REVIEW OF DOMESTIC POTASH PRODUCTION

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Many products begun in 1916 became active producers in 1917, and many former producers enlarged their capacity. At the close of 1917 there were 91 potash plants (including 45 producnig potah from wood ashes) in operation, and the production of the year amounted to 32,573 tons of potash (K2O) valued at $15,980,577. About 45 per cent of the output came from Nebraska brines, 18 per cent from Searles Lake and other bines, 11 per cent from kelp, 9 per cent from molasses distillery waste, 7 per cent from alumnite, 5 per cent from cement mills, and the other 5 per cent from blast furnaces, Steffins water, from sugar refineries, wool washings and wood ashes.

During 1918 more than 108 firms produced potash in the United States from ten ditinct sources. At the close of the year several new potash plants were about ready to begin operations, several were under construction, and a number of new companies had been organized. The estimated productive capacity was about 100,000 tons, valued more than $20,000,000 and represents more than 22 per cent of our normal consumption.

Sources of Domestic Potash.

Miscelaneous Organic Sources.—The production of potash from wool washings, tobacco stems, olive oil residues and other miscellaneous organic sources, though important, is small and will probably never amount to more than a few hundred tons annually. This statement does not refer in any way to natural potash manures, which may be used in

Wood Ashes.—At the present time about 45 companies are poducing potash from wood ashes, principally in Wisconsin and Michigan. The product is essentially a mixture of the carbonate and hydro-oxide, containing probably about 60 per cent potash (K2O). The production increased from about 412 tons of K2O in 1916 to about 567 tons in 1917, and to about 600 tons in 1918. The production from this source will never be large because of the scarcity and widespread distribution of wood ashes.

Steffins Waste Water from Sugar Refineries.—A recent important development is a by-product recovery of potash ordinarily wasted in the Steffins waters from the beet sugar refineries. Estimates put the amount of potash (K2O) now going to waste in Steffins water at about 8,000 tons. Seven companies produced 1,174 tons of potash (K2O) from this waste material in 1918 and several other companies installed potash plants. This source is saving from a large industry already established and so gives promise of permanency.

Molasses Waste.—Molasses residue from distilleries have been utilized as a source of a production of potash in California, Louisiana, Massachusetts, Pennsylvania, and Porto Rico, by far the largest yield from California. The production in 1916 was 1,845 tons of actual potash (including the small amount produced from Steffins waste waters). In 1917 the production from distillery waste alone was 2,846 tons and in 1918 about 3,352 tons. Estimates indicate that about 30,000 tons of potash are lost annually from the 25 or more distilleries using molasses. Efforts should be made to bring the production from this source up to capacity, and utilize a waste product from a well established industry.

Kelp.—More than ten companies have erected factories on the Pacific coast for producing potash from kelp, with a combined annual capacity estimated at between 5,000 and 10,000 tons of K2O. The Hercules Powder factory is the largest plant and has been the largest producer. The production from kelp increased from 1,556 tons of K2O in 1916 to 3,572 tons in 1917, and to 4,637 tons in 1918. It has been predicted that the available resources in raw material would not permit of a large increase in production from this source. Furthermore the cost of production is high and the price of potash is falling. Nearly all the kelp potash producers have closed their plants in anticipation of a price at which they could not operate.

Alunite.—The only known alunnite deposits in the United States of commercial value are located in the vicinity of Marysville, Utah. Several companies are interested in these properties. The Mineral Products Corporation produced potash from one of the principal claims during most of 1916, 1917 and 1918. The Florence Mining and Milling Company has a calcimning plant near Marysvale; the American Smelting & Refining Company has built a plant at Mirray, Utah; and other companies have been active.

Sufficient data are not available to justify an estimate as to the quantity of alunite rock available for potash production. Butler and Gale estimated the amount in one group of claims at 300,000 tons for each 100 feet in depth, and Loughlin increased this estimate to 475,000 tons. Loughline suggest the deposit may reach a depth of about 1,000 feet. The quantity available in other claims is largely a matter of conjecture. It appears, certain, however, that there is sufficient alunite in the Marysvale district to yield a large tonnage of potash for many years.

Blast Furnace.—Apparently systematic efforts have not been made to produce potash from blast-furnace dust, although several companies have reported production. Estimates based on inconclusive evidence have placed the amount of potash (K2O) charged annually into blast furnaces in the United States at 380,000 tons a large part of which is volatilized and goes to waste with the gases. This source may eventually supply a substantial part of our demands. Developments should be encouraged.

Cement Kilns.—Several cement plants have installed the Cttrell electric precipitation system and some have installed other dust-collecting apparatus in order to obtain potash as a by-product in the manufacture of cement. Much experimental work has been done in connection with the problem. Production has been small but regular for more than three years.

In 1914 there were 1[illegible] cement-producing plants in the United States, with an annual capacity of about 90,000,000 barrels. Recently W. H. Ross and others of the Bureau of Soils have made a careful study of the potash content of the operating conditions in nearly all the cement plants in the United States and Canada with the view of determining the amount of potash recoverable in the dust from these plants. Their conclusion is that under the present operating conditions about 1.66 pounds of potash is recoverable in available form for each barrel of cement produced representing a total of about 75,000 tons of actual potash (K2O) annually and that by changing the operating conditions slightly the amount could be increased to about 100000 tons.

Silicate Rocks.—Many processes have been devised for extracting potash from silicafe rocks and considerable experimental work on a comparatively large scale has been done to demonstrate the commercial practicability of some of these processes but so far only a very small production from this class of raw materials has been reported. Several large plants however, are about ready to begin the extraction of potash from silicate rocks.

Among the raw materials to be considered in this connection are the deposits of greensand (glauconite) in New Jersey, Delaware and Maryland which carry about 7 per cent of potash; the fieldspar deposits from Maine to North Carolina; the potash bearing rocks of the Leucke Hills in Sweetwater county, Wyoming, which carry about 10 per cent of potash; sericites and slates of Georgia, said to carry about 9 per cent of potash; and the tilings collected in dumps at certain copper and gold mines in the west, which carry probably from 5 to possibly as high as 10 per cent of potash. Fieldspar often contains from 10 to 14 per cent of potash (K2O) but a series of analysis (unpublished) by the United States Geological Survey indicates that the average quarry product rarely contains over 7.5 per cent.

No estimates of quantity for fieldspar and sericite are available but the quantity of these materials is known to be very large. Washington estimated the potash in the greensands of New Jersey at 2,034,000 metric tons. Schulz and Cross

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