

ever careful I was. This, however, can eventually be entirely overcome by storage and blending when handled on a larger scale. I obtained the best results by the Fullers earth and sulphuric acid method.

Had I the apparatus, I should have much liked to have tried the cold extraction process and thus get a much finer oil which could probably be used for culinary purposes.

One of the principal problems associated with the manufacture of fish waste into economic products is its collection. In order that a report on this subject may be submitted, a port survey should be made; for it is obvious every district has its own peculiarities. Canneries, of course, could be easily grouped and a plant erected and operated co-operatively. In some cases, it might be economic to have a floating digester and dryer, leaving the subsequent making up of the feeds to a land factory.

#### NEED FOR PROTEIN CONCENTRATES

As to the market for these feeds, I need hardly point out the increasing scarcity of protein concentrates in this country, and further, such feeds as do exist are controlled in foreign countries. It, therefore, only requires a series of demonstration experiments on a large scale at the different experimental farms to convince the farmer of the value of this new type of feed. I think there is little doubt that this standard concentrate can be put on the market at a less cost than linseed oil cake meal, the commonly used concentrate on the farm.

#### PROCESS OF MANUFACTURE IN OTHER COUNTRIES

The process of manufacture of these feeds as carried out in other countries is as follows: Fish waste in absolutely fresh condition alone must be taken, and, if the fish be large, they are cut up by machinery before being passed into the digester. There are many types of digesters, but I prefer those in which the temperature can be carefully controlled and in which disintegrators are employed. From this machine, part of the oil is extracted and the solid matter with a certain quantity of oil is then passed on to a press, where further oil is taken. The quantity of oil left must be governed by the feed you contemplate making subsequently. After the solid matter, now pressed, is emptied from the press, it is passed into a dryer. The type of dryer, if rotary, should be one in which there is no fear of the dust coming in contact with the fire, since it is very inflammable. From the dryer, the material is put either into storage for subsequent compounding during the winter months, or is passed through a mill and ground into a fine meal. If a vacuum dryer is used, great care must be taken to dry the material to the safety point.