

uniform value throughout the rock. On account of the necessity for this description it is not always sufficient to state that an average width of vein contains an average of so much value per ton, as this may be in the nature of a conclusion, not of a fact, and so may need to be justified by detailed facts of the report. The extent and character of dump piles at a worked mine often afford valuable confirmatory evidence as to the character and value of the property.

Geology and mineralogy should naturally be used with discretion, but only for purposes actually bearing on the description and conclusions to be drawn,—not for mere piddling nor for the airing of theories better treated in a purely scientific paper. I have seen a report which started with the nebular hypothesis and traced the progress of the earth from its pulpy state right down through its various stages to oxidation of the outcrop of a particular vein in the year of grace in which the report was written. These details were so full that there was no room left for anything but a very brief treatment of the merely commercial question of the value of the mine.

Examinations naturally differ greatly in the nature of the calls they make on the expert. In a district with which he is well acquainted there are often certain simple facts which enable him rapidly and safely to arrive at his own conclusions; in other cases it is often a matter of hard and conscientious work, however clever or experienced the engineer may be, and any scamping of this work will imply unreliableness. An experienced man in making a report will have an open mind for possible new forms of ore occurrence, while refraining from prophecy about things not in sight. Events may work against the most careful and experienced man by unforeseen increases or decreases in value on opening new ground; but as mine examination is an art and not an exact science, it is by average results that an engineer must be judged.

There are all degrees of "fixing a mine"; from the legitimate showing of its best features by not taking out all the rich ore before offering for sale, or by various degrees of skullduggery, up to palpable salting of mines, dumps, and expert's samples. In the less illegitimate stages much can be done, and very frequently is done, in the way of a judicious stopping of faces in good ore, and by the observing of a discreet silence as to past weaknesses and irregularities of the ore deposits. In such cases it is simply the ordinary commercial position of "let the buyer beware," and the expert has to show by his report if he has experience, observation, and sense enough to form a sound judgment as to value.

In a mine which is thus carefully prepared for selling, it is not at all uncommon for the owner to go beyond the legitimate limit already indicated, and to misrepresent facts by filling up or concealing old workings which would, if examined, produce an unfavorable impression. The next step in the downward path which leads to a hotter place (but in the meantime also sometimes to affluence) is the scooping-out of the inside of apparently solid blocks of good ground by openings afterwards filled up or timbered over. Some of the most experienced mining men and engineers have fallen victims to this and the previously described course of conduct; while some have just escaped being caught by a mere accidental indication of the fraud, or by "peaching" of some miner who helped in the work and had not been squared. Naturally the danger from the sources mentioned is much less in new mines of limited extent than in old mines extensively developed. In a mine which has been worked for some time the visiting engineer is at a great disadvantage as compared with the men who have worked in it for years, and perhaps devoted their greatest skill to making, not only a good record, but to concealing the exhaustion which is approaching. It happens occasionally also that the owners complete their work by "picking the eyes out of the mine" in the interval between the expert's report and the turning over of the property to the purchasers. The richer the nature of the pay ore in the mine, the greater the danger from this rascality, which needs specially providing against in the terms of purchase, and by other precautions.

The above-mentioned very real and not uncommon dangers, against which the engineer has to guard, are not, however, "salting" in its proper and technical sense, which is generally understood as covering any interference with the expert's chance of arriving at a true estimate of the value of ore. The salting may be done on the ore before the expert's arrival, or during his sampling, or on his samples when taken, or while panning or assaying.

Although cases are well known of faces in a mine being salted with such success as to catch the unwary, this form of salting is usually too difficult to carry out, and too superficial in character to offer much chance of catching an old bird. With ore dumps and alluvial deposits it can be done with better chances of success, but is naturally of an expensive nature if carried out on a really systematic plan. Cases are on record of successful salting of alluvial ground with precious stones as well as with gold, and the expert must clearly be on the watch against this, when circumstances allow of the possibility of its occurrence. With ore dumps it is often very easy to arrange a veneering of good ore over a very large pile of poor or barren rock, and then, when the ingenious gentleman who takes samples "at random" comes along, he will be sure to obtain a gratifying result.

The salting of samples is, however, much more common than any other form of getting ahead of the expert. It is less expensive than salting in advance, more deadly, and can be nicely adjusted to circumstances and to the individual weakness of the victim. When the owner of the mine, or anyone connected with him, is allowed to assist in the sampling itself, there is no lack of opportunity with some ores for the artistic salting while in the mine; but, as a rule, engineers do not have the requisite faith in human nature to accept such assistance, unless the character of the ore and kind of samples required make salting impossible at the time. In a strange district, where assistance of some sort has to be obtained in breaking and transporting large samples, and the character of such assistance is not absolutely certain, the engineer must guard himself by duplicating entirely alone certain test samples. Assuming that samples have been secured without any chance of outside interference, the business is by no means ended, for the enterprising salter will follow those samples until actually panned or assayed, or taken out of his reach.

To the successful cultivation of the art of salting no great knowledge or experience of mining is necessary, any more than a study of architecture is essential to the practice of burglary. True ability will assert itself in this as in other employments by the invention of new means to meet special cases, and by a proper discretion in regulating the dose of salt administered to the temperament of the patient. Sometimes the honest miner will freely relate stories of methods by which experts had been salted, implying delicately that no such scheme would be successful with his hearer, but reserving one, undescribed, for purposes of personal illustration later.

The microscope or a very strong glass is often of very great service. In silver ores the silver-bearing minerals can often be washed out and identified; and with gold ores the color and form of the metallic particles are sometimes suggestive. Once, in Dakota, I was taken to see a vein said to be rich in silver, but the appearance of the vein-matter raised an immediate doubt as to what form the silver could be concealed in. By panning I obtained some native silver; but when examined under a glass some of the pieces showed traces of native copper attached. The only place I know where native silver and copper occur actually welded together is the copper region of Lake Superior; and, on questioning a little the honest miner who was my guide,—and who had kindly assisted in crushing some samples,—I found he had formerly worked on Lake Superior. No great intellectual effort was then necessary to account for the occurrence of the silver in the very unpromising looking vein-matter.

In the case of panning tests on gold ore, or gravel, or for precious stones, it is of course comparatively easy for anyone who is allowed to be within a short distance of the expert to get in his salting work, and solitude is the only protection. The salter may use a quill tooth-pick as a weapon for long range shooting, or have gold dust in his nails for short range; or charge his pipe or cigar, and not watch where his ashes fall. Cases have been known of gold pans prepared in advance by a valuable varnish which gradually rubbed off in use. Although it is not possible to mention all the devices, there may be some utility in putting on record for others the better-known ones; for it is certain that many young engineers start out with confidence of much learning, ready to undertake responsible examinations, and without any clear idea of the dangers they are courting. A man may acquire a fair amount of practical experience, and confidence begotten of the same, without happening to get into surroundings of any real danger, and so, when least expecting it, may yet be nipped. All men of experience agree that the only absolute protection is solitude; and that trusting to knowledge of the old tricks or to personal watchfulness is quite insufficient if any person is immediately around.

## General Mining Association, Ltd.

A Dividend of 12½ Per Cent.

The Ordinary Half-yearly General Meeting of the shareholders of this Company was held at the offices, London, England, on 19th ulto., when the report and accounts for the year ended 31st December, 1894, were submitted as follows:

"The sales of coal were as follows:—

	1894. Tons.	1893. Tons.	Increase. Tons.
Sydney Mines .....	236,125	209,185	26,940
The profit on the year's trading, as set forth in the accounts, amounts to.....			£19,002 12 11
Brought forward from 1893 .....			684 14 1
			£19,687 7 0
Out of which the Directors propose a dividend of 14s. per share, free of income tax, viz.....			19,228 6 0
Leaving balance to carry forward.....			£459 1 0

From the commencement of the shipping season there was a good demand for coal, and the total shipments exceeded those of any previous year.

The financial crisis in Newfoundland, with which colony transactions have always been important, will, it is feared, eventually result in a loss to the Association.

It is as yet difficult to form a reliable estimate of this; the Board have, however, provided for what it is believed should fully cover it, and, after so doing, are able to recommend the dividend above referred to, which they believe will be considered very satisfactory, especially when it is remembered that a return of £2 10s. per share on capital account was made on 24th September last.

The Board are continuing to sanction such improvements as will tend to facilitate the shipping and delivery of the coal."

## Report of the Mine Manager.

I beg to submit the following annual report on this colliery for the year 1894: We employed an average number of 288 colliers during the season; the pit worked 272½ days drawing coal; and the total quantity of 256,312 tons of coal was raised. But little shipping was done early in the year; only 11 cargoes were shipped in January, 1 in March, and 6 small cargoes in April. From the 1st of May, however, until the close of the year, the demand for coal was steady and continuous. The total shipments for the year were 218,028 tons, and the local sales 18,096½ tons of large, run of mine and slack coal. Early in the season our western shipping pier at North Sydney was repaired, about 50 feet were added to its length; the trestle work or superstructure which carries the roadway, was entirely renewed, and the roadway raised to a height of 6 feet above its previous level. The bridge, whereby the roadway to this pier crosses the public road, was also renewed and raised in height. A new and powerful locomotive, built to specification, by the Baldwin Locomotive Works at Philadelphia, has been purchased; and 21 coal cars, to carry 6 tons of coal each, have been provided.

A Fairbank's truck weighing scale, to a capacity of 20 tons, was imported and set upon our railway. A new ventilating fan of 10 feet diameter was purchased and set up, to be used when necessary to assist or replace the old Guibal fan. Hadfield Cast Steel Wheels were, during the season, supplied and fitted to 210 of our pit coal tubs or boxes, to replace the cast iron wheels hitherto in use. A boiler feed heater was purchased, and set up in connection with the exhaust steam from our large winding engine, to warm the feed water for the use of our boilers. 1,251 yards of the 4in. iron pipes, which conduct the boiler feed water from the main reservoir to the pits, have, during the season, been replaced by pipes of 5 inches diameter; and a bore hole 283 feet 4 inches deep by 5 inches diameter, has been bored to a small feeder of pure water in the vicinity of the reservoir. This feeder is available during dry weather, either to supplement the supply from the reservoir, or to provide some of our workmen's houses with good water. A pair of new cylinders have been imported for the locomotive 'Stephenson,' and will be put in this winter, as soon as the locomotive 'John Bridge,' which is having a new fire box fitted at New Glasgow, shall be completed. Repairs, as usual, have been made on a number of our stationary boilers, on our coal tubs, waggons, railroad and plant generally, and everything is in good working order. Progress has been made with the erection at bank of the 'Lingan' engine, to be applied to work the north side underground haulage; and some new slidings, spears, or guides, of pitch pine, have been placed in the winding shaft. One breakage only occurred during the year to our main pumps. In June the clack door piece in the Staple set, which had been cracked for some time, gave out and had to be withdrawn and replaced by a new one.

(Signed) R. H. BROWN.

## Accounts for the Year Ended 31st December, 1894.

### BALANCE SHEET.

#### Liabilities.

	£	s.	d.	£	s.	d.
To Share Capital, viz., 27,469 shares of £8 each...	219,752	0	0			
Less £2 10s. per share repaid to shareholders...	68,672	10	0			
				151,079	10	0