50	30	8	Do.
Hancock.....	5	5	5	Do.
Houghton.....	2	2	1	50 cents per month.
Isle Royale.....	107	41	38	No charge.
Lake.....	43	39	9	Do.
La Salle.....	6	None.	None.	Do.
Laurium.....	None.	None.	None.	No charge.
Mass.....	35	None.	None.	Do.
Mohawk.....	179	None.	None.	Do.
Oneco.....	8	None.	None.	Do.
Osceola.....	267	65	15	50 cents per month.
Quincy.....	443	( <sup>2</sup> )	( <sup>2</sup> )	No charge.
Superior.....	16	None.	16	Do.
Tamarack.....	327	220	67	50 cents per month.
Winona.....	115	103	8	Do.
Wolverine.....	87	None.	None.	No charge.

<sup>1</sup> Including North Kearsarge and South Kearsarge.

<sup>2</sup> Not reported.

Probably in no mining district in the United States is the rent lower than it is in the Michigan copper district for houses rented to employees. The companies do not expect to make any profit on their houses, and the income from house rents is so small that some general managers complain that it is hard for them to get the stockholders of their companies to agree to erect enough houses to provide for all of the employees. The very low rent is an advantage to the employees that are married, and one reason of the companies for making the rents low is to hold the married men. They consider married men to be more reliable than single men, more apt to work regularly, and not so apt to leave the employment of the company to work for another mining company, or to seek employment outside the district. However, single men claim that married men are to some extent compensated for low wages by the low rent, but that low rents are of no benefit to the single men and really is one cause of keeping wages low.

As will be seen by this table, all the frame houses owned by the Calumet & Hecla, Copper Range, Hancock, and Houghton companies are provided with running water, with faucets in the houses; and some of the houses at the Centennial, Franklin, Isle Royale, Lake,

Osceola, Tamarack, and Winona mines are provided with faucets. No charge for water is made by the Calumet & Hecla, Centennial, Copper Range, Franklin, Hancock, Isle Royale, and Lake companies. At the Houghton, Osceola, Tamarack, and Winona mines a charge of 50 cents per month is made for water supplied to each house. The occupants of the houses that are not supplied with running water obtain water from wells, and the number of wells varies from one to each house to one well for five houses.

Electric light is furnished at a cost of from 5 to 12 cents per kilowatt hour for some of the houses at the Calumet & Hecla, Osceola, Ahmeek, Tamarack, Copper Range, Winona, and Houghton mines, and at \$2 a month for houses at the Mass mine.

Garbage is removed weekly from the houses of the Calumet & Hecla Co., and biweekly from the houses of the Copper Range Co. Some companies report that garbage is removed when necessary, and others that it is removed annually. No charge for removing garbage is made by any company. The privies of houses which have no sewerage connection are cleaned by the companies without charge. Some companies report that privies are cleaned whenever necessary, others that the cleaning is done annually or every two years. No charge for this is made.

The companies that have built houses during recent years were requested to furnish statements showing the number of houses, the number of rooms in the houses, the cost of construction, and the monthly rentals. The statements received are summarized in the following table:

	4-room houses.			5-room houses.		
	No.	Cost per house.	Rent per house.	No.	Cost per house.	Rent per house.
Osceola Consolidated Mining Co.....	7	\$818.74	\$4.00			
Ahmeek.....	4	715.25	4.00	10	\$843.60	\$5.00
Do.....	3	883.85	4.00	10	862.95	5.00
Superior.....				2	1,000.00	1 6.00
Mohawk.....				126	1,150.00	2 5.50
Oneco.....				7	550.00	3 4.00
Average cost and average rent.....	14	\$03.12	4.00	155	1,082.68	5.37
Per cent annual rent is of cost.....			6.00			6.00

	6-room houses.			7-room houses.			Year built.
	No.	Cost per house.	Rent per house.	No.	Cost per house.	Rent per house.	
Osceola Consolidated Mining Co.....				13	\$1,046.14	\$6.00	1906
Isle Royale Co.....				25	1,435.00	6.00	1907
Ahmeek.....				13	1,111.25	6.00	1904-1907
Do.....				15	1,160.00	6.00	1904-1907
Tamarack.....	130	\$931.57	\$6.00				1897-1900
Allouez.....				25	1,409.83	7.50	1907
Superior.....				12	1,450.00	6.00	1910
La Salle.....	2	1,500.00	6.00				1907-8
Quincy.....	30	1,100.00	6.00				1899-1907
Mohawk.....	53	1,050.00	5.50				1899
Franklin.....	10	620.00	5.00				1899
Oneco.....							1899
Average cost and average rent.....	225	973.13	5.84	103	1,300.65	6.36	
Per cent annual rent is of cost.....			7.20			5.90	

<sup>1</sup> One basement.

<sup>2</sup> One 8-room house, cost \$1,000, rents \$5.

In the cost reported the value of the land is not included. It appears by the table that the average cost of the houses was for the four-room houses, \$803.12, or \$200.78 per room; for the five-room houses, \$1,082.68, or \$216.54 per room; for the six-room houses, \$973.13, or \$162.19 per room; for the seven-room houses, \$1,300.65, or \$185.81 per room.

The average monthly rental of these recently constructed houses was for the four-room houses \$4, or \$1 per room; for the five-room houses \$5.37, or \$1.07 per room; for the six-room houses \$5.85, or \$0.97 per room; and for the seven-room houses \$6.36, or \$0.91 per room.

If the houses are rented during the whole year the average annual rentals amount to 6 per cent of the reported construction cost of the four-room houses, 6 per cent of the five-room houses, 7.2 per cent of the six-room houses, and 5.9 per cent of the seven-room houses. This small income from houses is but little, if any, more than the amount necessary to pay for taxes, insurance, and repairs, and to provide for depreciation.

In addition to the frame houses that are owned by the mining companies and rented by them to their employees, there are at a number of mines log cabins containing from 2 to 10 rooms each. Most of these cabins were built in the early days of mining in the district, but a few have been built within recent years. They were built of hewn logs and have shingle roofs and plank floors. The spaces between the logs are well chinked up and these cabins are about as warm in winter as are the frame houses. However, they have comparatively few windows and the windows are small. The number of these cabins owned by each company and the monthly rentals according to the size of the cabin are shown in the following table:

Log cabins.

Mine.	Number and monthly rental of houses of--								Total number of cabins.				
	2 rooms.		3 rooms.		4 rooms.		5 rooms.			6 rooms.		7 rooms and over.	
	No.	Rent.	No.	Rent.	No.	Rent.	No.	Rent.		No.	Rent.	No.	Rent.
Ahmeek			2	\$2.00	5	\$3.00	4	\$3.00					13
Allouez							1	3.50					17
Calumet & Hecla							10	2.50					40
Centennial					4	2.50	1	5.00					5
Copper Range													None.
Franklin													2 13
Hancock													None.
Houghton													None.
Isle Royale					11	3.00							11
Lake	2	\$1.00											2
La Salle					1	(3)	3	3.00					4
Laurium													None.
Mass			1	(3)	2	2.00							3
Mohawk													None.
North Kearsarge													(9)
Oneco													None.
Osceola					1	3.00	61	(6)	12	4.00	5	(6)	7 79
Quincey													8 25
South Kearsarge													(9)
Superior													None.
Tamarack			3	3.00	10	4.00	64	5.00	1	5.00			78
Winona			5	2.00									5
Wolverine			1	3.00									1
	2	1.00	11	2.36	33	3.18	88	4.39	16	4.13	5	\$7.20	296

<sup>1</sup> Rent from \$0.50 to \$3 per month.

<sup>2</sup> Number of rooms not reported; rent, free.

<sup>3</sup> Rent free.

<sup>4</sup> Three 8-room cabins at \$8 per month and two 10-room cabins at \$6 per month.

<sup>5</sup> Including North Kearsarge and South Kearsarge

As will be seen, the rent of these cabins is less even than the rent of the frame houses, and for that reason they are in demand by mine workers who wish to economize as closely as possible.

Some of the mine workers that are employed in the mines near Hancock and Houghton own the houses in which they live and the land on which the houses stand. At other mines the companies own all of the ground, and they will not sell any ground to employees or anyone else, even with the mining rights reserved. At some of these mines some of the employees have built their own houses on ground rented from the companies. Each company was requested to state the number of its employees that occupied houses built on ground leased to them, the annual ground rent, and the number that occupied houses built on land that they owned. The statements of the companies are shown in the following table, but the information is not very definite, and there is no information about the number of freeholders:

Mines.	Houses owned by employees.		
	Houses on ground-rent lease.	Annual ground rent.	Number of employees who are freeholders
Ahmeek	None.		(1)
Allouez	15	\$5.00	(1)
Calumet & Hecla	2 1,000	5.00	(1)
Copper Range	144	\$5.00-6.00	None.
Centennial	27	5.00	(1)
Franklin	30	5.00	None.
Hancock	2	5.00	None.
Houghton	None.		None.
Isle Royale	None.		(1)
Lake	None.		(1)
La Salle	None.		(1)
Laurium	(1)	(1)	(1)
Mass	None.		(1)
Mohawk	120	6.00	None.
Oneco	None.		None.
Osceola	81	5.00	(1)
Quincey	202	5.00	230
Superior	None.		(1)
Tamarack	30	5.00	(1)
Winona	36	1.00	None
Wolverine	64	6.00-10.00	None

<sup>1</sup> Not reported.

<sup>2</sup> Estimated.

STIPULATIONS IN LEASES.

The leases of the mining companies for houses rented to their tenants provide that the house shall not be used for any purpose other than a dwelling, boarding or lodging house for employees of the company, that the tenant has no right to possession beyond 15 days after he has quit the employment of the company or been discharged, and that then the company has the right, without notice, to recover possession, and also that for any cause or reason whatsoever the company may, after 15 days' notice, put the tenant out of the house. Following is the principal portion of the house lease of the Calumet & Hecla Mining Co. and its subsidiary companies:

Witnesseth, That said party of the first part hath agreed to let and hereby doth let, and the said party of the second part hath agreed to hire, and hereby doth hire, the following described premises belonging to the party of the first part, and in said county situated, to wit:

To be used and occupied solely for a dwelling house—boarding house for boarding and lodging the employees of the party of the first part by the party of the second part—for which the said party of the second part agrees to pay to said party of the first part ..... dollars per month, for each and every month of such occupation, and a proportional part thereof for any part of a month, payable on the pay day of each month, the first payment to be made on the pay day of ....., A. D. 19.... Provided, however, and this lease is upon the following express conditions, to wit: That if the party of the second part shall refuse or neglect to pay the rent above mentioned at the time above mentioned, or shall let, demise, sell, underlet, or assign this lease, or the whole or any part of said premises without the consent of the party of the first part thereto obtained, or shall sell or suffer to be sold in or upon said premises any spirituous or intoxicating liquors, ..... or shall refuse or neglect to keep said premises in good preservation (ordinary wear and tear and damages by the elements excepted); or shall continue to occupy or hold, or suffer to be occupied or held, said premises beyond 15 days after said party of the second part ceases to be an employee of the party of the first part, whether because of being discharged by the party of the first part or on voluntarily terminating his relation as employee to the party of the first part; in such and in any such case it is hereby expressly understood and agreed that this lease shall, at the option of the party of the first part, wholly cease and determine, and it shall thereupon be lawful for the party of the first part to reenter into and repossess and recover said premises, and the party of the second part, and any other occupant, to remove and put out, and in such or in any such case it is expressly agreed that no notice to quit whatever shall be required to be given by the party of the first part to the party of the second part.

It is further agreed that should the said first party wish to terminate the tenancy hereby created, for any cause or reason whatsoever, other than those mentioned in the preceding conditions (although said second party should have fulfilled, performed, and kept each and every condition and covenant hereof), it may do so at any time by giving said second party 15 days' notice of such wish (and such notice shall not be required to terminate at the expiration of any rental period), and at the expiration of such 15 days this lease shall wholly cease and determine, and the party of the first part shall thereupon, and without further or other or different notice, be entitled to immediate possession of said premises, and to recover the same, and the party of the second part, or any other occupant, to remove and put out. The said party of the second part covenants and agrees to keep, perform, and observe each and all of the conditions herein mentioned.

It is further agreed that said first party may retain, out of any moneys due, or to become due, from it to said second party, any rent due or to become due hereunder, and also an amount sufficient to fairly compensate said first party for any injury done, or suffered to be done, to said premises by said second party, contrary to the terms hereof.

The mining companies grant five-year ground-rent leases to employees who wish to build houses to use as dwellings. The ground-rent lease of the Calumet & Hecla Mining Co. and subsidiary companies provides that if the lessee should fail to pay any taxes or assessment, or if he should cease to be an employee of the company by discharge or otherwise, or if, without the written consent of the company, he should sell, assign, or transfer the lease, or sell, assign, lease, or sublet the house he has built on the land, or if he should do several other specified things, the lease shall after 90 days become void, the company shall have the right, without notice, to take full possession of the land and the house thereon built by the lessee; and if the house should not be removed by the lessee within 90 days after reentry it shall fully vest in and become the property of the company, its successors and assigns, without conveyance thereof and without liability to pay for the same or any part thereof.

Following is the principal portion of the ground lease of the Calumet & Hecla Mining Co. and subsidiary companies:

Witnesseth as follows: The said party of the first part in consideration of the rents and covenants hereinafter specified, doth hereby let and lease to the party of the second part the following described piece of land, situate in the township of..... in said county, to wit:.....

(expressly saving, reserving, and excepting, however, to itself, its successors and assigns, all metals and minerals upon said land and the right to enter upon said land to remove the same and the right to dig and mine for the same to within 15 feet of the surface of the rock and to construct and maintain all excavations, pipes, conduits, and other structures upon the demised premises which it may deem necessary for its mining operations upon this or other land, being liable to the party of the second part only for damages actually done thereby) for the term of five years from and after ....., at the rent of ..... dollars per annum, payable annually in advance, to be used and occupied for the sole purpose of erecting and maintaining thereon a ..... single dwelling house and outbuildings only, and for a single family.

Provided, That in case any rent shall be due and unpaid, or the party of the second part shall erect or maintain, or suffer to be erected or maintained, thereon, any other structure or structures than as aforesaid, or shall neglect to pay any tax or assessment, ordinary or extraordinary, levied upon said land, or upon the structure or structures to be erected thereon during the life of this lease, for the space of 60 days after the same shall become due and payable, or shall sell or suffer to be sold, upon said land any spirituous or intoxicating liquors, or shall carry on, or suffer to be carried on upon said land, or in said structure or structures, any business or occupation contrary to law or to good morals, or shall sell, assign or transfer this lease, or sell, assign, lease or sublet the structures upon said land, or any part thereof, without the written consent of the party of the first part, first obtained, or shall continue to occupy or hold, or suffer to be occupied or held, said premises beyond 90 days after said party of the second part ceases to be an employee of the party of the first part, whether because of being discharged by the party of the first part, or on voluntarily terminating his relation as employee to the party of the first part, then and from thenceforth, in such and in any such case, it is hereby expressly understood and agreed that this lease shall at the option of the party of the first part, wholly cease and determine, and it shall thereupon be lawful for the said party of the first part, without notice to the party of the second part, to reenter into and repossess the said lands, and to take full possession of said land, and of such structure or structures, and in such and in any such case, the party of the second part shall have the right to remove from said land any structure or structures he may have erected or maintained thereon for the space of 90 days next after such reentry, and no longer, and all such structures remaining upon said land after the lapse of said 90 days, shall fully vest in, and become the property of the party of the first part, its successors and assigns, without conveyance thereof, and without any liability on the party of the first part, its successors or assigns, to pay for the same or any part thereof.

And the said party of the second part doth hereby hire said piece of land for the term of five years, as above mentioned, and doth covenant and agree to and with the said party of the first part, its successors and assigns, that he will pay therefor ..... dollars per annum, annually in advance, that he will erect and maintain thereon no other structure or structures than as aforesaid: that he will pay, 60 days after the same shall become due and payable, any and all taxes and assessments, ordinary and extraordinary, that may be levied upon said land, or upon the structures thereon, that he will neither sell, nor suffer to be sold upon said land any spirituous or intoxicating liquors; that he will not carry on, nor suffer to be carried on, upon said land or in said structures, any business or occupation contrary to law or to good morals; that he will not sell, assign, or transfer this lease, or sell, assign, lease or sublet the structures upon said land, or any part thereof, without first obtaining the consent of the party of the first part thereto in writing, and in case of breach or nonobservance of any or either of the covenants or conditions above mentioned he will quit and yield up the possession of said land and of such structure or structures, and that such structure or structures shall vest in and become the property of the party of the first part, its successors or assigns, unless the party of the second part shall remove the same from said land within said 90 days.

And the said party of the first part doth agree that the said party of the second part, on paying the aforesaid rent, performing and keeping all the covenants, and observing all the conditions aforesaid, shall and may peaceably and quietly have, hold and enjoy the said premises for the term aforesaid.

It is unnecessary to comment on the drastic nature of the terms of these five-year ground-rent leases, but it seems strange that any person would build a house on land leased on such conditions, and it is most astonishing that 1,000 houses have been built on land so leased from the Calumet & Hecla Mining Co., as estimated by the company, and 153 at subsidiary companies—81 at Osceola, 30 at Tamarack, 27 at Centennial, and 15 at Allouez.

Under the provision that the lease shall terminate when the lessee shall cease to be an employee of the company, by discharge or otherwise, or shall terminate on account of violation of any other stipulation, the only relief that the lessee has is to move his house from the land within 90 days; but this permission to move his house is ineffectual, because the various companies own vast tracts of land and there is no other land near most of the mine locations. Copies of the ground-rent leases of all the mining companies were not secured, but those that were obtained are of much the same tenor as that of the Calumet & Hecla Mining Co. Some of them expressly provide that the company may terminate the lease at any time it desires, and some of them provide that compensation at an appraised valuation shall be paid to the lessee at the termination or cancellation of the lease.

The ground-rent lease of the Trimountain Mining Co. contains the same provisions as the lease of the Calumet & Hecla Mining Co. in regard to the lessee being allowed, on the termination of the lease, to move his house from the land without liability on the part of the company to pay for any improvements, but this lease also contains the following provisions:

And the said party of the second part doth hereby hire said piece of land for the term of \_\_\_\_\_ years, as above mentioned, and doth covenant and agree to and with the said party of the first part, its successors and assigns, that he will pay therefor \_\_\_\_\_ dollars per annum, annually in advance; that he will erect and maintain thereon no other structure or structures than as aforesaid; that he will pay, within 60 days after the same shall become due and payable, any and all taxes and assessments, ordinary and extraordinary, that may be assessed or levied upon said land, or upon the structures thereon; that he will neither sell, nor suffer to be sold upon said land, any spirituous, malt, or intoxicating liquors; that he will not carry on, or suffer to be carried on, upon said land or in said structures, any business or occupation contrary to law or to good morals; that he will not sell, assign, or transfer this lease, nor sell, assign, lease, or sublet said land, or any part thereof, or the structures upon said land, or any part thereof, without first obtaining the consent of the party of the first part thereto in writing, and, in case of breach or nonobservance of any or either of the covenants or conditions above mentioned, and upon notice from said first party, its successors or assigns, that it desires said premises for mining or other purposes, as hereinafter provided, he will quit and yield up the possession of said land and of such structure or structures, and that any and all structure or structures erected by said lessee, his legal representatives or assigns, on said land shall vest in and become the property of the party of the first part, its successors or assigns, unless the party of the second part shall remove the same from said land within said 90 days.

It is expressly agreed by and between the parties hereto that should said first party, its successors or assigns, desire said premises for any purpose or purposes connected with its mining operations and property, it shall have the right to and may cancel this lease by a 30 days' written notice to said lessee, his legal representatives or assigns (if there shall be any under the terms hereof), which said notice may be served by mail by delivery to said lessee, his legal representatives or assigns, personally, or by leaving the same with any person occupying said premises, and in such event this lease and all the obligations, agreements, and covenants of said first party herein contained shall cease and determine immediately after the expiration of 30 days from such service of said notice.

It is hereby mutually agreed and understood that on the expiration of the term of this lease, to wit, said \_\_\_\_\_ years, if the party of the first part shall, on demand, refuse to renew the same for another term, or when the said party of the second part, having quit or been discharged from the employment of said Trimountain Mining Co., shall, within 90 days next thereafter, have quit said land and the structures thereon and surrendered the same to said company, and in no other case or contingency whatever the structures erected upon said land by said lessee, his legal representatives or assigns, shall be valued and appraised at their then cash value in manner following.

The party of the first part, by its agent or superintendent, shall choose or nominate one person, and the party of the second part one person, to make such appraisal, and in

case of their failure to agree these two shall appoint a third person, in which case a majority of the three shall make such appraisal; and the amount thus ascertained shall thereupon become and be due and payable by the party of the first part to the party of the second part, and on the payment or tender of the amount so ascertained, the full title to such structure or structures shall vest in the party of the first part, its successors or assigns, without other or further conveyance; but on the expiration of the term hereof, in the absence of such demand and refusal, all such structures upon the land shall vest in and become the property of the party of the first part, as above provided, unless the party of the second part shall remove the same within 90 days next after such expiration. This provision as to appraisal and payment of valuation applying only to cases where within the 90 days aforesaid said lessee shall notify said party that he voluntarily surrenders such structures to said first party and request an appraisal as in this paragraph provided, and within the same time appoints and names to said first party the person to act as his appraiser.

The following is quoted from the ground-rent lease of the Champion Copper Co. and the Winona Copper Co., which are identical in form:

It is further expressly agreed that said first party may at any time at its option, upon 90 days' written notice, terminate this lease and purchase said dwelling house or other buildings and appurtenances which may have been erected upon said premises by said second part...., ..... heirs or assigns. Notice of the election of said first party to so purchase shall be deposited in the United States mail in the post office at Painesdale, Mich., inclosed in a sealed envelope, with legal postage thereon fully prepaid, addressed to said part... of the second part, ..... heirs or assigns, at his, her, their, or any of their last-known place or places of residence; and on the expiration of 90 days after said notice is so deposited as aforesaid in said post office said lease shall thereby be terminated.

Whenever under any of the terms of this lease said first party shall elect to purchase said dwelling house or other buildings and appurtenances which may have been erected upon said premises by said second part...., ..... heirs or assigns, it may do so at the value thereof, to be determined by the general manager of said first party and said second part...., or ..... heirs, executors, administrators, or assigns within 10 days from the date of the notice of the election of said first party to purchase; and in case they can not agree upon said value within said 10 days, then they shall, within five days after the lapse of said 10 days, select some competent person to determine the same, who shall determine the same within 10 days after his selection; and in any event in computing said value there shall be deducted by the persons or person determining the same any and all rent then due or to grow due from said second part...., ..... heirs or assigns to said first party, and also any bonus paid to said second part... by said first party, which sum, after making said deductions, shall be paid by said first party to said second part...., ..... heirs or assigns, if and when said second part...., ..... heirs or assigns shall vacate and surrender said premises to said first party.

And it is expressly understood and agreed by the parties hereto, their respective heirs, executors, administrators, successors, and assigns, that the whole amount of rent reserved and agreed to be paid by said second part.... for said above demised premises, and each and every installment thereof, and any bonus that may have been paid by said first party to said second part...., shall be and are hereby declared to be a valid and first lien upon any and all buildings and improvements that may have been or that may at any time in the future be erected, placed, or put upon said premises by said part.... of second part, ..... heirs or assigns, and that whenever and as often as any installment of rent shall become due and remain unpaid for ..... days after the same becomes due and payable said party of the first part, its agent, attorney, successors, or assigns, may sell at public auction, to the highest bidder for cash, after having first given notice of the time and place of such sale by posting up notice thereof in three public places in the township of Adams at least 10 days previous to the time of such sale, all the buildings and improvements on said premises, and as attorney of said part.... of the second part, hereby irrevocably constituted, may make to the purchaser or purchasers thereof a suitable and proper transfer, bill of sale, or other conveyance and out of the proceeds arising from such sale, after first paying the costs and expenses of such sale, including attorney fees, retain to itself, its successors or assigns, the whole amount due on said lease up to the date of said sale for such rent and bonus, rendering the surplus, if any, to the said part.... of the second part, ..... heirs, executors, administrators, or assigns, which sale shall be a perpetual bar to and against all rights and equities of said part.... of the second part, ..... heirs, executors, administrators, and assigns in and to the property sold.