

REPORT ON VISIT TO DOMINION OF CANADA AND UNITED STATES OF AMERICA IN CONNECTION WITH METHODS OF LAND-DRAINAGE IN THOSE COUNTRIES.

SIR,—

24th June, 1921.

In accordance with your instructions to inquire into the latest methods of land-drainage in practice in the above countries, and to select suitable up-to-date plant for prosecuting work in this Dominion, I departed from Auckland on the 6th May, 1920, and returned on the 24th March last. I have advised you from time to time of the several places visited and my impressions of the works seen in progress, and now propose to as briefly as possible condense this matter, and also deal with items coming under special headings.

LOCALITIES VISITED.

Dominion of Canada.—I successively visited the Provinces of British Columbia, Alberta, Manitoba, and Ottawa, and got in touch with the various authorities controlling drainage. I found that these provinces were on the eve of embarking on very extensive operations, but that the greater portion of the land to be drained came within the category of periodically flooded lands. There did not appear to be any extensive areas of the class of country I desired to see, such as muck and peat lands; and, after discussing the subject very fully with Mr. Dawson, Chief Irrigation Engineer, Calgary; Mr. Bowman, Provincial Drainage Engineer; the Manitoba Drainage Commissioners, Winnipeg; and Mr. E. S. Drake, Director of Reclamation Service, Ottawa, I decided that my best field of observation would be in the United States of America, seeing that our conditions were more similar.

I, however, took the opportunity of inspecting levee works along the Fraser River, British Columbia; drainage of irrigated lands in Alberta; drainage of gumbo lands in Manitoba; and operations being conducted on peaty country in Ontario. All this work was being operated by dipper dredges, walking-dippers, and drag-line excavators. Very excellent work was being done, but none of it under as wet conditions as usually prevail in New Zealand. Maintenance, I found, was more or less a dead-letter, and this, the authorities informed me, was still an unsolved problem. With the exception of the machine maintenance of irrigation ditches near Calgary, I saw no mechanical means for cleaning.

For the construction of all classes of large ditches, hand labour has been superseded by machinery of various classes, and of these, walking-dippers and drag-lines are much in favour and doing excellent work.

Special facilities were afforded me of seeing the work of several dipper and clam-shell dredges operating at Toronto and Montreal, but these machines were generally too large for our operations in this Dominion.

In connection with river-protection works, it was noted that rock-filled cribbing was in general use and proving very satisfactory. This form of protection owes much of its popularity to the nearness of lumber-supplies.

United States of America.—I proceeded from Montreal, Canada, to Washington, D.C., and presented my credentials to His Excellency the British Ambassador and the Secretary of State, and was at once placed in touch with the officers of the Drainage Investigations Branch of the Department of Agriculture. These gentlemen immediately prepared an itinerary covering all the main drainage projects in several States, and either accompanied me thereto or else made arrangements for me to meet engineers at the several points. Drainage operations were inspected in the following States: Minnesota, Wisconsin, Michigan, Illinois, Iowa, Ohio, North Carolina, Missouri, Arkansas, Louisiana, Indiana, Kentucky, Tennessee, Florida, and California. The methods used for reclamation were closely observed, and much learned from the various eminent engineers and authorities met with. Very great importance is attached to the necessity for bringing to profit all flooded and swamp lands, as it is recognized (as in New Zealand) that probably the richest land is the swamp area.

My observations as regards respective qualities convinced me that there is no better swamp area in America than can be found in New Zealand; but the area in the former country is quite staggering. This, of course, is very obvious. In the United States the wet areas are approximately as follows: Swamp, 66,000,000 acres; periodically overflowed, 31,000,000 acres; tidal marsh, 4,000,000 acres. Probably three-fourths of these lands are timbered, and in many instances cut over.

THE DRAINAGE MOVEMENT IN CANADA AND THE UNITED STATES OF AMERICA.

The benefits and results attending the drainage of flooded and swampy lands in both Canada and the United States of America have opened the eyes of the public and authorities to the great potential value of the still-undeveloped areas, and a strong and insistent movement has been on foot for the systematic attack of all projects which appear on examination to be practicable.

Canada.—Provincial aid has been enlisted in Canada, and several of the provinces have—like Manitoba, for instance—enacted legislation in the direction of land-drainage. Under the enactment the Provincial Government undertakes the work, and issues debentures, and may also invest certain moneys in the same. Repayment is spread over terms of from twenty to thirty-five years.

The Dominion Government has also a Department which controls certain areas throughout, and prepares them for settlement.