

thickener. The separated clear liquid is not filtered but the sludge is filtered in Kelly filter presses and in Oliver rotary filters with very successful results, particularly with the Oliver rotary filter.

The presscake coming off is very hard and very satisfactory and the solution is quite clear and is evaporated in two sets of quadruple effect evaporators of large capacity, of the Kiestner style with tubes about 22 feet long. The evaporators are six feet in diameter, and evaporate many hundred thousand gallons per day, and in their quadruple effect the evaporation is necessarily quite cheap. Were it not for a previous fermentation, the elimination of the water by multiple effect would be impossible, and this is the big problem in kelp utilization, the elimination of the water which in the best case is at least 85 per cent of the volume of the kelp as received. Unfortunately, in their fermentation some water has to be added. At the present time there is no pure culture of yeast or bacteria or anything used except the natural bacteria which accompanies the kelp, and I do not think that they are using the process which we call in the alcohol business yeasting back, or as our sanitary friends call it, using activated sludge; that is, transferring active bacteria to an incoming solution that may be later on fermented, but it is merely the bacteria which accompany the kelp which suffices for fermentation.

When the liquid is evaporated down to the crystallizing point, it is run into ordinary salting out evaporators which are worked at the atmospheric pressure under single effect, and salt out the sodium chloride which at first is very pure, but the later portions are very impure and are sent through a series of centrifugal separators where by washing with various waters it is purified from the potash and the potash is recovered again. After the salt is precipitated as far as possible or desirable, the solution is transferred over to what they call the cold side. These are crystallizers built with salting-out boxes at the bottom just like the ordinary salt evaporator, but they are artificially cooled with a brine solution. Here the potassium chloride crystallizes out and falls to the bottom and the sides of the evaporators are scraped, keeping them clean. The residual liquor contains almost anhydrous sodium acetate and I understand they have to add water before it will crystallize out with its natural water of crystallization. This sodium acetate thus crystallized out from the residual liquor is dried, rendered anhydrous, and the residual liquor is not, as yet, further treated for any other products. The anhydrous