THE FUTURE OF AMERICAN POTASH

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Much of the responsibility for the future of potash in America rests with Congress and the National Administration backed by public sentiment. Some people will be against protection and further development, because of selfishness springing from local conditions, but most citizens may be expected to reflect a larger and more patriotic view. Though the dominant factor in the future of the industry will be federal legislation, this procedure will be influenced by such things as the extent of the domestic potash resources, the cost of production, the attitude of fertilizer companies, German propaganda, the amount of capital invested in American plants and the treaty relations. The ultimate purpose should be to conserve the industry for the good of the country by creating a sure supply of potash at a low cost to the consumer.

Domestic Potash Resources.

Our potash resources were not fully investigated prior to the war mainly because cheap potash was coming in from Germany. When the war cut off the foreign supply, it became necessary at once to make a strenuous search for domestic potash. Surveys were organized and made by federal and state departments and by private intersets. The surveys and investigations were unusually successful and production was soon started from various sources as from the natural brines, various kinds of rocks and industrial plants. The high price received for the domestic production was a stimulus for investigation and development.

It is now known that the United States is richly endowed with potash resources, occurring under a wide range of conditions. The natural brines, cement plants, beet sugar factories distilleries and silicate rocks appear to be the most promising sources for future development.

The Industry Established.

The government urged the development of domestic potash. The response was prompt and with good results. Starting with very little output of potash at the beginning of the war, the amount rapidly increased until there was a production of about 60,000 tons of K20 in 1918. The production was about 1,000 tons of K20 in 1915; 9,220 tons in 1916; 26,700 tons in 1917; and 60,000 tons in 1918. In the United States there are now about 90 potash plants, large and small, representing an investment of about $50,000,000. The largest installations are in Nebraska, southern California, and Utah, yet Colorado, Wyoming, Wisconsin, Michigan, Illinois, Indiana, Kentucky, New York, Massachusets, Pennsylvania, New Jersey, Maryland, Georgia, Louisiana and other states have become producers of optash.

I will briefly view some of the potash developments in order to show how the industry stands with respect to its future possibilities.

Potash from Wood Ash.

This is one of the oldest sources, especially in wood areas. Ashes are collected mainly from the burning of fire wood, stored and leached for making lye, which is especially a strong potash brine. The hard woods are well suited for this purpose. Much of the production is in isolated places where the lye is made for home consumption and has no commercial importance.

A number of the big lumber companies, notably those of Michigan and Wisconsin, produce a large amount of waste in the form of slabs, short pieces, strips, bark and saw dust. Much of this waste is burned to prevent fires and to get it out of the way. The burning produces ashes which are crudely treated by leaching. A better grade of product could be formed by leaching, evaporation, and crystallization. It is estimated that something like 1,000 tons of commercial potash was manufactured at the saw mills in 1918.

There has been some recovery of potash from corn cobs, corn stalks and other plant materials. Potash occurs in considerable quantities in soap weed, sage brush, mesquite and sun flower plants. Some sun flower potash has been imported from Russia.

It seems now that we should not expect to manufacture potash in a large way from the woody plants, scrap timber and saw dust. The production from these sources will go mostly for local use and will supplement the output from other sources.

Potash from Distillery Wastes.

Alcohol is made at a number of plants in the United States from molasses containing potash. The molasses is secured principally from the cane sugar mills. In the manufacture of alcohol, the inedible molasses is diluted with water, treated with acid and allowed to ferment. The alcohol is removed by distillation leaving a liquor known as distillery slop in which occurs a mixture of potash and other salts. This liquor is evaporated and charred, making crude potash which runs from 25 to 40 per cent K20.

It is estimated that in 1915 there was a loss of 38,690 tons of K20 in the distilleries of the United States, much of which could have been conserved. In 1917 four companies of California, Louisiana and Porto Rico produced from this source 8,589 tons of materials, containing 2,846 tons of potash. Additional installations were made in 1918 and the production is increasing.

Potash from Beet Sugar Factories.

Beets contain about 0.303 per cent of K20. The 6,000,000 short tons of beets grown annually in the United States carry about 18,000 tons of K20. This potash is largely extracted as juice, condensed in the residues of the low-grade molasses, and finally lost in the Steffenhouse waters. There are 102 beet sugar factories in the United States.

The recovery of potash at the sugar factories requires large vats in which to hold the Steffenhouse waters, and dries in which to handle the product after it has left the evaporators and effects of the factory. This means that much of the regular equipment is used in the recovery of potash.

In 1917, five sugar factories—three operating in California, one in Colorado and one in Michigan—reported a production of 2,642 tons of crude potash, the equivalent of 369 tons of pure K20. Additional installations were made in 1918. One of these, located at Scottsbluff, Nebraska, recovered 1,620 tons of potash salts, running about 45 per cent K20.

The potash or the beet sugar plants is a by-product made at relatively low cost. Here is a field which warrants further development. It should become a factor in solving the potash problem of the country.

Potash from Kelp.

Kelp is a sea weed containing a high percentage of potash absorbed from sea water. It grows at a number of places along the Pacific coast. The United States Geographic Survey estimates that there are 160 square miles of commercially valuable kelp on the coast of Alaska; five square miles on the coast of Puget Sound and 225 square miles on the coast of southern California, or a total of 390 square miles on the Pacific coast. The sea weeks of these areas are said to produce an annual growth of 59,300,000 short tons of kelp carrying 2,226,000 short tons of potassium chloride or 1,431,446 tons of potassium oxide.

The above statement by the Survey should not be taken very seriously as indicating the future of potash. In the first place, the kelp is under the control of departments having to do with fish culture. In the second place, the experience in recovering potash from kelp has not been entirely successful. There were ten producers in 1916, six in 1917, and all of them closed in 1918.

It is now thought that the kelp resources of the Pacific coast could be caused to supply about 3,000 tons of K20 per year under good management. The cost would be quite high, yet the recovery would give, not only potash but one or more by-products of value. In the simplest methods of production of potash from kelp, the weeds are gathered or harvested, dried, and ground for use as a featilizer. Part of the production is charred by burning in the open or in especially devised equipment known as kelp furnaces. The kelp char con-

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