WHAT OUR CORRESPONDENT SAYS ABOUT IT.

Our correspondent writing from Bonheur, Ont., under date of May 1st, says :—

"I have just returned here from a hurried visit to Saw Bill Lake and during my trip made some inquiries about the prospects of the new Golden Twins. What was universally said would offer no encouragement to the stockholders of that company. On the contrary the results so far obtained, as one would judge from current report, leave not even a slight hope for the stockholders getting anything from their investment."

JOHNSON BROWN'S NAME WAS FORGED.

The following is a copy of the affidavit of Johnson Brown, the half-breed Indian, who was quoted as the mining engineer from Wolfe river as saying that "the property was capable of paying large dividends on an equally large capital:"

DISTRICT OF THUNDER BAY, Province of Ontario, To Wit: } WOLFE RIVER, Ontorio, 29th April, 1898.

I, JOHNSON BROWN, of Wolfe River, do solomenly declare that my name mentioned in the prospectus of the New Golden Twins, capable of paying very large dividends on equally large capital is false, and that what Mr. Johnson Brown, M.E., of Wolfe River, Ontario, says in his report dated 30th January, 1897, stating that I have much pleasure in informing you that I examined properties known as gold locations 327 and 328 on Clear Water Lake, near the Saw Bill in the Rainy River District, Ontario, where free gold is frequently seen, etc., etc., is also false, and in said prospectus Mr. H. A. Wiley is the managing director, and other particulars have been read to me as I cannot read or write as suggested in said prospectus, and that I am not a miner or mining engineer, and that my name has been forged and used in a fraudulent manner attached to the said mining prospectus, and that I am a half-breed Indian who makes my living hunting and trapping, and that I live in the woods among Indians, and last summer about in June H. A. Wiley employed me at Wolfe River to work around the Saw Bill mine and to do some prospecting, and I never saw Clear Water. I never put my name or mark on any paper as a mining report, and never heard of the New Golden Twins or of my name being used for such a purpose before said prospectus was read and shown to me to-day, and I make this solemn declaration conscientiously believing the same to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act of 1893.

[Signed] JOHNSON BROWN. { His X Mark. }

Declared before me at Wolfe River, in the District of Thunder Bay, this 29th day of April, 1898. } M. POWER MORROW, *Witness.*

[Signed] J. P. DONNELLY,
Commissioner, Etc.

Province of Ontario, DISTRICT OF THUNDER BAY, To Wit: }

I, ALEXANDER J. McCUMBER, of the Town of Port Arthur, in the District of Thunder Bay, explorer, make oath and say:

That I reside in the Town of Port Arthur, in the District of Thunder Bay, and have resided there about nineteen years.

That I am personally acquainted with Johnson Brown of Wolfe River, Ontario, and have been acquainted with him for about seven years.

That the said Johnson Brown is a half-breed Chippewa Indian who makes a living by hunting, fishing and acting as guide, and lives among the Indians in the woods.

That the said Johnson Brown speaks some English but can not read nor write.

Sworn before me this 4th day of March, A.D. 1898, at the Town of Port Arthur, in the District of Thunder Bay, Ontario. } ALEXANDER McCUMBER.

J. P. DONNELLY,
A Commissioner for taking Affidavits, etc.

The Stamp Milling of Gold Ores in its Relation to Cyaniding.*

By MR. E. H. JOHNSON.

The President, in his inaugural address, delivered here in July, in comparing the two solvents, cyanide and chlorine, on closely concentrated ores, used the expression: "given equal preparation of the material for the use of the solvent." This question of "preparation of material" could, I think, be given a wider field of application than merely to closely concentrated ores, and include the consideration of the present methods of preparation of tailings. The recovery of gold from tailings and slimes has assumed a position of sufficient importance at the present day to warrant consideration of their preparation at a stage prior to their collection. Beyond the various methods of collection and classification, the actual preparation of the tailings is outside the domain of the cyanide worker, and I hope I may therefore be forgiven in venturing outside that province to point out one or two details of common milling practice which militate against the successful treatment of tailings and slimes. I feel encouraged to do so since I find on enquiry that differences of opinion exist between experienced mill men themselves on these points.

It is usual, in referring to the degree of fineness, to which an ore is crushed, to quote the mesh (in number of holes to the square inch) through which the material has been passed, and to overlook the important part played by the height of discharge, which is regulated by the "chuck block" of the mortar-box screen. Though, doubtless, you are all familiar with this device, it would, perhaps, be as well for me to define it. It may be described as a block of wood, covered on the mortar-box side with an amalgamated plate, fitting in the screen opening of the mortar-box below the screen frame, and varied in height according to the wear of the dies and the individual taste of the millman. The deleterious influence of the "chuck-block" on tailings preparation is in direct ratio to its height, and I find anything from 3 inches to 9 inches recommended by its advocates. Admitting for the moment its utility for the purposes of amalgamation—a much disputed point—surely the ores of the Main Reef series do not vary sufficiently in character to warrant this wide range in its application. The action of a high discharge is to cause the repeated return of ore particles beneath the stamps, although they were probably sufficiently reduced in size to have passed the screen could they have reached it. The screen-mesh, therefore, becomes no guide to a knowledge of the degree of fineness of pulp without acquaintance of the height of discharge. This is further complicated by the length of drop of the stamps and quantity of water fed into the mill, since by these means also facility of discharge can be accelerated or retarded. The result of a high discharge on the pulp is the reduction of a large proportion of the sand particles to a degree of fineness which is unleachable without excessive loss of sands in classification. Another disadvantage is that the pyritic portion, being the most friable, a large percentage of the fine pyrites passes into the tailings, since it is difficult to retain them in spitzlute concentration.

I made a series of sifting tests some time since of tailings produced by a mill crushing with a 900-mesh sieve and a 9-inch "chuck block." I found that 75 per cent. to 85 per cent. of the tailings produced would pass through an 8,100 mesh sieve. The result was the separation of an abnormal amount as slime and a most imperfectly leachable product of the remainder. So impermeable indeed was this material, that vats containing 100 tons of sand absorbed 30 tons of solution without allowing any to pass the filter. The only means of draining these vats was by boring holes with a long rod through the sands, and so forming channels—hardly a desirable form of leaching, you will admit. The ideal physical condition of tailings for treatment is perfect accessibility of every particle, with the crushing carried sufficiently far to expose the gold to the solvent, and a minimum reduced beyond that point. The nature of the rock here, where the gold is principally carried in the more friable portion—the matrix of the pebble—renders the use of high discharge still more disadvantageous. The tendency of unevenly crushed material is to form compact masses of mixed tailings and slimes, which not only resist treatment, but become enriched by the absorption of gold-bearing solution. These lumps may be noticed forming a fringe round the edge of dumps and round the conical heaps formed during the filling of a leaching vat.

I have touched upon the influence of the "chuck-block" only in its relation to the production of tailings. It would be interesting, metallurgically, if one of our representative mill-men would explain its action and advantages, or otherwise, from the amalgamation standpoint. With the high stamp duty required of mill-men on these fields (something like double the quantity per stamp as is the case anywhere else in the world), any retarding of the discharge of the crushed material beyond the desired mesh of sieve seems to me to be anything but a desideratum.

Another common milling practice is that of taking the heated water from the condenser of the engine for milling purposes. In this connection I would like to draw attention to the well-known report of Mr. Wm. Skey, analyst to the Geological Survey of New Zealand, on the losses in gold amalgamation occurring in the Thames Goldfields. You will pardon me quoting somewhat fully, as his remarks have taken an extended bearing from their applicability to cyaniding as well as amalgamation. He reports:—

1. "That numerous samples of bright, clean-looking gold, of all degrees of fineness, refused to amalgamate on any of their natural surfaces, though taken directly from the reef and untouched by hand.
2. "That on such surfaces sulphur was always present.
3. "That native gold, or gold in a pure state, readily absorbs sulphur from moist sulphuretted hydrogen or ammonium sulphide, and absorbs it directly when administered in boiling water.
4. "That surfaces so treated refused to amalgamate, though no apparent change could be observed in their aspect.
5. "That gold so affected is rendered amalgamable by roasting in an open fire, unless copper is present to the extent of 7 per cent., or perhaps less, while the same effect is produced by contact with potassium cyanide, chromic or nitric acid, and calcium chloride acidified.
6. "That this absorption is altogether of a chemical nature.
7. "That sulphate of iron in presence of air and water decomposes various metallic sulphides common to auriferous ores, in such a manner as to liberate sulphuretted hydrogen."

The point I wish to emphasize is that the absorption of sulphur from sulphuretted hydrogen by native gold occurred *immediately* when administered in boiling water. Ferrous sulphate is present to some extent in all our mine water, and, consequently, in the water used in milling. The conditions necessary for the decomposition of the metallic sulphides, and consequent evolution of sulphuretted hydrogen, are therefore present. It is fair to assume that the rapidity of this decomposition is in ratio to the temperature of the water, as indicated by Mr. Caldecott in his paper on the "Treatment of Accumulated Slimes," read at the July meeting of this Society. Mr. Skey has pointed out the injurious action upon the free gold, and we have to consider the injurious action of this decomposition in providing us with those oxygen-absorbents and cyanicides which impair results in subsequent treatment of tailings and slimes. Nature has been already sufficiently generous with respect to these ferrous compounds without our adding to the supply by a system that is advantageous to no department of gold recovery.

There are two chemical conditions of the ore in which the cyanide treatment progresses satisfactorily: 1st—The condition before any decomposition of the metallic sulphides has taken place; 2nd—When complete decomposition has been obtained, or, in other words, when the ore has satisfied its absorbent capacity for oxygen. No better example of this could be given than the experiment made by the President, and quoted by him at the August meeting of this Society. It was in reply to a question respecting the effect of partial roasting. He said; "We made a careful series of determinations by partial roasting. We started on top and took our samples right down through the

*Paper read before the Chemical and Metallurgical Society of South Africa.