WEIGHTS AND MEASURES IN MINERALS.

A VERY common puzzle to business men, who are necessarily in our days of sub-division of interest, not acquainted closely with the kinds of measurement in vogue in metals and minerals, is how to deal with the unusual and unexpected when it turns up in their own dealings. For the purpose of helping every one dealing in minerals of all kinds, metals and non-metallic minerals, we give the weights and measurements used in the United States—and they are almost the same as those in use in Canada—of the minerals of any real importance in the industrial world. The short ton is more convenient than the long ton for nearly all purposes of calculation, but the influence of British custom in adhering to its old measurements, is yet sufficiently patent on this side of the Atlantic to almost compel the use of the long ton, as a mere matter of commercial convenience.

We recommend our readers who may have occasionally some mineral or metal to deal with outside of their own regular line to cut out and paste somewhere the following memoranda.

Short tons represent 2,000 lbs. The following metals and non-metaliferous minerals are weighed by it: Corundum and emery, garnet, grindstones, milletones, Tripoli and infusorial earths, whetstones, alum, antimony, antimony ore, asbestos, fibrous talc, talc and soapstone, asphalt, asphaltic limestone, bituminous rock, bituminous sandstone, barytes, refractory clay. kaolin, anthracite coal, bituminous coal, coke, copperas, fluorspar, amorphous graphite, gypsum, lead, magnesite, mineral wool, mineral paints, vermillion paints, white lead paints, zinc oxide paints, natural soda, limestone flux, antimony, zinc spelter.

The long ton (20 cwts. of 112 lbs. = 2240 lbs.) is used with:—bauxite, chrome ore, feldspar, iron ore, manganese ore, rock phosphate, maris, pyrites, sand, and quartz silica, sulphur and pig iron.

Natural hydraulic cement is weighed by barrels of 300 lbs; Portland cement by barrels of 400 lbs., and lime by barrels of 200 lbs.; crude petroleum is measured at 42 gallons per barrel.

Evaporated salt and rock salt are measured by barrels of 280 lbs.; gold, platinum and silver are weighed by Troy ounces.

By pounds are weighed:—Aluminum, borax, bromine, cobal toxide, sulphate of copper, graphite, sheet and ground mica, monazite, copper.

Quicksilver is weighed by flasks of 76½ lbs.

By cubic feet are measured marble and onyx.

Manufactures of slate are measured by square feet.

Roofing slate is measured by squares, i.e., 100 square feet lapped and laid.

Manufactured soda is weighed by the metric ton (2,204.6 lbs.)

We would recommend Canadians in most of the cases mentioned to specify exactly the weight or measure by regular arbitrary rules. There are rules of the thumb—so to call it—devices and changeable too, in trade, which, however familiar to some in the centres of particular businesses, are not familiar to others, and hence may lead to misunderstandings and even lawsuits.

TREATING TALCY ORES.

NEW PROCESS TO MAKE LOW GRADES REMUNERATIVE.

THE introduction of a successful and cheap method of reducing low grade refractory ores means much for British Columbia and other mining countries. The application of the Pelatan-Clerici electric process to the De Larnor Idaho mine has proven successful. The theory of the treatment is the solution of the bullion in pulp by the use of cyanide, and then recovering the values by electricity, much after the manner in which ordinary electroplating is done. It has been found that the familiar cyanide process, in which the values are recovered by leeching through zinc shaving, could not be employed on talcy ores of this and many other camps, because the solution could not be drawn from the slimy pulp. The electric process extracts the value from the solution while still mixed with the pulp. The plant consists of two circular wooden tanks, or vats, with copper bottoms, each with a four-armed sweep, or stirrer, rotating horizontally a few inches from the bottom. The lower side of the sweep arms is attached to plates of boiler iron, in which are wooden pins to keep the pulp and solution thoroughly in motion. Through these iron plates an electric current is carried from a dynamo, the plates serving as the anode of the electric bath. In the bottom of the tank a heavy layer of quicksilver is placed, which is connected with the negative pole of the current and serves as the cathode of the battery, in which the bullion carried in the solution is deposited. A charge of two and one-half tons of pulp is put in the tank and treated with the cyanide and is kept in constant motion for 11 hours, with the current of electricity constantly passing through it taking up the bullion in the solution and depositing it in the quicksilver cathode in the bottom of the tank. It is found that 11 hours is sufficient time to practically dissolve all the values in the pulp, and to extract and deposit them in the quicksilver cathode. It is only the work of a few minutes to draw off the exhausted pulp and recharge the tank, repeating the operation every 12 hours, or treating 5 tons per day in each tank, the bullion remaining in the quicksilver being left there until the weekly or monthly clean-up. The ore is crushed in a Huntington mill, and the pulp deposited in reservoir tanks, where it is constantly agitated in order to keep it in condition to be drawn into the treatment tanks as required. The official test made consisted of 100 tons of the same big mill, and, second, of 85 tons of ore of lower grade. In the first test the percentage saved, as shown by careful assays of pulp and tailings, was 87; but the bullion recovered was 3 per cent. less, the discrepancy being accounted for by the amount remaining upon the new copper plates. The test of the low grade ore showed practically a saving of 83 per cent. These are considerably higher percentages than are made on these ores on the excellently equipped big pan amalgamation process mill. The loss of quicksilver in the 100 ton test was 15 pounds; in the 85 ton test it was 13 pounds. Eight more tanks will now be added to the plant, making its capacity, as per original agreement, 50 tons per day.

In regard to the cost of treatment by this process, the following demonstrates that it will be comparatively small: (1) A 25-horse power engine is required to run the dynamo and agitators for the 50-ton plant; (2) one man on each shift can run it; (3) one man one shift in 24 hours can run the Huntington mills to crush the 50 tons of ore—practically requiring only three men to run the plant; (4) no grinding is done with mullers, as in the pan process, and there are no shoes and dies to wear out and be replaced; (5) the power required, as compared with the amalgamation process, is comparatively small, which, with the cost of fuel here, is an important saving; (6) the loss of quicksilver is comparatively slight.

THE CYANIDE PROCESS.

A PAPER, by Geo. A. Packard, read at the Colorado meeting of the American Institute of Mining Engineers, gives interesting tables showing the character of the ore treated by cyanide at a number of mills in the United States, and the details of the treatment. The paper is worthy of the careful study of those in Canada who use or contemplate using either the cyanide or chlorination process. It says that the process has been applied on a large scale only to rather low-grade, highly siliceous ores, containing but a small percentage of base metals and having their value principally in gold. It gives one instance in which cyanide competed successfully with the smelters on ore carrying as high as 4 oz. in gold, the ore being one in which the value was easily extracted to a high percentage. In the Cripple Creek District where an extraction of 90% is obtained in from four to six days, where the smelting-charges were from $5 to $7 per ton, ore running as high as $40 was in 1895 bought by the cyanide mills. With silver-ores, while some very good results have been obtained, the length of time required for treatment has usually been too long, and the consumption of cyanide too high to give economical results. There are, however, several plants in the vicinity of Tombstone, Ariz., working on silver ores. In the case of ores containing from 1 to 10 oz. of silver, in addition to a commercial gold value, the process has been advantageously employed. Thus the Golden Reward Company, in South Dakota, having certain ores containing from 1 to 5 oz. of silver, which was lost in chlorination, has built an addition to the plant in which such ores are treated with cyanide.

Chlorination is the only process in the field of which the cyanide method is seriously invading. For mines located at a considerable distance from a railroad the cost of transportation of the chemicals used in chlorination has been hitherto high, and at least until the use of liquid chlorine becomes a practical success, cyanide has the advantage in this respect. At the Golden Reward plant in South Dakota, early in 1895, they were using for chlorination about 35 lbs. of chemicals per ton of ore, while only 2 1-2 lbs. were necessary for treating one ton with cyanide. If there is silver present, the cyanide has the advantage that part of the silver is recovered; but the gold extraction is usually higher by chlorination than by cyanide. With amalgamation, cyanide enters into competition only in the case of very finely divided gold, which is saved more or less successfully in pans. The cost of cyaniding varies largely with the character of the ore. There are a number of mills which crush and cyanide ore for less than $2 a ton, exclusive of royalty paid to the company owning the patents. The lowest cost reported is 85c. a ton at the Mercur. No company has yet been able to reduce the cost of treating tailings to the minimum reached in South Africa, 59c. per ton; but one plant operating under exceptionally favorable conditions is working at a cost of 69c. a ton. In general, the tailing plants working in the United States do not obtain a high extraction. There are a large number of tailing-plants in the United States, especially in the south-west, where the hot, dry climate renders expensive buildings and drying machinery unnecessary. Including the output of these mills, Mr. Packard finds that nearly 200,000 tons of ore and tailings were treated by cyanide in 1895, producing over $1,000,000 in bullion value.