

running up the face of the groyne roots out and scours away the material at the head of the groyne and sets up destruction along the shore-line.

The length to which groynes should be carried seawards depends largely on local conditions. Normally, on an exposed foreshore to be defended by a system of groyning it is desirable to carry at any rate some of the groynes from 50 to 70 feet beyond low water. It is this portion of the groyne which is most effective in building up the beach and preventing the dispersal of the material. The result, moreover, is the flattening of the foreshore slope, which is a great end to be attained.

One of the most difficult problems in connection with coast defence is the protection of the coast-line of British Guiana. The low-lying portion of the colony consists in the main of deltaic alluvium, and its soil, agriculturally fertile, is unsuited to resist the inroads of the sea. The wind *régime* on this coast follows a regular sequence. During three months of the year attacks of the Nortes recur. When these hurricanes sweep down their effect is incredibly severe. The North-east Trade winds blow steadily for the rest of the year, but in the autumn months the sudden stroke of the Nortes is a recognized phenomenon. Under the impulsion of these winds a furious rolling sea strikes the coast-line. According to the Report (dated 1910) of the Colonial Commissioners appointed to enquire into the subject, it would appear that the average annual expenditure on sea and river defences for the previous ten years had been not less than £12,000. In the previous forty years the average rate of coast erosion had in some localities been 32 feet per annum, and many vital façades of the colony were thus threatened. A lack of continuity of defensive measures to cope with the trouble seems to have rendered the efforts of the colony somewhat ineffective. The problem of the Guiana coast-line would appear to resolve itself into three elements:—

1. Measures to render the crest of the coast-line immune from the actual transit of the seas.

2. Measures for safeguarding the visible foreshore of the coast-line. In this respect systematic plantation, supplemented by some defensive work, would appear to be necessary.