Any Minister selected will prove an encumbrance unless he surrounds himself with experienced advisers and keeps constantly in touch with the industry. Therefore it is imperatively necessary that the Minister, unless he is to be a figurehead, be forearmed with a knowledge of what mining means to Canada. In other words, he must have had occasion to study conditions at first hand.

We seize this opportunity of pronouncing our views because experience has convinced us that, of all our industries, that of mining is most in need of careful attention from Ottawa. This assertion needs no laboured proof.

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Before our new Premier and his Minister of Mines lies a supreme opportunity. Canada can easily improve her position in the mining world. But much will depend upon Ottawa. The revision and codification of our mining laws, a measure already begun, must be completed at an early date. The questions of handling explosives, of rescue work in coal mines, and similar problems can best be met by the Federal Mines Branch. Provincial Departments will follow the lead set by Ottawa.

There is no doubt that the erection of a vigorous Department of Mines at Ottawa, under a competent Minister, will mark the inception of a remarkable development in Canadian mining. We cannot too strongly urge upon the new Government its duty in this respect.

THE ECONOMICS OF TUBE-MILLING.

A remarkably exhaustive thesis, the work of Mr. H. Standish Ball, M.Sc., has just been published in the Bulletin of the Institution of Mining and Metallurgy, of which body Mr. Ball is a student-member. Mr. Ball undertook the work in order to acquire his M.S.C. degree at McGill University, and also to do his duty as the recipient of the Research Scholarship awarded by the Transvaal Chamber of Mines in the year 1909.

Working under the general direction of Dr. J. Bonsall Porter, Mr. Ball made an analysis of the conditions that determine the efficiency of tube-milling. Sketching first the growth of tube-milling practice, he touches upon the factors controlling efficient work, outlines the tests proposed and the tests actually carried out, the general theories of rock crushing, describes the equipment used, and then proceedsd to give a detailed account of each experiment.

The rock used was a hard, compact, nepheline syenite. The tests were divided into four series, in the first of which the feed was varied, the moisture, pebble load, and revolutions per minute remaining constant. In the second series, the moisture was varied; in the third, the pebble load; and in the fourth, the speed.

The preparation of the rock proved to be an unexpectedly arduous task. After reduction to -¼-in. through a "Comet" crusher, 14 tons had to be crushed in a 5-stamp battery through a screen of 18 holes to the linear inch, and de-slimed in a classifier. The sands were then dried, weighed, and stored.

The mill used was formerly an old chlorination barrel, the outside dimensions of which were: length, 4 ft. 8in.; diameter, 3 ft. 5 in. The inside dimensions were: length, 3 ft. 6 in.; diameter, 2 ft. 10 in. The tube shell was built of ⅜-in. steel, bolted to cast iron end pieces, 2 inches thick, which were stiffened by six 2-inch ribs. The lining consisted of 8-inch by 4-inch by 2½-inch Silex bricks, set in patent cement. An iron screen, with ¾-inch holes, was fixed at the discharge end. 18-mesh sand was delivered by means of a pipe from a bucket elevator to the cone, the size of the discharge orifice being regulated by means of carefully calibrated caps with different sized apertures.

The barrel was driven by a chain and sprocket gearing, and revolved on hollow trunnions. The stamp battery consisted of five 600-lb. stamps, the total crushing capacity being 800 lbs. per hour.

The amounts of rock used in each test ranged from 800 lbs. to 2,000 lbs. After careful screening of the sand through ⅛-inch screen, the water was measured and the flow adjusted. The time consumed by each test varied from 45 minutes to one hour. Thorough screen analyses checked every trial.

It is impracticable here to follow the elaborate tests conducted by Mr. Ball. It must suffice to note some of his conclusions. From figures adduced throughout the experiments, it is indicated, provided there be a fair basis of comparison between the large mills in use in South Africa and small mill used by Mr. Ball, that the present general tendency is to overfeed. That is, the "critical feed," is exceeded, power is wasted, and the results obtained are not commensurate with the material and power used.

As regards moisture, the fact is demonstrated that 37.7 per cent. is much more advantageous than any other proportion. This corresponds more or less closely, with the conclusions of other investigators.

The pebble load tests tended to show that the highest efficiency is reached when that load has a volume of 7/16 the volume of the mill.

The conclusion that a peripheral speed of 333 feet per minute, or 37 revolutions per minute, is most efficient is in close accord with results obtained by Richards and others.

Mr. Ball's paper is an excellent student production. It exhibits evidence of care, thoughtfulness, and ability. It is open to certain criticisms, as, for instance, the fact that several of the curves, notably those displaying "moisture efficiency" and "moisture power," are based upon quite insufficient data. Generally, this applies to the whole paper. There is no adequate