

THE CANADIAN MICA INDUSTRY.

The Occurrence, Production, Exports and Uses of the Mineral, together with a Description of Canadian Mines.

Since the application of mica for electrical purposes, the production of this mineral has assumed during the past two years considerable importance and has attracted, on account of its abundant occurrence in Canada, the attention of mining men and capitalists to the Dominion. The United States, and more especially the State of North Carolina, has largely contributed to the world's supply, but owing it is said, to the comparatively limited character of the workable deposits, the output from this source, as may be seen from a comparison of the last census returns, has materially diminished. Quoting from Dr. David T. Day's "Mineral Resources of the United States" for 1889 and 1890, being the last statistical volume issued by the United States Geological Survey, we find the returns of cut mica produced in that country from 1880 to 1890 given as follows:—

OUTPUT OF THE UNITED STATES.

Years.	Amount, Lbs.	Value, \$.
1890	60,000	75,000
1889	81,069	127,825
1881	100,000	250,000
1882	100,000	250,000
1883	114,000	285,000
1884	147,000	367,500
1885	92,000	230,000
1886	40,000	70,000
1887	70,000	140,250
1888	48,000	70,000
1889	49,000	50,000

Writing of the occurrence of the mineral in the United States, Mr. L. B. Childs, (The United States Census, of the U. S. 1890) says, "While deposits have been noted in nearly all of the States on the eastern border of the Appalachian mountain system, it is only in New Hampshire and North Carolina that the industry has assumed at any time much importance. In the West the most important deposits are located in the Black Hills, in the neighbourhood of Hartzville, Wyoming, and in the Cribberville district of New Mexico."

IMPORTS INTO THE UNITED STATES.

The importation of mica into the United States has steadily increased, the sources of supply being Germany, British East Indies, British Australasia, the United Kingdom and Canada, the official returns for a period of ten years ending 31st December, 1890, being as follows:—

1890 (30th June)	Value....	\$12,662
1881	"	5,836
1882	"	5,175
1883	"	9,884
1884	"	28,284
1885	"	28,685
1886 (31st December)	"	56,354
1887	"	49,085
1888	"	57,541
1889	"	97,351
1890	"	207,375

EARLY KNOWN OCCURRENCES OF MICA DEPOSITS IN CANADA.

Canada has long been known to be rich in the occurrence of economic mica deposits. More than thirty years ago, Sir William Logan, (Geology of Canada, 1863, pp. 494-5, and 795) referred to the deposits of muscovite, then known to exist on Yeo's Island, Cape Tourmente and other sections of the Province of Quebec. Mention is also made of the Philopates at Grenville, Que., and in North and South Burgoyne, Ontario. "In all of which," says Sir William, "the mica is obtained in large sheets, which being transparent and free from flaws are wrought and employed for the same purposes as the muscovite or potash varieties." A crystal from Grenville was so large as to furnish sheets measuring twenty-four by fourteen inches. Good mica was also found on the tenth lot of the fifth range, and on the first lot of the tenth range of Grenville, as well as farther to the westward in the augmentation of this township. On the 17th lot of the Township of North Burgoyne, large crystals of magnesian mica were found in abundance in a bed of soft pyroxyenic rock. The mica was traced for about 300 feet and considerable quantities were extracted. "It appears," concludes Sir William, "that in this region, and in Grenville, sufficient quantities of mica could be obtained to supply a larger demand." In 1884 an important deposit of muscovite was opened at the Villeneuve mine, in the Township of Villeneuve, Ottawa County, and a considerable quantity has been mined at different times up to the present date. Another early producer was the Sydenham Mica and Mining Co., in the Kingston district.

CANADIAN PRODUCTION OF MICA.

Until the past three years, the production of the mineral in Canada was limited, the output being almost wholly consumed by foundries for the panelling of stoves and furnace doors. A certain quantity, however, was ground for lubricants, fireproof paints and cements. Referring to the statistical report issued by the Division of Mines, (Geological Survey of Canada, 1891) we find the following returns:—

1886	\$29,008
1887	29,816
1888	30,207
1889	28,718
1890	68,074

The discovery of its value as an insulator and the rapid extension of its use in electrical practice, however, has had a marked effect in stimulating the development of the Canadian industry. In 1891 the production had increased in value to \$71,510, while, in 1892 and in the first six months of the present year the exports as reported to the CANADIAN MINING REVIEW were:—

Port of Ottawa, to the U. S.	\$54,729.82
" Brockville, to the U. S.	6,608.44
" Kingston, to the U. S.	11,421.00

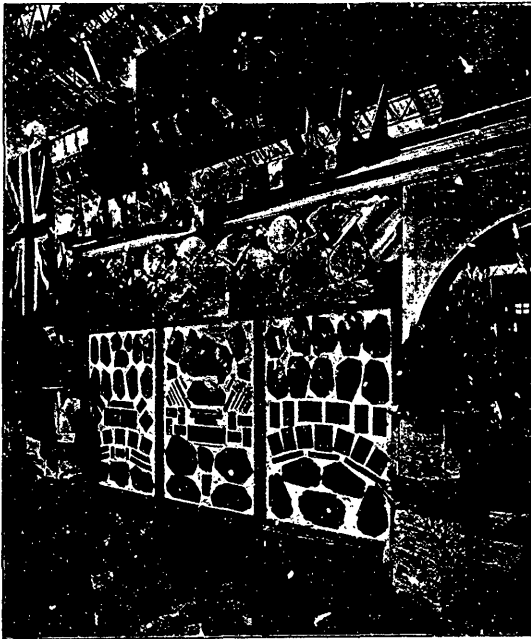


Exhibit of the Lake G'ard Mica Mining System, given highest award at the World's Fair, Chicago.

" Montreal, to G'l. Britain.	\$ 615.00
" " United States	1,473.00
Total cut mica....	\$2,088.00
Port of Montreal, to Great Britain	\$ 179.00
" " United States	4,313.00
" " Germany....	485.00
" " Newfoundland	25.00
Total ground mica....	5,002.00
Total to 31st January, 1892 ..	\$79,849.26
To 31st July, 1893.	
Port of Ottawa, to United States	\$27,156.82
" Brockville, " (to end of April only)	3,614.53
" Kingston, to United States	19,135.00
" Montreal, to Great Britain and United States	1,792.00
Total from 1st Jan., 1893, to 31st July, 1893,	\$131,567.31

COMMERCIAL APPLICATIONS OF MICA.

USE IN ELECTRICAL INSULATION.—On account of its superior cleavage, Canadian mica is greatly favored by electricians in the United States, and notwithstanding a duty of 33% *ad valorem*, it has more than held its own against local and foreign products in that market. "The bulk of the mica used by us," writes the Edison General Electric Co. of New York, "is Canadian mica, which is known in the market as 'amber mica,' being of amber color and clear. It is essential that the mica should be smooth, free from wrinkles and crevices, it must split readily and must be flexible, so much so that a piece of mica .010 in. thick would bend to a curvature of about 3 in. diameter without cracking. Mica that has dark spots or spots similar to rainbow colour, or what is known as smoky mica, is not at all suitable for electrical purposes. Mica must also stand a flame of intense heat without crumbling up, or showing any disintegration. We give you below the principal size of mica used by us, and would say that at the present time we have orders for some of the sizes ranging from 200 to 600 pounds:—Commutator mica: 1 1/2 x 4 in., 1 1/2 x 6 1/2, 1 1/2 x 4 1/2 x 1 1/2 x 6 1/2, 1 1/2 x 8, 1 1/2 x 8, 2 x 5, 2 1/2 x 5, 2 x 7, 2 x 12, 2 1/2 x 12, 4 x 4, 5 x 8. Binding mica, 1 1/2 in. wide."

"The insulating power of mica," says an eminent electrician, is superior to that of any other substance applicable to armatures. An advantage peculiar to itself, is its even laminated structure. The builders of armatures can split the sheets into any desired and uniform thickness with great ease and accuracy. A valuable property of mica in connection with commutator insulation is its proper degree of hardness, which does not wear away too rapidly under the action of the brushes.

Of all substances mica is probably the best material for use in armatures, if it is desired to obtain not only efficient electric insulation, but also durability under the influence of heat. The highest temperature to which an armature is subjected even by short circuits or bad constructions, will have no injurious effect on mica. Mica thick or thin may be held in a gas flame without burning or melting.

Mica for electrical purposes must be flexible and non-conductive. Color does not matter, but perfect cleavage is of the highest importance, as "electrical mica" must be of uniform thickness, and is often gauged to the thousandth part of an inch. Thicknesses and shapes of sheets vary greatly, 450 different patterns having been collected for. The price is from 10c. to \$2.50 and upwards per lb., and varies with the size of sheet and difficulty of cutting the pattern.

MICANITE.—One of the most recent uses to which mica is commercially applied is in the manufacture of micantite, by which large quantities of scrap or inferior qualities are utilized, and by means of a patented process, small pieces of waste mica are built up into sheets 40 inches square and larger if necessary. The product can also be made in any desired form and is largely supplied to the electrical trade for insulating purposes.

PAINTS, WALL PAPER AND ORNAMENTAL USES.—Another use for mica is its application, when previously colored or metallized, to ornamental purposes. From its unalterable nature the material presents a gliding, silencing or coloring from deterioration, and from its diaphanity, the articles so treated will preserve all their brilliancy. Finely ground mica, or colored gelatin, also shows handsome effects, and when mixed with a solution of gum arabic, it makes a good silver ink. The gelatin combination is used for inlaying buttons. Another beautiful application of mica is in the production of bronze-like colors, which bear the names of bronzes, crystal colors and mica bronzes. Among the advantages of these are that they are indifferent to sulphurous exhalations, are very light in weight, and in some colors are even more brilliant than the metal bronzes. When small particles of mica silver are spread over articles coated with asphalt varnish, the result is a good imitation of granite. The crystal colors are also suitable for calico printing; and fabrics to which they are applied surpass in brilliancy the heavy bronze and glass dust fancy fabrics of yore. Such colors have been used to decorate porcelain and glassware, the articles undergoing a second heating up to the fusing point of their glazing. By suitable dyes, the material is colored to a variety of hues.

MICA FOR GLASSES AND SPECTACLES.—The best employment of the immense quantities of scraps and fragments of waste mica which suggests itself as worthy of a wider field than it now possesses is the substitution of mica for glass in spectacles worn by workmen, especially stone and metal workers, to protect their eyes from chips and splinters. As already made in Germany, the mica glasses are conceived in the shape of watch glasses, and are about one twenty-fifth of an inch in thickness. The advantages gained by this utilization are greater than would at first be imagined. Mica spectacles cannot be broken. Pounding with a sledge hammer merely flattens them, nor does molten metal poured on the mica affect it. The shower of pointed iron particles which issues from lathes merely rebounds from the elastic mica glasses.

AS A LUBRICANT.—The mineral is somewhat extensively used in the manufacture of mica grease. As a lubricant for railroad purposes its value lies in the fact that it is absolutely anti-friction, and it is claimed with its use hot boxes or journals are simply impossible.

OTHER USES.—Mica has been used on board war ves-