Graphite

One of the non-metallic minerals with which the public is more intimate is graphite, otherwise known as plumbago or black lead. It is a soft, dark grey, opaque solid, of a greasy metallic lustre found in detached masses, beds, crystals and sheets. Ceylon is the chief source of the world's supply of graphite, but it is also produced in Canada, England, New Zealand, Siberia, Germany and the United States. In Canada it is found in Northern British Columbia, in Eastern Ontario, in Ottawa, Argenteuil and Pontiac counties in Quebec, in Carleton, Charlotte and St. John counties in New Brunswick, and in Cape Breton, Inverness and Halifax counties, Nova Scotia.

Graphite occurs usually in the fissures or veins of granitic or similar rocks, but is also found as isolated plates, patches and pockets in what are known as bedded veins. It is commonly associated with quartz, calcite and mica, according to the rocks in which the graphite occurs.

The crude graphite must be very finely ground, to detach it from associated minerals, after which, by a concentration process, it is separated from the accompanying mineral particles. It is very carefully graded, both as to fineness and purity, to eliminate particles of grit.

Graphite is best known through its use in the manufacture of lead pencils. For this purpose it is mixed with clay, moulded into shape and baked. The proportion of clay used regulates the hardness of the pencil. For pencil-making the best graphite is secured from Borrowdale, Cumberland, England, and Batugal, Siberia.

Other uses of graphite are in the manufacture of stove polishes, and paints for ironwork, of crucibles for the casting of metals, and of electrotypes. As a lubricant graphite is used, both in dry form and mixed with grease or oil, in many industries where heavy work and high speed are required. In foundries it is used in facing moulds to give smooth-finished castings. The electrical industry is using large amounts of graphite, and in the manufacture of gun-powder it is utilized as a moisture-proofing material.

Canada produced 2,227 tons of graphite in 1920, valued at $173,537, as against 1,360 tons in 1919, of a value of $100,221. In 1920, Quebec contributed 233 tons and Ontario 1,994 tons, while, in 1919, almost the entire output was from Ontario.

By the use of by-product ovens, the coking plants at Sydney, N.S., Hamilton and Sault Ste. Marie, Ont., and at Anyox, B.C., in 1920, produced 14,026,172 gallons of tar and 19,142 tons of ammonium sulphate. In 1919 the production was 12,394,249 gallons of tar and 11,765 tons of ammonium sulphate.

Important Forest Trees of Canada

Douglas Fir

(Pseudotsuga mucronata)

Both botanists and lumbermen have experienced difficulty in selecting a name for this tree. It has been classified as pine, spruce, hemlock and fir, and is largely known yet in the export lumber trade as "Oregon pine." Though the wood somewhat resembles southern pine in appearance and texture, the tree has none of the distinguishing characteristics of pine. The leaves are very much like those of the true firs (Abies), but in other respects it is quite different.

Though almost entirely confined in its distribution to the Pacific states and the southern half of British Columbia, it is perhaps the most important tree from a lumber standpoint on the continent. In Canada, it is second only to spruce (which includes several species) in the quantity of lumber produced. In 1919, over 800 million feet, comprising 22·6 per cent of the total lumber cut in Canada, was Douglas fir, and exceeding the cut of white pine by 70 per cent.

The growth of the Douglas fir industry is due mainly to the large accessible supply and the superior quality of the wood.

The survey of the forest resources of British Columbia, conducted by the Commission of Conservation, showed a total stand of 76 billion board feet of Douglas fir. Not all of this is commercially accessible at present, but, since over 80 per cent is situated on Vancouver Island and the adjoining mainland, a large proportion is within reasonable hauling distance of salt water. About one-half of the fir in the interior of the province is adjacent to rail or water transportation. The extensive system of protected waterways along the coast offers exceptional opportunities for logging and for the towing of logs to manufacturing centres, which greatly facilitates the exploitation and marketing of the timber.

Extensive tests have demonstrated that, of the native species, Douglas fir is the strongest wood for its weight and it is, therefore, particularly valuable for construction purposes. There is considerable variation in the strength of different samples of Douglas fir, due to different conditions of growth. In order to secure maximum and uniform strength, the lumber should be graded according to the density rule which has recently been adopted. For dense Douglas fir, this rule stipulates that there must be at least six annual rings per inch, and that at least one-third must be summer-wood. Though technically a soft-wood and easily worked, Douglas fir presents a hard wear-resisting surface, especially on the edge grain face which makes it valuable as flooring. The distinct alternating rings of light spring-wood and dark summer-wood form a very attractive grain when cut tangentically, and for this reason it is extensively used for sash, doors, panels and other interior finish.

The trees grow to immense size, frequently exceeding six feet in diameter and 200 feet in height. Owing to its intolerance of shade, the lower limbs soon die and drop off in the dense forests, leaving long, clear boles with very little taper. This makes it possible to secure timbers and masts of very large sizes and also a high percentage of clear lumber.

Douglas fir reproduces prolifically and grows rapidly under suitable conditions. A light fire, such as is secured in slash burning after cutting, promotes the reproduction. It is being used extensively for reforestation in Great Britain and continental Europe, where it is found to succeed better than the native species.

For planting in eastern Canada, care should be taken to secure only stock from the interior mountainous portion of British Columbia, as the coast type will not withstand the severe winter climate. It is doubtful if even the mountain type will prove of much value in the east except for ornamental purposes.—*R. D. Craig.*

Hogs on Pasture

Cost of production plays a very important part in determining the net profit a farmer makes on what he has to sell. Manufacturers of the articles that a farmer has to buy study the question of cost of production very carefully. The farmer produces many of the things the urban worker has to buy and should do more towards lessening production costs. Take as an example the production of pork. Economical production of pork depends largely upon the cost of feeds. This may be materially reduced by the use of pasture and forage crops in conjunction with the grain ration. If the pasture is luxuriant, mature hogs may be maintained in a satisfactory condition with a very small amount of grain in addition to the pasture.

Pasture forage has a variable composition. Alfalfa, clover, vetch and peas furnish feed much higher in protein than most other crops. Where such leguminous crops are used for hog pasture a smaller ration of concentrates is necessary than where timothy, bluegrass, or where the non-leguminous cereals are sown for pasture. Hog raisers differ in their opinion as to the quantity of grain that should supplement the pasture. Some give the hogs all they will eat, others from two to three pounds of grain per hundred pounds live weight of the animals, while some feed as low as one pound of grain per hundred weight of the live animals. The amount of grain which should be fed to growing hogs or hogs being fattened must depend on the quality and abundance of the pasture, the length of time available for finishing the animals and the gains being made. Plenty of clean water, clean quarters, and succulent pasture, along with the grain ration, will certainly reduce the cost of producing pork and increase the profits.

—*F. C. Nunnick.*

A Meal of Cut Worms

C. A. Nash, of Toronto, records an experiment with the robin as a cutworm destroyer. One young robin, kept in confinement, ate 165 cutworms in a day. Had he been compelled to find his own food he would probably have varied it somewhat, as he would not likely find so many cutworms. What he could do when he had the opportunity was clearly demonstrated.

Killing Surplus Buffaloes

The increase in the number of buffaloes in Buffalo Park, Wainwright, Alta., has reached such proportions that it is proposed to slaughter 1,000 of the animals this year. It is expected that a considerable sum will be realized from the sale of the meat, hides and heads.

Pigs in Alfalfa near Indian Head, Sask.