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**Canadian Mining Schools.**

The work and usefulness of mining schools in Canada is, in the phrase of physicians, indicated by (1) the deep and wide-spread ignorance of the country's mineral resources; and (2) the ill success of too many efforts for the development of its mineral wealth. It is too often attempted to hide the first behind sweetly-sounding generalities upon our enormous subterranean riches. Capital and pluck have too frequently been the blind and beaten pioneers in fields where no intelligent investigator has yet entered. No country in the list of the English-speaking communities "each stretch round the globe has done so little to promote the scientific investigation of the mineral resources of its territory as the Province of Ontario. Its highest function as yet in the discharge of this duty is in the publication of a very excellent yearly report. While the common sense of the Australian provinces has for many years past found ample reward for its liberal yearly appropriations for diamond drill exploration, Canadian honest imbecility and careful stupidity, which, like Siamese twins, have been yoked together in the rule of Ontario mining affairs, place this part of the Dominion behind all other communities, having regard to the wide extent of its mineral areas and their extensive distribution in the eastern section along the rear agricultural frontier. Nor has the Geological Survey of Canada been less culpable. What work of helpful value has it done for the iron ores of Frontenac, Lanark and Renfrew, for the gold miners of Hastings, for the silver miners of Thunder Bay? While Prof. Winchell's explorations in Minnesota have almost at his heels been followed by capitalists who have developed the greatest iron mines the world has yet seen, resulting in the employment of an army of laborers, the construction of railways, the building of a fleet of the largest freight carriers on the lakes, and in a large measure in the reduction of the price of pig iron throughout the Northern States—thus spreading the benefit among a population six old that of the Dominion—our geologists

have been supplying us with their yearly tale of ponderous waddle, their canoe trips hither and thither, and other topographical work, all very good and useful in its way and excellently well done no doubt by right good fellows, but for the practical development of the industries of the country for the most part of no value whatever. It is plain to every one, to every citizen and to every intelligent foreign visitor that irrespective of anything savoring of politics the men at the head of Government mining affairs in this country have no "go" in them. Look at Ontario's expenditure of \$800,000 in the last 20 years for surveying townships for the benefit of that class alone which gets all the good things in this country—the lumbermen while in the same period she has not expended one dollar for anything in the nature of original mineral exploration. If it is a government function to examine the condition and value of our forest areas so that the purchaser may equally with the seller have reliable information of the value of any part; if it is in the same line of duty that such examination is made of various belts of land as to warrant the advertisement that these are fit or those unfit for settlement; if it is the duty of Government to admonish the farmer of the blunders of his dairying system and instruct him in improved processes, it is more so than all these the duty of Government to explore the mineral areas in its possession as to enable the Crown as the public trustee and the miner as a customer to form an estimate of the value of mining locations and the best methods of exploiting them. For this reason: that where the business of mining has to undergo the least hazard, wherever it is a prosperous industry, it adds vastly more to the national wealth in proportion to the capital and the men employed in it than manufacturing, farming or any other industry.

A paper on "The Growth of American Mining Schools and their Relations to the Mining Industry," by Prof. S. B. Christy of California University, read at the International Engineering Congress, in August last, very clearly establishes the claims of these institutions upon the regard of the State.

Having pointed out that in the United States the yearly increase in the number of students of mining engineering keeps pace very closely with the yearly increase of mineral production, the writer proceeds to show that the numbers of mining, civil and mechanical engineers graduated from the different schools are in the ratio of 1, 6, 11. In answer to the question, "Are mining schools justified?" Prof. Christy answers thus: "Miners may be insignificant in numbers but in respect to the value produced as a result of their labor, they are the most important element in the entire population." In 1880 the actual money value produced in the United States as result of labor per capita was as follows:

Agricultural . . . . .	\$ 289 00
Manufactures . . . . .	996 00
Mining industries (all engaged) . . . . .	1,167 00
Miners only . . . . .	1,577 00

In 1889:

Actual value produced by all engaged in mining industries	
per capita . . . . .	\$ 984 00
Per miner only engaged . . . . .	2,900 00
Per administrative officer . . . . .	23,020 00
Per estimated engineer . . . . .	97,872 00

Between the two periods it will be seen that the effective value of the miner's industry was nearly doubled, which was no doubt chiefly due to the improved machinery and methods introduced, and this in turn may be credited to the skill of the mining engineer. "Surely it is not a bad investment to spend a thousand dollars a year in educating a man for four or five years who shall have the direct control of the production of \$5,000,000 as the result of the work directed by each mining engineer in the United States during his working life." "The farmer can harvest his crops year after year; most of his increase comes from sun and air and rain; he has only to fertilize the soil now and then, and his farm remains a source of wealth from generation to generation. But there are no fertilizers for worked out mines. The crops the miner reaps can be harvested but once, and what he leaves behind through lack of skill is forever lost."

The two features of the work of American mining schools which have produced the best practical results are the "Mining Laboratory" and the "Summer Schools of Practical Mining." In the former problems in ore dressing and metallurgy are worked out by the student "very nearly on a scale of 12 inches to the foot." The latter begun as a mere summer jaunt, has been developed by Prof. Munroe of the Columbia School of Mines, into a three months' course in surveying, field geology, mining and metallurgy. Experience gained shows that a saving of energy will be effected if the schools study mainly, though not exclusively, those branches locally more important and readily studied in detail. Thus, for example, where argentiferous galena abounds, the mining and smelting of silver-lead ores will be the principal theme.

The 3rd section of the Canadian Statute establishing the Geological Survey, enacts as follows: "The object and purposes of the survey and the museum in connection therewith, shall be, to elucidate the geology and mineralogy of Canada and to make a full and scientific examination of the various strata, soils, ores, coals, oils and mineral waters, and of its fauna and flora, so as to afford to the mining, metallurgical and other interests of the country, correct and full information as to its character and resources." This is comprehensive enough certainly. It warrants the Government to commit to a summer mining school the exploration by means of the diamond drill of any mineral territory whatsoever in Canada. If such work shall be undertaken in some of the eastern sections of Ontario where the mining industry once active now languishes, the results even if of negative value will be most important. They will either lead, as many believe, to the revival of mining industry upon an intelligent basis, or