

**COAST EROSION  
PROTECTION WORKS ON  
THE CASE SYSTEM  
IN BRITISH GUIANA**

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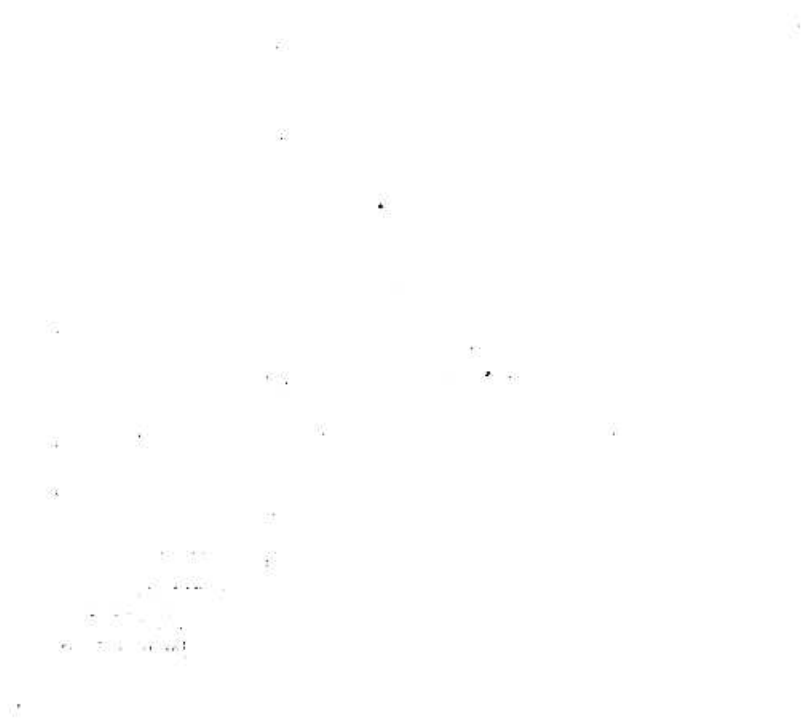
## Preface

**I**N view of the fact that millions of dollars have been spent on useless coast protection works on the coasts of the United States of America, and particularly on the coast of New Jersey, the author thinks that no apology is needed for the present work which gives the details of the investigation made to ascertain the causes of the serious erosion in British Guiana (S. A.), and describes the permanent works which have been carried out to protect over 50 miles of coast and prevent further ravages of the sea. While no two shores can be treated exactly alike in order to prevent erosion, the problems which presented themselves for solution in British Guiana have in many respects their counterparts on the New Jersey Coast.

Millions of dollars were spent in British Guiana in erecting bulk-heads of vertical sheet piling, wave screens and other works of a similar type to those built on the New Jersey coast and with the same result. Not only were such works ineffective, but they actually caused erosion.

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January, 1920.

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**B**RITISH GUIANA which is bounded on three sides by three different countries—Venezuela, Brazil and Dutch Guiana—and on one side by the Atlantic Ocean, is the only British Colony on the mainland of South America. The area of the Colony is computed to be 89,480 square miles, it is therefore as extensive as the combined area of England, Scotland and Wales, and about twice the area of the State of Pennsylvania.

Sugar with its allied product of rum constitutes the most important industry of British Guiana. There are also considerable areas of rice and coconuts. In 1918 the total value of imports amounted to \$16,292,249, a large part of which were from the United States, and the total value of exports was \$14,799,316. Practically the whole of the cultivated lands of British Guiana and all the chief towns and villages are situated on the front lands, which are flat and from 3 to 4 feet below the level of high tide. The reclamation of the coast lands of British Guiana was commenced by the Dutch about the year 1750 and afterwards continued under British rule. The maintenance of the sea embankments which protect the towns and cultivated lands of the Colony from inundation by the sea is therefore of primary importance to the Colony's existence. The upkeep of the sea dams was for many years left to the estate proprietors and as more land gradually came into cultivation, it was found that the flow of water from the artificial drainage channels soon caused erosion of the foreshore. In his comprehensive report on British Guiana made in 1919, the Hon. C. Clementi, Colonial Secretary, reviewing the history of the coast protection works of the Colony, states that the adjacent proprietors emulated each other in endeavoring to divert attacks of the sea from themselves to their neighbors. So grew up an irregular and unnatural coast line, in which each drainage outlet was a danger spot. Heavy expenditure was incurred by estates' proprietors upon sea defence\* work of useless and often harmful design. Vertical sheet-piling and stone piled wave-screens only hastened erosion, while the true angle of groynes, their proper height above the foreshore and the importance of maintaining them in an impervious state was never understood.

When the sea defence expenditure of an estate became more than its proprietor could bear, the old line of dams was abandoned and retirement inland was effected without consideration being given to the consequence of such retirement to the adjacent estate. Thus the coast line grew still more irregular and the sea defence expenditure of all owners of coastal estates steadily increased. In 1883 the Director of Public Works was empowered to make regulations for protecting the foreshore, to supervise all sea defences, and, with the assent of the Governor-in-Council, to compel the execution of works necessary for preventing erosion. In 1906 a body of Sea Defence Commissioners were formed with the Director of Public Works as Chairman and all sea defences on the East

\*Local term and to denote coast protection works.

COAST EROSION AND PROTECTION WORKS

TO MIND  
ANSONIA



*Methods of protection prior to 1916. Earth dam with fascines in front*



*Methods of protection prior to 1916. Earth dam with fascines attacked by waves*

Coast were vested in the Commissioners, who were given power to levy assessments in order to pay for work done. In 1913 the ordinance was amended and all sea defences were vested in the Director of Public Works and it was provided that the Public Works Department should execute all works, and that one-fourth of the cost of all sea defence works should be defrayed by the Government and the remaining three-fourths by the proprietors of estates and villages. Erosion of the foreshore, however, steadily continued and consequently the difficulties and cost of protecting the sea dams steadily increased.

### Work Done by Sea Defence Commissioners

**W**HEN the Sea Defence Commissioners took over the East and West Coast Districts, there were long lengths of exposed dams protected by fascine work\* and various wave screens and stretches of vertical sheet piling. While making little or no effort to pull out or modify such structures found on the coast when they took over the district, it must be stated in justice to the Commissioners that they appear to have recognized the advantages of utilizing the forces of nature to build up a natural protection instead of fighting the sea and they experimented with low timber groynes. Owing, however, to lack of expert knowledge as to the correct length, angle, distance apart, etc., at which the groynes should have been placed, the results were not altogether satisfactory.

As a direct result of difficulties arising from sea defences, Plantation Bel Air, Hague, La Jalousie, Windsor Forest and Vreed-en-Hoop were cropped and went out of sugar cultivation prior to 1915. In that year Sir Walter Egerton, K. C. M. G., Governor of British Guiana, recognizing the seriousness of the position, appointed a Commission to enquire into the Colony's sea defences. The Committee in their report state that;† "Serious breaches by the sea at Montrose, Success, Triumph, Mon Repos, D'Endraght, Lusignan and elsewhere on the East Coast, Demerara, have revealed the danger to the entire coasted industries of the Colony, as well as to the City of Georgetown involved in this growing menace of the sea." In moving the adoption of the Organization Committee's Report of the Sea Defence Commission on January 17th, 1916, the Hon. J. J. Numan, K. C., said: "The emergency is too grave to waste words upon it. Our inadequate and unscientific sea defences have been broken in several places within a few miles of Georgetown during the four weeks of the Commission's existence. The high Spring tides have flooded through two great breaches at Triumph since we last met and have closed the public road during several hours for some days, washing away the parapets and causing great general damage. The matter is vital. No vehemence of ours on this Commission could exaggerate the importance of the issue . . . It is also whether we should allow the sea to encroach more and more upon the land, allow the sugar and rice industries to be ruined and watch with equanimity

\*Brushwood Mattress Work.

†Report of Sea Defence Commission 1916.