to make tidal power at all possible, and I am firmly convinced that we have at Hopewell the site that is most promising at the present time, from a commercial standpoint.

I will now discuss the principle which I have proposed for obtaining continuous power from these great tides. Fig. 1 is a map of the two tidal estuaries, the Petitcodiac and the Memramcook rivers. This map shows the general trend of these rivers, and their confluence at Hopewell, and it also shows the fresh-water drainage areas of the two rivers, which, although a minor item as compared to the great volume of salt water that flows up and down these rivers, should still be borne in mind in reviewing this proposal.

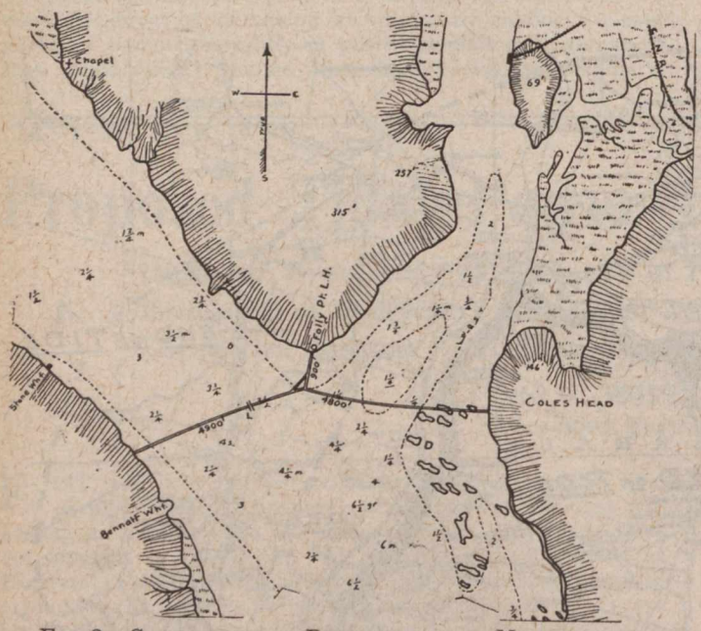

FIG. 2—CONFLUENCE OF PETITCODIAC AND MEMRAMCOOK RIVERS

The dotted lines show the respective drainage areas approximately, and these have been calculated to show a drainage basin for the Petitcodiac of 784 sq. miles, and for the Memramcook of 134 sq. miles, or in the ratio of nearly 6 to 1.

At present the flood tide makes up these rivers for approximately six hours and then turns and flows back into the bay for 6½ hours, and this map also shows the approximate limits of this flow, above which points the streams are fresh water.

Fig. 2 is a scale chart of the confluence at Hopewell of these two rivers, the proposed location of the dams that will be necessary to control the waters, the depths of water at low tide, etc.

Dams Two Miles Long

The western dam would be 4,900 ft. long, the eastern dam 4,800 ft. long, and a wing dam of 900 ft. would connect the two, and it would, of course, be part of the plan to have a highway and trolley line (operated by the plant) over the tops of these dams, connecting up the two main shores and the long peninsula between the two rivers. This highway would only be a matter of local benefit, but it would be of immense benefit to the building up of this locality. At present Hopewell can only be reached from Cole's Head by a little ferry that can only operate for a few hours near high tide. The Petitcodiac is only bridged at Moncton, 19 miles above Hopewell. The Memramcook was bridged at Upper Dorchester, 5 miles above Hopewell, but this bridge is now gone, and the government is at present making borings for a new bridge that will cost about $1,000,000.

At present Hopewell, Hillsborough and the bog peninsula are hard places to get into, and still harder places to get out of, and yet they are regions of great mineral resources that only require, but still await, development. In Fig. 2 is indicated a lock in the western dam, through which vessels could be passed at any suitable time of the tide on their way up and down the Petitcodiac. Hillsborough and Moncton would be provided with deep water harbors instead of the mud flats which they at present enjoy at every low tide. The gates of the locks would naturally be swung by electric power furnished by the nearby power house.

The proposal provides for making the Petitcodiac a high level basin in which the water would always be high, and be replenished at every high tide, while the Memramcook river would be a low level basin to be partially filled from the high level basin and to be always emptied during the latter part of the ebb tide. This arrangement would also suit local conditions admirably, for the Memramcook is exclusively a farming district in which much time and money is at present expended in excluding the tides by means of dykes, and I have been informed by farmers of this valley that they would only wish to have the salt water flood their lands about once in ten years for the purpose of fertilizing them. The navigation of this river is practically nil, so it would hardly be necessary to provide any lock in the eastern dam. Two or three times during a summer a small vessel will lie at the Dorchester Island wharf for the purpose of discharging goods, but these could be as well discharged below the dam and the power company could well afford to pay for the short extra haulage.

Continuous Operation, Varying Head

Fig. 3 illustrates—in scheme but not to scale—the principle that I propose to employ to get continuous power from the tides, with a varying head to be sure, but with the water always passing through the turbines in the same direction, and always with a head sufficient to make turbine operation successful. The diagram shows the confluence of the two rivers, with the necessary dams and gates to control the flow. The gates (J) in the western dam would be automatic flap-gates, opening up-stream, allowing the high level basin (the Petitcodiac) to fill at every high tide. The gates (H) of the eastern dam would be automatic flap-gates, opening down stream, allowing the low level basin (the Memramcook) to empty on every ebb tide. The gates (G and G_1) would be in the nature of lock-gates. They would be operated by electric motors driven by the power-

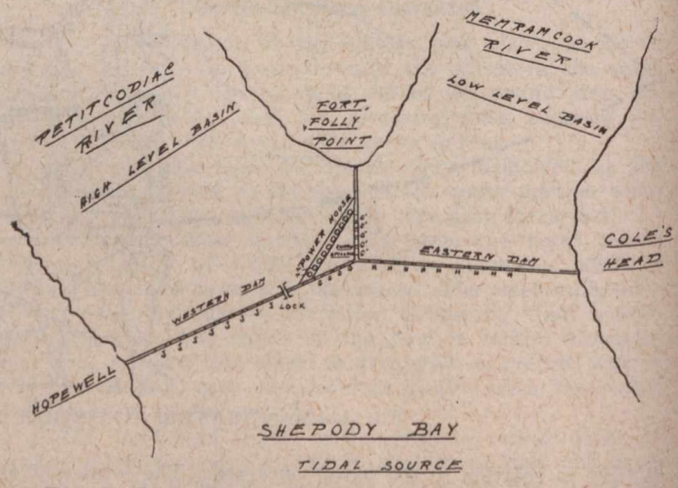

FIG. 3—LAYOUT FOR OBTAINING CONTINUOUS POWER FROM THE TIDES

plant itself, and under the control of the attendants, who would open them and close them, in accordance with the height of the external tide, at stated times that can be fixed for months in advance directly from the tide tables.

The power house is represented as a long building, with turbines (T) extending diagonally from the wing dam to the western dam, these turbines discharging continuously from the high level basin into the common, triangular, spillway.

Let us now follow through a cycle of operations from low tide to the following low tide, remembering that the high level basin was filled automatically at the last high