

18th YEAR OF PUBLICATION.

# The CANADIAN MINING REVIEW

Established 1882

THE OLDEST AND ONLY OFFICIAL MINING AND ENGINEERING JOURNAL PUBLISHED IN THE DOMINION OF CANADA.

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Published Monthly.

OFFICES {Slater Building, Ottawa;  
Windsor Hotel, Montreal.

VOL. XIX., No. 3.

MARCH, 1900.

VOI. XIX., No. 3.

## A Plea for Safer Mining Methods.

One of the most encouraging evidences that a mining industry has passed beyond the embryonic stage is to see the leading mines thoroughly developed and their underground operations carried on in accordance with well matured plans. No mining is really cheap that is not conducted systematically, and a system can only be evolved after the deposit has been explored, so that its position and extent up to a certain limit may be accurately known. The tendency in some of the mines of the Dominion has been to start production too soon, and this has led to many errors, the seriousness of which has not been fully appreciated. Although the cost of the ore delivered at the surface may be low during a period of active production, the actual cost in all cases that have come to our notice has been exceedingly high, when the dead work, and the changes in underground methods of mining and handling are taken into account. But beyond such considerations is another of grave import. The methods of ore winning necessitated by this scramble after a large output from an undeveloped mine may be characterized as an unsystematic gouging out of the vein. The ore bodies are stripped as clean as possible, regardless of consequences. No respect is paid to the maintenance of suitable shaft pillars, and supporting ribs and arches of ore are few and far between, and usually of wholly insufficient dimensions. The chasms left, (by some stretch of the miners' imagination called "stopes") are often frightful to behold, and constitute a perpetual menace to the lives of the workmen and to the security of the mine. That accidents by collapse of the hanging wall in these yawning "stope" caverns have been rare in Canada is no argument for a continuance of this reckless custom. The memory of the old Copper Bay disaster is still fresh in the minds of our older mining men, and the conditions are favorable today in more localities than one for a repetition of this accident, on even a more tremendous scale. It is the plain duty of the mining inspectors throughout the Dominion to take cognizance of this state of affairs, in view of the frequent protests of the miners against the conditions imposed upon them, which they do not hesitate to declare are threatening their lives. It is easy for officials to become too meddling and exacting, and to demand more than could be expected of mining companies in the way of provisions for safety, but we do not think there have been any embarrassing exactions imposed in Canada by the representatives of the provincial governments. The error has been certainly on the side of too great laxity. There is no excuse in these days for leaving stopping chambers of vast dimensions without support for the hanging wall. The caving system, which is safe under intelligent, skilled

direction, is not applicable to the great majority of Canadian mines, and the square set method of timbering is too expensive. But rock filling is cheap, and thoroughly effective. It has been applied with success in a number of Canadian properties, where the margin of profit in mining was not great, and its use should be insisted upon as a way out of the difficulties which, from evidence before us, threaten the security of a number of important mines.

## Some Points on Riffle-Washers.

We are pleased to see that the riffle-washer is gaining rapid ascendancy in Canadian gold mills over the vanners, which so long held the day against all other concentrators for fine pulp. It undoubtedly means an increased saving at a reduced cost, which is a matter of great importance in a country where the gold ores are mostly of low grade. In the hands of an experienced man the vanner will give an almost ideal concentration with classified sands, but it is a delicate type of machine, requiring greater skill than is often possessed by the ordinary millman. This difficulty was met in part by the introduction of the corrugated belt, which would give fair results without such careful adjustment as was needed for the plain belt. But it did not do as fine work as was possible with the older form of machine under the best conditions, and was withdrawn after a brief trial, to be re-introduced in obedience to the demand for a less delicate appliance, which could be operated economically without such constant attention. The riffle-washer, however, of which the Wilfley table is at present the best known representative, has solved the problem very neatly. The friction of ore particles on a surface is not utilized in this machine. A series of riffles of gradually diminishing height from the head towards the foot of the table, are placed lengthwise on the concentrator, nearly at right angles to the flow of the pulp and fresh water, which flow is induced by a side slope of the table. A reciprocating motion in the direction of the riffles causes the material banked behind each riffle to advance toward the discharge end, where the stips are shallower. Thus every opportunity is afforded for a settling of the heavy particles in the ore, while the gangue is washed over, escaping along the edge of the table. The rich ore follows from the end of one riffle to the next longer one, and so on to the last, whence it discharges into the heads-box. The adjustments of the table are the number and length of reciprocating strokes per minute; the slope of the table, adjusted by a lever arm; the quantity and dilution of the pulp; and the quantity of feed water. A tyro can soon learn to achieve good results with this simple appliance. But, as usually happens with new devices,