

at Bay St. Paul 54 miles below the City of Quebec. Here an immense bed 90 feet thick has been traced for several hundred yards and yields on analysis:—

Peroxide of iron.....	10.42
Protoxide of iron.....	37.06
Titanic Acid .....	18.60
Magnesia.....	3.60

From the large quantity of fuel necessary to overcome this high percentage of titanite acid I cannot imagine that the future of this deposit is brilliant. All the coal must be sea-borne, and inasmuch as Nova Scotia is so richly endowed with all classes of ores of iron, it must be more economical to manufacture in the Lower Provinces and ship the iron up the St. Lawrence than incur the expense attendant on imported fuel. However if, as appears likely, the Nova Scotian coal is to ascend the river in barges, by which means transportation expenses will be reduced to a minimum, the operation which the Canadian Titanic Iron Co. initiated with two furnaces and afterwards discontinued in 1880 might be profitably resumed. There are, however, large deposits of peat in the flat country east of the St. Lawrence which might be utilized in lieu of coal, or as an auxiliary fuel, in the same manner as in certain parts of Europe. Apparently all that is required to do this, even in a wet state, is a peculiar kind of furnace, similar to those used in Sweden, in which it is found practicable to use a peat fuel containing as much as 45 per cent. of water, in a profitable manner. Many of the rocks in the Laurentian series, which is so extensively developed north of the mouth of the river St. Lawrence, are mixed with grains or crystals of ilmenite and magnetite. During the mechanical progress of disintegration these particles are gathered by a local concentration and formed into stretches of iron sand, often many miles in length along the coast. In some instances these are of post-pliocene age and lie from one to two hundred feet above the level of the tide, reminding me very much of portions of the coast of New Zealand. Dr. Hunt found that an unwashed sample contained 46.2 per cent. of magnetic grains, and increased this percentage to 52 merely by the action of washing. In an unwashed state the sand contained 55.23 per cent. of iron, 16.00 titanite acid, .07 sulphur, .007 phosphorus and 5.92 per cent. of insoluble matter. Although these sands have been smelted in a furnace they still remain of little economic value or importance as related at the outset.

**Hematite**—Geologically Canadian hematite ranges over the Laurentian, Huronian, Silurian, Devonian, Carboniferous and Trias systems of rocks. Harrington imagines that those of the Laurentian and Huronian rocks do not form any specially important groups apart from the more recent ones, and this hypothesis is probably accurate. Canadian hematites like Canadian magnetites occur in both beds and veins in rocks of diverse character, such as crystalline limestones, chloritic slate associated with crystal pyrites, gneiss, etc. Their geographical range is: (1) British Columbia, upon the shores of the Straits of Fuca, where, however, no economically important deposits are known at present. (2) Manitoba, upon Big Island, Lake Winnipeg, where ore yielding from 45 to 63 per cent. of iron has been properly tested and proved of good quality. (3) Ontario, at Thunder Bay. Here the ore occurs in a series of beds 40 to 50 feet minimum thickness, associated with suitable flux. As a rule these beds consist of pure hematite and crop out 470 feet above the shores of Lake Superior in a very favorable situation for mining and smelting with charcoal. Prof. Alleyne Nicholson, of Newcastle, of Tyne, Eng., estimates that they contain from 68 to 69 per cent. of iron, and at McNab, where the ore has a surface thickness of 30 feet, styles them of excellent quality. Analysis:—Peroxide of iron 84.42; metallic iron 59.09; carbonate of lime 5.40; of magnesia 1.05; phosphorus 0.03; sulphur 0.065; insoluble matter 7.16. (4) Quebec. An important bed of iron ore is encountered at Hull, about 90 feet thick, being in a dome shaped structure flanked with gneiss and pierced from base to summit by a mass of crystalline limestone. Both magnetite and hematite are drawn from this. The hematite contains metallic iron 58.78 and silica 10.44, and the bed ranges from 2 to 12 feet. Other deposits of hematite are scattered in more or less important quantities through the provinces and especially in the eastern townships. It is of course impossible to state where iron industries could be initiated to the greatest advantage in Quebec, but it appears that some such central town as Sherbrooke might be selected. Surrounded as this town is by important lines of rail, many important transport advantages could be derived from its selection. The inception of iron industries would have a beneficial effect upon the restless French Canadians, great numbers of whom persistently repair to the centres of industries in the adjacent New England States. Industries are all that Canada has to rely upon for the retention of population in the east. Owing to a curious physical idiosyncrasy races upon the American Continent mass in areas where the percentage of moisture ranges from 65 to 75 per cent. of the total capacity of the atmosphere, and where no industries thrive no legislative interference can prohibit this westward migration. Very little is at present known of the ores of iron in the adjacent Province of New Brunswick. In point of fact very little is known of Brunswick at all. In the year 1836 Dr. Charles Jackson, director of the Geological survey of the adjoining American State of Maine discovered the iron ores of Woodstock and traced them northward to the St. John River. Other explorations prove the sequential distribution of these ores in important belts over Carleton County and demonstrate that they vary from true hematites to hydrous peroxide of iron or limonite. Considerable quantities have been smelted, but no or little industrial progress is made in this direction. Generalizations upon the future of the iron industry in New Brunswick are fruitless. I should not recommend capitalists to enter upon such responsibilities until the present tide of progress has set in with greater strength.

(To be Continued.)

DRAUGHTS-CHECKERS

All communications to this department must be addressed directly to the Checker Editor, Mr. W. Forsyth, 38 Grafton St.

B. STEWART, M. D., Bridgewater.—Your letter received. You will see by last week's issue that we have made ample amends for our mistake. We are always pleased to have your criticisms. Could not you occasionally send us a game or a position?

Mr LIVINGSTONE, Clyde Bank, Glasgow.—Will this week mail a reply to yours.

SOLUTION.

PROBLEM 352.—The position was:—black men 3, 10, 15, 19, king 25; white men 27, 28, 31, king 7; black to play and win.

"BRIDGEWATER" has favored us with the correct solution which we give as follows:—

10—14a-I-11 16 15—18 31 22  
7 11 18—22 23 14 29—9  
14—18 16 23 22—26 B wins

The above play is that which was actually followed in the Forsyth-Kelly match. Mr. Fletcher one of Toronto's best players was rather demonstrative in trying to convince Mr. Kelly that he might have drawn by playing 27 24. We give the play as it would have been from that move to show him that the draw was not there even upon his lines.

VAR. I.

27 24 11 16 16 19 19 26  
19—23 3—7 7—10 25—30  
B. wins.

GAME 233.—"KELSO."

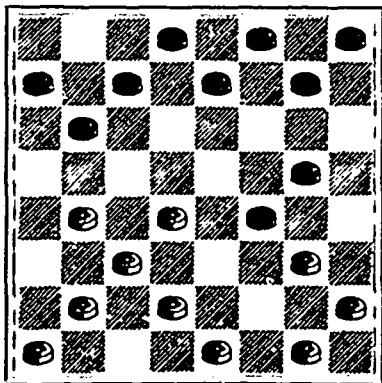
Recently played between Messrs. A. J. Grant (black) and "Steve" Hislop (white) both of Halifax.

10—15 1—6 10—19 11—16  
23 18 30 26 23 16 \*27 24  
6—10 15—19 12—19 black  
26 23 24 15 21 17 wins.

\* We here leave the play and present the position as

PROBLEM 354.

Black men 2, 3, 4, 5, 6, 7, 8, 9, 16, 19.



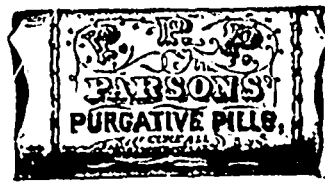
White men 17, 18, 22, 24, 25, 26, 28, 29, 31, 32.

Black to play and win.

This is one of the many curious positions that are continually cropping up in our delightful game. At first glance the win looks to be evident, but below the surface there are dangers that will tax an expert to discover and avoid. To the first who sends a correct solution we will mail a copy of the American Checker Review.

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