

the pig iron? This question must now be answered in the negative, but whether the results reached are of sufficient importance, commercially, to induce further and more protracted experiments is doubtful. Some years ago, in the flush times at Birmingham, Ala., a company was organized for the purpose of building a blast furnace to be lined with basic instead of acid brick. It was known as the Pratt Steel Company, and was to have been capitalized at \$20,000,000. But money grew scarce and the capitalization was finally put at \$7,000,000. It was understood that \$20,000 of this was subscribed, and that the foundations of the furnace were laid at Cartersville, Ga. But the project failed. It is possible that with a basic lined furnace, a basic burden and a low temperature the phosphorus of the ore may, in great measure, be induced to enter the slag, but we cannot believe that this action would go on to such an extent as to make Bessemer pig out of non-Bessemer stock, or to make even a profitable reduction of the phosphorus. When ores contain too much phosphorus for the Bessemer process it is not likely that any blast furnace practice can, on the large scale and with coke as fuel, reduce this to the Bessemer limit, and do it profitably. On the same grounds it may be urged that a reduction of phosphorus in non-Bessemer stock, but not to the Bessemer limit, would have no advantage commensurate with the cost.

The great difficulty in the way of the utilization of non-Bessemer ores for steel making is not in the reduction of the phosphorus in the pig iron, but the silicon. This is the bug-bear, and the question is how to make low silicon iron of ores containing from 10 to 20 per cent of silica and coke with 8 to 15 per cent of ash. If this can be successfully done, and basic open-hearth stock of not more than 1 per cent of silicon be furnished regularly and in large quantities, the phosphorus question will take care of itself.

TIMBERING IN MINES.

The following is the paper read by Mr. Madden, Deputy Inspector, at a meeting of the Westville Mining Student's Association.

GENTLEMEN,—Before beginning my subject I must thank you for electing me vice president of your institute. I also wish to express my regret for being absent at your last meeting, but circumstances, over which I had no control, prevented my attendance. You requested me to write a paper on some mining subject. I do not wish to disappoint you, so have hastily put together a few thoughts. We are now approaching what we term our rush of summer work, therefore I would like to draw the attention of this meeting to one important feature of mining in which we have the most accidents, namely, falls of coal and roof stone at the working face. I assure you this is a matter in mining which requires all the care and attention that can be given it. To-night as I stand here with mining officials from various collieries and men whom I know to be practical men, I thought this subject would set you thinking, and that then your thoughts put to action might be conducive to safety of life and limb. As I have had over 10 years experience through the various mines of this province and have seen many different ways of setting timber, I have been called upon, at different times, to investigate accidents from this cause, in nearly every mine in the province, and I think I am safe in saying that in all cases I found plenty of timber, but in my opinion the timber was not properly set, and instead of broaking and giving warning to the miner they have slipped out and let the broken measures down. It requires great skill and care on the part of the miner in order to protect himself from injury by falls of coal and stone. Nevertheless a greater number of the accidents which occur from the above cause could be by the exercise of proper precautions, be prevented. I have observed that in most places there is a great lack of discipline and a disregard among the employees, of instructions given them for their own safety. In some cases these instructions are totally disregarded thereby placing the miners life in double danger.

Most of these accidents are preventable, and therefore can be clearly charged to neglect. It is impossible to establish a general rule regarding timbering in mines, as the conditions of each mine vary so that there is no way of making a rule that would apply successfully to the remedying of this source of danger. In fact the condition existing in one vein alone changes from day to day, as the work advances, so that the miner has only his own good judgment, or that of the mine boss, to guide him.

Statistics show that 50 to 60% of the accidents in mining is caused by falls from roof and sides.

Now the safeguard on which the miner must rely is careful attention to the peculiarities of the roof and sides, and he should frequently sound them to see if they remain solid.

The responsibility of securing his workplace rests with the miner himself, but he must be subject—to a certain extent in this matter—to the management. The management is supposed to know the general characteristics of the veins in the colliery, and they can make their rules so that they will be of considerable practicable benefit, but the rules will be worthless unless they are enforced.

History tells us that a well-disciplined army will put to rout and overcome double its number of undisciplined soldiers, so in a mine under good discipline much more work will be accomplished than in one that is not well governed. Even under the best discipline rules will sometimes be disobeyed, but, generally, kind words and a request not to repeat the offence, or at most a good firm "lecture," will be sufficient to keep things in order. Under poor discipline, cursing and swearing and discharging the offender will only aggravate the tendency to disobedience.

It is as much the duty of the mine official to see that booms are set on good firm bitches, and props set as near the pitch as possible, as it is to see that the coal is taken clean out of the mine, and if this is done I think accidents from falls will decrease.

It is my desire that this important subject will not rest here, and I trust that some other member will follow and let us thrash it out. It is not a

scientific subject, but a practical one, and every man in this meeting can throw some light on it.

The trapper at the door in the pit and the draftsman in the office are meeting with something new every day, and there is something to be learned from the least as from the greatest man in the mine. By uniting together and exchanging views we will learn, and therefore prepare ourselves for greater usefulness in time of need.

An interesting discussion ensued.

draughts-checkers

All communications to this department must be addressed directly to the Checker Editor, Mr. W. Forsyth, 36 Grafton St.

To CORRESPONDENTS.
Mr E. Kelly, of Winnipeg, has forwarded to Mr. W. Forsyth, of this city, for his signature draft articles of agreement to play a match of thirty games of checkers at Toronto, commencing on Monday, the 11th of September next, for the championship of Canada and a trophy to be given by the draughts club of that city. Mr. Forsyth holds said draft, pending official intimation from the Toronto club of its desires and intentions in this connection. Each will appoint his own umpire and time-keeper, and the club will probably name a referee. Some amendments will have to be made in some of the clauses of this draft before it is finally signed by both the parties to the match—indeed Mr. Kelly has himself suggested, in a letter written by him and received subsequent to sending on the draft, several additions therein. For the above reasons we refrain for the present from publishing the articles as they now stand.

SOLUTION.

PROBLEM 340.—The position was: black men 3, 5, 19, 20, king 29, white men 22, 27, 28, 32, king 26; white to play and win. This position is by James Wyllie, champion of the world, and we give his play as follows.
26 31 19—26 32 23 15—24
a-3—7 31 22 7—10 28 19
27 23 20—27 23 19 w. wins.

a Mr. Wyllie evidently overlooked the fact that 3—8 enables black to draw. This should be an encouragement to students of the game, as proving that even the champion of the world is liable to make a slip.

GAME 225.—"BLACK DOCTOR."

From the July number of the *American Checker Review*, whose columns are always replete with fresh, newsy material which is certain to be beneficial to the careful student. This game was recently played at the Chicago club between Messrs. Ganaby (black) and Charles Hester (white).

11—15 2—7 10—15 24—27
23 19 a-29 25 28 24 31 24
8—11 4—8 12—16 29—25
22 17 24 20 24 19 23 18
9—13 6—10 15—24 14—23
17 14 27 23 18 15 26 19
10—17 1—6 11—25 25—22
19 10 22 18 20 2 21 14
7—14 6—9 25—29 black
25 22 25 22 32 28 won

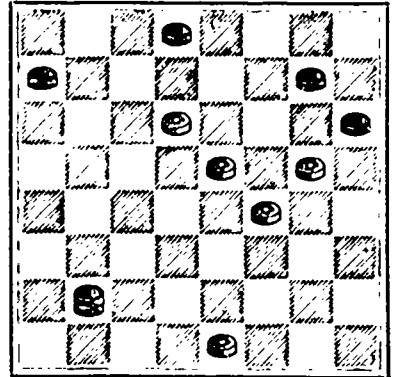
a The editor of the *Am. Ch. Rev.* says:—"From our experience with the 'Doctor' we have realized that there is a great danger if 29 25 is played too soon, and we believe that the man on 29 should be held back as long as possible, because lines can be forced that will invariably win if the piece on 29 is played prematurely."

PROBLEM 342.

By Mr. R. Martins, ex-champion,

in a recent issue of the *Glasgow Herald*.

Black men 2, 5, 8, 12, king 25.



White men 10, 15, 16, 19, 31.

White to play and win. This position affords a fine exercise for a student, who should do his best to see the way to force a win before he moves a piece.

X X

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