

(Paper No. 4300.)

“Coastal Sand Travel Near Madras Harbour.”

By Sir FRANCIS JOSEPH EDWARD SPRING, K.C.I.E., M.A.I.,
M. Inst. C.E.

IN replying to the discussion on his previous Paper¹ on this subject, the Author submitted a plan showing the advance of the sand from the south, round the eastern side of the harbour, on a 5-fathom contour, in the years 1910–13. He is now able to present a later plan, on similar lines, showing the 5-fathom contours from January, 1910, to January, 1919, as well as the 6-fathom contours for the same series of 10 years.

Had the 6-fathom contours not been available it might have been thought—so persistently do the 5-fathom contours appear, year after year, to end at a certain bend in the breakwater—that a practical illustration was being offered of a phenomenon similar to that observed at Timaru and Napier harbours in New Zealand, referred to by Mr. Keele,² namely, that when a breakwater is on a certain angular alignment to the incoming waves of greatest sand-moving potency, the sand stream is liable to be ground up small, diverted, and dissipated.

At first, so persistently did the 5-fathom line at Madras refuse to move north of a certain bend in the breakwater, that the Author believed he had found corroboration of Mr. Keele's observations. A study, however, of the 6-fathom contours seems to belie this optimism. The sand from the south is undoubtedly creeping up steadily, at the rate, as shown in the Author's former Paper, of more or less 1 million tons per annum, and it is only a matter of time before the Harbour Authority will have to deal with the trouble at the entrance in one way or another.

Either (1) the sand along the beach south of the harbour may be railed away, for land reclamation and raising purposes, at the rate of about 3,000 tons—say, more or less, ten train-loads—per working-day all the year round; or (2) a dredger capable of dropping at sea or pumping ashore about 3,000 tons per day will have to be stationed more or less in the track of the advancing sand stream,

¹ Minutes of Proceedings Inst. C.E., vol. cxciv, p. 153.

² *Ibid.*, p. 199.

as at A on the plan (Plate 2); or (3) another breakwater must be run out to oppose the sand stream.

The Author, having worked for nearly half a century in India, has now retired for a long-needed rest; so he does not venture to offer an opinion as to which of these three, or other, alternatives should be tried. He had fully intended to recommend a trial of alternative (3) as a substitute for dredging the sand, the breakwater so formed to serve as the commencement of a new deep-water harbour for vessels up to, say, 40 feet draught. But the effect on the north-east breakwater of the cyclone of November, 1916 (which he has described in a separate communication), has made him shy of any such experiment; for it would surely be intolerable to have to end each season's work on such a breakwater with some sort of head that might be trusted to stand in the event of a repetition of the cyclone of 1916 repeating itself.

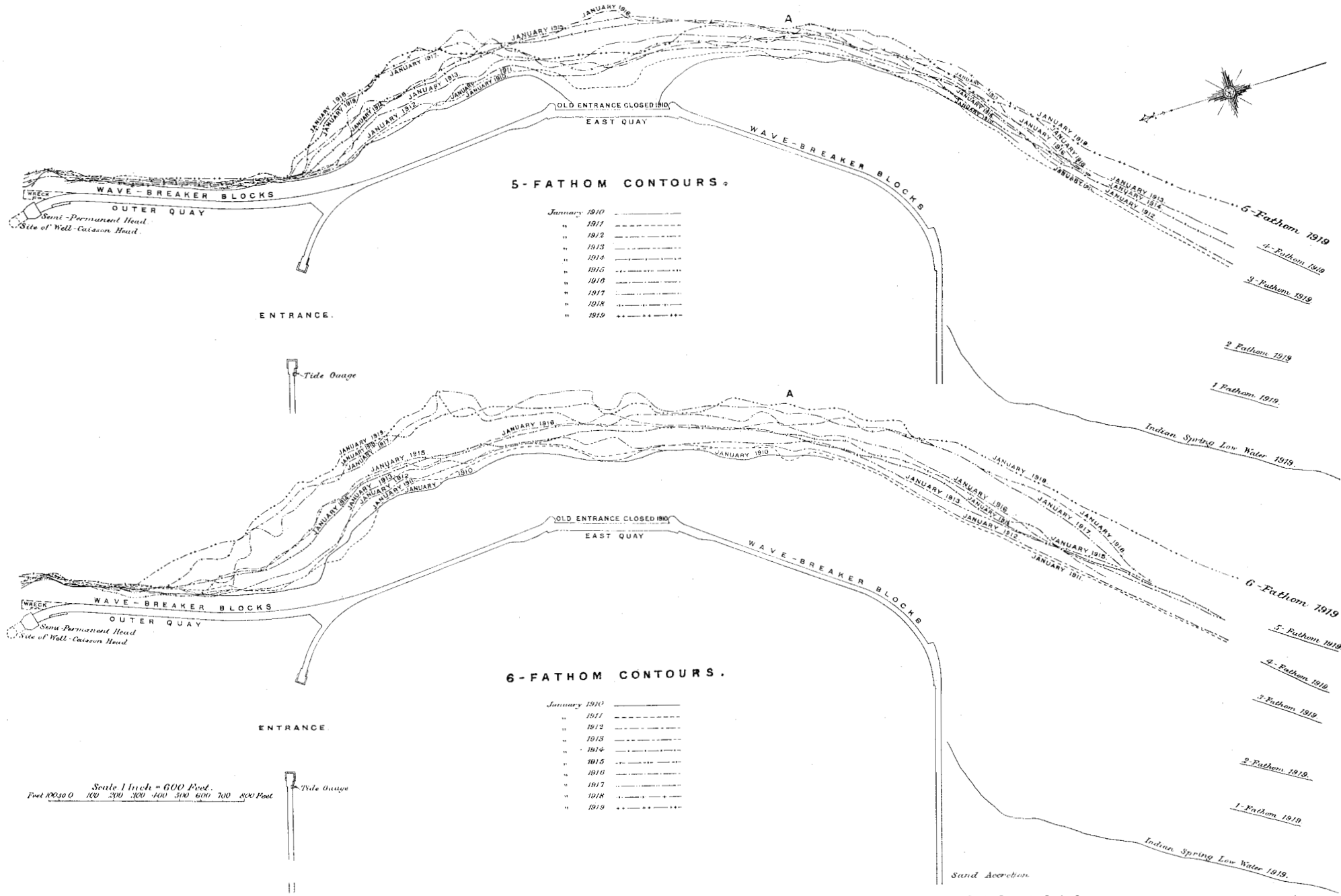
Leaving, therefore, a decision on the engineering point to the men of the future, the Author contents himself with congratulating the present Port Authority on its decision to get completely out of debt by the year 1952, so that its successors may have quite as free a hand in starting to spend a new million or two as their forebears of 40 years ago had, and—though with some trepidation—availed themselves of.

It seems a pity that so valuable a piece of evidence as is afforded by the two plans now presented to The Institution should be lost to the engineering world, and this must serve as the Author's justification for presenting them.

The Paper is accompanied by one sun-print, from which Plate 2 has been prepared.

COASTAL SAND TRAVEL NEAR MADRAS HARBOUR.

PLATE 2.
COASTAL SAND TRAVEL
NEAR MADRAS HARBOUR.



PLANS SHOWING THE ADVANCE OF THE SAND FROM THE SOUTH, 1910-1919.

Minutes of Proceedings of The Institution of Civil Engineers, Vol. CCX. Session 1919-20, Part II.

Sir F. J. E. SPRING.