adapted and much used for both purposes. The black mica is unavailable for glazing and flour, but is generally excellent for electric purposes, when not marred by specks and streaks, to which it is peculiarly subject, and which absolutely destroy its usefulness. That which is most in repute for the last-named use, however, is a dark wine-colored or ruby variety from India, called by the trade name "India mica," though the colour is not confined to India, and India produces other mica. The green micas, on the contrary are rather too hard for electrical uses and a bad colour for glazing, as it happens that a greenish tinge sticks to them and is perceptible even in thin sheets; and again, it has been found unfortunately that when ground they give a flour deficient in lustre, so as to be unfitted for this purpose; they are therefore, of inferior value.

"Coming now to the defects properly so called, that of specks and streaks is one to which biotite is peculiarly subject. It sometimes occurs literally pied with black dots, consisting in general of black oxide of iron or garnet, and when even a few of these are present its commercial value is destroyed, because such mica when used as an insulator is peculiarly liable to puncture, the specks forming practically short circuits for the electric current. The same is true of streaks, which are sometimes turned to red rust. Strange freaks in the arrangement of the streaks have been observed, as for instance where a block was half white and half black, the margins being sharply defined by a straight line running through the middle of each sheet; or again where the streaks ran parallel to one or both edges of the block, marking off the sheets like a checkerboard. The causes for these strange formations, as well as for the following similar ones, are entirely problematic.

"Some otherwise excellent mica is found to be ruled or cut, as it were, with a series of perfectly straight lines, parallel to one side of the crystal, so that on being split the mica falls immediately into strips. The defect may be confined to the sides of the block, or extend entirely across, and sometimes the block is "double-ruled" so as to break up into small lozenges. Such mica is of course perfectly good as scrap, though its value as sheet mica be destroyed. Or again, instead of being striped or ruled, the mica is often deeply ribbed or corrugated parallel to the adjacent edges of the crystal, so as to give the appearance of the letter A (or rather V) whence it is termed "A-mica." As the ribbed portion has to be but away in sheets, such mica is also unprofitable, unless the blocks be large. Wedge-mica is that in which the block is thicker at one end than the other, the laminae partaking in the uneveness. Such blocks are wholly worthless except as scrap.

"The reader will doubtless now begin to understand why mica is high-priced. It is not at all that it is a rare mineral, like gold, silver, uranium, etc., but because of the hazards and uncertainties of mining it, and the extraordinary proportion of waste between the rough block and the finished product. But all is not yet told, for even after all else is allowed for, the somewhat irregular sheet of good material must be further diminished in size by cutting or trimming. Electric mica is now generally "thumb-trimmed," but nearly all mica mined in the United States for glazing purposes is still cut into rectangular shape before leaving the mine; and thus nearly one-half of the good portion goes to the scrap heap. Finally, if, as often happens, the square plates of cut mica are again cut up into other shapes, another large fraction of the material is wasted at the point of use."

Speaking of production from this county Mr. Colles remarks that "The Canada mica comes principally from Ottawa county in Quebec, though some is also mined in Perth and Renfrew counties in Ontario, and the mines are chiefly the outcome and the legacy of the "phosphate boom" of the 80's, during which many valuable deposits of mica were discovered in the soft apatite. Here lies at least part of the secret of the cheapness of Canadian mica, for apatite is far more easily mined than the flinty matrices of the pegmatite dikes. The increasing demand of recent years for mica for electrical purposes has caused great development of the mines, modern machinery has been installed, and the production of Canada now equals in value and exceeds in quantity that of the United States. This mica is deficient in transparency and in size, but is considered very good for electrical purposes."

The value of sheet mica produced annually by India is, however, far in excess of that produced either by the United States or Canada, and the quantity would bear a still greater proportion, and moreover the production is on the increase. By values we may reckon the production at the present time about as follows: India one-half, and the United States and Canada each about one-fourth. Of this world's production it is interesting to note that the United States consumes more than one-half, including all its own product, the bulk of that from Canada, and a large fraction of the Indian mica, the amounts of Canadian and India mica imported each being about equal to the home product. The remaining portion of the Indian mica goes almost all to England, and is there partially reshipped to Germany and France, the only other users of consequence.

METALLURGICAL PROGRESS IN BOUNDARY DISTRICT.

THE GRANBY WORKS—THE LARGEST COPPER SMELTING WORKS IN CANADA.

By W. A. Harkin.

THE development of the mining industry in the Boundary country is very largely a record of the progress of the Granby Consolidated Mining, Smelting and Power Co. This will become apparent from an analysis of the production of the various mines, and the volume of tonnage treated at the two existing district smelters. Out of a total tonnage of 410,880 tons in 1900 and 1901 the Granby plant is credited with 293,315 tons. Smelting operations in Grand Forks were not commenced until August 21, 1900, and from a period of two weeks thereafter two furnaces have practically been in full blast ever since. Including the year 1902, up to February 15, the Granby record forms a gross total of 314,000 tons. It must be remembered that the smelter of the British Columbia Copper Co,, at Greenwood (one furnace) did not begin the treatment of ore until February, 1901, since which period it has handled a tonnage approximating 130,000 tons.

A gratifying feature is the increased effectiveness of treatment as compared with the showing during the first year. For instance, in November and December of 1900, the plant treated 36,517 tons of ore, giving a daily average for those two months of 598⅔ tons. During the corresponding months of 1901, the same two furnaces reduced 42,677 tons, or a daily average for those two months of 699⅔ tons,—an increase of 101 tons daily. These figures refer to ore alone—no coke consumed in smelting is included, and no barren fluxes are used, owing to the self-fluxing character of the ores.