those to which most of the companies using a chemical plant have given their attention, is the production of wood alcohol and acetate of lime, and those have been found to be, I believe, profitable, and it is very probable that within a very short time every battery of kilns will have its chemical plant adjoining, and the smoke that is now wasted will be drawn down and distilled, so that nothing will be lost. When this is done the value to the country of a cord of wood will naturally be largely increased.

Now that I have roughly outlined the systems followed in the making of charcoal, I must ask your permission to touch on the value to the country, and to this province in particular, of charcoal making, and the principal industry connected with it, and on the difficulties in the way of its development, and to ask your consideration and assistance towards overcoming those difficulties and developing the "charcoal industries."

COLONIZATION.

In colonizing our wooded lands, the value of the charcoal industry will be readily seen. Heretofore, and with good reason, the settler looked upon the wood on his lands (from which, as a general thing, the lumberman had removed the merchantable timber) as a detriment, and he (the settler) had very little to hope for until he had made a respectable clearing, and put in seed for his first crop. If he was within one or two miles of railway communication, it might be possible for him to sell a certain amount of selected wood to cord wood merchants. They did not take the run of the forest, nor would they accept branches or knotty sticks, or anything of that kind, so that at the outside he could very seldom afford to team the wood more than a mile or two, and even then, owing largely to the amount of waste, his remuneration is small. With the charcoal iron industry in the district, all this is changed, and the settler on taking up a piece of wooded land finds ready at his hand a crop that will yield good returns from the day he first swings an axe, whether he delivers his wood at kilns for burning, or at the nearest railway station in the form of cord wood, or whether he burns it himself, he can utilize practically everything, as the furnace companies can take practically all classes of wood grown in this province, and they are ready to accept the tops and branches, the large knotty sticks that cannot be split, and everything in the shape of sound wood. In our long winter months he can fell trees, saw them into cord wood and team to the nearest wood depot, or he can, with the assistance of his sons and what help can be obtained, burn the wood on his own farm in pits, and he can work at it all the year round if he desires, or during his slack season, and earn good wages whether he makes cord wood or coal.

When I speak of the importance of the fact of charcoal kilns or pits being able to utilize tops and branches and knotty pieces, etc., I think you will understand how very important this is to the settler when I say that as an actual fact, in the average forests only about one-third of the wood felled is fit for merchant cord wood, and of the balance the settler can use a portion for his own purposes, but the great bulk has to be chopped into a suitable size for piling and burning, and then watched carefully in the spring, or almost as much attention given to it by a careful settler as if he was burning for charcoal purposes, owing to the danger to the surrounding forests from fire, so that the making of merchant cord wood cannot be considered as remunerative to the settler in comparison with the making of wood for charcoal purposes. Then too, there is this burning of refuse, and I think you will understand what the danger in that is. If the settler is careless, his spring "bonfire" means the destruction of miles of valuable timber, for the settler's "clearing up" fires have certainly been instrumental in causing more forest fires than anything else we know of.

Where the charcoal iron industry exists, the wood that was formerly a detriment becomes a valuable asset to the settler, and he realizes it, and knowing it to be an assurance of abundant and remunerative labor, he becomes a caretaker of our forests instead of a danger, for with good cause the owners of timber limits have grown to look upon the settler as something to be kept out if possible, through fear of the effects of his spring burnings.

Where wood can only be sold in the form of merchant cord wood, as I have already pointed out, it would scarcely pay the settler to locate further back than say two miles from the railway line, if he was looking forward to obtain anything for the wood he cut, but where charcoal iron industries exist the better average price obtained allows of his teaming his wood greater distances, and if he burns into charcoal he can afford to transport that material even farther.

VALUE TO THE FARMER.

The value of the charcoal industry to the farmers of the district is, of course, the same, to a large extent, as that derived by the settler. During slack seasons they can make wood and coal on their own lands at remunerative figures, or they can arrange to work on adjacent lands, and use their horses during the winter months for teaming their own wood or coal, or that of neighbors, and where they are not desirous of working on their own lands they and their sons can find work in contractors' camps either felling, or teaming, or burning.

The charcoal iron industry is essentially a farmer's industry, and affords, both from coal and ore, steady and remunerative labor from one end of the year to the other if necessary, and certainly in all slack seasons. Our farmers have, unfortunately, a good many slack seasons, and I think it is largely due to this fact that farming has not been as remunerative as it might be. There are so many months in the year when there is nothing for the farmer to do and he has to live during those on the results of the other months. Now if he is an industrious man, and there is a charcoal iron industry in the district, he can fill in every day of his off seasons. As I have said, in winter he can fell wood, burn charcoal, and team either on his own or neighboring lands, and in early spring time, if he has confined himself to cutting wood during the winter, he can burn his coal then, and in the summer time from seed time to harvest he can find employment in the ore fields raising ore and teaming, and in our St. Maurice district he can, in most cases, make and wash ore on his own land, and the result in that district is that both settlers and farmers are prosperous, and reports which we have received direct from the farmers themselves and from the Cures of the district go to show that since the establishment of our works in the St. Maurice district the agriculturists have reaped large and lasting benefits. They have obtained plenty of remunerative labor during off seasons, and a good market for whatever produce they have raised on the farms.

The province of Quebec, as I think was very fully pointed out in a paper last year, has every natural requirement for the production of charcoal pig iron, and the value of such an industry to the Province and the Dominion must be fully recognized by every one. We have the iron ore, and while we have neither coal nor natural gas, we have plenty of hard and unmerchantable or waste woods, and this fact makes it possible for the establishment of an iron industry of the greatest value, and I see no reason why such an industry should not be carried to a successful issue, as it has been in Sweden and the United States. What is wanted, however, is the assurance of an adequate supply of charcoal, both for the present and the future. To do this some steps must be taken by our government to conserve certain woods or portions of forests so that this industry can be established on a permanent basis. How this can be done is some thing that will have to be carefully thought out, but if it is done the value to Canada will be great. If it is not, then we will have wasted a very large proportion of our forest wealth, for that is wasted which is not used to the best advantage, and I hold that more profit can be derived from our unmerchantable and waste woods by utilizing them and conserving them to the development of the charcoal iron industry than in any other way. If this is done the establishment of the industry is possible and certain, if it is not, then it can only be carried on in a very desultory way.

One of the principal difficulties that stand in the way of the establishment of the charcoal industry in some of the districts is the fact of large tracts of lands being held by limit holders. Limit rights were originally intended to convey an area valued for its merchantable timber alone, yet the limit holders, even in cases where the merchantable timber has been removed, still retain possession and control, with the result that the hard and unmerchantable wood cannot be utilized. The only way by which these woods can be diverted is by actual settlement, and, as in a great many cases, the land may not be suitable for agricultural purposes, the wood, if these conditions are to exist, is practically inaccessable.

Another great difficulty is the lack of knowledge in regard to charcoal burning. Of course so far as kiln practice is concerned men can be readily obtained or educated to good practice, but for pit burning it is necessary that a much broader system of education than could be carried on by a private enterprise should be adopted, as a knowledge of pit burning would be of the greatest value to our settlers and farmers in the wooded districts.

Now, these two questions are, I hold, provincial and national ones, and these difficulties should be considered and overcome by our governments.

In Sweden there are national schools for charcoal burning, which have done and are doing good work in training men and spreading information throughout the country as to the most economical systems of making charcoal, especially in pits. Both the Dominion and the Provincial Governments should follow this example, and disseminate useful information on the subject among agriculturalists, especially in the wooded districts and where charcoal consuming industries have been or can be established. This should be done by lecturers, papers, and in every practicable manner. The practice, especially of pit burning should be taught in our agricultural institutions, and certainly no mining school should be without a course in charcoal burning, and when development comes, as it surely should come in a land of wood and iron, national schools should be established, as in Sweden. Our governments have spent large sums in this way on dairy practice, and we all know that the results have been profitable and satisfactory, and I believe that if the same course is adopted in regard to charcoal making, which is a farmer's and practically a domestic industry, the results will be also to the national good.

Steps should also be taken to prevent the locking up by speculators or others of woods suitable for charcoal purposes, and where this evil exists, as in the cases I have referred to, it should be overcome by just changes in the present laws if necessary. I do not believe that in the case of the limits any value was considered or paid for, nor was it intended to convey to the limit holders the unmerchantable woods for which lumbermen and others purchasing these limits have no use. This is proven by the fact, I consider, that at all times the government has reserved the right to settlers taking up any portion of the land, the only reservation in favor of the limit holder being in regard to the merchantable wood, which he is given a certain time to remove. I therefore hold that under all circumstances, and especially where the lands are not suitable for agricultural purposes, and the unmerchantable wood cannot be realized on through the settler, the government should have the right to divert unmerchantable wood to other purposes when and where it is deemed advisable.

When an enterprise that requires this fuel can be started in any district, it should be especially encouraged by the setting aside of woodlands to insure a continued supply and by assistance in teaching the principles of "burning" to the inhabitants of the districts, and by rebating of stumpage dues where the wood is used for charcoal purposes, and encouragement given in every practicable manner within the powers of the Dominion or Provincial Government.

The industry is, and must always be, if successful, a settler's, a farmer's, and a people's home industry, and for this reason it is especially deserving of national support and encouragement.

Our farmers should be taught and enabled to use to their own and the nation's profit everything the land has to give, and here are mighty crops wasting, burning and rotting that properly used might here in Canada, and especially in our own Province of Quebec, be made, as in Sweden, the mainstay of a nation.

Mr. President and gentlemen,—This is a "burning" question. Let us hope it will not remain a "burning shame," but in the near future become a "burning" success.

Mining as an Investment.

By Robert C. Adams, Montreal.

If one wishes to give a capitalist cold shivers, he can usually produce the effect by requesting him to invest in a mine; or if he desires to descend to the depths of humiliation he can get there speedily by taking to heart the scorn and contempt which, by word or look, often meet the solicitation to risk money in digging. Yet we learn from the last U. S. Census that over one thousand million dollars is invested in the country in securing the earth's products from beneath its surface. The exact figures are $1,284,911,435. Such an outlay would not be made unless it afforded a considerable amount of profit to some of the workers. It is therefore safe to assume that the mineral producing industries are often profitable, though whether they are so on the average is a matter for question. Especially does this doubt pertain to the mining of precious metals, which, in many instances, gives *bonanza*, but in more cases yields *formica*. A statement of some of the facts and figures relating to the gold, silver and copper mines of the United States will enable us to form some conclusions as to the pecuniary results of mining operations.

The *Engineering and Mining Journal* publishes a list of 144 dividend paying mines and 145 non-dividend paying mines. The latter have never paid a divident and some of the former have not paid a dividend since 1870.

Of the dividend paying mines 51 have paid over a million dollars and 25 of these have paid more than their capital stock. Of the 51 only 27 have paid dividends since 1891. Only 13 of these have paid more than their nominal capital, and only three companies that have paid a total of less than a million, and have paid dividends in the last three years, have paid more than their capital.

The 144 dividend paying mines are capitalized at a total of $643,000,000. If 25 cents on the dollar has been paid in, this would give of cash paid $161,000,000. Assessments have been levied to the amount of $53,000,000, making total cash paid in $214,000,000; the total of the dividends paid is $241,000,000, so that the returns