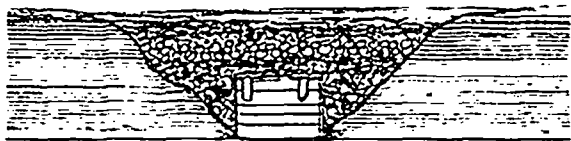


ment, that the successors of the Acadian farmers have never been as successful at the work as the original dike builders here, and to this day the farmers of British extraction usually go to some old Acadian diker when such work is to be done. And yet the work does not apparently require any high degree of engineering skill. These sea walls are of two kinds, one called an "Abatteau" or "Abattue" for cutting off the tide from the upper reaches of a stream or for walling out the sea altogether, and the ordinary dike, which serves both to wall out the sea and wa!! it in when required. Our first sketch shows a cross-section of a



Section of Dyke

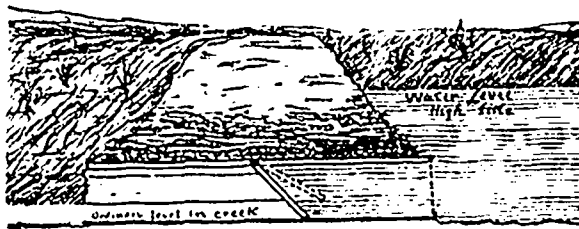
common dike. These are built from 4 to 8 feet high, according to the height of tide to be kept out, and are made of earth sodded over in the rounded form shown. The dikes may be seen marking out the course of some winding stream, or intersecting the country in parallel ridges like hedge fences on an Ontario farm. In many cases these have been formed by degrees, the first dike being built at the limits of the tide in the old days, and then fresh fields being made by new dikes built farther down towards the sea, and built higher if required by a lower level of land. So the realm hitherto controlled by the tide is still gradually being invaded, and new land formed. At times it is necessary to renew the soil and obtain moisture in dry times, and to do this a tidal canal is made by dikes, or the banks of a stream are diked along as the sea is invaded. Sometimes these streams are diked by nature by a ridge of mud formed along the shores. To let the tide in a cut is made in the dike, and at high tide the land is flooded with the muddy water. It is remarkable how quickly the mud settles. The tide may be stationary for a few minutes, or at most less than half-an-hour, but during this time fully two inches of mud will be found to have settled on the land and very little gets back to the sea. It is thus that great tracts of land have been formed under the action of the enormous tides of the Bay of Fundy, which in places rise and fall 50 to 60 feet, being unique in the geography of the world. To show the effect of these deposits, Judge Morse mentions that lakes of fresh water 15 feet deep have been completely filled and have been turned into marsh farms within his own memory. Some spots may be filled to the depth of several feet in a single year; and he has himself filled up six lakes by leading the tides in.



CROSS SECTION OF "ABATTEAU."

The two sketches here shown illustrate the construction of the abatteau. The first is a cross section showing the bed of the bottom of the river. In the bottom is the sluice gate and box containing it. It is formed of plank, and is like a sluice way, with a plank gate swinging from the top, and made longer than the depth of the box, so that when fixed in it stands as shown in the last sketch. Its hinges may be of iron, or may be a simple extension of the top plank inserted in a hole in the top plank of the side planking. The box is fixed in at low tide on the bottom of the stream, and is covered over with trees and limbs which are

weighted down by stones, and these in turn are covered over with earth up to the top level of the banks as shown. Now when the tide



SIDE VIEW OF ABATTEAU AT HIGH TIDE.

is out the sluice gate is opened by the ordinary flow of water in the stream, as shown by the dotted lines; but when the tide rises above this level, and the tide water begins to press back upon it, the gate closes, holding the water out. This, simply, is the construction of the abatteau. It is of course of special use as a defence against tidal waters, and to save diking on the higher lands, but it would be of service in any situation where, by the backing of water from a freshet, lands might be flooded. The value of such works in the situation we have referred to may be estimated when it is known that these marsh lands thus reclaimed from the sea are worth \$100 to \$200 per acre. It should be explained that where such lands are irrigated and rejuvenated by means of artificial canals, these canals must be kept open by fresh water streams, otherwise the deposits of mud will soon choke them up.

The marsh lands of the Maritime Provinces are under the governance of a commission, guided by a code of regulations which amounts almost to a separate government. The voting on this commission is governed by the acreage of land owned, there being one vote allowed to each acre of land, on questions of land improvement. Each district of marsh land is known as a "body." In Belgium, Holland and France, where sea-reclaimed lands are so extensive, the Government maintains the outer sea dikes, but it is not so in Canada. Here the man who owns the farm next to the sea has to keep the sea wall in repair. Towards these repairs the marsh land owners inside contribute not a cent, though they are completely protected by the labors and expenditure of the man next the sea. The man with the sea wall may appeal to his inland neighbors in case of extra repairs or accident, only to be laughed at; and the only way in which he may punish his neighbors' indifference is to repeat the heroic recklessness of Samson of old when that worthy, by pulling down the pillars, brought destruction alike upon himself and his enemies. So the sea-wall farmer might let the tide pour in a broken wall, but his own crops would be destroyed with his neighbors'. Either the Government ought to maintain these outer walls or a tax should be levied on the owners of the whole "body" of marsh lands, or otherwise the Government might contribute an amount equal to that raised by the owners of the lands benefited.

The Minister of Marine was waited on at Ottawa not long since by a deputation which asked for the establishment of a school of navigation at Kingston. Several speakers pointed out the advantage of imparting technical education in the matter of the navigation of the great lakes. Sir Hibbert Tupper, in reply, intimated that the Government would carry out the suggestion, perhaps not this year, but certainly at a later date. THE CANADIAN ENGINEER holds up both hands in favor of the scheme.