

## LIGNITE BOARD ENCOUNTERED DIFFICULTIES

Published Information Led the Board to Believe that the Carbonization of Lignites Had Advanced Further Than Investigation Proved to be the Case

**T**HAT the Lignite Utilization Board of Canada met difficulties in designing a plant for the economical carbonization of Saskatchewan's lignite in commercial quantities, is shown by the following statement recently issued by the Board:—

At the commencement of the Board's activities on October 1st, 1918, it was decided that every briquetting and coal treating plant in the United States and Canada, where information pertinent to lignite carbonization might be available, ought to be visited by the board's engineers, in order that the last word on carbonizing and briquetting might be obtained. At that time it was hoped that, as a result of this investigation, the board's engineers would be able, on their return, to recommend that such-and-such carbonizers be adopted, such-and-such mixers, and such-and-such briquetting presses. It would then have been possible to proceed immediately with the erection of the plant and purchase of machinery. It should be noted that a great deal of published information had led the board to believe that the carbonization of lignite had advanced further than actual personal investigation proved to be the case. Their expectations, therefore, in regard to carbonizing of lignite were not realized, and it became necessary for the board to develop a special type of carbonizer that might be suitable for the low-grade Saskatchewan deposits.

The results of the investigation of crushers, dryers, mixers and presses were, however, much more encouraging. It became evident that various commercial machines could be obtained in the open market that would be suitable for the board's needs with but slight alterations.

### Present Program

The present program may be briefly summed up as follows: The board is developing a special type of carbonizer, and within a couple of weeks the preliminary trials of this apparatus will be made. In the event of success, the board's plans will permit it to start the erection of a plant during this coming autumn. In the event of this carbonizer not being successful, further designs will be made, but the board is determined that not one dollar will be spent on large retort equipment until it is absolutely certain of the ground now being explored.

In addition to its own researches, the board has arranged with a number of investigators in Canada, the United States and Great Britain, to undertake certain experimental programs. In this way, the board is sure of having at its command the best scientific information along these lines that can possibly be secured.

### Site of Proposed Plant

The board has collected as much data as possible on the physical characteristic of the whole Souris field. This data includes information on depth, width, quality and ash content of the seams in each mine, the stratification of the whole area, water supply, topographical characteristics, approximate values of land, quantity of slack available in mines, population of the various towns, and railway facilities. In addition, the board has come to an arrangement with the Department of the Interior whereby no new mining lease within a radius of 20 miles of Estevan will be granted without the board's certificate that such lease will not conflict with the future operations of the board. In this way the interests of the public are safeguarded. No immediate decision, however, will be announced as to the exact location of the proposed plant.

### Difficulties of Board's Program

The main divisions of the process of producing a carbonized and briquetted domestic fuel from raw lignite are as follows: (a) Crushing, (b) drying, (c) pulverizing, (d) carbonizing, (e) mixing, (f) briquetting, (g) water-proofing, and (h) cooling. These steps will be discussed briefly, in order that it may be clearly seen what the board is at-

tempting to do. It must be noted that the following remarks are applicable specifically to the Saskatchewan lignites.

(a) and (c). Enough information regarding crushing and pulverizing is at hand to know that these processes can probably be carried out by means of some type of standard apparatus at present on the market. In any event only slight changes will be necessary in order to make existing machinery practicable.

(b). Certain technical difficulties exist with the drying. Standard machinery that can be purchased in the open market, however, will probably be suitable.

(d). As mentioned above, the question of the commercial carbonization of lignite is one that presents, at the moment, the most difficulty to the board. It is also at this point that the board's objectives differ most widely from those of so many firms in the United States that are retorting coal on a large scale. The latter have in mind the production of the maximum quantity of by-products, while the defined objective of the Lignite Board is the production of the maximum number of heat units in the residue, in order that it may be available as a domestic fuel. These differences are the more marked when it is remembered that the successful coal-treating firms of the United States are dealing with a much higher grade of fuel than the Lignite Utilization Board. There is no question that the carbonization of the lignite *can* be accomplished. The only point is, how cheaply can it be done on a commercial scale with commercial apparatus and with commercial quantities. In order to solve this specific problem, the board, through the courtesy of the Department of Mines, Mines Branch, has been erecting a small experimental plant at Ottawa, which is, however, to be supplied with units that, though small, may still be regarded as commercial. In this plant the new carbonizer is one toward which the board is looking with great hopes.

Mention has already been made of the fact that the board has not only its own investigations under way, but has arranged with a number of well-known scientists to undertake special research work on carbonization.

(f). The question of briquetting is one that is practically solved, and the board's present objective is to discover the minimum quantities of those binders which are available in commercial quantities in the west. It is interesting to note that the amount of binder necessary for carbonizing lignite is very much in excess of the quantity of the same binder necessary for briquetting anthracite. Enough information with regard to briquetting and binding, however, is now in the board's possession to enable it to state that, for briquetting presses, it will probably be able to utilize existing commercial machinery with but slight alterations.

(g). In order that the briquettes may be smokeless, it will be necessary to subject them to a heat treatment, and it only remains to determine whether this heat treatment can be made sufficiently cheap to warrant its adoption.

(h). Cooling. This is purely a commercial detail.

### Probable Future Construction

At present the board wishes to guard against any absolute promises, because future construction is entirely dependent upon the results of the experimental investigations now going on at Ottawa and elsewhere. The board has plans and layouts sufficiently advanced to proceed at the earliest moment with the letting of contracts, purchase of land, machinery, etc., provided the experiments are successful. The board hopes that erection of the plant itself may be started by October or November, 1919. If the experiments are not successful, the whole matter must wait until success is achieved, because the board will not under any circumstances spend public funds for one dollar's worth of capital equipment that might afterwards prove unsuitable.

Jones & Attwood, Ltd., of Stourbridge, Eng., who are the owners of the patents on the activated sludge method of sewage disposal, and who have been the pioneers in its development in England, are transferring the activated sludge department of their business to a newly-formed firm, Activated Sludge, Limited, of Stourbridge.