

## THE BUSINESS ASPECT OF THE KELP PROPOSITION.

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It is thoroughly well established that the giant kelps of the Pacific provide an enormous store of KCl. Various papers have appeared upon the broad, general aspect of the question, but for the most part they have dealt in glittering generalities and many of them have started in the middle of the proposition. Many writers neglect or slur over the gathering and preliminary drying of the kelp, and base their real consideration of the subject upon the air-dried material. This is very attractive and easy to do, but the cost of the air-dried kelp is a most serious business consideration.

There are various technical and business problems connected with the matter. Without in the least doubting the eventual solution of these problems, it may be said with entire safety that their solution with financial profit will require the expenditure of much time and money, under the best technical and business direction, and that it must be several years before KCl from kelp can become a commercial commodity, if it ever does.

The consideration of the subject divides itself naturally under the following heads:

- Harvesting the kelp.
- Air-drying.
- Oven-drying.
- Distillation.
- Crystallizing KCl.
- Marketing.

To start with the growing kelp. How can it be harvested?

It will be an entirely new industry and manifestly various machines of different types will have to be constructed and subjected to actual practical tests before an efficient and economical machine is secured. Dr. Cameron<sup>1</sup> has suggested 1,000,000 tons of KCl as a conservative annual yield. This would mean the harvesting of approximately 30,000,000 tons of kelp. This harvesting cannot extend over the whole year. Just how long it may last cannot yet be definitely known, but in any event the vast machinery required to harvest 30,000,000 tons in a short season must stand idle a good part of the year at a heavy interest charge against the product.

Having brought the kelp to shore it must be dried. To produce a ton of KCl, approximately 27 tons of water must be evaporated. Clearly the most inexpensive natural means for drying must be adopted, but even this would require the construction of drying sheds covering an enormous area and the building of especially designed machinery to distribute the wet kelp on the drying shelves and to gather up the dried stuff. As with the harvesting machinery, these sheds and machinery must remain unemployed a good part of the year.

There is, however, a limit to the extent that natural drying in open sheds can be carried. When about 25 tons of our 27 tons of water have been evaporated, provision must be made to protect the efflorescing KCl which will soon be produced on further drying. This will require the application of artificial heat. It may possibly be assumed that this can be obtained from the kelp itself in a subsequent operation. By proper oven-drying it is possible to recover 40-50 per cent. of the KCl as effloresced salt by simply shaking it off from the dried kelp.

The recovery of the balance of the KCl from the dried and shaken kelp requires the breaking up of the organic matter of the kelp body and this must be done with as full as possible utilization of its value. Simple burning with the utilization of its heat value only will not be sufficient, even if we now had a furnace adapted to avoid enclosing unburned material in the inorganic salts by sintering and to avoid undue loss of KCl by volatilization.

<sup>1</sup> THIS JOURNAL, 4, 77.

At present, there does not seem to be any method available for this part of the work except destructive distillation with the recovery of the condensable by-products and the utilization of the gas, first to heat the retorts, and secondly, for the oven-drying of the kelp as far as may be. Probably there are no technical difficulties in this operation, but it must be remembered that only about half of the weight, including the effloresced KCl, of the oven-dried kelp is organic matter. In other words, broadly speaking, in the production of one ton of KCl only one ton of organic matter is available for the production of by-products of distillation. On the other hand, the total production of such by-products in the recovery of 1,000,000 tons of KCl would be so large that much of them would have to be transported long distances to find a market and therefore the profit of the operation would largely depend upon freight conditions.

Undoubtedly a limited amount of the residue from the retorts could find direct application as a fertilizer within a certain radius, but the real market for KCl is on the Atlantic coast, and under the present freight conditions of 80 cents per 100 lbs. the KCl must be dissolved and recrystallized. Upon the opening of the Panama Canal and the expected halving of the freight rates, the distillation residue might possibly better be shipped direct.

The mother liquors from the recrystallizing of the KCl will contain iodine and when sufficiently enriched they may be treated for the recovery of this element.

It would be a liberal estimate to assume that the by-products recovered including the iodine, would have a value sufficient to pay for all of the operations upon the air-dried kelp. If we do this and also assume that after sufficient trial and development of the necessary machinery the kelp can be harvested for 25 cents per ton and air-dried for 15 cents per ton more, a ton of KCl laid down on the Atlantic coast would cost \$28 as follows:

Harvesting 30 tons at 25 cents.....	\$7.50
Air-drying 30 tons at 15 cents.....	4.50
Freight 1 ton at 80 cents per 100 lbs.....	16.00
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	\$28.00

On the completion of the Panama Canal it is expected that the freight will come down to \$8 per ton, but the present prices of KCl must be very profitable to the German Potash Syndicate and if actually faced with the possible loss of its American trade the prices would undoubtedly be reduced. This reduction might even wipe out the advantage of the low water-freight.

In conclusion it would appear that the feldspars have not yet been displaced by the kelps as a possible source of potash.

WASHINGTON, D. C.,  
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## IMPORTATIONS OF ACETIC ANHYDRIDE.

The importation of acetic anhydride, which for some years has been steadily on the increase, is showing since last March a very rapid decline, according to the figures published by the quarterly report of the Department of Commerce and Labor on Imported Merchandise Entered for Consumption in the United States. The amounts in pounds imported during the quarters ending at dates given and their valuations are as follows:

Sept. 30, 1910, 202,227 lbs., \$38,531; Dec. 31, 1910, 266,204 lbs., \$50,838; March 31, 1911, 504,536 lbs., \$93,501; June 30, 1911, 197,518 lbs., \$35,806; Sept. 30, 1911, 117,093 lbs., \$20,842.

This sharp decline in the consumption of acetic anhydride is probably due to the abandonment of the manufacture of cellulose acetate films for photographic purposes.