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CANADIAN ABRASIVE MATERIALS

Mines Branch Will Investigate Their Occurrence and Uses

One of the principal functions of the Mines Branch of the Department of Mines is to carry on field investigations of mineral resources to aid in the development of the mining industry. The public generally are ill-informed about the potentialities of Canada's mineral resources and realize neither their importance nor their relations to every day life and occupations. True, reports of mineral production are published annually, and the public has a limited knowledge of such relatively common metals as gold, silver, iron, or copper, or such non-metallic materials as coal or limestone, since these products play an important part in Canada's economic life. Many of the minerals that are essential to industry are almost totally unknown to any but specialists.

One group of these are the natural abrasives, such as tripoli, sandstone, garnet, or corundum, without which many of our manufacturing industries would be at a standstill. It is true excellent artificial abrasives are employed in many industries, but these are all made from natural mineral products. There are some operations for which natural abrasives are best suited. During the present summer one of the mining engineers of the Mines Branch staff, Mr. V. L. Eardley-Wilmot, is conducting an investigation into the location of deposits, possibilities, uses, and methods of development of the various natural abrasive materials which are found in Canada; he is also inquiring into the processes employed for preparing these materials for market and will study the requirements of the manufacturers using this class of materials.

Abrasive Materials Found in Canada.

The principal abrasive minerals known to occur in Canada are corundum, garnet, quartz, tripoli and infusorial earths, volcanic ashes, sandstones, and quartzites. Specimens of corundum in their purest form are the well known gemstones, ruby and sapphire, which differ slightly in chemical composition, but chiefly in color; the crudest varieties constitute emery. The variety found in Canada is neither so pure as to be called emery nor so pure as to be valuable as a gemstone. It is found in commercial quantities in an igneous rock in several places in Renfrew and Hastings Counties, Ontario. This mineral is comparatively brittle and is hard enough to scratch glass or a steel knife blade easily. The material used as an abrasive which is pure but opaque is crushed to sand and powder and is graded into sizes for marketing. The demand is limited, because certain artificial abrasives can be made more cheaply from imported natural emery, and the annual production is small.

Tripoli and infusorial earths are siliceous materials, consisting of accumulations of the discarded shells of minute unicellular plants known, on account of their minute size, as diatoms. These deposits are found in the bottoms of old lakes or swampy areas, and are frequently contaminated with clay, iron oxide, silt, or other materials. This product occurs exclusively in powdered form, and is slightly harsh to the feel. Where the deposits are dry the material may be caked, but it readily disintegrates. Tripoli has been found in several provinces, and has been produced commercially in Nova Scotia.

Grindstones for use in machine shops, pulpstones for use in paper mills producing mechanical wood pulp and burrstones for milling wheat and

oats are shaped from natural sandstones which occur in beds. The thickness of the bed of stone determines the width of the face of the stone. Most of the grindstones made in Canada are used in metal grinding; pulpstones and burrstones are nearly all imported, although experimental work instigated by the Mines Branch has shown that very good pulpstones could be produced in Canada. In addition to grindstones, whetstones and scythestones are made from natural sandstones. In 1921 there were 1,281 tons of abrasive stones, valued at \$64,607, produced and sold by quarrymen in Nova Scotia and New Brunswick. In the same year grindstones and burrstones to the value of \$452,899 were imported chiefly by the paper mills and flour mills.

Garnet is a natural mineral, slightly softer than corundum, which is used for making polishing powders, wheels, stones, and polishing or smoothing cloths or papers. It has been produced commercially in small quantities from Haliburton County, Ontario, and large deposits, as yet undeveloped, occur in the Muskoka region.

Artificial Abrasives.

Two kinds of artificial abrasives are made in Canada in electric furnaces. One of these is made from coke, sand and hardwood sawdust; the other is sometimes made from imported emery, but more commonly from imported bauxite, an ore of aluminum. The first product is well known to many users under the trade name of carborundum. Other products which are essentially the same are sold under such names as carbolon, carbosolite, crystolon and electroton. The abrasive made from emery or bauxite is essentially artificial corundum. This product also is marketed under a variety of trade names, such as aloxite, alundum, coralex, exolon, artificial alumina, and others. There are two electro-chemical centres in Canada at which these products are made, one in the vicinity of Niagara Falls, Ontario, the other at Shawinigan Falls, Quebec. Three firms are engaged in the production of carborundum at four plants, and five firms are manufacturing artificial aluminous abrasives in six plants.

Rouge and crocus powder are made by calcining ferrous sulphate in crucibles. Ferrous sulphate is obtained as a by-product in the manufacture of tin plate, terné plate, and galvanized iron.

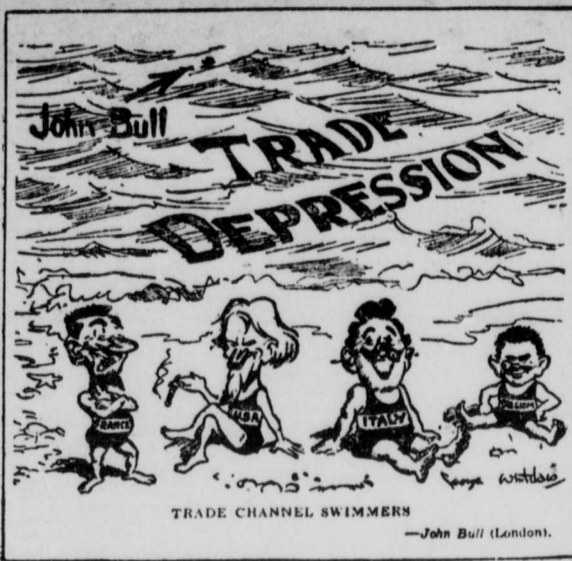
Uses of Abrasives.

Grindstones, scythestones, and whetstones are made directly from blocks of natural sandstone that are free from flaws. Artificial stones, emery wheels, and cutting wheels of many kinds are made from powdered abrasive materials, either natural or artificial, by the use of certain binders. The crushed abrasive materials are graded into definite sizes by screening. A suitable quantity of a selected size of grain is then mixed with a binding material and pressed into special moulds. The binders used differ according to the service to which the finished product is to be applied; clay, shellac, water glass and rubber are sometimes used for this purpose. The wheel or block is removed from the mould and is dried or cured, and is then baked in a special oven to harden the binder.

The finer grades of abrasives in powdered form are used for fine grinding and polishing. They are sometimes sold as dry powders, but more often they are made into pastes with grease, oil, petrolatum, or water and glycerine. These products are familiar as valve grinding pastes and metal polishing powders.

Intermediate grades of crushed garnet, crushed glass, sand, emery, carborundum, alundum, and other products are used for making abrasive cloths, such as emery cloth and abrasive papers, such as sand paper, garnet paper, and others.

The investigations undertaken by the Mines Branch will undoubtedly aid in broadening the market for native abrasive materials, and they will also make available to Canadian manufacturers and users of these products much information about these materials, their properties, and uses.



(Great Britain is the only country attempting to pay its debts and the only country struggling with trade depression).

Days.

Some days one touches lightly
As seagulls touch the foam,
Finding no joy, for dreaming
Of joy that is to come.

Or luring ghosts of laughter
Down dim forgotten ways
Where luring winds stir the ashes
Of buried yesterdays.

To-day I have lived deeply,
On currents strong and free
As those that sweep the ocean
This day has carried me.

Where Yesterday is only
A faint receding shore,
And somewhere lurks to-morrow
An island to explore.

But I am kin to neither;
For me does naught exist
Save wide gray seas of water
And freedom and a mist.

No day has been save this one,
No day shall ever be,
No day I will touch lightly
To keep this memory.
—Helen Frazee-Bower.

How Pearls are Strung.

One of the "closest" professions in Britain is that of pearl stringer. This craft is handed down from mother to daughter, and as the pearls being strung are often of untold value, there is not much of an "open door" for outsiders.

The work is not as easy as it sounds. Indeed, it takes over a year of incessant practice to master the knot that holds each gem in place. It is no ordinary knot, and the pearl stringer has to be able to place it accurately. If it is only one hair's-breadth out, it will spoil the hang of the necklace.

So the knack of this accurate placing has to be acquired before the worker is allowed to string a pearl. The needle used is very short and is made of wire as fine as a hair. The pearl stringer is taught to thread the pearls so that they merely touch each other lightly. If wrongly strung, there would either be a gap between the pearls or they would look crowded.

Germans Have Eclipse Data.

German astronomers who observed the recent eclipse of the sun from a point in Mexico feel sure their photographs are the best taken and are hastening to the observatory at Potsdam to develop the plates and work up the data. It will be remembered that several expeditions, notably those stationed at San Diego, Cal., were badly handicapped by clouds at the moment of total obscuration.

Prof. Hans Ludendorff, brother of the German General, was in charge of the German astronomers, and he will be assisted by Prof. Einstein, who has left Holland for Berlin. In determining just what the observations prove. It will take months, however, for the data to be worked up and full conclusions drawn. An American expedition and one from France also observed the eclipse under good conditions in the Mexican mountains, and the completion of the work really makes a three cornered scientific race.

Marvellous!

Visitor—"How old are you, Maggie?"
Maggie—"I'm five, and mother says if I'm good an' eat lots of oatmeal I'll be six next birthday."

"A mind content both crown and kingdom is."—Greene.

If you want a happy home, see to it that your wife's husband helps toward the happiness.

Minard's Liniment for Dandruff.

A Fallen Planet?

Astronomers have long known that between the orbits of Mars and Jupiter a large number of tiny planetary bodies revolve round the sun. Some of these have a circumference of but a few miles.

In addition, there are countless billions of what might be called meteoric stones hurtling round the sun. These are constantly entering the earth's atmosphere and being burnt up by the friction much more completely than the moth that flies into the candle flame.

Has one of the small planets ever entered our atmosphere and landed on the earth without being entirely consumed? If it ever did, it was long ages before man appeared upon the earth, for the impact of such an outsider would cause an earthquake indeed.

However, in Arizona there is a curious eminence called Coon Butte which rises about 150ft. above the plain. At the top is a depression or crater 4,000 ft. wide and about 150 ft. deep. Scattered far and wide around this hill are fragments resembling meteoric iron which contain microscopic diamonds and many curiously-shaped boulders.

It is suggested that this hill was formed by the impact of a gigantic body from the outside, and mining operations are to be started with a view to discovering whether the theory has any foundation in fact.



Appreciated Attention.

Traffic Cop—"Didn't you see me wave to you? Why didn't you stop?"
Miss Passay (pleasently excited)—"I didn't see you at all, officer! Now what is it?"

Minard's Liniment Heals Cuts.

Impossible.

The wife was greatly pleased with her success at the women's meeting. On her return home she said to her husband: "Yes, I was absolutely outspoken at the meeting this afternoon."
Her husband looked incredulous.
"I can hardly believe it, my dear," he said. "Who outspokened you?"

Even deep-seated rust on steel or iron can be removed by applying a coat of unsalted lard, then dusting over this very fine powdered lime and letting it remain until rust disappears.

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