1921

COCHIN HARBOUR—HISTORY.

The question of improving Cochin harbour has occupied the attention of Government for several years. It will be seen from the papers available that the earliest survey of the port was made in 1835 and that private enterprise had carried out jetties.

In 1858, the Cochin Chamber of Commerce made a proposal to maintain a steam tug and rake at Cochin and the Government requested the Marine Board to report on it. 1858.

In 1859, Lieutenant A. D. Taylor of the Indian Navy after a survey suggested (1) that a steam tug to tow vessels in and out and a steam rake or dredge to deepen the bar should be obtained, and (2) that a good Government pier would be a great improvement to Cochin as he felt no doubt that it would be chosen as the coaling station on the Malabar coast. 1859.

In 1871, Mr. G. Robertson, an expert from England, suggested the construction of long projecting groynes on each side of the harbour, dredging or raking being carried on between them. A dredger—the Albuquerque—was obtained on his suggestion but did no work at Cochin and was finally sold to Karachi as it was reported to be too large for the requirements of this Presidency. 1871.

In 1877, His Grace the Duke of Buckingham, Governor of Madras, having expressed a wish to know the state of Cochin bar and the probability of increasing the depth over it by means of the steam dredge "Albuquerque", the Superintendent of Marine Surveys instructed Leiutenant G. Hammond, Navigating Lieutenant, to make the required examination. Lieutenant Hammond after visiting Cochin reported that the steam dredge was a powerful vessel but that dredging works on the bar would be impossible during the south-west monsoon and also forwarded a tracing showing the alteration in the depth and position of Cochin bar. 1877.

Lieutenant J. H. Taylor, Master attendant, Madras, visited the place at the same time, also submitted a report in which he stated that, even if the bar was removed, it would be utterly impossible to keep dredged a large area of the channel to the required depth. He inspected the Cruz Milagre gap, the stoppage of which was said to be necessary to the safety of Cochin, and recommended that it should be entirely filled up.

Lieutenant A. D. Taylor, Superintendent, Marine Surveys, who also visited the place at the same time (his previous visit to Cochin was in 1859), reported that he never contemplated the possibility of dredging a channel right through the shallow water and was of opinion that the newly dug passage would be obliterated by the south-west monsoon. He therefore recommended that the dredge Albuquerque should be taken to Pamban where she could do good service. On the advice of the Chief Engineer, however, it was decided that the dredge should for a month be employed at Cochin on the excavation of the bar in order to see how it worked in a sea way.

In November 1878, Colonel Thomason, R. E., visited the port and conferred with the local Chamber of Commerce about proposals for the improvement of the harbour. The works which were under contemplation at this interview were the construction of two piers from the mouth of the backwater and such protective works to prevent erosion of the sea beach north and south of these piers as might be necessary and also quay walls inside the harbour. 1878.

In 1880, the Chamber brought the above proposals to the notice of the Madras Government for consideration but the Government decided that no action should be taken in regard to them until after personal inspection by the Chief Engineer and the Master attendant. At the same time the Government of India was requested to obtain the opinion of Captain A. D. Taylor, Superintendent, Marine Survey of India, on the general question as it was understood that he was intimately acquainted with 1880.

XXIII-E/14

the port, and also to forward to this Government any report which Colonel Thomason might have had before that Government in connexion with his examination of the bar in 1878.

1881. In February 1881, Colonel R. H. Sankey, Chief Engineer, and Lieutenant J. H. Taylor, Master attendant, visited the harbour and after discussing the points at issue with the Chamber of Commerce felt themselves unable to recommend the scheme put forward by that body.

In March, Mr. N. Parkes, Chief Engineer, Madras Harbour Works, made a personal inspection of the port, apparently at the instant of the Chamber. He was of opinion that the bar could be permanently removed, and the port converted into a first-class harbour, but that the works to accomplish that would be more extensive and costly than hitherto estimated. He estimated the cost at 81 lakhs, which the Chamber thought was much beyond the ability of the trade.

The Government accepting the unanimous opinion of the Chief Engineer, Master attendant and Mr. Parkes that no permanent improvement to the harbour was attainable except at a cost, the interest of which could not possibly be met by the trade of the port even allowing for the increase that might reasonably be expected, forwarded the papers to the Government of India for consideration as to whether the construction of a first-class harbour at this port was of sufficient importance from an Imperial point of view to justify its construction without reference to financial results. The Government of India replied that they were not inclined to favour the scheme as the Imperial interests involved in the undertaking were not of sufficient magnitude to justify an outlay which was expected to amount to 81 lakhs. The matter was then dropped for the time.

1887. In November 1887, a scheme propounded by Mr. Brunton, Chairman, Cochin Chamber of Commerce, for deepening the bar of the harbour by a sluicing apparatus was brought to the notice of His Excellency Lord Connemara in an address presented to him by the Chamber when he was on tour in the West Coast.

1888. In March 1888, the Chief Engineer and the Master Attendant were asked to submit a joint report after inquiry on the spot upon Mr. Brunton's proposals. They reported that it was not likely to be of such advantage as to justify the estimated expenditure and the Government rejected the scheme—G.O. No. 30, Marine, dated 2nd February 1888.

1900. At the end of 1900, His Excellency Lord Curzon visited Cochin and the Cochin Chamber of Commerce took that opportunity to reopen the question in an address presented to him. He could make no definite pronouncement thereon as the Viceroy possessed no information on the subject. The subject was, however, noticed by the Chief Engineer, Mr. deWinton. He expressed the opinion that a channel through the bar and up the backwater could be dredged without difficulty by one of the powerful suction dredgers described by Mr. Larmine, which would enable ships of all sizes to enter the backwater and lie alongside wharves in perfect security. He estimated that the dredger would cost 5 lakhs and that a wharf 1,000 feet long and 20 feet wide would cost another 5 lakhs, so that for 10 lakhs plus the annual working expenses of the dredger Cochin would obtain a harbour sufficient for all her requirements. Thereupon the Chief Engineer was asked to formulate and submit definite proposals for the formation of a harbour at Cochin—G.O. No. 96 W., dated 15th January 1901.

1901. In 1901, the question of providing a safe harbour on the West Coast was raised by the United Planters' Association of Southern India and after a review of the conditions, both economic and natural, of the harbours on the West Coast, the conclusion arrived at was that the only port where a tolerably good harbour could be made was Cochin. It was also considered that Cochin was the only port where the trade could afford to pay for a harbour.

1902. Consequently, in 1902, the measures recommended by the Chief Engineer for the improvement of the port were in the first instance referred to the Secretary of State for India in order that the opinion of the Consulting Engineer might be obtained. The measures suggested for improvement were

(1) the dredging of a channel 30 feet below low water,

(2) the provision of two wharves, each 1,000 feet long, and

(3) the purchase of a dredger.

It was proposed to finance the scheme by the introduction of Landing and Shipping Fees Act which was expected to bring in a revenue of Rs. 1,30,000, this amount being enough to serve a loan of 15 lakhs in 30 years by an annual payment of Rs. 86,748 towards capital and interest leaving a sum of Rs. 43,252 for working expenses. The Chamber of Commerce, however, recommended that expenditure should be limited in the first instance to purchase of dredger, leaving the question of wharves to stand over—G.O. No. 150, Marine, dated 4th March 1902.

Messrs. Coode, Son and Matthews, Harbour Engineers, whom the Secretary of State consulted, were of opinion 1903.

(1) that the dredging of the channel and its maintenance were not feasible in such an exposed position,

(2) that the best type of dredger would be a pump hopper dredger,

(3) that, even if the channel was formed, it could not be maintained to a sufficient extent to be of practical utility for the navigation of deep-draft vessels, and certainly not during the occurrence of south-west monsoons,

(4) that the only mode of effectually treating the entrance, having regard to the physical conditions, would be the construction of training and sheltering moles on either side of the entrance but that the cost would be prohibitive.

In view of the above opinion, the Government abandoned the scheme—vide G.O. No. 308, Marine, dated 13th July 1903.

In November of the same year, the Cochin Chamber of Commerce again raised the question and asked Government whether they would introduce Landing and Shipping Dues Act at this port with a view to providing sufficient funds to enable a thorough survey of the port being made by an experienced Engineer for the reason that Messrs. Coode, Son and Matthew's report had been written on insufficient data—G.O. No. 250, Marine, dated 20th June 1904.

The Government, after consulting the Presidency Port Officer and the Collector 1904. of Malabar, rejected the Chamber's proposals on the ground that no useful purpose would be served by introducing the Act as the cost of effectively improving the harbour was beyond the means of the port—G.O. No. 250, Marine, dated 20th June 1904.

In June 1907, the Diwan of Cochin brought to the notice of the Government, 1907. through the Resident, the seriousness of the erosion of the sea coast and suggested a joint inspection of the affected locality by the Engineers of the British Government as well as those of the Travancore and Cochin Darbars with a view to ascertain what protective works should be carried out. This suggestion was accepted and the joint inspection was accordingly made in September. The report disclosed that (1) the Vypeen foreshore, (2) the coast in the neighbourhood of the Andikadavu some 6 to 9 miles south of Cochin, (3) the coast in the neighbourhood of Kushipalli about 10 miles north of Cochin required protection. The Chief Engineer considered that the Vypeen foreshore chiefly which covered a length of about two miles required protection and he put down the cost at 5 lakhs.

In November 1909, the Resident in Travancore and Cochin was asked to 1909. ascertain the views of the Travancore and Cochin Darbars on (1) the measures recommended to protect the foreshore from Cruz Mileagre to Azhikal from erosion, and (2) the apportionment of the cost of any measures that might be taken for the purpose.

The Resident replied that the Travancore Darbar did not consider that the 1910. Travancore State was largely affected by any of the erosions and that the Cochin Darbar were unable to offer any opinion until the actual measures to be adopted were determined and the cost ascertained. The Cochin Darbar also suggested that the whole matter might be decided as a complete scheme by the Madras Government and that an equitable distribution of costs might be made in accordance with the several interests involved. It appeared to Government that the interests of the British Government were affected by the erosions only so far as the protection and maintenance of the Cochin Harbour were concerned, and that the only places where it might be necessary to take action in the interests of the harbour were (1) the Vypeen foreshore from the harbour entrance to Cruz Mileagre and (2) Andikadava. As at both these places, however, the Cochin State was losing valuable land planted with cocoanuts in consequence of the erosion and as it was clearly to the interests of that State, quite apart from any interests of the Cochin Harbour, to take preventive measures, the Government considered that the works necessary in those two places should be undertaken by the Cochin State, but having regard to the fact that the interests of the Cochin Harbour were also involved to some extent, they decided that the Madras Government should contribute a share—one-third of the cost of these works—on condition that the plans and estimates were passed by the Chief Engineer, Public Works Department, Madras, before the works were undertaken and the works certified to by him after completion—G.O. No. 355, Marine, dated 10th November 1910.

911. As the reports received in 1911 showed that the Vypeen foreshore was in dangerous condition and required immediate attention, the Government sanctioned estimates at once for immediate execution and requested the Resident to acquaint the Cochin Darbar of the above and to seek their acquiescence in the action taken and also to invite the Darbar to make a contribution of two-thirds of the cost of the above works—G.Os. Nos. 611 W., dated 9th May 1911, and 703 W., dated 3rd June 1911.

In his letter dated 24th October 1911 to the Resident, the Diwan stated that the Darbar strongly held the opinion that this erosion question should be considered from an Imperial standpoint and dealt with as such in direct reference to the very feasible scheme for the improvement of the harbour and that both the questions were so intimately connected with one another that neither could be taken up independently and irrespective of the other. On these grounds the Darbar was not agreeable to the proposed method of distribution of the cost of protective works.

912 In 1912, the Cochin Chamber of Commerce brought up the question of harbour improvement once more through the Collector for the following reasons :—

(1) That the trade of the port was increasing,

(2) that the backwater could be converted at comparatively small cost into one of the finest harbours in the world,

(3) that they did not accept the opinion of Messrs. Coode, Son & Matthews as final,

(4) that there was reason to hope that harbour engineering had made such strides that the idea of opening the bar by a powerful suction dredger might be found not hopeless, and

(5) that they would agree to the introduction of the Landing and Shipping Fees Act solely for the purpose of defraying the cost of this investigation and of financing in part at any rate any scheme for the development of the harbour which might be found to be feasible.

The Collector, while submitting to Government the Chamber's letter together with a note on the harbour project by Mr. Campbell, Executive Engineer, West Coast division, suggested that Government should revert to the proposal rejected in 1904 and bring out from home a first class harbour engineer to study the problem on the spot and to report whether the harbour could be opened for ocean-going steamers at reasonable cost. Mr. Campbell, in his note above referred to, observed that of the former reports on the subject of the bar, only those of Colonel Sakey's and Lieutenant Taylor's conveyed any useful information and that Messrs. Coode, Son & Matthews' report was on a harbour they had never seen and could not be otherwise than condemnatory or at least non-committal and was of the following opinion :—

(1) That the bar could be opened by suction dredger of the largest capacity,

(2) that there was no reason to suppose that once the channel had been completed that it would proceed to silt up again to any great extent,

(3) that it was no use to proceed to develop the harbour internally until it had been clearly demonstrated that it would be possible to keep the entrance clear at all seasons of the year,

(4) that he would not place the quays and wharves on the south side of the harbour owing to the difficulty of connecting that side with the railway and to the fact that all, except a small portion, the harbour frontage was already occupied, but would place them on the north side,

(5) that the placing of the quays and wharves on the north side would involve reclamation which could be done by building a large rectangular enclosure of quay walls and filling the interior with the spoil dredged to deepen the harbour, the island thus created affording berth for 20 vessels alongside, and

(6) that the cost of the improvements suggested would be roughly Rs. 1,50,00,000 (Rs. 15,00,000 for dredging and Rs. 1,35,00,000 for internal improvements).

On the 27th January, the Resident in Travancore and Cochin forwarded to Government a letter from Diwan of Cochin dealing with the questions of erosion and harbour improvement together with two reports by Mr. Browning, Chief Engineer of the State, one dated 7th October 1900 and the other 1st August 1911.

In his report of 1900, Mr. Browning came to the following conclusions :—

(1) That the best and most effective means for the removal of the narrow bar that obstructs the entrance to the Cochin Harbour would unquestionably be to construct training walls,

(2) that the backwaters opposite Ernakulam could be dredged out by powerful dredgers in order to convert them into a first-class inner harbour ;

(3) that the priliminary work would cost approximately 85 lakhs, that the shipping returns which might be depended upon for paying interest on any loan raised would amount to at least three lakhs per annum, and that from the beginning the harbour would pay three per cent on the 85 lakhs first required ;

(4) that he had no hesitation in stating, should the measures recommended by him be adopted, that Cochin would become one of the finest harbours in the world, open in all weathers and capable of unlimited expansion.

The conclusions he arrived at in his report of 1911 were—

(1) that short areas of protection on easily eroded coasts invariably proved disastrous to the neighbourhood, and that, if sufficiently extensive groyne works were carried out all along the coast, not only would erosion be checked but considerable accretion and even reclamation might be definitely anticipated ;

(2) that the advance in dredging appliances rendered breakwater, etc., unnecessary ; and

(3) that it was important to get the largest and most powerful type of dredger for the Cochin bar, the cost of it being approximately £70,000.

The Diwan in his letter showed that Cochin was geographically interested and argued that, if Government persisted in considering the question of harbour improvement from a commercial and not an Imperial point of view, then Cochin had a strong claim to deal with it herself. He also urged that the survey of the port, which he understood was about to be undertaken, might be ordered to be taken up without delay and that, as the Darbar considered that the scheme would not cost more than 100 lakhs, there would be sufficient income to pay interest on the capital expended. He further suggested that the question of apportioning the income might be considered by the British Government and the Cochin Darbar jointly.

In forwarding the letter, the Resident informed the Government that the scheme of the improvement of the harbour was commercially sound and requested the appointment of a committee to inquire into and report on the engineering and financial aspects of the combined scheme of coast protection and harbour improvement.

The Government then decided that observations requisite for the formulation of a complete statement of the conditions in the Cochin harbour and backwater should be made and that such a statement be forwarded to the India Office for expert advice. They accordingly sanctioned an estimate for Rs. 25,000 for meeting the cost of establishment for making such observations.

Having set the party to work, the Secretary of State was addressed on the subject of obtaining from home an expert to visit Cochin and advise on proposals for the improvement of the harbour. The Secretary of State recommended Mr. J. R. Bell, a retired officer of the Indian Public Works Department (Railways).

1913. In January 1913, Mr. Bell visited Cochin and submitted his report in February. The conclusions he arrived at were :—

(1) That it was absolutely necessary to explore and record the peculiarities of the breakwaters ;

(2) that the treatment and segregation of the various erosions should be set on a definitive basis ;

(3) that the ultimate feasibility of dredging the bar to admit sea-going steamers at all seasons could only be established by crucial and costly experiment ;

(4) that there was no prospect of making any valid progress unless the authorities concerned were prepared to stake 15 lakhs on the sheer preliminary of employing in the first instance one 2,400 ton hopper dredger on this bar ;

(5) that there was much room to fear that deepening the entrance, if successfully effected, might greatly lessen the security of the inner harbour and marginal villages and towns.

This report was considered and sanction was accorded in G.O. No. 861 W., dated 29th April 1913, for the continuance of the investigation for a further period of one year.

1914. The further investigation closed on 31st March 1914 and the final report prepared by Mr. Campbell, Executive Engineer, West Coast Division, was received towards the end of 1914. The report pointed out—

(1) That no measures were necessary for improving the tidal compartment ;

(2) that two rubble groynes should be constructed to conserve the existing sandbanks ;

(3) that there was no reason to suppose that a channel dredged through the bar would silt up on an average of more than one inch a year ;

(4) that not much good would be gained by experimental dredging by "Manaar" when there could be no doubt that a channel would keep open and that there were ample data to warrant the purchase of a suction dredger seeing that the investigation had not revealed a single feature adverse to the maintenance of a channel through the bar excepting perhaps the erosion of the Vypeen shore and the sandbanks attached to it, which could easily be remedied.

Simultaneously with the above investigations, the Port Department employed the dredger "Manaar" to dredge an experimental channel through the bar. The dredger was at work between 8th January 1914 and 10th April 1914. The results of the investigation were to be sent to Mr. J. R. Bell who was then to make his final recommendations on the feasibility of a deep water harbour, but the gentleman died shortly after leaving India in February 1913. The question whether another expert should be called in at that stage was considered and dropped. Attempts were made to get a dredger to conduct further dredging experiments and as there was no chance of getting one and as there was no work for Mr. Campbell to do, his services were terminated in July 1915 (G.O. No. 1267 W., dated 7th July 1915).

As regards coast erosion, some further correspondence took place between this Government and the Cochin Darbar, and in 1914 this Government informed the Darbar that the protective works which had been constructed had the effect of staying erosion, but that if the Darbar were still satisfied that the benefits accruing to it therefrom were such as to place it under no obligation to contribute towards their cost, the Government would not press their claim further. As the Cochin Darbar refused to contribute towards the cost of protective works, the Government in the same year directed the cost of such works to be met one-half from the Minor Ports Fund and the other half as a loan from that fund to the Cochin Landing and Shipping Fund.

1916. In 1916, the Government of India was addressed on the subject of obtaining from home an expert for advising this Government on the proposals for the improvement of the Cochin harbour.

In 1917, the Secretary of State arranged with Messrs. Wolfe Barry, Lyster and Partners to depute Mr. Savile, Harbour Engineer in the employ of the Bombay Harbour Trust Board. Mr. Savile visited Cochin and his investigations were completed early in May, after which he returned to England and conferred with Messrs. Wolfe Barry, Lyster and Partners.

In January 1918, Messrs. Wolfe Barry, Lyster and Partners submitted their report and the following is a summary of their conclusions :— 1918.

(1) The foreshores of the pits north and south of Cochin should be preserved against encroachments of the sea by the construction of a system of groynes connected by a suitable embankment and by carrying out reclamation on the backwater side of the spit.

(2) There should be no difficulty in dealing with the sand by the best type of suction dredger constructed with hoppers.

(3) The most suitable position for the provision of mooring berths was the shore line to the south of the Government buildings at Ernakulam.

(4) The capital cost of the preliminary works including cost of dredger would reach 55 lakhs, on which Rs. 3,57,500 would pay 5 per cent interest and provide for amortization of the amount within 30 years.

(5) The works though in the nature of preliminary improvements, to be supplemented later by the construction of wharves and further dredging at Ernakulam, should, if carried out, certainly give a fresh impetus to the trade of the port which would not only enable it to effect great economies but also to add considerably to its revenues.

(6) Under the scheme outlined by them the steady progress and advancement of the port would be assured and the prosperity of this part of India would be materially advanced.

In January 1919, it was decided that no further action should be taken with reference to the port of Cochin until the whole matter had been discussed by His Excellency with the Raja of Cochin, who was then expected to visit Madras, but this discussion did not take place. 1919.

In February, Sir George Buchanan, who toured with the Director of Industries on the West Coast in connexion with the work of the Indian Munitions Board and who told His Excellency the Governor at his interview with him that he would acquaint the Director of Industries, for His Excellency's information, with anything of interest that came to his notice, forwarded through the Director a note on the Cochin harbour. In this note he criticized Sir John Wolfe Barry and Partners report and questioned the wisdom (1) of spending money on the groynes and embankments at Vypeen and (2) of putting in a continuous low rubble stone mound on either side of the dredged channel and also doubted the necessity of any protective works at Andikadavu. He suggested (1) that a scientific examination of ways and means from the financial and commercial aspects, should first be made, (2) that the extension of the channel to Ernakulam and building of wharves should be considered before the dredging of bar and mooring berths, and (3) that a young engineer with port experience should be appointed for the purpose of preparing detailed plans and estimates.

In June, a conference was held and the decisions arrived at were (1) that the Diwan of Cochin should be invited to come and discuss informally the questions connected with the development of the port and (2) that the Government of India should be informed demi-officially that the Government were discussing the question of the Cochin harbour with the Cochin Darbar, particularly the division of the customs revenue and wished to know whether the Government of India had any suggestions to make.

About the end of the same month, it was decided in Council that the Secretary of State be asked to engage as soon as possible on behalf of the Government of Madras a specialist engineer for harbour works on a temporary contract and that Messrs. Sir John Wolfe Barry and Lyster be asked for a general specification of the dredger required for the Cochin harbour.

On the 20th August, Mr. Thompson, Mechanical Engineer, who had previously explained his proposals for the Cochin harbour, was asked to send in a statement of the same in sufficient detail to enable the Government to make a further reference to Messrs. Barry, Lyster and Partners. His proposals consisted in the construction of three groynes projecting into the sea for a distance of nearly two miles and he expected that these groynes would result in the protection of the deep-water channel which was to be dredged and also in the accretion of a few acres. He thought that for a very small sum wharves could be built both at Cochin and Ernakulam.

On the 5th September, a conference was held at which the general policy was agreed to between the Government and the Diwan and it was decided that nothing further could be done until the Special Harbour Engineer came out.

A.N.—7-12-20.

II

EXTRACTS FROM REPORTS OF ENGINEERS ON THE POSSIBILITY OF DREDGING AND MAINTAINING A CHANNEL THROUGH THE COCHIN BAR.

Lieut. A. D. Taylor.—My survey shows the Cochin bar to be a very narrow ridge of sand extending in a semicircle from the shoal water off Vypeen point to that off Cochin point. Literally speaking the whole of this semicircular sand is the bar. 1859

What is wanted is a steam tug to tow vessels in and out, and she may be used for the purpose of working a steam rake or dredge to deepen the bar. If a rake be worked over that bar on strong ebb tides I have no doubt that the channel may be deepened at least 2 feet . . . . .

In a place like Cochin, where the sandy margin of the shore is liable to be cut away by strong tides aided by the wash of the sea, a stout screw pile of teak or other such hard work will be the only permanent bench mark we can adopt. I may perhaps be permitted to make a suggestion which though irrelevant to the subject of the bar is not unimportant to the improvement of Cochin; it is, that the river face of the town be properly revetted with piling and stones, as it seems to be getting undermined by the current and a few years of delay may reduplicate the required outlay.

If the steam rake be adopted, I venture to predict that certainly most of the steamers that are employed in trooping may come in and coal alongside a pier.

I cannot help thinking that a dredge will be better than a rake, for the sand that is got up from the bar will be useful in Cochin where there is not a grain to spare for ballasting small craft. But a steam dredge for Cochin needs careful supervision in the building.

The subject of deepening the bar, still more than can be done by a dredge alone, may hereafter be taken into consideration—G.O. No. 48, dated 12th February 1859.

Lieut. J. H. Taylor.—Now the presence of a first-class harbour midway between Bombay and Galle would be of such importance to British shipping that hardly any expense would be too great to secure it, and the promoters of this movement would appear to have had this prospect in view; but *it is my duty to point out* again, as I have already done in former reports, *that, if the bar was removed to-morrow, a large area of the channel*, not less than half a mile in length, *remains as shallow as* 16 *feet, which it would be utterly impossible to keep dredged to the depth of say* 22 *feet* (the least water that could raise Cochin into a harbour) *by any mechanical means.* The merchants of Cochin will doubtless derive great comforts and assistance from the additional facilities gained by the removal of the bar, but I cannot believe that any great increase of trade will arise, or any material benefit accrue either to the interests of commerce in general, or that of Cochin in particular—G.O. No. 624 W., dated 22nd August 1877. 1877

Lieut. Hammond.—During south-west monsoon dredging works on the bar would be impossible—G.O. No. 624 W., dated 22nd August 1877.

Lieut. A. D. Taylor.—The merchants of Cochin are anxious that their river bar should be deepened by dredging, and the Government of Madras has obtained the *Albuquerque* for that purpose. But the difficulties are great and (I think) not generally understood. After examination of this port, just 20 years ago, I suggested that a steam rake might advantageously be used every fine season to scrape down (on the ebb tide) a narrow passage through the little ridge of sand which forms the bar and has at low water a depth of 13 feet. The utmost I expected of such an operation was that a depth of 15 feet at low water might be gained and retained during four or five months through the narrow ridge, so that vessels with a draught of 15 feet might be towed across the bar. The vessel for this purpose was to be the steam tug and rake, and I merely suggested this in anticipation that English builders and engineers could carry out the idea if it met approval from the Government of Madras.

I never contemplated the possibility of dredging a channel with a depth of 18 feet right through the shallow water at the entrance of Cochin river. Inside the narrow ridge, which is the bar proper, the chart shows a plateau which is about 1,000 feet across, and carries only 15 or 16 feet over it. The most sanguine engineer could hardly expect that the ocean swell and tidal streams of March would respect the trough he had succeeded in digging during December and January. Having been on the Malabar Coast at all times of year, I am bold to say that the dredge would not find 100 working days of six hours each, whilst Lieut. Hammond estimated she would require 146 days of 10 hours each. The ocean swell, raised by the north-west winds of March, April and May, would play havoc with the newly dug passage; but *the south-west monsoon swell* of five or six months' duration *would obliterate all traces of any trench dug in that movable sand.*—G.O. No. 435, Marine, dated 24th July 1877.

Colonel E. A. Foord. I have no apprehension of the channel through the bar when once excavated being obliterated as prophesied by Capt. A. D. Taylor. The very fact that when as under present conditions with only one outlet from the estuaries, the depth of water on the bar was maintained at 18 feet, or nearly so till the Cruz Milagre breach occurred, sufficiently proves that *no such obliteration of an artificially deepened channel need be feared.* It is a well-known fact that the ebb discharge from estuaries is far more rapid than the flood inflow, and bearing in mind that during the heavy rainfalls on the coast, for days and days together, the discharge from the gigantic estuaries in the vicinity of Cochin is such as to overcome tidal influence and flows continuously seawards through the solitary embouchure at Cochin at an enormously increased velocity and scouring power and concentrated as it will be in the deepened channel *would not only maintain it, but in all probability deepen it in its progress seawards.*—G.O. No. 624 W., dated 22nd August 1877.

1881. *Col. R. H. Sankey and Lieut J. H. Taylor.*—In this sense we will consider the scheme in its present form to consist of the construction of two long breakwaters running parallel to each other or nearly so, say 400 or 450 yards apart, into 30 feet depth of water, so as to concentrate such scouring power as may exist in the ebb tide, with a view to the removal of the present bar, and to maintaining this depth throughout the year.

The difficulties we have felt to exist in regard to any scheme of this character are:—

(1) The construction of breakwaters on this plan would neither change the volume nor the velocity of the stream which now issues through the mouth, in spite of which the present bar has been formed. The natural and inevitable tendency would therefore, we consider to be the reconstruction of the bar, and gradual reproduction of much the same condition of matters as now exists only a little further out to sea.

(2) The removal of the bar were such ultimately possible, would allow of rollers, entering the new mouth during the south-west monsoons, to advance unchecked right up to the easternmost extremity of the harbour so formed; and we are thus of opinion that the entrance of any vessels at such periods between the pier heads would be an extremely hazardous and even dangerous proceeding; excepting during ebb tide with steamers or sailing vessels assisted by steam tugs. This condition would seriously diminish the value of the harbour as one of refuge. Again all shipping inside the harbour as proposed would be exposed to the full force of these rollers, and the anchorage or wharfage be in consequence rendered extremely inconvenient if not unsafe.

(3) From the manner in which the breakwaters are proposed to be carried out we consider that no future dredging of any practical value would be possible.

Mr. N. Parkes.—Proposals appear to have been considered by the Chamber for carrying out piers from Cochin and Vypeen respectively so as to concentrate the scour on the bar.........I agree in very much of the principles upon which these lines were laid down, but there are some important respects in which I think the plan requires to be modified and supplemented, and these will further increase the cost. In the first place, the process of obtaining the increased depth by scour in the face of the waves is a hazardous one......Another objection to the lines as laid down is that there is no room for the wave to spend itself between the piers, so that the seas entering between their ends would be propelled in almost full force to the ships' berths. At present the seas are broken by the bar and the shallow water on either side and this advantage would be lost. To avoid these two evils it would be necessary to start the piers from the shore at a much greater distance apart, and they should be kept at such a distance from the existing navigable channel that any disturbance or accumulation that may take place around their advancing ends may not affect the channel. They should begin to approach one another only when they have arrived in the depth of water in which the bottom is not affected by the wave ......In order to carry out the principles here laid down therefore I would propose to remove the north pier to a distance of 900 yards northward from the shore of the channel, and the south pier 1,100 yards southward, giving with the width of the channel itself a total width between them of 2,700 yards; that they be carried out parallel to one another in a due westerly direction to a depth of 24 feet and then, curving towards one another, terminate in 27 feet with a distance between them of 900 yards or double that of the channel between Cochin and Vypeen......The piers as I have described them, one 10,600 feet and the other 11,330 feet, or each over two miles in length, together with the dredging of the channel, I estimate to cost 81 lakhs of rupees. Their execution would make Cochin a first-class port and utilize the fine anchorage 3,000 yards long by 250 yards and upwards wide, with more than 24 feet depth......G.O. No. 911 W., dated 4th April 1881.

Mr. W. B. de Winton.—My own opinion is that *a channel through the bar, and up the backwater, could be dredged without difficulty by one of the powerful suction dredgers* described by Mr. Larminie, which would enable ships of all sizes to enter the backwater and lie alongside wharves in perfect security. The dredger would cost 5 lakhs, and a wharf 1,000 feet long and 20 feet wide, would cost another 5 lakhs, so that for 10 lakhs, plus the annual working expenses of the dredger, Cochin would obtain a harbour sufficient for all her requirements. There are, however, certain elements of doubt about the scheme, viz.,— 1900.

(1) Whether the channel once opened through the bar would remain open during the three months of the south-west monsoon, when the weather would probably be too strong for the dredger to work thereon,

(2) Whether with the removal of the bar, the rollers during the south-west monsoon, would not enter the backwater and render it temporarily impossible for ships to lie alongside wharves. And before such a scheme is sanctioned, evidence from experts in Europe should be obtained on these points—G.O. No. 96 W., dated 15th January 1901.

Messrs. Coode, Son and Mathews.—As far as an opinion can be expressed from the particulars available in the documents transmitted to us, taken in conjunction with our knowledge of the monsoons and their action, we have no hesitation in stating that if the channel is dredged as contemplated, from the anchorage to the entrance to the backwater, which forms the most essential feature of the proposed undertaking the operations in connexion therewith being largely conducted during the south-west monsoon, in consequence of wave disturbance, such deepened and improved channel would, to a large extent, be filled by sand, drawn from the vast supplies in the sea-bed and in the banks lying on either side of the proposed deep-water track. *We do not consider that it could be maintained to a sufficient extent to be of practical utility for the navigation of deep-draft vessels, certainly not during the occurrence of south-west monsoons,* when a channel for a length of nearly two miles would lie open to the disturbing action of the sea. In our opinion, the only mode of effectually treating such an entrance as that at Cochin, having regard to the physical conditions which prevail there, would be to construct a sheltering and training mole on either side of the entrance, the cost of which, having regard to the extent to which trade is carried on at the port, would, we take it, be altogether prohibitory. In this last named connexion, we may observe that the *partial* execution of such moles would, to some extent, increase the depth on the bar. Whether such improvement would produce results equivalent to the required expenditure, could only be determined after a careful engineering survey and inspection has been made, and reliable figures procured with regard to the cost at which suitable material could be obtained for the construction of the moles. *We do not* 1902.

consider the dredging of the channel and its maintenance to be feasible in such an exposed position, having regard to the duration of the south-west monsoons, when maintenance dredging would, under general conditions, be impracticable from excessive wave action. *We are of opinion that the channel could not be adequately maintained* for the reasons we have stated—G.O. No. 308, Marine, dated 13th July 1903.

Mr. W. B. deWinton.—I had a long talk on the subject with Mr. Mathews, when in London in January last, and he convinced me that, *without protecting moles on either side, it was a hopeless task to attempt to keep a channel open through the Cochin bar for vessels of deep draught.* Neither the present, nor in all probability, the future trade of Cochin can bear the cost of such moles, constructed either to the 5-fathom line or to the partial extent sugggested by Messrs. Coode, Son and Mathews, and therefore, unless the Government of India or the Home Government are prepared to assist in the construction of a harbour at Cochin for strategic purposes, I recommend that the proposal be allowed to drop—G.O. No. 308 Marine, dated 13th July 1903 (page 3 of notes).

1911. *Mr. Browning.*—The great dredgers which will inevitably ultimately be used for keeping open the Cochin harbour mouth will be unable to work there during the south-west monsoon. Meanwhile, if this erosion has not previously been completely stopped, the great pit which the dredgers will have dug out during the non-monsoon period to trap the bar, will not only be completely filled in by the roded material, but a fresh bar will be formed during the south-west monsoon when the dredgers are not able to work, with the result that steamers will be unable to make the harbour mouth during that season, and shipping and revenue will be interfered with most seriously. It will be remembered that when I first brought up the question of the Cochin harbour improvement, I advocated the construction of a specially designed curved breakwater and training walls to concentrate the ebb and flow of the tidal waters at the Cochin harbour mouth in order to scour out and maintain a deep channel where the bar now exists. I also laid special stress on the then great necessity for retaining the largest tidal area of backwater possible, for sluicing reservoir purposes. This was a matter which I had the great good fortune of discussing with some of the greatest experts on harbour matters. Since those days, however, the advance in mechanical appliances has been so stupendous that the old accepted principle of harbour construction has lately been revolutionized, and though the old principle above referred to must not be lost sight of, yet in view of the gigantic strides made in dredging operations and the developments that are now known will take place as regards same, I have come to the conclusion that the question of the breakwater, etc., may be set aside, at any rate for the present. With the abandonment of this curved breakwater and training walls goes the necessity for the retention of the sluicing reservoirs inseparable from them. The principle on which the dredging will have to be done at Cochin is as follows: During the non-monsoon months, an immense trench will have to be excavated adjacent to the present bar, to act as a trap during the monsoon months, when the dredger will be unable to work outside the harbour mouth. Experience with these dredgers has shown that when such bar traps are excavated, *and coast erosion affecting such points checked,* the wave action, instead of forming a new bar during the non-working period, only precipitates sand and detritus into the trap dug, and the bar is thus controlled. It has further been found that with the bar so controlled at such harbour mouths, the *channels dug out by the dredgers,* not only seaward but also inland, *retain their shape remarkably well, excepting when subjected to peculiarly violent temporary storms* (paragraphs 13, 24 and 29 of G.O. No. 1356 W, dated 30th September 1912).

1912. *Mr. A. Campbell.*—The most obvious remedy therefore, for the present state of affairs would be to re-establish a *status quo*, by enlarging and deepening the water to an extent sufficient to keep the bar at any required depth. This is, however, I fear the 'gospel of perfection' and not altogether within the range of practical politics. Still undoubtedly much may be done in this direction on the following lines:—

(1) By dredging and reclaiming scientifically to facilitate the propagation of the tidal wave and thus increase the capacity of the backwaters as a tidal compartment.

(2) By excluding as much river water as practical, the currents of which are prejudicial to that of the tide.

(3) By bunding out the tidal water that enters at Munambam, thereby increasing the quantity that passes through the Cochin opening.

In considering the matter, the fact should not be overlooked that any improvement thus obtained will have a very lasting effect in keeping open the bar, once it is dredged.

It has been contended with a certain show of reason, that if the dredging of the bar is to be rendered practical and effective, it will be necessary to protect the foreshore from erosion for a considerable number of miles on either side of the harbour entrance in order to arrest the supply of sand to the bar. It must be admitted that this argument is given most prominence to by those interested in the preservation of land along the littoral, and, therefore, cannot be accepted as altogether impartial. Personally, I find myself unable to accept it at all, unless very much more substantial grounds, than those already preferred, can be advanced in favour of it . . . It will be seen that owing to the state of the sea no considerable sand movements can take place excepting during four months in the year, so that we need only concern ourselves with the changes that take place then . . . If my surmise proves to be correct, I should have no hesitation in stating that the sources of the supply of sand, that can remain on the bar, are so limited that the silting up of a channel dredged through it, once its sides have attained their natural angle of repose, will be a very slow process . . .

Now if my theory regarding the formation of the bar should prove correct, all that would be required to be done, in order to improve it, would be to dredge it thoroughly once and then proceed to improve the tidal basin, also by means of the same dredging, and so establish a regime which it would cost, comparatively, very little to maintain. Of course, the simplest and most satisfactory way of ascertaining what truth there is in my theory would be to dredge an experimental channel through the bar, possibly by means of the "Manaar" . . .

In the event of it being proved that I am mistaken and that the supply of sand which can be deposited on the bar is really unlimited, the proposals for improving the tidal compartment will still hold good, but at the same time we shall have to be prepared to deal directly with the sand on the bar. Methods by which this can be done are as follows:—

(1) By dredging the bar, more or less, continuously.

(2) By the construction of long groynes, which will concentrate the river flow, and force the bar into deep water.

(3) By the protection of the foreshore which will arrest the erosion of sand.

No. (1) will certainly have to be undertaken whether Nos. (2) and (3) also would be a matter for experts to decide. It must not be overlooked that the mere fact of dredging the bar alone, by admitting the tidal waves more freely, will most probably increase the rise and fall in tide, within the backwaters and, consequently, the scour on the bar (pages 40 to 42 of G.O. No. 1356 W., dated 30th September 1912).

Mr. J. R. Bell.—Summarized, that opinion (Messrs. Coode, Son & Mathews) 1913. affirmed that no satisfactory entrance of the desired class can be made without extending a pair of breakwaters to deep water and allowed . . . that the available data . . . . amply suffice to show experts that the cost of the breakwaters must be, in any case, prohibitive. It is safe to say that the above conclusion as to cost is accepted by all competent reasonable opinion and that unless breakwaters can be dispensed with, this part of the case may be regarded as definitely closed . . . .

Allowing that all idea of breakwaters (especially now that 33 feet not 30, has to be aimed at) may be regarded as impracticable, we come to the question of how far dredging alone has been commended. A brief history of this alternative may be summarized as follows:—

After it became clear that the closure of the Cruz Milagre Gap had not materially benefited this bar the Government procured a new bucket dredger, the Albuquerque, intended to deepen the bar by 2 feet, i.e., from 13 or 14 to 15 or 16 feet. When tested on the bar during March 1877 in a normal ground swell with a heave of $1\frac{1}{2}$ feet she failed quite hopelessly and was promptly withdrawn to sheltered waters.

In 1888 Mr. Brunton advanced his new design of a "sluice-dredger" which would squirt clean surface water against the crest of the bar so that (clearly only during the ebb) the agitated would be carried off seawards. The Government, in my view very properly, declined to entertain that proposal and matters rested till the reference to Sir William Mathews' firm was made.

Since those days suction dredging on a very large scale has attained many notable developments especially in the United States where the Government is doing wonders to improve minor harbours. In this connexion I quote, without however wholly endorsing, the remarks of an eminent fellow member of the American Society recorded so lately as last November in a discussion on Pacific Coast Harbours. Mr. LeConte said "It may be stated that the day for extending jetties (i.e., breakwaters) out into deep water in order to maintain depth on the bar is gone for ever. The annual interest on cost of deep water extensions will pay for the necessary dredging five times over." I demur to so vigorous an assertion because, for reasons to be presently given, such dredging in India has cost hitherto quite thrice the rate Mr. LeConte seems to figure on.

Apart from American experience of dredging very notable results have been attained at Natal, initiated indeed by the father of Mr. Browning (Chief Engineer to the Cochin Darbar) whose interest in dredging is well known to all concerned with this case. Mr. Campbell, a comparatively junior Engineer of the Madras Public Works Department, whose primary duties I take to be directly connected with work of more immediate urgency, has also made a study of this question and is now prosecuting private enquiries at home into the type of dredger that Messrs. Simonds recommended for Cochin. I myself have been called into council because I have many years' intimacy with this method more particularly as applied on my advice as their Consulting Engineer, by the Chittagong Port Commissioners . . . .

The truth . . . seems to be that groynes and similarly light defences only suit instances where Nature occupies a semi-neutral attitude and is ready on small provocation to adopt either of two alternative courses. Where Nature is approximately neutral, groynes can undoubtedly help her to, so to speak, make up her mind. When Nature and Art act together, their unanimity and progress are wonderful, whereas in the contrary case the Groyner's Art is always useless and not uncommonly harmful. . . .

The permanence of the Cochin bar depends for the most part on the converging orientation of the deeper backwater channels. It is possible but not likely that a breach may so occur as to seriously tap the Cochin tidal prism. If that ever happens, I wish to leave it on record that we ought to be prepared with projects for so damming the backwater nearest to the breach as to isolate its tidal reach from the main backwater. . . .

I venture to say that although I regard the risks due to erosions as far less imminent than some have supposed, I consider it absolutely futile to embark in any serious undertaking on the bar at Cochin until after it is perfectly clear that all possible risks from erosion are absolutely under control. . . . .

It will clear the air to say at once that this bar can only be treated by a hopper dredger which carries away her spoil in her hold. The idea of landing it through pipes is, here, utterly illusory. So is that of delivering it by relays of sump-scows while the dredger keeps on digging. . . . . . From a harbour engineer's point of view a main merit of merely dredging consists in the fact that, unlike fixed training walls, dredging does not irrevocably commit us to any foreordained alignment. If the dredged alignment proves wrong, we can abandon or change it without serious harm. As already indicated, I need a great deal more information before feeling justified in recommending any action whatever, and, in my view, nothing but extended experience can prove where the line of least resistance can be found. . . . . Personally I do not believe that any *monsoon* bar-dredging can be done . . . .

In conclusion I may here perhaps revise and reiterate the gist of my ad interim conclusion as already outlined in conversations with the Honourable the Chief Engineer and with the Chamber of Commerce—

(1) It is absolutely necessary on every account that the peculiarities of the backwaters should forthwith be exhaustively explored and recorded.

(2) The treatment and segregation of the various erosions . . . have got to be set on a definitive basis. Until the Government can feel absolutely assured that they possess the means of infallibly dealing with any possible seabreaches it is idle to regard costly improvements on the bar as within the sphere of practical polity.

(3) It is right to go on investigating the bar and its conditions although not to spend money on bar-works. . . . . If the authorities concerned . . . . . . are prepared to stake 15 lakhs . . . on the sheer preliminary of employing, in the first instance, one 2,400 ton hopper dredger on this bar—well and good. If not I see no prospect of making any valid progress.

(4) Lastly there is much room to fear that deepening the entrance, if successfully effected, may greatly lessen the present security of the inner harbour and marginal villages and towns. . . . I am not now prepared to suggest any comprehensive inner harbour scheme in sequel to a very hypothetical entrance (G.O. No. 861 W., dated 29th April 1913).

Mr. A. H. S. Campbell. . . . . No measures are necessary for improving the tidal compartment. . . . Works should be undertaken without delay to conserve the existing sandbanks on other side of the harbour entrance and to assist them in concentrating the tidal currents on the bar by means of two rubble groynes. . . . . These groynes need not be taken out into more than 6 feet depth of water. . . . There is no reason to suppose that *a channel dredged through the Cochin bar* will silt up on average of more than one inch a year. . . . and there is no reason to anticipate that it will adversely affect a channel through the bar. . . . 1914.
The height of the bar, during the year, does not fluctuate to any appreciable extent, and the line of deepest water across the bar *may be considered as permanent*. . . . . . Sand and shingle being the only material that can be deposited on a bar and these being very limited in quantity at Cochin, there are no means by which a channel through the bar could be materially filled up. The sand composing the bar and the mud underlying it are suitable for suction dredging. . . . . . There are no grounds for supposing that the dredging of the bar will be, indirectly, the cause of damage to the foreshore of the harbour. . . . . I am of the opinion that not much good is to be gained by experimental dredging . . . when *there can be no doubt that a channel will keep open*. . . . Finally I may state that we have ample data at our disposal to warrant the purchase of a suction dredger, seeing that *the results of our investigation* and study of the harbour *have not revealed a single feature that is adverse to the maintenance of a channel through the bar*, excepting perhaps the erosion of the Vypeen shore and the sandbanks attached to it, which can easily be remedied (pages 9 to 11 of G.O. No. 1267 W., dated 7th July 1915).

Sir John Wolfe Barry, Lyster and Partners.—It has been recognized by all those 1918.
who have interested themselves in the welfare and improvement of the port that it was essential to its maintenance that the coastal strips should be preserved against encroachments of the sea, as otherwise, owing to the substratum being alluvial, serious breaches of the spits might be caused such as would lead to a deterioration of the main channel between the sea and backwater at Cochin, upon which the access to the port of Cochin depends. This view we entirely endorse. . . . . Attempts have been made to arrest the encroachment of the sea, by groynes in the first instance, and more recently by a bund or bank raised about 12 feet 6 inches above Admiralty datum level and having a paved slope on either face. . . . . This type of structure does not, according to modern experience and practice, give the best results in accumulating sand. . . . From the sections of the foreshore abreast of the bund for 1916 and 1917, it is evident, on the contrary, that this work has done nothing to arrest the erosion, and we understand that this view is confirmed by the fact that it has been necessary recently to add to the protection which it affords by forming a rubble apron along its toe. . . . The most successful groynes are those which are only slightly raised above the foreshore at first and are so constructed that they can be gradually raised and extended as the sand accumulates. . . . . The construction of such a system of groynes connected by a suitable embankment at their shore end to prevent their being outflanked by the sea is therefore, in our judgment, the first step to be taken in connexion with improvement works at Cochin. . . . . . At the same time we think it would be well if reclamation was carried out on the backwater side of the spit along this length, so as to increase its width so far as may reasonably be practicable. . . . .

The most effective method of removing such a barrier, if that were the only point to be considered, would be by constructing moles or breakwaters on either side of the channel in such a manner and to such an extent as to preserve the continuity of contraction and depth beyond the limits of the Gut and so to prevent the dispersal and slackening of the currents on which the channel depends for its maintenance. Such a course is not possible in the present case for two reasons: (1) because the projection of such works to the required depth into the sea would arrest the travel of the sand along the coast and tend to promote a breach through the coastal spit on the leeward side, and (2) because the cost of such works would impose a prohibitive burden on the finances of the port at the outset.

The other alternative is that to which most of, if not all, the authorities have looked for improvement, viz., dredging. . . . *We are firmly of opinion that, if such a channel as is proposed* to commence with viz., 600 feet in width and 30 feet below low water, *were formed by dredging before the monsoon and left undredged during that period it would be practically obliterated at the end of that time.* This view is confirmed by the evidence of the sections which were taken through the comparatively small trial channel which was dredged before the monsoon period in 1914. These show that, after the dredging was completed in April, there was steady shoaling throughout the monsoon period and that by October the channel had shoaled to its original depth . . .

We therefore consider it essential that all dredging work should be preceded by the deposit on either side of the channel of a continuous, low, rubble stone mound which, as the deepening work proceeded, would gradually subside and ultimately revet or face the sides of the newly-formed channel, and thus prevent them from falling in or any lowering of the contiguous banks taking place . . . It would also avoid the undesirable enlargement of sectional area of channel resulting from a dredged channel with unrestricted slopes, and so give the current a better scouring value than it would otherwise possess . . .

We do not anticipate that the maintenance of the channel outside the monsoon period will involve any serious proportion of the dredger's time . . .

The conditions under which our investigations have been made do not, unfortunately, permit of such a complete review of the case being made . . . . The nature of the works possible and desirable in order to effect the improvements demanded could only be settled after Mr. Savile's return, when all this information had been laid before us and duly analysed. It will be understood, therefore, though the information we have received has been sufficient to enable us to prescribe generally the character of the works required, further investigations would be required on the spot before they could be designed in sufficient detail to enable their cost to be ascertained with accuracy . . .

The following is a list of the preliminary works recommended in the foregoing:

Two miles of groynes and one mile of embankment at Vypeen.

Two miles of groynes and two miles of embankment at Andikadavu.

Dredging a channel across the bar 600 feet wide to a level of 30 feet below low water ordinary spring tides.

Dredging an area in the backwater and providing moorings for ten or twelve ships.

Channel and mooring buoys, tug, etc. The nearest approximation to the cost of these works which can be made with the information at present available is 25 lakhs . . .

As we pointed out at the commencement of this report, it is essential that the reinforcement of the coastal strips, particularly that north of Vypeen, should be thoroughly well established before the dredging of the bar channel is undertaken . . .

The works tabulated above, though in the nature of preliminary improvements, to be supplemented later by the construction of wharves and further dredging at Ernakulam, should, if carried out, certainly give a fresh impetus to the trade of the port, which would not only enable it to effect great economies, but also to add considerably to its revenues.

Sir George Buchanan.—I have read the report by Sir John Wolfe Barry and Partners, . . . but it cannot be called a detailed project on which Government or a public body would embark on expenditure. The works proposed comprise— 1919.

(*a*) two miles of groynes and one mile of embankment at Vypeen,

(*b*) two miles of groynes and one mile of embankment at Andikadavu,

(*c*) dredging a channel across the bar 600 feet wide to a level of 30 feet below L.W.O.S.

(*d*) dredging an area in the backwater and providing moorings for ten or twelve ships, and

(*e*) provision of channel and mooring buoys, tug, etc. It is stated that the nearest approximation to the cost of the works, which can be made with the information available, is 25 lakhs.

As a matter of interest I have examined the plans, and charts, and inspected the port, and the following remarks may be taken for what they are worth:—

(*a*) the groynes and embankments carried out at Vypeen by Mr. A. Campbell, Executive Engineer, are in such good condition and doing their work so satisfactorily that I cannot see any object whatever in spending money in that locality especially as there is a large reserve of stone available on the spot to repair any breaches in the apron which may occur in the next few years.

(*b*) I did not go to Andikadavu, and as the report states that the writers themselves had been unable to obtain any specific information in the form of sections, or foreshore lines but 'are informed that erosion is proceeding,' it is evident that their proposals are premature, and that proper plans and sections must be prepared before any opinion can be formed; I understand that Andikadavu is some eight miles south of the entrance to Cochin port, and it is open to question whether the possible effect of a breach in that locality is not very much overestimated.

(*c*) I must confess that the proposal to deposit, on either side of the dredged channel, a continuous low rubble stone mound, causes me grave misgivings, as I am afraid that after a heavy monsoon the stone would be washed into the channel, where its removal would be exceedingly difficult. I cannot call to my mind any similar work elsewhere, and *I cannot subscribe to the opinion* expressed in paragraph 64 of the report to the effect *that a channel dredged before the monsoon and left undredged during that period would be practically obliterated at the end of that time.* I attach no importance to the fact that when the bucket dredger 'Manaar' made a small experimental cut, the hole filled up during the monsoon, *and I believe a properly dredged channel would, with a certain amount of periodical dredging, maintain itself*; at all events the experiment should be tried before adopting the highly dangerous expedient of dumping rubble at the edge of the channel.

(*d*) The report gives no details in respect to the dredger, which is the crux of the whole scheme, but merely observes that the exact form and type would require to be carefully considered in order that she might be specially adapted to the work required of her . . .

In my judgment there are no insuperable difficulties in dredging a channel through the bar, and making a port at Cochin, but to enable a reasonable and complete project to be placed before Government the following action is, I suggest, necessary:—

(*a*) First and foremost a scientific examination of ways and means from the financial and commercial aspect.

(*b*) It is a matter for consideration, whether the works at present contemplated are not of prohibitive cost for the port of British Cochin alone, and whether the second part of the scheme, namely, the extension of the channel to Ernakulam and building of wharves there, should not at all events be considered in greater detail than has been the case. A port without any hinterland has not much prospect of large development . . . . I therefore consider that although the necessities of British Cochin may warrant the early extension of Part I of the scheme, i.e., dredging of bar, and mooring berths, section 2, i.e., the extension to Ernakulam, should be properly considered before section No. 1 is put in hand.

(*c*) Assuming that the considerations under (*a*) and (*b*) have been worked out in detail, and it has been settled definitely that the scheme is justified, then a proper project accompanied by detailed plans and estimates can be prepared, and I should recommend the appointment as Port Engineer of a comparatively young engineer with port experience, who would, subject to supervision, be entrusted with the whole-time work of making the port.

(*d*) I need hardly say that everything depends on getting the right kind of dredger . . . . A modern dredger for sea work is an exceedingly costly machine, and it is impossible to be too careful in its selection and design.

Mr. S. Bhaskara Ayyar.—With regard to the works proposed to the south of the approach channel, the protection and reclamation of the foreshore there and the preservation of it between the backwater and the open sea are quite as important as in the case of the foreshore to the north. A single breach in it connecting it with the sea within 10 miles on either side of the harbour, will ruin the backwater and the approach channel near the harbour, owing to the ingress of tides from different directions and the prevention of free tidal propagation in the backwater channel.

Mr. W. Hutton.—It will at once suggest itself that the formation of these rubble mounds on each side of the site of the channel to be dredged is a detail of the channel work which can best be determined by the practical experiment of using the new dredger, which is to be obtained, to dredge a short length of channel before the monsoon and then observe the action of the monsoon on the dredged channel. If this short length of channel be filled up during the monsoon months, then it would be necessary to adopt the plan of rubble mounds or some other system. Neither Sir John Wolfe Barry, Lyster and Partners, nor Sir George Buchanan rest their opinion in this matter on any similar problem successfully dealt with elsewhere, and both their opinions can only be correctly judged by the experiment I have indicated. But I must confess that, in this matter, I am inclined to agree with Sir George Buchanan for a reason that neither he nor the firm refer to. If the rubble mounds settle down so as to revet the channel which they can only do in a partial way, then when the channel has to be re-dredged periodically or continuously, as the case may be, the presence of this rubble stone in the bed of the channel would interfere with the process of dredging. Some of the stone is bound to find its way as far as the bed of the channel. Surely it seems preferable to retain a sandy or mud bottom to the channel rather than artificially cause obstructions in the form of rubble stone.

The other criticisms of Sir George Buchanan refer to the provision of groynes to protect the sea north and south of Cochin. The firm propose two miles of groynes to the north and two miles to the south of Cochin. Sir George Buchanan does not consider these groynes necessary, as the existing groynes to the north are doing their work satisfactorily and are in good condition. The Public Works Department have, since the firm sent in their report, obtained a plan of the correct type of groyne from Mr. Savile and have prepared an estimate for the two miles to the north, the cost being Rs. 90,000. In constructing groynes to protect a foreshore and arrest the travel of the sand drift, it is not necessary to construct a whole series of groynes included in an estimate before observing their action. We can construct a few and then decide by observation whether their construction promises to fulfil the original intention. Consequently I again advocate the practical test of trying whether the groynes will be useful or not before deciding finally for or against the construction of four miles of them. In this matter of criticising the firm's proposal to construct groynes it seems to me that Sir George Buchanan is unnecessarily giving this minor item in the firm's scheme undue importance probably for want of more important points to criticise.

Another criticism of Sir George Buchanan is that the firm do not give any details of the dredger. Again, I think Sir George Buchanan's statement is unacceptable, because the report of the firm is not a detailed report accompanied by plans and estimates, but a general report laying down the main lines on which detailed plans and estimates should be drawn up. The firm give sufficient information of the dredger for a general report . . . . . .

Sir George Buchanan's demi-official letter is valuable in this way that he approves the general principle of the scheme and contents himself, ineffectually, I submit, with criticisms of relatively unimportant details. He states that 'in his judgment there are no insuperable difficulties in dredging a channel through the bar and making a port of Cochin.' This is, I think, every one's opinion, and the case is

to my mind on a par with the Madras harbour northern entrance question. For very many years expert after expert, before and after the construction of the harbour, advocated an entrance on the north side . . . . and, after many years, the first entrance constructed on the east side was closed and an entrance to the north was constructed and found to be a success. Similarly with Cochin the crux of the problem is to dredge a channel through the bar and dredge an area in the backwater where steamers can lie close to the shore of British Cochin. I submit that the general report of Messrs. Wolfe Barry, Lyster and Partners should be accepted as the basis for detailed plans and estimates, which should be drawn up by an engineer of experience and not by a comparatively young engineer with port experience as recommended by Sir George Buchanan. Such an engineer might be from 35 to 40 years old. . . . .

Mr. E. Thompson.—I have read with interest the report of Sir John Wolfe Barry, Lyster and Partners on the proposed developments of the Cochin harbour. The following are my conclusions :—

I cannot agree with Mr. Campbell's report in which he assumes that the channel dredged through the bar will remain open without dredging from year to year. Neither do I agree with Sir John Wolfe Barry, Lyster and Partners' contention that stone mounds on both sides of the channel gradually diminishing in height to the deep water would be sufficient for protection for the channel against silting. . . . .

I think it necessary to have the rock mounds or groynes on both sides of the channel carried up to 10 feet above mean high tide so that the current from the harbour can automatically keep the channel open without dredging. . . . Another advantage will be that they will act as controlling groynes which should reduce the erosion at Vypeen. . . . .

I do not think it economical to dredge the proposed channel for buoy moorings as shown on the map attached to Sir John Wolfe Barry, Lyster and Partners' report. . . . I think that for a very small additional expense wharves can be built at both Cochin and Ernakulam and a much better anchorage basin afforded.

Mr. W. Hutton.—Mr. Thompson's proposals consisted in the construction of three groynes projecting into the sea for a distance of nearly two miles, and Mr. Thompson expects that these groynes would result in the protection of a deep-water channel which was to be dredged and also in the accretion of some 400 acres to the north and 400 acres to the south which accretion would be a valuable addition to the area of British Cochin. The question of the construction of the groynes in the sea at Cochin, for protecting the channel, is not a new proposal. It is contained in Mr. Browning's report and is referred to in Messrs. Wolfe Barry, Lyster and Partners' report. The latter firm state that the construction of groynes would result in erosion on the leeward side. I may say that this the usual experience everywhere. Consequently. . . . . I am not prepared to support Mr. Thompson's proposal without first getting the opinion of an engineer with experienee of harbour works.

A.N.—7-12-20.

III

COCHIN HARBOUR SCHEME—GENERAL.

It was decided in Council yesterday (1) that the Government of India be urged as strongly as possible to take over the Cochin harbour as an Imperial matter, the arguments being framed on the lines of my rough draft of the 1st November 1920, (2) that the question of the finance of the harbour scheme should be discussed by me with the Diwans of Cochin and Travancore at an early date, (3) that the Presidency Port Officer should be consulted as to the advisability of replacing the Landing and Shipping Fees Committee at Cochin by a Port Conservancy Board and of making an increase in the dues levied on the trade of the port as an intermediate step towards the much higher rates of dues contemplated under the Harbour scheme, and (4) that an account be made of all preliminary charges already incurred on account of the Harbour scheme and the amount debited to the Landing and Shipping Fees Committee or the Port Conservancy Board.

2. The following remarks relate to items (1), (2) and (4) above :—

(1) It is as well perhaps to repeat that my draft was written without records. As an instance of the sources from which it can be amplified, I would invite attention to paragraph 3 of Sir George Buchanan's note on page 20 of notes to G.O. No. 394, Marine, dated 22nd October 1920, in which he gives a list of Engineers consulted on the Harbour Scheme with the aid of which an amplification of this part of the draft might be prepared.

(2) The Chief Secretary will presumably write to arrange for the informal discussion with the Diwans. If there is any difficulty about their coming up to Madras, I should be quite ready to run down to Cochin for the discussion.

(4) Instances of the charges in question will be found on pages 11 and 16 of the notes to G.O. No. 394, Marine, dated 22nd October 1920. They relate mainly to reclamations and investigations. To these have to be added the charges incurred since Mr. Bristow's appointment and the further charges that will be incurred in the employment of the dredger "Mannar". In the case of some of the charges, they also involve the question of a recovery from the Cochin Darbar. It would perhaps help our finances for this year if we could debit this advance to the Provincial Loan Account and make a corresponding credit to Public Works Department. It would, however, I think be necessary that the loan should be one without interest and we should have to address the Government of India to secure sanction to this. We shall also need the advice of the Accountant-General on the whole question

3. To come to item (3), I think I must ask for a much more critical examination of the estimates of receipts and expenditure, capital and recurring, of the harbour before I am in a position to discuss matters with the Diwans, and I shall be glad if the Chief Secretary will have this put in hand at once.

4. Taking receipts first, I would observe that the port dues levied under the Ports Act, 1908, have to be credited to a Port Fund which can only be spent on purposes specified by the Act and further that, until the schedules of the Act are altered, the dues levied at Cochin go into a fund which is common to a number of ports. In these circumstances, it does not seem possible to take credit for these dues as part of the receipts available for expenditure on the harbour.

5. The rest of the receipts follow fairly closely the classification in the budget of the Madras Port Trust Board, but I should like to have an idea in each case how the figure is arrived at. The only instance in which any details are offered is that of the import and export dues which are calculated on the basis of a trade of 375,000 tons in 1913–14 increased by an average of 33 1/3 per cent in the intervening years taxed at the rate of Rs. 2 a ton. The first figure is based upon a note by Mr. Bristow which is referred to in the proceedings of the Sub-Committee at page 6

of their report. In view of the fact that no complete statistics of tonnage are kept and of the very varying estimates of tonnage that have been made in the past, I should like to see a copy of this note. As for the increase of trade, I gather that the increase in question is a normal increase, since for the greater part of the period the new facilities will not be in working order. I should like, therefore, to see the normal increase of the trade in the port as exhibited in rupees plotted in a curve up to 1913–14 and the curve continued to 1930. It might be possible to deduce from this a vague idea of what would be the normal trade apart from the harbour works over the period of development.

6. Lastly, as regards the rate, I observe that, while the Madras rates of import and export dues are less than Rs. 2 a ton, the addition to them of other dues such as transit and terminal dues raise the charge per ton to Rs. 3 and therefore the charges at Cochin will be something between Rs. 3-4-0 and Rs. 3-8-0 per ton. This charge until the wharves are built will be in addition to the charge for landing in cargo boats which has been condemned as prohibitive in itself. What the Chamber of Commerce undertook to do was to pay Rs. 2 a ton after the developments were in working order. The estimate seems to anticipate Rs. 3-8-0 a ton before this date.

Question of recent increases needs examination.
J.M.T.—23-11-20.

7. As to some of the other figures in the estimate, it has to be noted that they are really recoveries by the Port Trust from persons using the Port Trust premises of charges paid by the Port Trust to the railways or the municipality or other persons. In view of the inclusion of receipts of this nature, it is necessary to be certain that the estimate for expenditure includes sufficient provision for the corresponding charges.

8. The only expenditure provided for is expenditure on maintenance, which is estimated on the basis that, in a fully equipped port, the maintenance of the works costs 40 per cent of the revenue. It is assumed that there will be no work to be maintained in the first year and that the cost of maintenance will increase evenly from then to the tenth year in which it will reach 40 per cent. On this basis, an average of 20 per cent is taken. This calculation seems to ignore all the other charges of the port. Ports are not run for profit and the endeavour is to so regulate the levy on the trade as just to cover the cost. The cost is divided in the Port Trust budget into the following main heads:—(1) Administration, (2) Engineering and Maintenance, (3) Porterage, (4) Pensions and Contributions and (5) Interest on loans and sinking funds—vide page 5 of G.O. No. 320, Marine, dated 30th March 1920. In framing an estimate for Cochin, we may omit interest on loans and sinking fund for the time being and arrive at the amount available for that by deducting the other charges from the receipts. So far, however, as concerns 'administration' and the other heads there are charges being incurred now and they will increase as the trade of the port increases. It seems to be quite clear therefore that we cannot base our estimates on the sum required for maintenance alone and an alternative method of calculation must be found that will work up to somewhere close upon 100 per cent when all the five heads are considered.

9. The following note represents an endeavour to arrive at an alternative estimate of the recurring receipts and the recurring charges of the port by reference to the figures of the Madras Harbour and was prepared under my instructions by my shorthand writer. I hope that other means of arriving at alternative estimates will be discovered. It is clearly of the utmost importance to the whole scheme to arrive at as accurate an estimate as possible, and here I would invite attention to the great stress laid upon the necessity for the scientific investigation of this question both by Sir John Wolfe Barry, Lyster and Partners and by Sir George Buchanan.

The rates levied at ports have a fairly direct relation to values as well as to tonnage and, as statistics of values are the only ones available, it may be useful to check these estimates by a comparison with the port of Madras. The Cochin trade has fallen off since the war, so the figures for five years previous to it may be taken to establish a proportion. On the basis of these, the trade of Cochin was to that of Madras as 628 to 1960. The Madras figures for 1919–20 include super dues equal to 75 per cent of the pre-war taxation and provide a total of 25·50 lakhs collection,

equal to Rs. 3·4 per ton on trade of a value 1·9 times that of the pre-war period. As Cochin's trade in that year had only expanded by 1·2 times, the application of these rates to the unimproved port would seem likely to give a figure far in excess of what its trade could bear. The total receipts at Madras under heads that will be common to both * ports were Rs. 21,12,064, and 33·3 per cent of this, or the proportion leviable in respect of similar trade in Cochin, would be Rs. 7,04,016.

* Omitting harbour terminal charges, cranage, porterage special demurrage, hire of harbour waggons, contribution from port funds, contribution from Government, interest on investments, profit on investments, commission on Corporation timber licence fees.

"On the charges side, we may eliminate interest for the moment and the items of maintenance shown in the margin which will not come into operation for some time to come. There is left a sum of Rs. 9,64,898. On the same basis of proportion (33·3 per cent) the Cochin charges would come to Rs. 3,21,966.

Porterage special.
Demurrage.
Tracks.
Cranes power.
Locomotive-working.
Interest on Government loans.
Loss on investments.

"The net revenue on this basis would amount to Rs. 3,82,050. Assuming that the Government of India would allow loans for a term of 50 years, we may take a minimum of 10 per cent for interest and sinking fund charges. At this rate the port could afford to borrow 38 lakhs."

10. There remains the estimate of permanent capital works. As regards this, I understand that some of the estimates are ready and hope that the Chief Engineer will be able to give me an idea as to how far he is able to accept those that are before the discussion with the Diwans. I hope also that the estimate for the railway is under scrutiny in Public Works Department (Railways) and that Colonel Barnardiston will be able to inform me whether he is able to accept that also as not being under the mark. In connexion with these estimates, I should like to ask particularly what provision has been made for land acquisition. I observe that the railway will involve the acquisition of a long strip of land on the Ernakulam side, across the Venduruthi island, and right through both Native Cochin and British Cochin. In view of the very high prices of land in Cochin, it would seem that very large sums will be required for this purpose. The only separate provision for land acquisition which is made in the estimate of capital expenditure is a sum of 3·50 lakhs which Mr. Bristow told us yesterday is the sum required for acquisition of land between the new Custom House site and the boundary stone. Presumably therefore the money required for acquisition for the railway is included in the 215 lakhs provided for railway works. I should also like to understand what is the nature of the charge of 4½ lakhs as a premium for right of reclaiming the Venduruthi foreshore. This seems to be a very unusual charge to be made by the darbar upon a body which will be financed by themselves.

11. With reference to Mr. Turing's note dated 5th November 1920 to the effect that dredging by contract and purchase of a dredger simultaneously is the most expensive way of doing the work, I should be glad if Mr. Bristow would send me a note explaining what he told us in Council yesterday as to the reason why the adoption of this method is desirable. I should also like to know how, if it is found that it is not practicable to bring all the spoil dredged on the bar into the harbour, the estimate in respect of reclamation and value of land at Venduruthi will be affected. In this connexion I would invite attention to paragraph 48-III of Mr. Bell's report in which he contemplates that two, if not three, dredgers would be required (page 11 of G.O. No. 861 W., dated 29th April 1913). I should be glad to have Mr. Bristow's opinion upon this statement.

12. I should further like to know what has been the total cost up to date of the Madras Harbour and how much of this has been met respectively from (a) grants, (b) loans without interest, and (c) loans on interest; also how much of the loans taken have been repaid up to date. I think all this information will probably be found in Sir Francis Spring's history of the Harbour (G.O. No. 187, Marine, dated 1st May 1919).

13. I should also like to know whether it would not be practicable, if a special staff were put on, to apply the latest Madras schedule rates (in G.O. No. 360, Marine, dated 23rd September 1920) to the statistics of the trade of Cochin as collected for customs or for landing and shipping dues purposes. It is probable that we might find tonnage statistics in the latter for a good many of the items in respect of which they are not available in the former. The securing of as accurate an estimate as possible as to the probable return from the Harbour is a matter of so much importance that I think the expenditure of a few thousand rupees on the inquiry would be fully justified.

C. G. T[ODHUNTER]—20-11-20.

ANNEXURES.

(1)

Vide paragraph 1 of above note.

Order in Council.

A letter should be written to the Government of India on the lines of the Hon'ble Mr. Todhunter's draft.

2. The Diwans of Travancore and Cochin should be invited to a discussion informally with the Hon'ble Mr. Todhunter.

3. Dredging by the Manar should commence as soon as that dredger is ready.

4. The Presidency Port Officer should be asked to examine the question of the formation of a Port Conservency Board at Cochin and the rates to be charged by the same.

5. The expenditure on the Cochin Harbour should be debited to the Landing and Shipping Fund or Port Conservancy Board when formed.

W[ILLINGDON]—19-11-20.

(2)

Vide paragraph 1 of above note.

Draft letter to India.

I am directed to submit, for the favourable consideration of the Government of India, the report of a committee which has recently sat to consider the engineering, financial and other questions connected with the development of the Cochin harbour.

2. As the Government of India are aware, the port of Cochin lies about 680 miles south of Bombay and 160 miles north of Cape Comorin and affords the most favourable opportunity for the establishment of a safe harbour in all weathers on a stretch of coast on which there is at present no satisfactory harbourage except in the Portuguese territory of Goa. The coast is exposed to the full force of the south-west monsoon, during which it is almost impossible to work vessels lying at roadsteads. The hinterland is fertile to a degree and has no proper outlet. Nor is the opening up of the immediate hinterland to trade the only purpose which a harbour at Cochin would serve. The possibilities of the trade development that might follow from the institution of a really good harbour are immense. Such a harbour might carry trade from all parts of the Presidency and Mysore. It might receive mails direct from Europe for the south of India. It might relieve Colombo as a port of call, and it would also be most useful as a coaling, watering and repairing base and a naval harbour.

3. At the same time, it is difficult to exaggerate the natural facilities of the port. British Cochin is situated at the mouth of an immense backwater and the only difficulty to be overcome is the keeping open of the bar outside this mouth. As will be seen from the report, the engineers regard this as mainly a matter of dredging. Once this difficulty has been overcome it will be comparatively easy to establish berths at which vessels can lie alongside inside the backwater, which can be connected by means of a railway across the backwater with the Cochin State Railway and so with the south main line. It will of course be necessary to convert the Cochin State Railway to the broad gauge as well as to double it. In addition to this, there will be another very cheap method of transport available so far as concerns a very large tract of country, namely, the backwaters and canals which connect Cochin with Calicut on the north and with Quilon on the south, and the Travancore and Cochin Darbars and the planters are only awaiting an assurance of the undertaking of the harbour to open up further tramways and ropeways from the planting districts to the plains country.

4. The report of the present committee, which included members of every interest concerned, is only the last of a series by which the possibilities of the harbour have been examined. So long ago as 1903 Messrs. Coode, Son and Matthews examined the question at the instance of the Government. The firm reported unfavourably on the possibilities of keeping the bar open. It must be remembered, however, that they were merely advising on a case stated by the Madras Government and that neither they nor any representative of theirs have ever seen the port.

The Madras Government as at present advised incline to the view that the improvements in harbour engineering during the last seventeen years have rendered this opinion obsolete. It is proposed to establish this by full experiment before incurring the major portion of the expenditure necessary for the port's development. In the years 1912 to 1915, the Government placed one of their Executive Engineers, Mr. Campbell, on special duty to work out the details of a scheme. In 1917, these details and other papers were referred to Messrs. Sir John Wolfe Barry, Lyster and Partners who examined the possibilities of all the larger ports in the Presidency. During the current year the whole question has been examined again by the Madras Government's Harbour Engineer, Mr. Bristow, who is responsible for the engineering portion of the present scheme, while the committee accept responsibility for it as a whole.

5. While there is a general concurrence of opinion both that the scheme is a most necessary one and that there is every reason to think that it will be succesful, there are certain difficulties with which the Government of India are peculiarly concerned which have hitherto stood in the way of its execution. The first of these is the political difficulty. As the Government of India are aware, British Cochin consists of an area of one square mile, partly lying on the south of the opening of the backwater and partly in the island of Vypeen. The rest of the backwater and its banks belong to the Indian States of Cochin and Travancore, the former of which is entitled under the convention of 1865 to share in the customs revenue of the port. The railway across the backwater, which would be an extension of the Cochin State Railway, but which would be the property of the Port Trust, would lie upon land belonging to the State, while the customs revenue, in which, it is expected, there will be a large increase, will be divided between the Government of India and the Indian State. At the same time, the Port Trust when established must be established under a joint law of the State and the Government of India and must represent the interests of both parties, while there must be arrangements made for one magisterial jurisdiction to cover subjects of both Governments within Port Trust limits. I am to urge that the political difficulties involved in this arrangement constitute themselves a reason why the port should be taken under Imperial control.

6. As regards finance, it is of course not intended to embark on the whole scheme at once, but there will be an ordered succession of works depending on engineering necessities. When, however, the whole scheme is taken in hand, it is anticipated that it will involve an expenditure of 204½ lakhs, while it is by no means certain that the new Port Trust will be able to pay interest on the whole sum. In fact, it is suggested that the Cochin State and the Government between them should advance a sum of 68 lakhs as a loan without interest.

7. I am here to invite attention to the announcement made in Mr. 's letter No. , dated , of the initiation by the Government of India of a new and more forward policy on questions of easy and rapid transport with a view to co-ordinating effort in this direction and to subserving the interests of India as a whole. I need hardly say that the Government of Madras have given the most cordial welcome to this policy, as a result of which they hope to see a vast improvement in the communications in this Presidency, which has suffered much through the lack of such a policy in the past in respect of harbours, railways and trunk roads. They observe that, doubtless as an instalment of the policy referred to, it is the intention of the Government of India to take all the main ports of India under their direct control, and I am to urge that, in pursuance of this declaration, the Government of India should now take over the port of Cochin and treat its development as a question of Imperial concern, which, in the opinion of the Government of Madras, it undoubtedly is. A glance at the map of India will suffice to show how vastly important is a good port at this part of the coast line from the point of view of all parts of India, especially if it is linked up with the north by a broad gauge line. Added to this is the fact that its development can only be undertaken in consultation with an Indian State which we understand is shortly to be placed in direct relations with the Government of India, to which may also be added the fact that the large increase of revenue which is expected from the construction of the port will be an addition to the Imperial revenues. Again, the development of a port trust is a matter which the Government of India will doubtless desire to undertake on lines which they will render uniform so far as practicable, for the different ports of India, while they will doubtless be able to arrange for the financing of such a body in a manner that no local Government would be able to do On the other hand, the Madras Government understand that there is no precedent for a local Government undertaking port works of this magnitude. In the nearly parallel case of Chittagong, unless they are misinformed, the great bulk of the money was found by the Government of India. In the case of Vizagapatam in this Presidency much the same will be the case since the port will be developed as a railway port. This Government conceive that the fact of a port being a railway port is no ground for preferential treatment but rather the reverse. The need for railway and port development to go hand in hand is no less necessary in the case of Cochin than in that of Vizagapatam. In the latter case there is a powerful company which can co-ordinate the work and can, if it will, raise the capital itself. In the former there are numerous conflicting interests to be co-ordinated which can be co-ordinated only by such an Imperial Department of Ways and Communications as the Government of India have in contemplation and though the two railways concerned will profit largely by the work, they will do nothing to assist in raising the capital for it. A part of that must ultimately come out of the pocket of the general tax-payer, and as the work is one of Imperial importance, it is right that this part should come out of Imperial revenues.

8. In conclusion, I am to say that the Government of Madras are convinced that the scheme is one which is urgently necessary and of Imperial importance and that therefore it would be in accordance with the recently announced policy of the Government of India for it to be undertaken as an Imperial scheme. I am therefore to express the hope that the Government of India will be pleased to instruct their engineering and marine advisers to examine the technical details and their officers of the Political and Financial Departments to inquire into the political aspect of the case and the proportion of customs revenue to be allotted to the Cochin Harbar. They hope that the question of arranging for financing the scheme will be taken in hand in time for provision to be made in the Imperial budget of 1921–22.

As regards paragraph 2 (2) the Chief Secretary has already been asked to take action on a separate file.

2. As regards addressing the Government of India I already have a draft under preparation and do not require this file for this purpose.

3. With reference to the other action required the Honourable Member has asked in paragraph 3 that the Chief Secretary should take charge of this. Will the Chief Secretary therefore accept transfer of the file.

J. M. TURING—25-11-21.

FINANCIAL DEPARTMENT.

Paragraph 2 of the Honourable Member's note—Item 1.—A draft letter to India to treat Cochin as a major port is being prepared in the Marine Department.

Item (2)—Action is being taken in Political.

Item (4).—The action to be taken is—

(*a*) to ascertain the total expenditure incurred on Cochin harbour works in the past, the charges incurred since Mr. Bristow's appointment and the further charges that will be incurred in the employment of the dredger "Manaar";

(*b*) to consider whether the amount thus arrived at may be given as a loan under the Provincial Advance and Loan account by a corresponding credit to Public Works Department to which department the past expenditure was debited.

As regards (*a*) above, information will have to be furnished by Public Works Department. An extract of this note may be sent to that department for furnishing the information.

J.M.H.—4-12-20.

As regards (*b*) above, it is submitted that there is no objection to the transaction appearing in the Provincial Advance and Loan account. The difficulties to this are (1) to whom is the loan to be given and on what security and (2) the difficulty of providing funds. In regard to (1), it appears that until the constitution of a Port Trust at Cochin which will take some time to be formed there is no 'local body' to whom a loan could be advanced under the Local Authorities Loans Act; on the question of security presumably the future revenues of the port may be guaranteed. The difficulty as to funds is greater. If the amount of past expenditure which Public Works Department will furnish is found to be considerable, it may not be possible to provide funds by reappropriation from the total budget grant for advances in the current year as it is doubtful whether the Board of Revenue and Local and Municipal Department will be able to make available any considerable amount for the purpose. The chances of the Government of India making an allotment seem also remote. The preferable course seems in the circumstances to be to consider this point after the Port Trust is constituted.

Article 117, Civil Account Code, Volume I.

The Honourable Member has suggested that the loan should be free of interest. Please see in this connexion paragraph 6 (*a*) on page 3 of printed notes regarding Cochin Harbour scheme. It will be seen therefrom that the sanction of the Government of India will be necessary for a loan in the current year, but if in the ensuing year it will apparently be within the sanctioning powers of this Government. It is not known whether the scheme will materialize in the current year.

2. *Paragraph 4 of the Honourable Member's note.*—At page 4 of the report of the sub-committee is given an estimate of the probable receipts of the Port Trust to be constituted at Cochin. Credit is taken for receipts to the extent of 2 lakhs from shipping dues. As these latter are leviable under the Indian Ports Act it is not regular to take credit for them for the Cochin Port Trust as pointed out by the Honourable Member. The difficulty can, however, it seems, be got over by constituting along side of the Port Trust, a Cochin Port fund also on the analogy of the arrangements at Madras and by transferring the receipts of the Cochin Port fund to the Cochin Port Trust. It is essential to increase in every possible way the receipts of the Cochin Port Trust Board to be constituted so as to make the harbour scheme as far as possible self-supporting.

Cf. section 49 of the Madras Port Trust Act, 1905.

3. *Paragraph 5 of the Honourable Member's note.*—The Honourable Member has asked for information—

(1) as to the details of how the figures of receipts on page 4 of sub-committee's report have been worked out;

(2) a copy of Mr. Bristow's note showing the tonnage, etc., of Cochin port; and

(3) a curve showing the normal increase of the trade of the Cochin port up to 1913–14 and continued to 1930.

Submitted that the Public Works Department may be requested to take immediate action to obtain the information in (1) and (2) from Mr. Bristow.

As regards (3) above, the average normal increase during the pre-war period 1890–91 to 1913–14 works out to Rs. 23,35,487 per annum. The figures in the statement have been carried forward to 1930 by adding this average pre-war increase to the figures subsequent to 1919–20. A curve arrived at on this basis is put up.

4. *Paragraphs 10 and 11 of the Honourable Member's note.*—An extract of these paragraphs may be sent to Public Works Department for very early action.

5. *Paragraph 12 of the Honourable Member's note.*—As regards expenditure on the Madras Harbour and its financing, attention is solicited to Appendix III on page 11 of the Port Trust administration report for 1919–20. Up to the end of 1919–20 the amount of loans paid off amounted to Rs. 1,21,73,552.

6. *Paragraph 13 of the Honourable Member's note.*—The Honourable Member has directed that the schedule of rates for the Madras port as approved in G.O. No. 360, Marine, dated 23rd September 1920, should be applied to Cochin with a view to secure as accurate an estimate as possible as to the probable return from the harbour. It is submitted that this is a matter for the administrative department. Please see also 'Order in Council.' The Revenue (Special) (Marine) Department may be requested to take up the examination of this point.

I think it must be done here as Marine Finance.

R.A.G.

7. The other portions of the Honourable Member's note relate to certain discrepancies in the estimate at pages 4 and 5 of the sub-committee's report and the Honourable Member wants an estimate worked out of the probable receipts and expenditure of the future Port Trust at Cochin on the figures of trade for the Madras port. This is being examined. To arrive at a fairly accurate estimate it is necessary to await the information called for from Public Works Department. Submitted that in the meanwhile the un-official references to Public Works Department and Marine Department—paragraphs 1, 3 and 4 and 6 respectively—may be issued.

Issue references and then let the Chief Secretary see.

C.R.S.—4-12-20.

J. M. HOOPER—6-12-20.

[U.o. references issued.]

A good deal of time has been lost already and the Diwan of Cochin is coming to see the Honourable Member on the 11th. We must get on with this quickly.

R. A. GRAHAM—7-12-20.

PUBLIC (POLITICAL) DEPARTMENT.

The Honourable Member (Financial) has arranged to discuss the Cochin Harbour scheme with the Diwans of Travancore and Cochin on the 11th instant. The departments of the Secretariat concerned are requested to get their notes ready and send them to the Honourable Member as soon as possible.

S.S.—2-12-20.

E. M. GAWNE—3-12-20.

FINANCIAL DEPARTMENT.

Paragraphs 6—9 of the Honourable Member's note and paragraph 7 on page 7 ante.—The Honourable Member has indicated certain discrepancies in the calculations made in paragraphs 17–18 of the sub-committees report and has worked out a rough statement of the probable net revenue for the Cochin port on a comparison of the statistics of value of the trade of Madras with that of Cochin. The figures have been arrived at as follows :—

	LAKHS OF RUPEES.
(*a*) Receipts of the Madras Port Trust. (Items common to Madras and Cochin have been taken.) Revised estimate figures for 1919–20 (page 8 of administration report).	21·12
(*b*) Expenditure on maintenance taking items common to Madras and Cochin (page 9 of administration report.)	9·65
(*c*) Net revenue for Madras Port Trust	11·47
(*d*) Net revenue for Cochin Port Trust on the basis of the statistics of trade worked out on pre-war values of trade of the two ports, viz., Rs. 628 to 1,960 or roughly 1 to 3.	3·82

On the assumption that the Government of India would allow loans for a term of fifty years, a minimum of 10 per cent for interest and sinking fund charges has been taken, and it has been calculated that on this basis a loan of 38 lakhs only could be raised by Cochin Port Trust to be formed. The 10 per cent for interest and sinking fund charges has apparently been arrived at as shown below :—

	PER CENT.
(1) Payment of interest for open market loan	8
(2) Payment towards interest-free loan of 68 lakhs from Government to be paid in annual instalments of 1·36 lakhs.	2
Total ...	10

The above calculations do not take into account the payments into a *sinking* fund for the discharge of the open market loan at the end of fifty years. It also assumes that the Government loan will be interest-free. The annual *sinking* fund charges if the investment be in 5 per cent for a period of fifty years is ·00477674 * or roughly ½ per cent of the amount of the open market loan. As Government will have to borrow themselves for their requirements, it appears out of the question to consider an interest-free loan. Accordingly it may be assumed that the whole of the amount required will be raised in the open market. It will be sufficient to calculate the amount of loan that could be taken on the basis of an annual payment of Rs. 8½ (8 for interest, ½ for sinking fund charges) for every Rs. 100. A loan of 44·94 lakhs can be raised with the available annual *surplus* of 3·82 lakhs as against 38 lakhs estimated in paragraph 9 of notes.

* Page 157, Archers Tables.

2. The estimates on pages 4–5 of the sub-committee's report seem to call for the following remarks :—Please see paragraph 2 of this department's note dated 4th December 1920. It has been pointed out that it is possible to take credit for the future Port Trust for receipts to the extent of 2 lakhs from shipping dues which will be available for raising an additional loan.

3. The Harbour Engineer has given separately a programme of works. It is expected that the expenditure will be spread out thus :—

	Estimated expenditure in lakhs of rupees.
First year	22·25
Second year	31·75
Third year	40·00
Fourth year	46·00
Fifth and sixth year	63·00
Total ...	203·00

A sum of 1 lakh has been taken credit for on account of rents for godowns. It is expected that godowns will be begun in the second year and completed in the third year of the progress of works according to the programme. And the mercantile community have expressed their opinion that Government godowns would be used. There is therefore no objection to taking credit for receipts from this source, at any rate from the fourth year onwards. This amount will also be available for raising a further loan from that year.

4. Attention is solicited to the report of the Cochin Harbour Sub-Committee dated 23rd July 1920. It will be seen therefrom that the harbour dues to be levied at the port of Cochin are proposed to be fixed at Rs. 2 per ton which is at least 4 annas higher than the Madras rate. In the calculation of receipts for Cochin, account has been taken of harbour dues at the Madras rate. If the 2-rupee rate is adopted, this will give an additional revenue of Rs. 81,933 as shown below :—

(1) *Harbour dues at Madras.*

	RS.
(*a*) On imports	13,07,928
(*b*) On exports	4,12,657
Total ...	17,20,585

(2) *Harbour dues at Cochin.*

According to the 33⅓ per cent basis it will be	5,73,528
(3) *Additional revenue* that will be realized at the higher rate of Rs. 2 per ton [one-seventh of item (2)]	81,933

5. It will be seen from the foregoing that an additional sum of Rs. 3,81,933 * will be available for an additional loan. A loan of Rs. 44,93,329 or 44·93 lakhs can be taken thus raising the total loan to 89·87 lakhs. It may be mentioned in this connexion that in the calculations made above it has been generally assumed that the whole of the available loan will be taken all at once. If the programme of expenditure shown in paragraph 3 above is adhered to, it will be sufficient to take only so much loan each year as will be necessary for that year's working. This will reduce the interest charges and enable a larger loan than 89·87 lakhs to be taken. Details of other items of receipts shown on page 4 of the Cochin Harbour Sub-Committee's report when received from Mr. Bristow will, it is submitted, enable a more accurate estimate to be framed.

	RS.
* Paragraph 2 ante	2,00,000
,, 3 ,, ...	1,00,000
,, 4 ,, ...	81,933
	3,81,933

6. Please see paragraph 6 of Financial notes on page 7 ante and the Chief Secretary's marginal note. It is respectfully submitted that the cases relating to the framing of schedule of rates for ports are dealt with in the administrative Marine Department (cf. G.O. No. 360, Marine, dated 23rd September 1920). It is understood that for the compilation of figures required by Honourable Member no data are available in that department and that they are accordingly suggesting a reference to the Collector of Customs.

C.R.S.—8-12-20. J. M. HOOPER—9-12-20. R. A. GRAHAM—9-12-20.

PUBLIC WORKS DEPARTMENT.

With reference to Honourable Member's (Financial) notes above the Harbour Engineer to Government may be requested to furnish the following information :—

(1) the charges that will be incurred in the employment of the dredge "Manaar";

(2) details of how the figures of receipts have been worked out ; and

(3) a copy of his note showing the tonnage, etc., of Cochin Port.

He may also be requested to offer his remarks on paragraphs 10 and 11 of Honourable Member's notes and also furnish a note asked for by Honourable Member therein.

A copy of these notes with a copy of the Committee's report has been separately sent to the Secretary, Railways, for remarks on the Railway questions connected with the scheme.

Information in regard to expenditure on Harbour works, etc., is being collected separately.

V.K.K.—11-12-20. W. HUTTON—13-12-20.

OFFICE OF HARBOUR ENGINEER.

The charges that will be incurred in the employment of the dredger "Manaar" are made up as follows:—

Charged to item for dredging.

(1) Daily rate for dredger and any hoppers used.
(2) Wages of crews unless vessel is laid up for seven days or more.
(3) Cost of coal, water, consumable stores.
(4) Cost of temporary files, tide guages, etc.

Charged to item for repairs.

(1) Wages of crew when vessel is laid up for seven days or more
(2) Cost of all minor and major repairs and renewals.
(3) Cost of repairing and renewing equipment such as chains, ropes, pulley tackle, etc.

Pending some experience of the working of this dredger it is not possible to give figures for the above items separately. I estimate from general experience however that the monthly cost will be between Rs. 3,000 and Rs. 5,000 dependent upon what hours are worked, the number of small hopper barges that may be hired, and other circumstances.

Regarding (2) the figures for receipts were taken out—

(a) by estimating tonnage of goods and shipping;
(b) by taking one-third of the budget figures for Madras Port Trust as regards all the small items; and
(c) by approximation as regards the tools over proposed bridge.

Regarding (3) I have not got a copy of the note regarding tonnage. It was merely to the effect that the Harbour Engineer and his assistant Mr. Dickinson had taken the volume of trade statistics supplied by Mr. Hood and extracted the tonnage for five years prior to the war. When the figures given in the volume gave values only (not weights), an *approximation* of weight was made by determining roughly the unit cost per ton of material. For example, machinery valued say at Rs. 3,000 would be priced at Rs. 1,000 per ton giving 3 tons weight. It should be noted however that many of the larger quantities were given in the volume as *weight*, not value.

After reading the above and giving the average for the five years, Mr. Cooper gave figures prepared independently by himself and Mr. Pitcairn. These gentlemen constituted the chief 'opposition' at the time, and when it was seen that their figures agreed with the Harbour Engineer's within 10,000 or 15,000 tons, the Committee considered the approximation sufficiently accurate.

Regarding paragraph 10.—There is some mistake here. Thirty-six lakhs, not 45, were taken for railway works, and included the bridge to Vendurthy and sidings there. Neither the railway extension at Ernakulam nor the bridge to Cochin have been included in the estimate because the former is not a Port Trust matter and the latter is only a future extension.

Regarding paragraph 11.—If contractors do the work on bar by bucket dredger all the spoil can be saved for reclamation inside. If it is done by suction dredger it cannot be used for reclamation inside. Therefore there is a waste of material in the latter method which more than balances the slight saving in daily rate apart from the fact that the suction dredger may not be ready for 2½ years thereby delaying the port development.

I concur with Mr. Bell that two if not three dredgers will be required ultimately, and have already stated we must have 'Triton' or 'Manaar' for work inside. Later we may require another dredger for maintenance work down to 33 feet at L. W. O. S. T. but this does not arise in the period of construction.

R. C. BRISTOW,
Harbour Engineer to Government.

PUBLIC WORKS DEPARTMENT.

The Harbour Engineer's note above may be submitted to Honourable Member (Financial) with reference to Honourable Member's notes on pages 1-4 ante.

V.K.K.—15-12-20.

[Information in regard to expenditure on Harbour Work's is being collected separately. The railway portion of the report has not yet been received from the Secretary, Railways.]

Yes; and Honourable Member, Financial, will be asked if he will kindly, return this file before Saturday or bring it to the meeting at my office.

W. HUTTON—26-12-20.

IV

(i)

PROCEEDINGS OF AN INFORMAL CONFERENCE HELD AT THE PRESIDENCY PORT OFFICE ON TUESDAY, THE 14TH DECEMBER 1920 AT 3 P.M.

[SUBJECT.—*Financing of Cochin Harbour.*]

PRESENT:

The Hon'ble Mr. C. G. TODHUNTER, C.S.I.
The DIWAN OF COCHIN.
The DIWAN OF TRAVANCORE.
H. H. HOOD, Esq.
Capt. E. W. HUDDLESTON, C.I.E., O.B.E., R.I.M.

The first question considered was the committee's estimate of the revenue of the port.

Mr. Hood produced and explained figures by which he had supplied the deficiency in the tonnage figures with a view to check the present trade of the port. He thought the figure of 375,000 tons might be accepted.

As regards the probable increase, his figure of increase prior to the war agreed with those in the chart produced. This gave a figure of about 90,000,000 tons as against 70,000,000 tons in 1920, in other words an increase of 29 per cent. Applying this percentage to the figure of 375,000 tons, a figure of 482,143 tons would be arrived at for the year 1930, in other words, the normal increase in the trade would produce a total at the close of the period less than the figure assumed by the committee as the average for the whole period.

This led to the questions (*a*) how long it would take for the harbour to be improved so that a ship could anchor inside, (*b*) whether the imposition of increased taxation in the intervening period would not divert trade from the port, and (*c*) whether an increase in trade considerably in excess of the normal might not be provided for after the date on which vessels were able to enter the harbour. Captain Huddleston was of opinion that, considering the usual delays, five years was a safe period to allow before vessels could be anchored in the port. It was agreed that the addition of a tax of Rs. 2 a ton to the present heavy lighterage charges would tend to discourage trade and that once ships could anchor inside a considerable expansion might be expected. It was impossible to do anything but guess at the effects of these factors, but it was agreed that a moderate guess would be an increase of 10,000 tons a year for the first five years and an increase of 25,000 tons for the last five. This gave an average of 442,500 tons for the whole period.

The Diwans of Cochin and Travancore were also requested to suggest any alternate method of arriving at the average tonnage of trade during the next ten years.

2. *Dues on shipping.*—With reference to section 36 of the Indian Ports Act, 1908, as harbour dues would be credited to the Minor Ports Fund, it was decided that no credit should be taken on account of this item.

3. *Transit dues*, rent for storage space, jetty and wharfage charges, harbour terminal dues and bridge dues. As jetties, railway lines, etc., were not expected to be ready for use during the first ten years, it was agreed that receipts on account of these items should not be taken into consideration.

4. *Rents of godowns.*—The provision of one lakh under this head was considered reasonable and was allowed to stand.

5. *Overtime fees.*—As these fees are payable to the staff, it was decided that this item also should be omitted.

6. *Passenger tolls, etc.*—It was decided to omit this also as the railways were not expected to be in working order during the first ten years.

7. *Rents of lands at Venduruthy.*—The Diwans of Cochin and Travancore were of opinion that people would be quite ready to lease the lands at Venduruthy at very high rents for growing paddy on them. The sum of ·62 lakh under this head was therefore allowed to stand.

8. *Watersold to boats.*—As this had also a contra charge, it was decided to omit this item also.

The gross revenue arrived at on this basis was 10·62 lakhs as against the committee's estimate of 15·53 lakhs—

	Lakhs. RS.
Dues on imports and exports	9·00
Rents of godowns	1·00
Rents of lands at Venduruthy	0·62
Total ...	10·62

9. *Charges.*—The next question taken up for consideration was what percentage of revenue should be taken as normal maintenance charges of a port. Mr. Hood produced a chart by Mr. Mitchell which showed the charges of the Madras Port to be Rs. 1–2–0 a ton, or about 60 per cent of the revenue. He also referred the committee to Appendix XIV of the Administration Report of the Madras Port Trust for 1919–20, which showed that during the 33 years from 1887–88, the charges of the Madras port were 75·57 per cent of the revenue. The Diwans of Cochin and Travancore said that as Cochin would not be a fully developed port like Madras during the first ten years, the charges would not be so great as in Madras. But the Hon'ble Mr. Todhunter pointed out that if the charges in an undeveloped port were small, the revenue also would be small and that therefore the charges must bear an uniform percentage to the revenue. In any case, he said, the charges of the port could not at any time be considered to be nil. After some further discussion it was agreed that the charges of the port might be considered to bear a constant percentage to its revenue and the Diwans of Cochin and Travancore were requested to work out, with reference to the Madras Port Trust figures, what this percentage was likely to be.

10. *Capital charges.*—Captain Huddleston was asked whether he could say that all items of capital expenditure had been included in the committee's estimate. Though he considered this to be mainly a matter for Engineers to decide, in his opinion there were two omissions—slipways for the dredger and a coal depot.

With a view to reduce the capital cost, the Hon'ble Mr. Todhunter asked whether the Cochin Darbar would be prepared to dredge the inner harbour and dump the spoil on the Venduruthy lands and then take the reclaimed lands as property of the Cochin Darbar. The Diwan said that he would consider the suggestion. The Diwan was also asked whether the darbar would be willing to extend the Cochin State Railway to the harbour at their own cost. The Diwan agreed to consider this suggestion also. But Captain Huddleston was of opinion that if a Port Trust was to be created, it was essential in order to avoid difficulties about clearing cargoes, etc., that the railway within the port limits should belong to the port. On the other hand, a very considerable expansion of traffic would be necessary before the construction of a railway would be justified and an isolated railway of the kind without workshops, etc., would be an expensive and difficult proposition. On the whole, it seemed best to defer a consideration of this question until there was a sufficient increase of trade to justify the undertaking of so large an expenditure.

11. In reply to a question whether there was a danger that, if the dredging of the bar was a failure or only a partial success, the guarantors of the scheme might be involved in very large further expenditure for groynes or other works to protect the opening, Captain Huddleston said that in his opinion there was very grave risk of failure to keep the bar open by dredging alone, but did not contemplate the throwing out of groynes as practical politics.

12. He had pointed out the risk to Mr. Bristow who had accepted it, but had stated that he was hopeful of success and that the Government had passed orders to the effect that they had recognised the risk but were prepared to run it. Captain Huddleston filed a copy of his minute which he had placed before the committee to this effect.

13. On the question whether from a nautical point of view, it was likely to be possible to extend the port ultimately five miles south to the limits of Travancore territory, Captain Huddleston stated that he had not surveyed the channel in question, but that so far as he was aware there was no reason why such an extension should not be practicable.

REPORT ON THE COCHIN HARBOUR BY CAPTAIN E. W. HUDDLESTON.

As a member of the Committee I should like to say at the outset in view of the doubts expressed by Messrs. Wolfe Barry and other experts on the possibility of keeping the bar channel always open that I would have voted with the member of the Sub-Committee who advised that whether the whole scheme were adopted or not, the construction of piers should not be proceeded with until such time as it was proved that the bar channel could and would be kept open always.

2. I have however had a long conversation with Mr. Bristow on the subject and he has told me that though he cannot guarantee it (as no engineer could) he has no doubt about it; and that Government concurring with this view have given him orders to proceed with the work on the broad lines laid down by Sir Wolfe Barry Lyster and Partners in their report. It is an engineering question pure and simple and in these circumstances I consider that I cannot do better than follow Mr. Bristow's opinion especially as I understand from Mr. Bristow that Government know the risk and are prepared to accept it.

3. This being admitted I am of opinion that wharves form an essential part of the work, for the reasons given in the Sub-Committee's report, but their position is a point to be considered from the nautical point of view as well as from the engineering and other points of view.

4. It will be noticed that Messrs. Wolfe Barry suggested wharves at Cochin to be placed on the east side almost opposite to the position selected by Mr. Bristow at Venduruthi Island and I should like to say at once that the site selected by Mr. Bristow and the reclamation suggested from a nautical point of view, leaves nothing for criticism and in fact cannot be bettered.

5. I now speak, not as a member of the Committee so much as from a nautical point of view of the wharf suggested at the north-east corner of Cochin.

6. I admit at once that from its position it is most convenient for the merchants and therefore the best site possible from their point of view. From a nautical point of view, however, I have grave doubts as to the suitability of its position.

(1) Because it is right in the fair way of the channel coming into the port both for ships going alongside and going round to the projected south wharf at Venduruthi. (I am not yet aware where the moorings are to be exactly—they are not shown on the plan.)

(2) There is a strong current which at times flows for three or four days in the south-west monsoon continuously to the westward.

(3) It is in the most exposed position as regards wind in the south-west monsoon and in a direct line with the swell that naturally must come into the harbour and does come into the harbour during that period and which I think may increase with the cutting of the bar channel and is certainly not likely to *decrease*.

(4) It is proposed to place one ship on the outside of the wharf and one ship on the inside.

7. There is no doubt in my mind that ships can be placed on the outside berth with ordinary care and skill as Mr. Bristow has told me he will dredge the channel to the north to allow plenty of room for ships to swing. From a seaman's point of view the placing of a ship on the inside is fraught with a *great deal of risk*. I do not say it is an impossible manoeuvre but with only two hundred feet between the inside of the berth and the shore (which Mr. Bristow says he is prepared to dredge to 300 *feet*) the strong current running and the swell, if the ship takes the slightest cant, serious results may follow. It will require more than ordinary skill to manoeuvre a ship 450 feet long and a beam say of 50 feet into that berth and there is no margin for safety.

8. Mr. Bristow states he proposes placing Dolphins on the inshore side and has also explained how lines can be run both from the shore side and the wharf side in manoeuvring the ship. This manoeuvre and the running of lines takes time and a sudden squall such as one frequently gets throughout the south-west monsoon—the

carrying away of a line or any other untoward incident—would cause a serious accident and possibly block the channel for some time and probably do infinite damage to the wharf and the ship. I should like to have seen sufficient space for a ship to swing clear inside the wharf, i.e., 500 feet at least, but this is impossible of attainment. The channel at Cochin between the inside of the wharf and the shore is at present to be 200 feet wide. A ship coming into the berth on the flood-tide will have to turn to the west and drop into the berth stern first—not an easy manœuvre nor an impossible one however, but one fraught as I said before with risk every time it is accomplished even with tugs to assist.

9. Mr. Bristow argues that it is only difficult in bad weather of which you get very little, I do not agree it will be difficult at any time and dangerous in bad weather.

10. Granting that you get your ship alongside in safety either on the inside or outside berth there will be days in the south-west monsoon on account of the swell that the ship will not be able to lie alongside with safety to the wharf or the ship. There will be days of course when a ship can lie there, and on those days that she cannot, Mr. Bristow explains she can leave the wharf and go to the moorings. This is so provided you can manoeuvre her successfully out of the position that she is in, unfortunately bad weather does not confine itself to the daylight hours and the weather may become suddenly bad at night when the danger to the ship and the wharf would be very great. You will not get the full use of your wharf which I think you have a right to expect. From a nautical point of view therefore I consider that the position is too dangerous and should not be adhered to. There is however the committee's point of view.

11. I have already said I consider it the best position from the mercantile point because it is adjacent to the warehouses, etc.

12. Mr. Bristow explains that the arm from the shore is the integral part, and that if we take the very worst view, only four lakhs will have been expended on the arm, which the ships are to be berthed alongside, and that as the whole harbour scheme is estimated to cost 204 lakhs that at that price it is worth it—even if there is a risk and even if the wharf cannot be used always. Having expressed my opinion—it must be left to the committee to decide whether this is so or not and for Government to sanction the construction.

13. I should like it placed on record that I am of opinion that on account of its exposed position, i.e., in the direct fairway and projecting into that fairway as it does, and in view of the strong currents and the wind and the swell which enters the harbour, that the position leaves no margin for safety and is not from a nautical point of view a good one, and that risks are entailed both in berthing ships, and in keeping them alongside when they are berthed, which would be eliminated if the wharf was constructed on the east side of Cochin and sheltered and in fact in the position suggested in Messrs. Wolfe Barry's scheme, that I consider it would be better, safer and more economical to lay moorings where the projected wharf is to be, or near that position, and that the construction of the Venduruthi wharf and reclamation might first be undertaken if any wharves are built, before it is proved that the bar channel can be kept open.

1st September 1920. E. W. Huddleston.

(ii)

PROCEEDINGS OF AN INFORMAL CONFERENCE HELD ON THE 16TH DECEMBER 1920.

The Hon'ble Mr. Graham was first asked what in his opinion was the longest period for which the Government of India were likely to sanction a loan. He stated that the period of a loan had reference to the life of the work constructed out of the loan funds, that 30 years was the period for which loans were usually granted, though in some cases this limit had been exceeded and that 60 years was the outside limit for which a loan would be sanctioned by the Government of India.

In view of the present tightness of the money market, the Diwan of Cochin doubted whether it would be sound policy to take a loan at the present high rates for a long period. But as the present rates of interest appeared to be much the same for long and short term loans and as it would be costly to issue a short term loan first and then convert it into a long term loan, it was agreed that the loan might be issued for a period of 50 or 60 years.

2. The next question was what percentage should be provided for meeting interest and sinking fund charges. Assuming that the loan was issued at 7 per cent income-tax free, Mr. Graham considered that $\frac{1}{3}$ per cent should be set apart for income-tax, $\frac{1}{6}$ per cent for advertisement, brokerage and other contingent charges, $\frac{1}{2}$ per cent for depreciation fund and another $\frac{1}{2}$ per cent for sinking fund. In his view therefore nothing less than a provision of $8\frac{1}{2}$ per cent would be safe. This was agreed to.

3. On being asked whether he would advise the use of the loan funds right from the beginning of the scheme, Mr. Graham said that it was no use borrowing money that would have to be paid back to some one else unless there was a reasonable certainty that the scheme would succeed. At present the scheme was in an experimental stage and he would therefore suggest that the initial cost of dredging the bar and finding out whether it could be kept open by dredging alone should be borne by the Madras Government and the two Darbars. If the scheme succeeded the cost would be treated as part of capital charges and debited to the Cochin Harbour; if it failed, the Government and the Darbars must be prepared to write off the amount.

4. When asked whether he would suggest any limit for the initial cost of the experiment, he stated that 33 lakhs had been estimated as the cost of dredging the bar and 30 lakhs as the cost of a dredger and that therefore he would suggest 75 lakhs as the outside limit of the cost of the experimental scheme and that the Madras Government and the two Darbars should share the cost between them equally. The Diwans of Travancore and Cochin agreed to this suggestion on behalf of their respective Darbars.

5. The Hon'ble Mr. Todhunter then raised the question as to the agency which should be entrusted with the carrying out of the experimental stage. In his opinion, a local port trust or some similar local authority would manage the scheme more economically than a Government department. But Mr. Graham thought that more effective control could be exercised over an officer working under Government than over a local authority.

6. The Hon'ble Mr. Todhunter then said that the Minor Ports Fund had large accumulated balances to its credit, although of recent years its receipts had fallen short of the charges, and he asked whether in future the receipts should not be adjusted so as to be as nearly equal as may be to the expenditure, whether the minor ports should not be made to depend upon the Local Government for loans, and whether the accumulated balances of the fund could not be applied to harbour construction and divided between the two important ports on the East and West Coasts, respectively, viz., Tuticorin and Cochin. The Diwan of Cochin thought there might be legal difficulties in the way. Mr. Graham said that he would examine the question.

7. The jurisdiction question was next taken up for consideration. The Hon'ble Mr. Todhunter said that he saw no reason for making any change at all in the existing arrangements and that a man who pleaded want of jurisdiction could easily be sent to the court by which he claimed to be tried. Mr. Graham said that that arrangement might lead to trouble if the question were raised by an accused person, as in such a case if it was proved that the police who arrested the man had no jurisdiction action might lie against them for wrongful restraint. The Diwan of Cochin said that as the British and Cochin police had been working in harmony there had been no such difficulty in practice in the past. It was therefore agreed that the question might be left alone till it was definitely raised.

8. Regarding the boundary question, the Diwan of Cochin said that he had collected some facts and prepared some maps which tended to make matters very clear, but that unfortunately he had not yet received those papers from Cochin. Further discussion on this point was therefore postponed pending receipt of the Diwan's papers.

(iii)

PROCEEDINGS OF AN INFORMAL CONFERENCE HELD AT THE COUNCIL CHAMBERS AT 12 NOON ON SATURDAY THE 18TH DECEMBER 1920.

[SUBJECT.—*Cochin Harbour.*]

PRESENT:

The Hon'ble Mr. TODHUNTER, C.S.I.
W. HUTTON, Esq.
The DIWAN OF COCHIN.
The DIWAN OF TRAVANCORE.

It being explained that what was wanted was to secure from the Chief Engineer as near a figure as it was possible to give on the materials available of the amount for which finance will have to be found under the committee's scheme, Mr. Hutton said that, in view of his experience of the way in which rough estimates of the kind before him, were almost inevitably exceeded when they came to be worked out, it would not be safe to provide finance for less than 250 lakhs for the works which the committee had put into their programme. At the same time he was emphatically of opinion that the whole programme should not be embarked upon until it had been decided by experiment that the bar could be kept open by dredging alone. He fully recognized that there was expert opinion to the effect that it could not, but he was prepared to disregard this and make the experiment because expert opinion had been similarly opposed to the making of the northern opening to the Madras Harbour which had succeeded in spite of it. But there was no doubt there was considerable risk that the money spent on dredging might be lost or that further very expensive works such as groynes might be necessitated to keep up the opening. In this view, he did not advocate undertaking any works except those that were essential to the making of the opening until the experience of a full monsoon was available to show whether the channel was obliterated or not. He believed that Mr. Bristow was of the same opinion.

2. Coming to the items of the estimate, the estimate for the cost of dredger was based on exchange at 1·10 *d*. If the present rate of exchange did not improve, a large addition will have to be made to this item. Mr. Bristow had agreed that two or three dredgers might ultimately be required, but if dredging by contract was to be undertaken, there was no immediate necessity for more than one new dredger and the 'Manaar'.

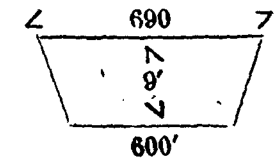
3. The estimate for the cost of the tugs was that of the Port officer. The Chief Engineer agreed that the tugs were likely to be required for towing hoppers and other such purposes, and that their purchase could not therefore be put off until the fourth year unless some arrangements for hiring were made.

4. The provision made in the estimate was only for accommodating eight steamers at the outset, four at moorings and four on jetties. This was approximately the average number accommodated in Madras. The proposal to buy the 'Triton' had been abandoned and the 'Manaar' was to be employed in its place. This involved less capital outlay, but full charges of depreciation would have to be paid. The provision for godowns included provision for a new custom house. It was originally proposed to place this on the top of the power station, but the present proposal was to put it on the top of one of the godowns.

5. The item of land acquisition was only for the land which it was proposed to acquire near the custom house for the erection of godowns, etc. The estimate was based on that of the Deputy Collector. The estimate for reclamation at Venduruthy

was based upon a figure of 4 annas a cubic yard, a condition of which was that the charges of the dredger should go to maintenance. Maintenance would also in effect bear a large share of the ultimate cost of making the channel. The provision in the estimate was a full provision for a square channel 600 by 30 feet but as this was dredged out the sand would be continuously falling in until the angle of natural repose was reached. All the clearance in excess of that in the estimate for the channel would go to maintenance.

Mr. Bristow now points out in his letter No. C.H. 1/21, dated 3rd January 1921, that he has allowed for a side slope of 5 to 1.



Average 645 feet or 215 yards. See item 2 in estimate.

W.H.—17-1-21.

6. The provision for the railway assumed that the Cochin State would first make the railway to a point opposite Venduruthy. It was proposed to debit the Port Trust with the cost of the sidings, etc., which were to be used by it and in addition with the whole cost of the bridge, although the State Railway would derive a large profit from goods delivered on to it over the bridge.

7. The question of the payment of premium to the Cochin Darbar for the right of reclaiming the lands at Venduruthy being raised, the Diwan said that he was prepared, if necessary, to forego that item, but had not yet made up his mind as to whether the Darbar might not make this land and subsequently lease it to the Trust. On it being pointed out that according to the estimate the Madras Government was going to give free whatever land there was in its possession which was required by the Trust, it was agreed that the account between the three contracting parties should give credit for all land or buildings made over free of charge to the Trust in a pro forma account and that the money grants to be made should be adjusted accordingly.

8. Mr. Hutton considered that the items of the estimate provided all that was necessary for a port. But he pointed out that according to the committee the estimate provided for only the first part of the scheme. He did not think that provision of a dry dock or slipway was necessary. A slipway would not serve for a large dredger and even the Madras authorities always send their large dredger to Colombo or Calcutta for repairs.

9. As regards the reclamation, he was of opinion that it would take one or two years before the reclaimed lands were fit to build upon.

The Diwan of Cochin did not think that there would be any serious difficulty in arranging for temporary leases meanwhile and said he would see to it that the limits of present ownership at Venduruthy island were duly demarcated.

10. Mr. Hutton was finally consulted as to the works that would be necessary and the order in which they should be taken up if his proposals were accepted that the expenditure should be confined to the experiment in dredging through the bar and the reclamation, etc., incidental thereto before wharves, jetties and railway works were taken up.

11. He did not anticipate that the dredger 'Manaar' would commence work much before March 1921. She could then dredge till May 1921, when she would be stopped by the monsoon. She would not have time in that year to complete the channel and all that would be effected would be a partial dredging. She would begin again in September 1921. She could then carry on dredging until May 1922, by which time it ought to be possible to complete the 15 feet channel. The result of the experiment would be known in October 1922 and if it was successful it will then be possible to go ahead with the larger channel. If all details were worked out in the meanwhile and the experiment were a success, contractors would at once be asked to come out and begin dredging the larger channel and they might be expected to begin work in January 1923. Meanwhile the 'Manaar' would during the monsoon periods be dredging the deep channels within the harbour and carrying on the reclamation at Venduruthy. At the same time it would be desirable to put down at least two moorings for vessels of small draught which entered by the 15 feet channel. Asked whether in these circumstances it would not be wiser to order a

large dredger for the Port Trust at once and to utilise that instead of dredging by contract, Mr. Hutton stated that if ordered at once, the harbour dredger would be ready some time between January and June 1923 and there would therefore be little saving in time, which was the only advantage secured by providing for dredging by contract. On the other hand, it would undoubtedly save something like 10 lakhs if the Port Trust employed their own dredger instead of employing contractors to dredge for them.

12. In conclusion, Mr. Hutton was of opinion that it would be sufficient for the present to work out a programme of works and finance on the above basis for the years 1921—25 and he undertook in consultation with Mr. Bristow to prepare a programme indicating the stages in which the works should be taken up and the amount of money that would be required in each of these five years.

15804

V

NOTES CONNECTED WITH THE DRAFT JOINT REPORT ON THE COCHIN HARBOUR SCHEME—FINANCE.

(i)

Demi-official—from the Hon'ble Mr. C. G. TODHUNTER, C.S.I., I.C.S., Member of Council.
To—W. HUTTON, Esq., A.C.H., A.M.I.C.E., Secretary to Government, Public Works Department.
Dated—the 18th December 1920.

A line to ask when you will be ready to meet the Diwan of Cochin and me for a discussion of the Cochin estimates. He will be here throughout the week and it would probably be most convenient if we came to talk matters over with you at your office.

Bristow rang me up on Saturday and, so far as I understood, said he would not be ready with his papers till Thursday. So, I suppose it is not much use asking you for an early date. Would Saturday be too soon? If not, I would suggest mid-day on that day.

It will perhaps save you time if I give you a note in advance of the kind of points on which we are likely to ask for information. These are, so far as I can see at present, as follows:—

(1) Does the estimate of capital cost cover every item that you consider necessary for the harbour?

(2) Basing your opinion on such estimates as you have before you, what do you think is the lowest figure which it would be safe to take as cost of all the works necessary *plus* that of those already carried out?

(3) What is the total amount that has already been ordered to be set down to the debit of the harbour on account of previous investigations, work on the foreshore, and work done since Bristow arrived?

(4) Does the estimate for the railway include the cost of acquisition of land, and do you accept it as sufficient, having regard to the length of the line, the length of the causeways, the cost of the movable spare and such other information as you have available. (I am putting this on to your list as I understand that Barnardiston is not likely to be available before the 20th.)

(5) Which are the works you consider necessary to what may be termed the first stage of the scheme, i.e., the opening of the bar and the reclamations or moorings or jetties which may be incidental to it?

(6) How long do you consider it will take for the completion of this stage, and what would be your programme of expenditure for it?

(7) Do you advise the combination of dredging by contract with purchase of a dredger, and if so, on what grounds?

(8) In either case, what do you consider is the reasonable period within which we may expect vessels to be able to anchor inside?

(ii)

Demi-official—from the Hon'ble Mr. C. G. TODHUNTER, C.S.I., I.C.S., Member of Council.
To—W. HUTTON, Esq., A.C.A.M., Chief Engineer (Roads and Buildings).
Dated—the 21st December 1920.

I enclose herewith for your acceptance or correction a note of our discussion on Saturday and shall be much obliged if you will kindly let me have a programme indicating the stages by which you would distribute the works which you have indicated should be taken up in the first instance over the years 1921-25 and the amount of finance which would be required for this purpose in each of those years.

(iii)

Demi-official—from W. HUTTON, Esq., A.C.A.M., Chief Engineer (Roads and Buildings).
To—the Hon'ble Mr. C. G. TODHUNTER, C.S.I., I.C.S., Member of Council.
Dated—the 19th January 1921.

With reference to your demi-official dated the 21st December 1920, I forwarded note of the discussions about the Cochin Harbour to Bristow, and his official reply dated the 3rd January 1921 is attached. I also attach a copy of his letter dated the 6th November 1920, in which he furnished a programme of expenditure (also printed on page 17 of the Secretariat notes). The only correction required in the notes of discussion is the statement that provision was made for a square channel 600 feet by 30 feet. Bristow has now pointed out that his estimate No. 2 contained a provision for a channel with side slopes of five to one, that is to say, he allowed for the sides falling in as the dredger carried out the excavation. This may be accepted. He also now admits the necessity for an additional shallow draft tug in the first year at a cost of Rs. 1 lakh. He explained to me that his original intention was to obtain such a tug which was being completed near Cochin or, alternatively, to hire launches for towing purposes. In his revised statement is included a sum of one lakh of rupees for the tug in the first year. You will observe that his estimate of expenditure in the first year now amounts to Rs. 10·79 lakhs, and this includes a sum of Rs. 1 lakh for land acquisition. The balance for land acquisition, 2½ lakhs, will have to be provided in the second year. I am unable to say whether this provision will be sufficient, as the land acquisition is a costly matter, and estimates are often exceeded.

2. You will observe from Bristow's letter that he advocates that if the first year's working is a success,—and he agrees to this first year's working,—the subsequent years' working should be according to his previous programme. From this it follows that the financial requirements will be in the first year Rs. 10·79 lakhs, in the second year 23½ + 2½ for land acquisition or 26 in all, third year 31¾, fourth year 37¾, fifth and sixth years 63 lakhs. I would prefer to add to these figures a certain percentage, say 25 per cent, so as to bring the total expenditure in proportion to the 250 lakhs which I mentioned as a likely sum (from 203 to 250), that is to say, my revised estimate would be, first year 11 lakhs, second year 32½ lakhs, third year 40 lakhs, fourth year 47 lakhs, fifth and sixth years 79 lakhs. In addition to these sums, if it is finally decided to order the new dredger, I would add 13 lakhs during the first three years.

ENCLOSURES

(1)

Letter—from R. C. BRISTOW, Esq., A.M.I.C.E., Harbour Engineer to Government, Cochin.

To—the Secretary to Government, Public Works Department.

Dated—the 3rd January 1921.

No.—C.H. 1/21.

With reference to our conversation in Madras on the 20th ultimo and to the proceedings of an informal conference held at the Council Chambers on the 18th ultimo, the minutes of which have recently been forwarded to me, I have the honour to enclose a revised estimate and memorandum as to the order of works to be undertaken at Cochin during the year 1921–22 and to offer the following remarks in regard to the matter as a whole.

2. It is presumed that subject to any modifications which may be suggested as a result of the first year's work, the scheme as proposed by the Cochin Ad hoc Committee is accepted by Government. As the proposals were agreed to by all concerned after protracted enquiry and consideration, it is submitted that it would be wise to secure permanence for the results achieved by a definite statement on the lines proposed above.

3. In the report of the full Ad hoc Committee, it will be seen that it was agreed at its last meeting that dredging inside and outside the harbour was necessary before the jetty as amended could be built. So far, therefore, this is in agreement with the policy outlined at the conference. It is, however, the view of the Harbour Engineer and others at Cochin that at least the godowns and improved wharfage accommodation are necessary in order to improve the port under present conditions, and whether the dredging succeeds or not, these extra facilities are required even now. It was never contemplated by the Ad hoc Committee as a whole that the construction of the godowns, etc., would be seriously delayed, and it is a matter for consideration whether this point should not be re-examined by the Ad hoc Committee.

4. With the above exception, the general line taken at the informal conference is substantially concurred in. Attention is drawn however to minor points of difference as follows:—

(*a*) If an amended estimate of Rs. 250 lakhs is put forward by Government on general grounds of prudence, it should not be allowed to affect the validity of the balance sheet given in the Ad hoc Committee's report, which by the addition of revenue to be obtained from the reclamation of further lands, can be adjusted to agree with the increased expenditure.

(*b*) The quantities of material allowed for in the estimates for dredging is shown in items 2 and 13 of the basis of the estimate. From these it will be observed that the estimate allows for a channel with sloping sides of about 5 to 1. The remarks at the top of page 3 of the proceedings are therefore not quite correct.

(*c*) As there would be plenty of room inside the harbour for vessels of 15 feet draught to swing at anchor, it is not considered necessary to put down special moorings for this class of vessel.

5. With regard to the final paragraph of the proceedings, it would be noted that a preliminary estimate of expenditure over a period of 5 or 6 years was handed to the Chief Engineer, Public Works Department, after consultation in Madras last November. It is obvious that such an estimate can only be tentative, as so much depends upon the result of the first year's work, and it is, therefore, suggested that the previous estimate might be accepted for present purposes, subject of course to the slight modification consequent upon the amended estimate for the first year forwarded with the memorandum herewith.

(2)

Memorandum as to the proposed order of work at Cochin.

(1) The dredger 'Manaar' will commence work on the outer bar as soon as she becomes available, and in the first instance, will dredge a channel 300 feet wide by 15 feet deep at L.W.O.S.T.

(2) As the arrangements for reclamation work at Vendurutby cannot be completed before the monsoon, it is proposed that for the first few months work on the bar the material shall be deposited at sea. If, however, it is possible to make temporary arrangements for utilizing the spoil at Vendurutby, these will be made.

(3) The above dredging operations necessitate the following survey works:—

(*a*) Current readings from the mouth of the harbour to the bar, both as regards speed and direction. These are required in order to ascertain the correct position of channel as far as present conditions permit.

(*b*) Soundings over the area to be dredged and observations of currents at the bar. These are necessary to check the progress of dredging and watch any silting up that occurs and to ascertain if possible, whether the mouth of the channel should be turned north or south or made bell-mouth fashion.

(*c*) Current readings and rise and fall of tide readings are necessary inside the harbour as far as lake Vembanad. These are necessary in order to ascertain the relative heights of tide in the harbour before and after dredging commences and also to discover where channels may best be dredged in order to increase the scouring action of the tide in the dredged channels.

(*d*) Observations of sand drift and littoral current require to be made south of Cochin. These are necessary in order to discover where the material comes from, should silting up occur, and how it may best be checked.

2. While the preliminary dredging on the bar is thus being started, arrangements will be made for the reclamation work at Vendurutby. This comprises the following items:—

(*a*) A survey of the northern part of the island with special reference to existing waterways, from which survey arrangements will have to be made for closing or diverting the waterways as may be necessary.

(*b*) A portion of the retaining banks must be built.

(*c*) Hopper barges and a small tug will be required for conveying the spoil to the area.

(*d*) Enquiries will be made as to the possibility of putting up a centrifugal pump on a pontoon at a central place near the reclamation for pumping the material ashore out of the hopper barges.

(*e*) A short length of pipe line will also be required in connexion with the above.

3. On those days when it is not possible for the 'Manaar' to work outside the harbour, whether before, during, or after the monsoon, she will be engaged in dredging through the inner bar to 15 feet at low-water ordinary spring tides, and temporary arrangements will be made, if possible, for handling the spoil in the reclamation area pending the setting up of a pumping system. This dredging is necessary in order to establish the reciprocal effect of the ebb and flow of tide required to assist in keeping the outer bar open.

4. All the above work afloat will require to be directed from a working base where pontoons may lie to receive stores, coal and water to take to the dredger; where the dredger itself may lie in order to land or ship plant and working parts, where timber, spare chain, spare tumblers, spare dredging buckets may be kept, and where the dredger may be put under heavy shears in the event of any accident to her bucket string or elsewhere requiring a very heavy lift.

5. This working area may be either (*a*) the site of the new or old Customs wharf adapted as necessary and approached by a sufficiently substantial temporary jetty leading to 10 feet of water or (*b*) a portion of the new wharves in front of the new or old Customs House and allowed for in the estimate item No. 7. The latter, being the economical course, is recommended.

6. It is anticipated that there will be a certain amount of silting up of the area dredged on the outer bar during the monsoon. Notwithstanding this, it is hoped that the 15 feet channels inside and outside the harbour will be completed during the financial year 1921–22. The succession of operations following will be largely determined by the result of the first year's dredging and survey work. But assuming that this is satisfactory, the subsequent proceedings would be accelerated or retarded according to the financial condition of the Madras Government and the Indian States of Cochin and Travancore. The result may be so successful that

it may be thought no time should be lost in proceeding with the whole scheme; or it may be thought safer to complete the dredging to 30 feet at low-water before dealing with the constructional works. All available evidence at other ports, without a single exception, shows that where a bar has been dredged successfully to a small depth of 15 feet or so, an increase in the size of the opening is an advantage rather than a disadvantage, because the action of the proper tidal wave becomes more marked as the depth increases, changing from a surface current to the vastly greater action which is the characteristic of the tidal wave. Chapter 5 of Tidal Rivers by Wheeler may be read in this connexion.

7. Assuming, however, that further dredging operations only should be proceeded with it is a matter for consideration whether the further dredging should be carried out by contract or with the suction dredger under order from England. It has been assumed hitherto that the new dredger will not be available for 2½ or three years, and that contract dredging is inevitable unless dredgers are hired. If, however, the suction dredger is likely to be available without causing great delay in the progress of work, it may be considered desirable to await its arrival before completing the dredging on the bar. This appears to be a matter which can be best decided in 12 months' time.

8. An estimate of works for the first year based upon the above outline is attached, and amounts to Rs. 10·79 lakhs. In preparing this estimate the plan has been adopted of taking the original basis of estimate (copy of which has been handed to the Chief Engineer, Public Works Department) and abstracting those items or portions of items which are affected.

ROBERT C. BRISTOW—3-1-21.

(3)

ESTIMATE FOR FIRST YEAR'S WORK AT COCHIN.

REFER TO ITEMS IN BASIS OF ESTIMATE.

	LAKHS. RS.
Item No. 2.	
Allow for one half of pilot channel on entrance bar, i.e., a channel 600 yards long by 100 yards wide by 2 yards deep	1·84
Protective work—	
Groynes at Vypeen say	·25
Do. Cochin say	·25
Mark piles, labour, etc.—	
1/6 of ·10.	
1/6 of ·50	·10
	2.44
Allow proportion of contingencies in above at 12½ per cent. ..	·31
Carried to summary	2·75
Items 3 and 4.	
The large tugs will not be required during the first year but a shallow draft tug will be very useful and one sufficiently large for dredging purposes can be purchased for	Rs. 1 lakh (carried to summary)
Item 7.	
Allow 1/3 of new wharf space	2·19
Allow for part of filling	·03
Allow for ferro-concrete sheet piling and capping along existing wharf	·63
	2·83
Proportion of contingencies at 10 per cent.	·28
Carried to summary	3·11
Item No. 11.	
Allow for acquisition of portion of land. If this is not required for the first year, it is practically certain to be wanted at the beginning of the second year and should be included to avoid delay later say	1·00 (carried to summary)
Item No. 12	
Take 1/3 expenditure on banks	1·33
And 1/3 pipe line item	1·00
Carried to summary	2·33
Item No. 13.	
Take 200,000 yards at 4 annas	·50 (carried to summary)
Item No. 15.	
Allow for borings (to be met out of contingency item)	·10 (carried to summary)

SUMMARY.

Item No. 2	2·75
Items Nos. 3 and 4	1·00
Do. 7	3·11
Do. 11	1·00
Do. 12	2·33
Do. 13	·50
Do. 15	·10
Total ..	10·79

(4)

Letter—from R. C. BRISTOW, Esq., Harbour Engineer.
To—the Secretary to Government.
Dated—the 6th November 1920.

REGARDING COCHIN HARBOUR SCHEME.

With reference to my interview with His Excellency, Mr. Todhunter and Captain Huddleston at Tuticorin on 31st ultimo, I have the honour to report that the work at Cochin should be carried out in the following order, and completed in from five to seven years, provided no serious delay arises from causes unforeseen at present:—

First year—(Operations to go on concurrently as far as possible).

Item 1. Dedging on the bar to 15 feet at L.W.O.S.T. to allow big dredgers to enter and also to permit certain experiments to be made as to sand drift current and tide before deep channel is dredged.

Item 2. Dredging beginning of deep water channels inside harbour in order to give definite direction to tidal wave and to assist in keeping open the bar. Material from both sources, i.e., channel and bar, to be used for reclamation.

Item 3. Acquiring land between new Custom House site and boundary stone; clearing the same and widening wharf space.

Item 4. Widening wharf space in front of new Custom House.

Estimated expenditure First year .. .. 14 lakhs.

NOTE.—If the keel plate of the new dredger is laid in this year, an additional amount of 8¼ lakhs will be required for the usual payment to shipbuilders.

Second year—

Items 2, 3 and 4 to continue.

Item 5. Building godowns, etc.

Item 6. Dredging of bar to continue to full depth.

Item 7. Protection of foreshore between Audikadavu and Cochin to check northward drift of sand as finally determined from first year's work on bar.

Estimated expenditure Second year .. .. 31¾ lakhs.

NOTE.—This includes the second payment of 8¼ lakhs to shipbuilders for a dredger.

Third year—

Items 2, 5, 6 and 7.

Estimated expenditure Third year .. .. 40 lakhs.

NOTE.—This includes the third payment of 8¼ lakhs for the dredger.

Fourth year—

Item 2. To continue.

Item 8. Jetties at Cochin and Venduruthy.

Item 9. Railway Ernakulam to Venduruthy.

Item 10. Tugs and moorings.

Estimated expenditure Fourth year .. .. 46 lakhs.

NOTE.—It is estimated the fourth payment of 8¼ lakhs for dredger e made this year after the usual six months' satisfactory working or site.

Fifth year and sixth year—

Items 8, 9 and 10 and miscellaneous.

Estimated expenditure Fifth and six year .. .. 63 lakhs.

(iv)

Demi-official—from the Hon'ble Mr. C. G. TODHUNTER, C.S.I., I.C.S., Member of Council.

To—W. HUTTON, Esq., A.M.I.C.E., Secretary to Government, Public Works Department.

Dated—Fort St. George, the 21st January 1921.

I think the best way of arriving at the estimate that is wanted in connexion with the Cochin harbour is to send you the enclosed copy of the draft report which I am drawing up as the result of the conference with the two Diwans.

2. This is of course only a draft and it may be necessary to ask them to come up again for further discussion. I should prefer that it should not go out of your hands.

3. Our general conclusion which was adopted largely on your advice was that we should, in the first instance, try to arrive at a scheme of finance that would carry us to the end of the stage of determining whether the bar can be kept open or not, though we decided to add to this provision for additional godowns on the ground that these are considered to be necessary whether the port is developed or not. (As you said when I saw you it may be as well not to confine the issue by adding this provision.)

4. Your advice is that this stage would take at least two years, and although Bristow is optimistic as to getting his channel cut before the monsoon of this year, I personally am much inclined to doubt whether he will get the *Mannar* in time to do that. Therefore it seems to be the only safe course to provide for spreading these works over two years.

5. To enable you to give me a rough estimate of what the cost of them will be I have endeavoured to draw up a table with reference to the estimate in the Committee's report and to Bristow's figures and have added to these items the other items of necessary expenditure which do not seem to have been provided for and shall be very grateful if you can fill up the blanks in this.

6. It is impossible to say what the amount of this estimate will come to; but it seems to me that it will be difficult to bring it within the figure of 57 lakhs which is the maximum loan that the Port Trust can finance at present.

7. I gather from Gopalakrishna Ayyar that you do not consider a fresh estimate necessary because you already have one for the different stages of the work in connexion with the estimate for the whole and all that you consider necessary is to call a halt at the end of a certain stage if the opening of the bar does not turn out to be satisfactory. I quite realize your point of view, but do not think that is a line on which it would be any use approaching the Government of India. They have definitely refused for this year to lend us anything more than 70 lakhs for all purposes and our acceptance of this loan prevents our going to the market ourselves. At the same time you will see from the evidence before the Railway Commission that it is extremely unlikely that any money will be found for railway extension, however urgent. In these circumstances, the chances of the Government of India being willing to embark on a 250 lakhs scheme in a port of which they know nothing are very remote. Whether they will sanction even our 50 lakhs scheme is doubtful, but if you will give me the estimates now asked for we can, I hope, show them a practicable way of setting about that which we could never do if we put the whole scheme before them at the present stage.

(v)

Demi-official—from W. HUTTON, Esq., A.M.I.C.E., Secretary to Government, Public Works Department.

To—the Hon'ble Mr. C. G. TODHUNTER, C.S.I., I.C.S., Member of Council.

Dated—the 2nd February 1921.

Your demi-official of 21st January regarding Cochin Harbour works.

As the cost of some of the items included in the programme of works to be carried out during the next two years was not available, I had to call for the information from the Harbour Engineer. A copy of his demi-official, dated the 26th January 1921, is enclosed for your information. The blanks in the estimates at pages 7 and 8 of the note have now been filled in and the other figures have also been checked and corrected where necessary. It is noticed that the estimates on page 8, current file, do not include the expenditure on preliminary investigations incurred before Mr. Bristow's arrival.

2. You will see that the total cost of the works during the first two years including the dredger and the cost of improvements already carried out comes to Rs. 82·73 lakhs as shown below:—

	LAKHS.
First year	18·19
Second year	23·14
Works already debited against Cochin Harbour	2·40
Cost of dredger	39·00
Total ..	82·73

As you observe, it will be difficult to bring the total cost within the figure of Rs. 57 lakhs referred to at the end of paragraph 10 of the note. I see that the only way of reducing the figure is to cut down the provision made in the estimates for additional godowns as already suggested by me. If that is done, then the amount required will come to Rs. 71·50 lakhs (82·73 — 11·23).

I also anticipate that there will be *some* saving in the provision for the dredger. From the recent telegram received from the Government of India (copy enclosed), I notice that the cost of the dredger will be about £259,900 and that owing to the lack of ship-building work at Home, we are likely to have the dredger much sooner than we expected. But I do not understand why the whole cost of the dredger should be charged against the first stage of the scheme. Although it will be paid for partly during the first stage, the correct amount to be charged to the first stage for the capital cost of the dredger should not, I suggest, be more than 20 per cent of the capital cost as the dredger at the end of the first stage will be required for subsequent work.

3. At the end of the draft I see that it is proposed that funds should be placed in the hands of the Presidency Port Officer for carrying out the Harbour works. I do not know of works of such magnitude ever having been carried out by a Presidency Port Officer and I should like, with permission, to consult with the Harbour Engineer on this point and forward our opinion. I always thought it was the Harbour Engineer in the Public Works Department that was to carry out the work until the formation of a Port Trust Board similar to Madras Port Trust.

I would suggest in order not to delay that this paragraph 18 (5) be omitted from the draft.

ENCLOSURES

(1)

Demi-official—from R. C. BRISTOW, Esq., Harbour Engineer to Government.

To—W. HUTTON, Esq., A.M.I.C.E., Secretary to Government, Public Works Department.

Dated—the 26th January 1921.

With reference to your letter of the 22nd instant, I have done my best to fill in the blanks in the estimates enclosed; but in the absence of particulars as to what some of the new items are supposed to include, I have had to exercise a certain amount of imagination.

Dealing with items affected.

Delete cost of tug Rs. 1 lakh included twice in the estimate.

Delete *here* (not cost) *of hopper barges and cost of bringing them from Tuticorin*, as this item is included partly in the contingencies and partly in the overall price for dredging.

Survey staff, Engineering staff and contingencies.—It is not practicable to separate the survey staff from the engineering staff as there will be considerable overlapping of duties during the year. I have therefore grouped these two together.

Existing charges of Landing and Shipping Committee.—It is presumed that this refers to the maintenance of the Vypeen bunds which are at present paid for by the Port and Marine Funds.

Cost of a centrifugal pump and pipeline.—Part of this was included in reclamation at Venduruthy, viz., Rs. 2·33 lakhs taken previously. I have amended the item accordingly.

Balance of estimate for parallel groynes, Vypeen, and certain other small works which will be completed next year. This item has been added for consideration. Amended total for the first year's work, Rs. 18·19 lakhs.

Second year.—Further dredging inside the harbour.—It is difficult to estimate what this will be unless contract work is permitted in the second year. I am inclined to think that if the first year's work appears to be successful, there will be a strong demand for the hastening of dredging work during the second year, and that some assistance to the 'Manaar' will have to be allowed for. I have put down a sum of Rs. 6 lakhs, which will allow for either (*a*) part of the work to be done by the new suction dredger if available, or (*b*) part of the work to be done by contract or (*c*) part of the work to be done by another dredger hired by the Port Trust.

Cost of staff.—I have allowed for 50 per cent increase in the second year.

Ordinary charges of the Port Trust.—This is a most difficult charge to estimate. Normally, on the basis of Madras Revenue Account, it should consist of the following expenditure:—

(*a*) General charges, which include direction, accounts, traffic, engineering, stationery, furniture, etc.
(*b*) Porterage of cargo.
(*c*) Engineering and maintenance.
(*d*) Contributions.
(*e*) Interest on Government loans.
(*f*) Miscellaneous.
(*g*) Items awaiting adjustment.

Of the above, it is not anticipated that the Port Trust will be ready to take over the *porterage of cargo* until wharves and jetties are completed. Engineering and maintenance are included elsewhere.

Item (*e*)—*Interest on Government loan.*—I am unable to estimate this.

Item (*f*)—*Miscellaneous* is a small item.

It therefore remains to put down something for *General charges* and *Contributions*, and out of these we may exclude salaries and office charges already taken elsewhere. On the basis of Madras, this would leave perhaps Rs. 1 lakh of expenditure, and I think that if we take one-seventh of this for the second year at Cochin, it will be sufficient. But of course, this is not much more than a guess, and it is open for any one to make a better guess if he can. This brings the cost of the second year's work up to Rs. 23·14 lakhs.

As noted in the memorandum, the cost of the new dredger is separate and I observe this has been increased to Rs. 39 lakhs. I hope there will be a saving on this item.

I am not sure if you wish me to remark on paragraph 2 of the memorandum, but as I understand it, it is proposed.

(*a*) to give the reclamation at Vendurthy to the Cochin Darbar at cost price;
(*b*) to have it made over to the Trust as part of the assets if the scheme succeeds, or
(*c*) let the Cochin Darbar keep it if the scheme fails.

I must say that this appears to me to be treating the Cochin Darbar very handsomely. I would rather suggest that if the scheme fails, it is all the more reason why the Port Trust should keep the reclamation in its own hands, because it will then have 640 acres of land valued at Rs. 10,000 an acre to sell and put against its losses. Even if it should bring in only Rs. 5,000 an acre as cocoanut land, the selling price would be enormously greater than the 'cost' price.

As regards the summary at the end of the memorandum, I do not know how much of the 'improvements already carried out' it is proposed to include whether merely the work done since my appointment in April last or for any time previous to that date. I am also unable to fill in the last item, namely, 'Lands to be made over to the Cochin Port Trust.'

The note is compiled rather hastily, but you asked for it before the 28th instant, and I hope it will serve your purpose.

(2)

Telegram—from the Secretary to the Government of India, Department of Commerce and Industry.
To—the Chief Secretary to the Government of Madras.
Dated—Delhi, the 28th January 1921.
No.—825.

Your telegram, 11th December, Cochin Dredger High Commissioner for India wires begins—

Lobnitz quotation including spare parts 259,900 pounds for 1,000 feet discharge for delivery in this country twelve months. 290,400 pounds for 3,000 feet for delivery in this country 13½ months. 382,800 pounds for 6,000 feet for delivery in this country fifteen months, etc., hopper capacity each 44,300 cubic feet single pump guarantee 2,000 tons shingle sand silt or fine day per hour shingle remaining hopper at end of hour 100 per cent. Suitable sand 75 silt or fine clay at less than 50. Lobnitz have vacant berths now. Simons cannot commence many months and his previous quotation for 1,000 feet discharge type same as above approximately 49,000 pounds dearer than Lobnitz now quote. Naval Architect recommends dredger 1,000 feet discharge from Lobnitz at once. Before berths filled let me know your wishes by telegraph.

Please telegraph what reply shall I give.

FINANCE (MARINE) DEPARTMENT.

Letter—from M.R.Ry. Rao Sahib V. GOPALAKRISHNA AYYAR Avargal, Assistant Secretary to Government, Finance (Marine) Department.
To—W. HUTTON, Esq., A.C.H., A.M.I.C.E., Secretary to Government, Public Works Department.
Dated—Madras, the 8th February 1921.

I am desired by the Hon'ble Finance Member to send you for perusal a copy of the draft report on the Cochin Harbour scheme.

In paragraph 10 of the report, the expenditure connected with the Harbour is put down at 4·73 lakhs. The Honourable Member has asked me to ascertain from the Public Works Department whether all the items have been included in the list.

PUBLIC WORKS DEPARTMENT.

The draft report is returned herewith. I see that paragraph 18 (5) has *not* been altered with reference to paragraph 3 of my demi-official, dated 2nd February 1921. The point should be specially brought to the notice of the Finance Member. **A**

2. The figures in paragraph 10 of the report have been checked and corrected where necessary. I think the list is now complete.

W. HUTTON—11-2-21.

Corrected figures have now been entered in the proof copy.

V.G.K.—17-2-21.

A. This point was considered by Honourable Member (Financial); and it was decided that no alterations was necessary. (Funds may be placed in the hands of the Presidency Port Officer instead of the Harbour Engineer.)

V. GOPALAKRISHNA AYYAR—17-2-21.

[A copy of the Draft Joint Report together with copies of the Proceedings of the Conferences held on the 14th, 16th and 18th December 1920 was sent to the Diwan of Travancore and Cochin during the last week of February 1921.]

VI

NOTES OF A DISCUSSION WITH MR. MCMURRAY OF MESSRS. SIEMENS, MANUFACTURERS OF DREDGERS FOR PORTS IN THE EAST AND ELSEWHERE.

Mr. McMurray has just come from Cochin where he has discussed the question of the dredger for the Cochin harbour with Mr. Bristow. The type of dredger required must be 'drag suction' which is similar to the 'Fruhling head.' This type of dredger is used where the spoil is very light mud and its speciality is that it gets rid of the water and only draws up mud in a semi-solid state so that the hopper is filled with mud and not with water which carries the mud back again into the sea. Messrs. Siemens make these 'drag suction' dredgers and an engineer who went home with the idea of purchasing a 'Fruhling head' type, after inspection of the two, preferred Messrs. Siemens's design.

2. The engines of a dredger of the type recommended would be sufficiently strong to pump through a pipeline of 2,500 to 3,000 feet. If a pipeline of 6,000 feet were required, it would be necessary either to have a stronger engine or a supplementary pumping installation at the end of the 3,000 feet of line. A pipeline of 2,500 to 3,000 feet would serve for the reclamation at Venduruthi.

3. Mr. McMurray thinks it will be possible to keep the bar open by dredging only, but it may be necessary to construct supplementary works from time to time as experience shows the need of them. If the dredger could not work throughout the monsoon it could probably work in the calmer intervals. Similar dredgers are worked in rough weather at Durban.

4. The present practice regarding the payment of instalments is to pay 10 per cent when the keel is laid and 15 per cent more when the frames are up. The whole payment is divided into six or seven instalments spread over the whole period of building.

5. The time of building in normal times would be about ten months; the firm could deliver the dredger now in about fifteen.

6. Prices will be lower than they are now six months hence and much lower a year hence.

7. The firm could conveniently take on the work about November.

8. The firm would not accept a contract in rupees.

9. Mr. McMurray understands that Mr. Bristow is preparing fresh specifications with a view to a fresh call for tenders. This makes it unnecessary to take any further action on the tenders already received.

10. The Chief Engineer, Public Works Department, may see this.

C. G. T[ODHUNTER]—1-3-21.

R. A. GRAHAM—1-3-21.

Noted. I talked over the Cochin Dredger case with Mr. McMurray and advised him to try and see the Honourable Member for Finance. A copy of above notes has now been taken and kept in Public Works Department for reference.

W. HUTTON—2-3-21.

VII

NOTES CONNECTED WITH DRAFT JOINT REPORT ON COCHIN HARBOUR SCHEME.

(i)

Demi-official—from R. A. GRAHAM, Esq., C.S.I., I.C.S., Secretary to the Government of Madras, Finance Department.

To—M.R.Ry. Rao Bahadur T. VIJAYARAGHAVA ACHARYA, M.B.E., Diwan of Cochin, Ernakulam.

Dated—the 28th March 1921. *No.*—524-IV/21-1.

With reference to the draft joint report of the Finance Member of the Government of Madras, you and the Diwan of Travancore on the Cochin Harbour Scheme—Finance, a proof copy of which was sent to you last month, I am desired to request you will kindly let me know when your remarks thereon may be expected.

(This was sent by me under Hon'ble Mr. Todhunter's orders.)
V.G.K

(ii)

Demi-official—from M.R.Ry. Rao Bahadur T. VIJAYARAGHAVA ACHARYA, M.B.E., Diwan of Cochin, Ernakulam.

To—R. A. GRAHAM, Esq., C.S.I., I.C.S., Secretary to the Government of Madras, Finance Department.

Dated—the 31st March 1921.

Please see your D.O. No. 524 IV/21-1, dated 28th March. Raghavayya has been unable to meet me and discuss the joint report. We have now arranged a meeting for 4th April at Ernakulam and I hope to be able to send our remarks soon after.

(iii)

Demi-official—from Diwan Bahadur T. RAGAVAYYA, Diwan of Travancore and T. VIJAYARAGHAVA ACHARYA, M.B.E., Diwan of Cochin, Ernakulam.

To—R. A. GRAHAM, Esq., C.S.I., I.C.S., Secretary to the Government of Madras, Finance Department.

Dated—the 15th April 1921.

Please see your D.O. No. 524-IV/21-1, dated 28th March 1921. We have gone through the draft and append a memorandum showing the alterations we would suggest in the draft. The modification suggested in paragraph 11 explains itself and only elaborates the principle already laid down by the Hon'ble Mr. Todhunter. The alterations suggested in paragraphs 12 and 14 are consequential on the alteration in paragraph 11. In regard to the omission suggested in paragraph 18, our idea is that while the matters referred to in paragraph 16 may well be dealt with by the Presidency Port Officer with the help of the advisory committee, the control over the execution of the harbour works should be with Government.

ENCLOSURE.

MEMORANDUM.

Paragraph 11 *of the report.*—*Omit* the sentence beginning with "We think it preferable, etc."

[That is—

"We think it is preferable that this land after reclamation should be taken over by the Cochin Darbar at the cost of reclamation as estimated by the Engineer and then made over to the Trust for use so long as it is required to Port Trust purposes just as the lands in British territory are made over, rather than that the Trust should pay for the reclamation and have an isolated piece of land left in their hands in the middle of the backwater and in State territory, should the scheme not come to fruition."]

Open a sub-paragraph under 11—It may run as follows:—

"As an alternative to the above proposal, and in order to keep down the capital cost of the undertaking, we think it is preferable that the lands transferred to the Port Trust by the several administrations should be treated as continuing in the ownership of the administrations concerned, only a rent being charged to the Port Trust for the use of the land. Applying the same principle, the land reclaimed at Vendaruthy should, we consider, be taken over by the

Cochin Darbar at the cost of reclamation as estimated by the Engineer and then made over to the Trust on rent so long as it is used by it. A similar principle should apply to all private property which may be acquired by the administrations concerned for the Port Trust."

Paragrapah 12.—*Omit* the words within brackets

[The words within brackets—

" Rs. 2·33 to be paid by Cochin Darbar " against item (i).

" Rs. 4·66 to be paid by Cochin Darbar " against item (ii).

" Excluding reclaimed land on Vendurathy " against item (v).]

and *add* at the end of paragraph 12—

" Should the alternative suggested in paragraph 11 be adopted, this estimate will be reduced by 11·99 lakhs.

Paragraph 14, *Sub-paragraphs* (4).—*Alter* this sub-paragraph as follows :—

from

" A sum of 4·88 lakhs is set down for the payment of charges already incurred by the Government of Madras and a further sum of 3 lakhs for land to be handed over by that Government. These should certainly be brought to account for the purpose of general distribution of charges between the three guarantors of the scheme, but perhaps the Madras Government might be willing in the circumstances to forego interest and sinking fund charges on this account. Similarly the Cochin Darbar might be induced, with reference to paragraph 11 above, to take over the initial cost of the reclamation of Vendurathy, say 6·99 lakhs, and to forego similar charges in respect of that land and any other land belonging to the Darbar which may be handed over for purposes of the scheme."

to

" A sum of (4·88) lakhs is set down for payment of charges already incurred by the Government of Madras. This should certainly be brought to account for the purpose of the general distribution of charges between the three guarantors of the scheme. But perhaps the Madras Government might be willing in the circumstances to forego interest and sinking fund charges on this account. And as already pointed out in paragraph 12, if the alternative proposal suggested in paragraph 11 about the ownership of land be adopted, a further saving of 11·99 lakhs will be effected.

Paragraph 18.—*Omit* clause (5).—[*viz.*]

" (5) that meanwhile funds should be placed in the hands of the Presidency Port officer for carrying out the harbour works, to be administered by him with the aid of a Port Conservancy Board constituted under section 7 (1) of the Indian Ports Act. "

Draft Joint report of the Hon'ble Mr. Todhunter, C.S.I., and the Travancore and Cochin Diwans.

The two Diwans have now agreed the draft report subject to the following minor alteration. (These are indicated on pages 5 to 8 of the draft report) :—

(1) *Paragraphs* 11, 12 *and* 14 (4) *of the draft report.*—The Darbars want to retain the ownership of the land and to charge rent to the Port Trust ; and the two Diwans have suggested certain consequential alterations in the draft.

For orders whether the alterations may be accepted.

No objection ; provided the period and other terms of the lease are fair. The term should be long, if not ' for ever.'

H.G.S.—20-4-21.

(2) *Paragraph* 18 (5) *of the draft report.*—The two Diwans suggest that this sub-paragraph should be omitted as the control for the execution of the harbour works should be with Government and not with the Presidency Port Officer. The intention of paragraph 18 (5) of the draft report was that the Presidency Port Officer, instead of the Harbour Engineer, should be held responsible for carrying out the harbour works and that the Presidency Port Officer will be under the control of Government.

H.G.S.—20-4-21.

2. Attention is solicited to paragraph 6 of " Note I, dated 6th April 1921, on discussion of certain marine matters at the Secretariat " and paragraphs 2 and 5 of " Note, II dated 8th April 1921 " in which it is proposed that the expenditure for 1921-22 should be confined to only six lakhs on experimental works and that the Travancore and Cochin Darbars should be asked to bear one-third of the cost of this experimental work.

V.G.K.—20-4-21. H. G. Stokes—20-4-21.

The proposals of the Diwans may be accepted, subject to the Secretary's remarks.

2. The estimates will need modification as to the cost of the dredger and the time which it will take to supply it with reference to the statements made by Mr. McMurray. This can be dealt with for the time being by a foot-note.

3. The action now to be taken is to place before the *ad hoc* committee—

(*a*) the financial proposals now arrived at,

(*b*) the Port Trust Bill, and

(*c*) the suggestion that they should bring into force in advance of the Port Trust Bill a schedule of rates which will bring in the revenue which has been estimated as necessary for financing the first stage of the improvement of the port.

4. As soon as they have accepted this, the Government of India can be addressed on the lines already indicated.

5. Meanwhile the scrutiny of the customs question must be completed so that proposals on that head may also form part of the same letter.

6. Meanwhile also, if the Port Trust Bill has not been scrutinised in the Law Department, that scrutiny may also proceed.

7. The draft to the *ad hoc* committee should be got ready at once and the whole matter pushed along with the utmost possible rapidity.

8. Meanwhile, the Chief Engineer must be asked to let us have at once estimates for the work to be done immediately on the experiment in opening the bar and the Accountant-General must be consulted as to whether there is any objection to our proceeding with this in advance.

C. G. T[odhunter]—20-4-21.

The draft order dictated by the Honourable Member (with reference to paragraph 7 of the Honourable Member's note, dated 20th April 1921, is submitted.

V.G.K.—22-4-21.

Please get * off the u.o. note to the Accountant-General at once and ask him for a very early reply, as I wish to deal with the matter before I go on leave.

* Despatched to the Accountant-General on 24th April 1921.

2. The draft Government Order had better be held up meanwhile. It needs one or two minor alterations. In the opening paragraph, the period of the discussions should be taken back to the last stage at which there was a break. Probably two or three years is the correct figure.

3. In paragraph 6, I do not quite like the idea of reappropriating the five lakhs grant to the Madras water-supply and drainage scheme. For one thing we do not want five lakhs, but two. For another, I do not quite see how we can exchange grant money against loan money in this case. It is simpler to do so if particular public works can be selected.

4. The draft demi-official to the Diwan's may be got ready meanwhile.

C. G. T[odhunter]—23-4-21.

Issue the draft Government Order below.

C. G. T[odhunter]—28-4-21.

[G.O. No. 157 Marine, dated 30th April 1921.]

VIII

COCHIN HARBOUR SCHEME—FINANCE.

April 1921.

Joint Report of the Hon'ble Mr. C. G. Todhunter, C.S.I., Finance Member to the Government of Madras, Diwan Bahadur T. Raghavaayya, Diwan of Travancore, and Rao Bahadur T. Vijayaraghava Achariyar, M.B.E., Diwan of Cochin.

We have, as desired, examined the question of financing the Cochin harbour scheme in consultation with the Chief Engineer, the Presidency Port Officer, the Collector of Customs and the Finance Secretary.

2. An important factor to be noticed in the first instance is the desire of the Travancore Darbar to be admitted as a partner in the scheme, that is to say, to contribute one-third of any cost that may fall upon the administrations that are responsible, on the understanding that it is to be credited with one-third of the customs revenue of the port. The Cochin Diwan, on behalf of his Darbar, is prepared to accept this arrangement, which may therefore be put to the Government of India, if no objection to that course appears on a scrutiny of past correspondence connected with the matter.

3. One feature of the scheme upon which more stress has been laid by the officers consulted than upon any other is the necessity for making sure of the possibility of keeping the bar open by dredging alone before proceeding with any other part of the scheme. Of the two expert firms that have been consulted on this point, one gave an opinion to the effect that it was not feasible to keep the bar open in this way, while the other considered that a channel which was left undredged during one monsoon would be practically obliterated. The Chief Engineer considers that too much reliance should not be placed on these opinions, which are not based on concrete facts, in view of the advice of the Harbour Engineer backed up by local opinion at Cochin, remembering also the case of the proposed opening of the northern entrance to the Madras harbour to ensure fairly calm water inside that harbour. In the latter case there was strong expert opinion against the success of the measure which nevertheless has

been proved after execution to be a complete success. The Chief Engineer advocates the construction of the preliminary 15-foot channel in order to provide the requisite data on which expert opinion can be invited. He agrees that there is considerable risk of the money spent on digging the channel being thrown away, in view of which he considers that it is inadvisable to incur any expenditure which is not dependent on the opening of the channel until it has been proved by the experience of one monsoon that the channel can be kept open. The other officers consulted all agree in this opinion, which, we understand, is in effect that intended to be conveyed by the report of the committee as altered by the amendment moved by Captain Huddleston. We understand from the Chief Engineer that the Harbour Engineer also accepts this.

At the same time, the Chief Engineer advises us that the estimate of capital works must be taken to be low. He considers that it would not be safe to assume an expenditure of less than 250 lakhs. Even this sum would only cover a part of the expenditure on the scheme. The accommodation provided would be for four vessels to lie alongside and for four vessels at moorings. The provision for the railway covers only the bridge and the sidings at Venduruthy and is dependent on the Cochin State making an extension from the present terminus to a point opposite the island. The estimate for contract dredging is based upon a 'full' estimate for a channel 600 by 30 feet with side slopes of 5 to 1, i.e., it allows for the sides falling in as the dredger carries out the excavation.

4. The estimates of receipts and expenditure are open to a good deal of criticism. Under the head of receipts, the port dues are not creditable to the harbour works, inasmuch as they have to be spent for purposes defined in the Indian Ports Act. Of the other items of receipt, some are for services which will not be rendered for some few years after the commencement of the work while others are items which are offset by corresponding charges for which no provision has been made. The net result would be to impose dues in an unimproved port considerably in excess of those levied in the past year in the port of Madras which included superdues of 75 per cent.

5. As regards charges, we are unable to agree that they will start with a nil figure and rise by annual increments in the tenth year to 40 per cent of the receipts, more especially in view of the fact that a considerable part of the cost of dredging is to be debited to this head. According to the figures shown us by the Collector of Customs, the charges of the Madras port have amounted on the average of 33 years to 75·57 per cent of the receipts, though in 1919–20 they were 60 per cent. It is true that the charges will be smaller in the earlier years, but as the revenue also will only grow by degrees, we think it better to take a constant percentage of the revenue.

6. In view of these considerations and of the advice of the officers consulted, we have come to the conclusion that the best course at present is to endeavour to arrange a scheme of finance in the first instance only for the period necessary for opening the bar, leaving further developments to be met out of further increases in the income, consequent on the increased trade which may be expected as soon as vessels are able to anchor inside.

7. The Chief Engineer's programme of the first stage of the scheme is as follows :—

Assuming that the 'Mannar' begins work in March next, she will not be able to complete clearing a 15-foot channel till the opening of the monsoon in 1922. It will not be possible therefore to say whether the channel can be kept open without the aid of groynes until October 1922, and if a contract is to be given for the further deepening, it will not be safe to enter into it until that month, and therefore the contractor will not be able to begin work until January 1923, that is to say, for a period of two years from now. The building of a dredger at Home is estimated to take from 2 to 2½ years, so that if an order were placed at once, that dredger would be available on some date between January and June 1923. On this basis, the saving of time resulting from dredging by contract, which is the only advantage claimed for the arrangement, is reduced to six months at the most. The Chief Engineer would therefore omit that item from the programme and order the dredger at once with a view to getting it to work, if the dredging of the 15-foot channel is successful, in 1923. Specifications for a suitable dredger have been drawn up and tenders called for from the Director-General of Stores, India Office. No orders can be passed until final tenders have been received by the Madras Government and considered by them and the Government of India.

8. On this basis the estimate of the works necessary to establish that the bar can be kept open which will be spread over a period of two years will work out roughly as follows :—

First year.

	LAKHS.
(1) Dredging channel on the bar 600 yards long by 100 yards wide by 2 yards deep	1·84
(2) Groynes at Vypeen and Cochin	·50
(3) Mark piles, labour, etc.	·10
(4) Contingencies	·30
(5) Cost of a shallow tug for tugging barges to Venduruthy	1·00
(6) Working area at the new wharf	3·11
(7) Acquisition of land	1·00
(8) Reclamation at Venduruthy	2·33
(9) Cost of dredging the channels in the harbour	0·50
(10) Borings	0·10
(11) Engineering and survey staff and contingencies	1·00
(12) Existing charges of the Landing and Shipping Dues Committee.	0·10
(13) Cost of a centrifugal pump and pipe line	0·50
(14) Cost of machinery and stores including heavy sheers	0·50
(15) First instalment of construction of new godowns	5·00
(16) Balance of estimates for parallel stone groynes at Vypeen and other small items	0·21
	18·09

Second year.

(17) Further dredging on bar	1·85
(18) Further dredging inside the harbour	6·00
(19) Further cost of reclamation at Venduruthy	4·66
(20) Cost of completion of godowns	6·23
(21) Cost of acquisition	2·50
(22) Cost of engineering and survey staff	1·50
(23) Ordinary charges of the Port Trust	0·50
(24) Cost of maintenance and depreciation of dredger and tugs ..	0·25
	23·49

9. In addition there is the cost of the new dredger estimated at 39 lakhs.

10. Besides these there is the past expenditure incurred in connexion with the harbour aggregating 4·88 lakhs as follows :—

	RS.
(*a*) Foreshore works	1,69,105
(*b*) Investigations	78,770
(*c*) Works done since the appointment of the Harbour Engineer	2,40,000
Total ..	4,87,875

11. A further item to be debited to the Port Trust is the cost of land, etc., handed over to them by the administrations concerned. This will include the existing customs premises, etc., which may be put for the present at a rough figure of 3 lakhs. There should also, we think, be included under this item the land at Venduruthy which is to be made by reclamation. In addition to this there will be a further area of existing land belonging to the Darbar to be made over as to the value of which we have at present no information but which may be put down at a guess at two lakhs.

*Addition suggested by the Diwans of Travancore and Cochin.

*As an alternative to the above proposal, and in order to keep down the capital cost of the undertaking we think it is preferable that the lands transferred to the Port Trust by the several administrations should be treated as continuing in the ownership of the administrations concerned, only a rent being charged to the Port Trust for the use of the land. Applying the same principle, the land reclaimed at Venduruthy should, we consider, be taken over by the Cochin Darbar at the cost of reclamation as estimated by the Engineer and then made over to the Trust on rent so long as it is used by it. A similar principle should apply to all private property which may be acquired by the administrations concerned for the Port Trust.

12. Thus, the total cost on account of the works necessary up to the stage of making sure that the bar can be kept open, including improvements already carried out, the purchase of a suction

dredger for deepening it and lands to be made over to the Cochin Port Trust amounts to 90½ lakhs as shown below :

	LAKHS.
(i) Cost of works, first year.	18·09
(ii) Cost of works, second year	23·49
(iii) Dredger	39·00
(iv) Past expenditure on the harbour	4·88
(v) Land	5·00
	90·46

* Should the alternative suggested in paragraph 11 be adopted, this estimate will be reduced by 11·99 lakhs.

* Addition suggested by the Diwans of Travancore and Cochin.

	TONS.
1921	385,000
1922	395,000
1923	405,000
1924	415,000
1925	425,000
	5) 2,025,000
	405,000

13. For the purpose of financing this sum, we have the undertaking of the Chamber of Commerce to impose rates upon goods up to maximum of Rs. 2 per ton. We have carefully examined such statistics as are available of the trade of the port and our conclusion is that it would not be safe to adopt a higher average figure for the next five years than 405,000 tons as shown in the margin.

This would give a gross revenue of Rs. 8,10,000. As regards the charges on this, they are not likely to work out to less than 40 per cent of the revenue, thus leaving a net sum of Rs. 4,86,000 for the service of a loan. This at 8½ per cent which will be necessary in order to cover interest, income-tax, sinking fund and other charges, would provide for a service of a loan of 57 lakhs.

14. (1) On this basis, the estimate for the first two years' expenditure is more than the port can afford and it has therefore to be seen what items can be omitted for the present in order to bring it within the sum of 57 lakhs which the port can raise.

(2) The cost of the dredger is taken at 39·00 * lakhs. It would not, we think, be improper to spread this expenditure over 3 years, since even if the opening of the bar was found impossible and the mercantile community were unwilling to continue the charge of Rs. 2 a ton in the third year, there would be the value of the dredger to set against the remaining liability.

(3) The sum of 6 lakhs provided for dredging in the second year includes provision for a second dredger to assist the "Manar" in order to expedite the work. This is no doubt very desirable, but, if

* This estimate will need modification as to the cost and the time which it will take to supply it with reference to the statements made by Mr. McMurray.

the port cannot afford the work, a reduction of this item would not be fatal to the scheme.

(4) A sum of 11·23 lakhs is provided for godowns. These are really no part of the first stage of the scheme, though they would be a great convenience. In view of the necessity for first getting the bar open, they might be omitted or the charge reduced for the present. *A sum of 4·88 lakhs is set down for payment of charges already incurred by the Government of Madras. This should certainly be brought to account for the purpose of the general distribution of charges between the three guarantors of the scheme. But perhaps the Madras Government might be willing in the circumstances to forego interest and sinking fund charges on this account. And as already pointed out in paragraph 12, if the alternative proposal suggested in paragraph 11 about the ownership of land be adopted, a further saving of 11·99 lakhs will be affected.

* Alteration suggested by the Diwans of Travancore and Cochin.

(5) On the whole, we think that the best way of squaring the account is to distribute the charges of the dredger over 3 years, reduce expenditure on godowns to an amount of 7 lakhs and to move the guarantors to forego interest and sinking fund charges on amount already spent and cost of land to be given for use of the harbour.

15. The loan should, we consider, subject to the approval of the Government of India, be advanced in equal parts by the three administrations concerned, their shares being determined after consideration of the value of the assets which they have handed over.

16. There remains the question of the body to administer the various works and the money for carrying them out. We agree that for this purpose there should be constituted as soon as possible a Port Trust, for which purpose the draft of a Bill has already been prepared by the Presidency Port Officer. Meanwhile, we suggest that there should be constituted a fund under the control of the Presidency Port Officer, to whom should be attached an advisory committee constituted as a Port Conservancy Board under section 7 (1) of the Indian Ports Act, whose first function would be to draw up a schedule of rates under the Landing and Shipping Fees Act calculated to yield dues sufficient to provide for the service of the loan, the same to be brought into force with effect from the 1st April next. We

would ask the same committee as well as other mercantile bodies along the West Coast to consider whether it would not be desirable to constitute a separate Port fund for Cochin by the issue of an order, subject to the sanction of the Government of India, to the effect that Cochin should be treated as a single port for the purposes of Schedule 1 to the Indian Ports Act and that the payment of port dues in Cochin should not cover payment of port dues at other ports on the coast or vice versa. Though the fund so constituted would not be available for expenditure on harbour works it would provide money for pilotage, moorings and other services mentioned in the Indian Ports Act.

17. Before action is taken on these proposals we consider that it would be best to refer them back to the committee constituted under G.O. No. 271, Revenue (Special) (Marine), dated the 9th July 1920.

18. The proposals to be referred may be summarized as follows:—

(1) That, without prejudice to the further developments proposed by the committee, the question of financing the first part of their scheme, namely, the ensuring the opening of the bar, be taken up in the first instance;

(2) that for this purpose the works referred to in paragraphs 8, 9 and 12 above, as modified by paragraph 14, be put in hand as soon as possible and carried out in the course of the years 1921 and 1922;

(3) that meanwhile the Government of India be moved to approve the placing of an order for a dredger which would then be available for work in 1923 or earlier;

(4) that legislation should be taken in hand as early as possible for the formation of a Port Trust and that the draft Bill be forwarded at once to the committee for criticism;

* * * *

(6) that the Port Conservancy Board should draw up a schedule of dues to be levied under the Landing and Shipping Fees Act calculated to yield approximately a rate of Rs. 2 per ton to be put into effect from the 1st April 1921.

19. It will be understood that these proposals as a whole will need the sanction of the Government of India before action can be taken and it is therefore desirable that they should be dealt with by the Committee as early as possible.

20th April 1921.

C. G. TODHUNTER.
T. RAGHAVAYYA.
T. VIJAYARAGHAVA ACHARYA.

IX

COCHIN HARBOUR SCHEME—FINANCE.

Details of the sum of 4·88 lakhs representing past expenditure on Cochin Harbour Scheme—Works referred to in paragraph 10 of the joint report on Cochin Harbour Scheme—Finance.

(a) FORESHORE WORKS.

		RS.	RS.
G.O. No. 228 W., dated 29th January 1913.	(1) Provision of temporary wooden groynes for Vypeen Foreshore, Cochin ..	8,003	
G.O. No. 1872 W., dated 22nd September 1913.	(2) Construction of a protective bund on the Vypeen Foreshore, Cochin	27,000	
G.O. No. 1425 W., dated 17th July 1914.	(3) Construction of protective bunds on Vypeen Foreshore, Cochin	51,000	
G.O. No. 1549 W., dated 20th August 1915.	(4) Certain works for protection of the foreshore at Cochin	25,647	
G.O. No. 1550 W., dated 20th August 1915.	(5) Extension of Campbell's bund	4,018	
G.O. No. 895 W., dated 8th June 1916.	(6) Extension of Campbell's bund for a length of 1,500 feet in front of Cruz Milagre gap on the Vypeen Foreshore.	30,000	
G.O. No. 1260 W., dated 28th August 1916.	(7) Special repair to the groynes on Vypeen Foreshore, Cochin	5,300	
G.O. No. 256 W., dated 13th February 1917.	(8) Constructing stone groynes at the centre of the new extension of Campbell's bund	5,120	
	(9) Protective works carried out under Superintending Engineer's sanction ..	11,877	1,69,105

(b) INVESTIGATIONS.

		RS.	RS.
	(10) Cost of special establishment and plant required for the investigation and survey of the Cochin Backwater Bar, etc., including payment to Mr. Bell for visiting Cochin and advising on the question of improvements to the Fort of Cochin	58,770	
	(11) Premium paid to Messrs. Wolfe Barry, Lyster and Partners for the Cochin Harbour Report	15,000	
	(12) Payment to Mr. Saville for advice in connexion with the protective works at Cochin	1,000	
	(13) Collecting samples of sand and alluvial deposits at the different parts of Cochin Harbour	4,000	78,770

(c) WORKS DONE SINCE THE APPOINTMENT OF THE HARBOUR ENGINEER.

		RS.	RS.
G.O. No. 601 W., dated 16th April 1920.	(14) Putting up mark piles and two dolphins at the site of the proposed channel ..	5,000	
G.O. No. 808 W., dated 22nd May 1920.	(15) Protecting Bastion bungalow	9,500	
	(16) Temporary repairs to the old Customs jetty and repairs to new Customs jetty	6,500	
	(17) Stores, office, etc., at Custom-house ..	5,000	
G.O. Mis. No. 974 W., dated 29th June 1920	(18) Provision of plant and materials ..	25,000	
G.O. No. 1412 W., dated 13th September 1920	(19) Temporary establishment for six months to work under Mr. Bristow	3,500	
	(20) Construction of parallel groynes to protect the Vypeen Foreshore, Cochin.	48,000	
G.O. R. No. 724 W., dated 22nd November 1920.	(21) Constructing a pile driving pontoon at Cochin	15,000	
	(22) Miscellaneous Public Improvements, Cochin Harbour Miner	12,500	
	(23) Miscellaneous Public Improvements, Cochin Harbour Repairs	9,595	
G.O. Mis. No. 1884 W., dated 4th December 1920.	(24) Tools and plant	50,300	
	(25) Purchasing heavy plant and machinery.	41,000	
	(26) Centage charge of 10 per cent on account of supervision on the value of stores issued from Public Works Stores approximately	9,105	
			2,40,000
	Grand total ..	..	4,87,875

X

COCHIN HARBOUR (FINANCING IN 1921–22).

It seems necessary to invite the attention of His Excellency the Governor to the financial position in respect of the Cochin Harbour works. This has been unsatisfactory from the beginning, and is very much more so now that the powers of Government in respect of expenditure are greatly restricted.

2. As His Excellency the Governor is aware, there is no provision for expenditure on harbours out of the ordinary provincial funds at all. The major harbours are Imperial and have their own port trust boards, which are responsible for finance. The minor harbours have a general ports fund derived from the dues on shipping which is not really intended for harbour work, the surplus of which has been employed for loans to local harbour authorities and for the purchase of dredgers to be used by them. In addition to this, the Local Port Conservancy Boards or Landing and Shipping Fees Committee levy small dues on cargoes which are only sufficient for the minor works and every-day administration of the ports.

EXPENDITURE IN 1920–21.

3. In the case of Cochin, owing to the desire expressed by the majority of the Government to begin work at once, estimates were sanctioned and work taken in hand by Mr. Bristow out of provincial funds as if the works were ordinary provincial works (G.O. No. 808 W., dated 22nd May 1920). This was done pending the constitution of a Port Trust, but that has been delayed and is likely to be still more delayed now by the proposed participation of Travancore in the scheme. An attempt therefore has been made to regularise the expenditure incurred in 1920–21 by making grants from provincial funds to the Cochin Landing and Shipping Fees Committee of the amount expended and asking them to pass it through their books (G.O. No. 105, Marine, dated 26th March 1921). While this will be a grant so far as the Landing and Shipping Fees Committee is concerned, it will be reckoned as part of the expenditure by the provincial Government for the purpose of the calculation of the share of the total cost to be entered into with Cochin and Travancore.

EXPENDITURE IN 1921–22.

Excluding the cost of dredger the first instalment towards which will be paid only in 1922–23.

	LAKHS.
Cost of works first year.	18·09
Deduct amount to be paid by Cochin.	2·33
	15·76
One-third (Government share).	5·25

4. There next arises the question as to how funds are to be provided for work to be done in 1921–22. The Public Works Department have provided no money for this in their budget. The Government have provided for a loan of 5 lakhs of rupees to the Cochin Landing and Shipping Fees Committee, but this is only one-third of the total amount required for expenditure in the year since it anticipates that Cochin and Travancore will each contribute a like amount. The Council have passed this without any objection beyond the general objection to lump grants which we have undertaken to explain to the Finance Committee.* In the present state of affairs, however, it is rather difficult to give the Finance Committee any exact account of how it is proposed to spend this money.

Administrative sanction to the scheme.

5. A much more serious difficulty arises over the question of sanction. Even the preliminary estimate as last worked out by the Public Works Department is going to cost, with the new dredger, over 90 lakhs of rupees. The Local

* But please see paragraph 6 of Note I of a discussion on marine matters at the Secretariat on 6th April 1921.

Government of India, Finance Department, Resolution No. 802 E.A., dated 4th April 1921, rule 6 (4).

Government have no power to incur expenditure on a scheme costing more than 50 lakhs without the prior sanction of the Secretary of State, and the real position is that we are, and have been, anticipating this sanction ever since Mr. Bristow began work.

* Subsequently received on 18th April 1921.

6. We are not in a position to ask for sanction because we have (1) to secure the agreement of the local ad hoc committee to the financial proposals which have been forwarded* a month ago to the Diwans of Travancore and Cochin for acceptance; (2) to examine the whole of the previous record regarding the giving of a share of the customs revenue to Travancore; (3) on the disposal of these two matters to obtain from the Public Works Department estimates in sufficient detail to satisfy the Government of India and the Secretary of State with regard to the 90 lakhs scheme; and (4) to secure the assent of the Government of India and the Secretary of State to the whole scheme including the share of the customs revenue by Travancore.

EXPENDITURE TO BE INCURRED IN 1921-22 IN ADVANCE OF THE ADMINISTRATIVE SANCTION.

† Since received on 18th April 1921.

7. Since it is essential that the dredging on the bar should go on until the monsoon breaks, I think the best course to adopt will be to secure † the assent of the Diwans and the Committee to the financial proposals as early as possible and then go up with the preliminary scheme and ask for sanction to proceed with the clearing of the bar, promising to follow with fuller details as soon as they can be secured. As the Council is not in session, I would suggest that this scheme be laid before the Finance Committee and their approval to proceed in anticipation of sanction secured, if possible. Meanwhile, I think it should be made clear to Mr. Bristow that we are proceeding in anticipation of sanction, and that therefore it is desirable that he should impose all restrictions possible on the amount of his expenditure.

As regards keeping Mr. Bristow in funds, I understand that we are to be allowed to draw our loan from the Government of India, when we require it, and I would therefore make it part of the proposals to be put before the Committee that they should open a regular loan account with effect from the 1st April and should finance Mr. Bristow out of that. The loans will have to be granted from time to time on application by the Presidency Port Officer, who is from the financial point of view the controlling authority of the Landing and Shipping Fees Committee, and he will have to satisfy himself by a scrutiny of estimates as to the necessity for each sum of money which is applied for. The money will of course be furnished in round sums of a lakh or half a lakh a time. The details of this arrangement will be worked out in consultation with the Accountant-General.

C. G. T[ODHUNTER]—5-4-21.

Seen by His Excellency the Governor on 6th April 1921.

NOTE.—The proposals in this note have been modified subsequently—please see paragraph 6 of Note I relating to discussions on marine matters at the Secretariat on 6th April 1921.

XI

SANCTION TO ESTIMATES FOR COCHIN HARBOUR WORKS.

FINANCE DEPARTMENT (MARINE).

Letter—from the Accountant-General.
To—the Secretary to Government, Public Works Department.
Dated—18th February 1921.
No.—81-C.H./4355.

I have the honour to submit a reference to G.Os. No. 808 W., dated the 22nd May [1920], and No. 855 W., dated the 1st June 1920, in which certain works were sanctioned [as b]eing "required in connexion with the scheme for the improvements to the Cochin [Har]bour", and to inquire whether any project estimate for the Cochin harbour [sch]eme (which should include all preliminary expenses of the nature mentioned in [th]e Government Orders above referred to) is under preparation for the sanction of [t]he Government of India or the Secretary of State—vide paragraph 429 of the Public Works Code, 10th edition.

U.O. Note No. 566-IV—21-1 dated 23rd April 1921.

With reference to his letter No. 81 C.H./4355, dated the 18th February 1921, the Accountant-General is requested to advise urgently on the following points:—

The improvement of the Cochin harbour is a matter which has been under discussion for a great many years, and a certain amount of work has already been done upon it. Thus, considerable expenditure has been incurred in reclamation of the narrow strip of sand between the Vypeen foreshore and the backwater to prevent the sea from breaking through. All this will now form part of the harbour work, if a large scheme is undertaken, but so far has been undertaken, without any further object than to prevent the alteration of the location of the mouth of the harbour. Again in 1914 an experiment was made in dredging in order to secure certain data regarding the set of current and the possibility of keeping the bar open. This experiment was not conclusive and the Government are now repeating it, the total cost of doing so being estimated at something like six lakhs. This experiment again is no part of the larger scheme, since, even if successful, it will not serve to render the harbour open to vessels. But the question whether the major scheme is ever to be proceeded with or not depends on the success of the experiment.

2. Meanwhile estimates are under preparation for the first stage of the major scheme estimated to cost 57 lakhs. These, as soon as they are ready, will be sent to the Government of India and the Secretary of State for sanction, together with complete financial proposals.

3. A local committee has already submitted rough estimates for a further stage of the same scheme amounting to 203 lakhs.

4. In his letter under reference the Accountant-General has raised the question whether any project estimate for the Cochin harbour is under preparation for submission to the Government of India with reference to the works referred to in G.Os. No. 808 W., dated 22nd May 1920 and No. 855 W., dated 1st June 1920. These works are partly works of reclamation which would be essential whether the scheme is proceeded with or not and partly works connected with the experiment which is being conducted independently of the main scheme which will follow if the experiment is finally successful. It does not appear to the Government that either of these forms part of the main scheme which falls within the sanctioning power of the

Government of India since if the experiment fails that scheme will never be proceeded with. As has already been stated estimates for the first stage of the main scheme are already under preparation with a view to submission for sanction to the execution of the scheme if and when the experiment proves successful, but pending that event they will never be put into effect.

5. In these circumstances, it is hoped that the Accountant-General will agree that no sanction of the Government of India is necessary at the present stage.

H. G. STOKES—23-4-21.

U.O. Note of the Accountant-General No. 53, dated 27th April 1921.

[Reference U.O. Note No. 566, dated 23rd April 1921, regarding Cochin harbour works.]

In the circumstances mentioned, I agree that sanction of the Government of India is not necessary at the present stage, for works of reclamation and experimental dredging.

2. As the preliminary expenditure incurred will also have to be taken into account in the event of the main scheme being undertaken, provision for this preliminary expenditure may be made in the project estimate under preparation.

3. The scheme will require the approval of the Secretary of State, as the cost is likely to exceed 50 lakhs of rupees—*vide* Government of India Resolution No. 802-E.A., dated 4th April 1921.

XII

(i)

NOTES OF A DISCUSSION ON CERTAIN MARINE MATTERS AT THE SECRETARIAT, FORT ST. GEORGE, ON THE 6TH APRIL 1921.

The following were present:—

(1) His Excellency the Governor, for the latter part of the time.

(2) Admiral Sir Edmond Slade, K.C.I.E., K.C.V.O., R.N.

(3) The Hon'ble Mr. C. G. Todhunter, C.S.I.

(4) Mr. W. Hutton, A.C.H.A.M.I.C.E.

(5) Mr. R. T. Menzies.

MARINE POLICY.

The general question of Marine policy being discussed, it was agreed that questions like that of the Pamban Canal, which raised issues of Imperial importance, ought to go up to the Government of India and to be dealt with by that Government as part of the general question of communications and not from the point of view of Marine alone. The letter drafted by Mr. Todhunter on the general question of Marine policy was read and accepted. His Excellency the Governor undertook to send a copy of this with a private letter to Admiral Tothill, with a view to securing his support.

Letter since issued as No. 129, Marine, dated 11th April 1921 [copy sent to Private Secretary to His Excellency the Governor on 20th April 1921].

2. On the general financial policy it was agreed that it was not possible, in the case of opening a new port, to make the port pay for the capital expenditure and that in such cases it was desirable that the Government of India should undertake the financing of loans or grants, if they were thought necessary. Meanwhile Admiral Slade suggested that one means of financing such a work as the Pamban Canal was that a dredging or contracting company or a syndicate of two companies would be willing to undertake the work and to accept payment for work done in the shape of bonds, which they would pass on to the market. This would involve an indirect payment to the company or syndicate which would be equal to the charges for underwriting the loan.

COCHIN HARBOUR.

3. On the subject of the Cochin Harbour, Admiral Slade expressed a doubt as to whether it would be possible to keep the channel open for the whole year even with dredging in the monsoon. His company would certainly not undertake to do the work of this harbour in return for payment in bonds secured on the trade of the port. He was quite prepared to see the proposed experiment made

COCHIN HARBOUR—*cont.*

4. Mr. Hutton explained that dredging was now going on and that it was not possible to make any more than a partial channel this year and that it was worth doing this for the sake of the data that would be collected by the Harbour Engineer with reference to the partial channel so dug, for the purpose of advertisement and in order to show that the Madras Government were in earnest. He had already sanctioned Rs. 20,000 for dredging in March and is expecting to spend another Rs. 50,000 before the monsoon sets in. Altogether he estimates the cost of the experimental work on the bar at five to six lakhs of rupees.

5. Mr. Todhunter raised the question of financing this work in view of the facts (1) that it is not usual to spend Provincial money upon harbour works, (2) that the Legislative Council has not sanctioned any definite allotment out of revenue for the work, and (3) that the loan amount entered in the budget is the local Government's share of the first year's expenditure on the 90 lakhs scheme which requires the sanction of the Secretary of State.

6. Mr. Hutton undertook to send an estimate for five or six lakhs of rupees, for the experiment only, to be spent in 1921–1922. It was suggested that the Cochin and Travancore Darbars should be asked each to undertake to bear one-third of the cost of this experimental work and that the Legislative Council should be asked to sanction a supplemental estimate for the Madras Government's share, the work to proceed meanwhile owing to the fact that it is necessary not to lose a day before the monsoon sets in. This estimate will be treated as an estimate for an experiment only and as such, within the sanctioning powers of the Madras Government. If the experiment is successful and the general scheme goes forward, the sum can subsequently be treated as a loan by the three parties to the Port Trust; the whole matter to be fully reported upon to the Finance Committee at their next meeting, after consulting the Accountant-General, if necessary. Funds can be found by transferring the loan amount to Provincial public works of permanent utility which are at present entered as to be paid for out of revenues and using the revenue thus saved to pay for the harbour scheme.

TUTICORIN.

Bristow disagreed to this yesterday.
W[ILLINGTON]—9-4-21.

7. Mr. Bristow's report on Tuticorin was read. The general opinion was that the opening up of the Pamban Pass, instead of being an integral part of the Tuticorin scheme, would result in reducing the trade of Tuticorin to a minimum, since quays will ultimately be built in the canal where ships could discharge alongside which they would do instead of going on to Tuticorin.

Admiral Slade suggested that, in the circumstances, the wisest course was to cut the opening and make provision for vessels anchoring inside and then to discharge into lighters as at present. His Excellency the Governor accepted this proposal which, it is believed, will be accepted by the local merchants. The Harbour Engineer may be asked to prepare estimates accordingly.

PAMBAN CANAL

8. The papers relating to the Pamban Canal were considered and it was unanimously agreed that, owing to the enormous saving of distance and therefore of coal (which Admiral Slade estimated at 15 lakhs of rupees a year) that would result to vessels from Europe or from the West Coast going to any place in the Bay of Bengal by this route, the scheme is one which should be pushed forward as early as possible. The old plans drawn up by the railway authorities for digging the canal were examined and it was agreed provisionally that Mr. Mitchell's alignment was the best. Mr. Hutton undertook to furnish Admiral Slade with the necessary data whereupon the latter will have prepared an estimate for cutting the canal at a cost, which, including a swinging bridge, is not expected to be more than Rs. 50 lakhs, and in a time which will probably be less than three years. No charge would be made for such an estimate if the work were ultimately given to the Company; otherwise the usual charge will be made. Admiral Slade strongly advised the cutting of this canal as early as possible in order that the income to be derived from dues thereon might be secured. Meanwhile provision might be made for a basin for purposes of wharves, etc., but this should not delay the cutting of the canal. Floodgates are likely to be necessary. Provision would have to be made for coal and fuel depots and no charge should be made on vessels which used the canal simply for coaling purposes. The pooling of dues on shipping as proposed in drafted by Mr. Todhunter's

Letter to the Government of India subsequently issued as No. 129, Marine, dated 11th April 1921.

letter would greatly facilitate the work of vessels using ports on the coast. A broad gauge line from Pamban to Jalarpet is an essential.

9. Much opposition is to be expected in regard to this scheme from the Ceylon Government and the South Indian Railway if it requires the sanction of the Government of India. The question is, however, whether it is necessary to send it up to the Government of India at all. The scheme is likely to cost less than 50 lakhs and Admiral Slade's firm would be ready to take loan scrip up to that amount in payment for work done If so, it should be possible to put the work through under the local Government's own powers of sanction.

C. G. T[ODHUNTER]—7-4-21.

Demi-official—from E. C. SMITH, Esq., I.C.S.,

To—the Hon'ble Mr. C. G. TODHUNTER, C.S.I., I.C.S., Member of Council, Madras.

Dated—Madras, the 9th April 1921.

With reference to your letter of the 7th to Duff, I am to say that His Excellency has seen the copy of your notes of discussion with Admiral Slade and has no remarks to offer.

[Copies of notes I and II sent to Mr. Hutton on 20th April 1921.]

(ii)

NOTES OF A FURTHER DISCUSSION ON CERTAIN MARINE MATTERS AT THE SECRETARIAT, FORT ST. GEORGE, ON THE 8TH APRIL 1921.

The following were present :—

(1) Admiral Sir Edmund Slade, K.C.I.E., K.C.V.O.

(2) Mr. W. Hutton, A.C.H.A.M.I.C.E.

(3) Mr. R. T. Menzies.

(4) Mr. R. C. Bristow.

His Excellency the Governor and the Hon'ble Mr. C. G. Todhunter, C.S.I., came in at the close.

The same three questions were discussed.

HARBOUR.

2. Mr. Bristow explained the observations in respect of currents which he had been taking at Cochin and the line which he proposes to adopt for cutting the channel. This was generally accepted.

PAMBAN CANAL.

3. As regards the Pamban channel, it was decided that the first thing to be done was simply to cut the channel and not to consider any question of making wharves or fuel supply depots on the banks. It was also pointed out that buoys or light buoys or possibly light ships would be needed, two to the north and two to the south of the channel, in order to indicate the deep-water approaches to the canal. This would be a charge on the Government of India.

TUTICORIN.

4. As regards Tuticorin, Mr. Bristow agreed that it was desirable to confine operations, for the present, to opening up a basin inside the reef in which ships can discharge into boats in calm water. He was not prepared for six months or a year to say what would be the exact position for the cut because he wishes to make borings and determine exactly where hard rock occurs at depths of 35 feet and where at less. If the channel can be cut where the hard rock occurs only at 35 feet or more, blasting will be avoided.

COCHIN.

5. Mr. Bristow agreed to put up an estimate for not more than six lakhs for experimental works at Cochin, including an experimental channel, to be paid

for equally between the two Darbars and the Madras Government: this estimate to be placed before the Finance Committee at the earliest possible date. Mr. Bristow will give a full explanation of the scheme in forwarding it.

PAMBAN CANAL.

6. Mr. Bristow preferred to make the estimate for the Pamban canal himself and not to have it made by an Engineer of the Tilbury Docking and Dredging Company because he has already an establishment and plant on that coast. A separate estimate for doing this work will be necessary.

TUTICORIN.

7. As regards Tuticorin, Mr. Bristow has already reported the instruments, etc., which are required for the observations he proposes to make. His estimate in this matter to be examined and, if complete, to be placed before the Port Conservancy Board for sanction.

PAMBAN.

8. For the estimate for the inquiry at Pamban, it will be necessary to go up for sanction to the Council since there is no local body at that port.

COCHIN.

9. The Public Works Department will send Messrs. Shaw Wallace & Company on behalf of the Tilbury Docking and Dredging Company plans and statements regarding the Cochin Harbour scheme so that this company can estimate for all the dredging work which is contemplated at Cochin.

DREDGING AND MAINTENANCE WORKS AT THE MINOR PORTS.

10. With reference to the company's offer to undertake all dredging and maintenance works at the minor ports of the Presidency, it was decided that, in the first instance, the number of cubic feet of dredging done in the last ten years should be examined. It seems unlikely that the amount was sufficient to justify entering into such an arrangement. The Harbour Engineer will also inspect these ports with a view to deciding what would be the best method of dealing with their maintenance in future and will also inspect and report on all the dredgers and other plant now maintained there. On receipt of this report, the general question of the policy to be pursued in maintaining ports which are not of a status to have Port Trusts of their own will be examined.

C. G. TODHUNTER—8-4-21.

[Copies of notes I and II sent to Mr. Hutton on 20th April 1921.]

FINANCE (MARINE) DEPARTMENT.

Notes (i) and (ii) ante.—Submitted that three copies of Notes (i) and (ii) relating to discussions on certain Marine matters at the Secretariat on the 6th and 8th April 1921 may be forwarded to Mr. Hutton for further action. The Chief Engineer will no doubt give necessary instructions to Mr. Bristow.

V. GOPALA KRISHNAN—20-4-21.

H. G. STOKES—20-4-21.

[Three copies sent to Mr. Hutton, Ootacamund, on 20th April 1921 and two copies to the Chief Engineer's office, Madras.]

…vision of Interportal Trade Convention of 1865 between the British Government and the Native States of Travancore and Cochin.

Previous papers:

G.O. 214, *Political*, *13th April* 1860
" 706, *Revenue*, *23rd April* 1864
" 339-40 " *15th February* 1865
" 813 " *10th April* 1865
" 845 " *25th April* 1865
" 1101 " *23rd May* "
" 800 " *8th October* 1900
" 673, *Revenue*, *9th February* 1905
" 407, *Political*, *6th July* 1905

G.O. 551, *Revenue*, *1st March* 1911
" 546, *Political*, *14th October* 1913
" 845, *Financial*, (*Separate Revenue*), *1st October* 1916.
" 987, *Revenue*, *24th November* 1915
" 494, *Marine*, *24th October* 1920
" 105, *Marine*, *26th March* 1921
" 106, " *26th March* 1921

Extract of the notes on the questions discussed at Calcutta by the Hon'ble Mr. C. G. Todhunter, C.S.I., with the Hon'ble Mr. Hailey.

* * * * * * *

VII. *Customs Revenue.*

Would India be prepared to forego a portion of their customs revenue (1) in the case of Pondicherry and Karikal to remove legitimate complaint on the part of the French Government and its subjects, (2) in the case of Travancore and Cochin to ensure the financial co-operation of the Travancore State in the development of the Cochin Harbour?

A As regards the case of Travancore and Cochin, Mr. Hailey was quite prepared to examine the question of re-distributing the customs receipts on the understanding that the three administrations shared the financing of the harbour works. The whole case will, however, have to be stated to the department concerned.

* * * * * * *

C. G. T[odhunter]—26-1-21.

* * * * * * *

Point VII is important and I would urge going ahead with that both with reference to the French Government and with reference to the Travancore and Cochin Darbar as to which I saw a note lately.

* * * * * * *

W[illingdon]—11-2-21.

Finance Department.

The foregoing extracts of notes may be sent to Finance (Central) u.o.

T.A.S.—16-2-21. J. M. Hooper—17-2-21.

Finance (Marine) Department.

This department is concerned with the portions marked **A** above.

Vide paragraphs 5-10 of Revenue note on pages 2-3 and paragraph 2, Financial note, on page 7 of notes in G.O. 551, Revenue, 1st March 1911.

2. Under the Interportal Trade Convention, the *Cochin* Darbar is entitled to receive the following compensation for surrendering the greater port of its customs revenues:—

(1) the wole of the *net* duty on foreign tobacco levied at the port of British Cochin, the British Government guaranteeing to the State a revenue of Rs. 10,500 on this account.

(2) a moiety of the *net* customs revenue at British Cochin from other sources (salt, pepper and opium excepted), the British Government guaranteeing to the State a revenue of *one lakh* including the customs dues realized at the ports of the Cochin State.

3. The following statement shows the imports and exports at Cochin and payments made to the Cochin Durbar under interportal trade convention for five years ending 1919–20 :—

Year.	Imports.	Exports.	Total.	Gross revenue realized.	Net revenue (after deduction).	Moiety of net customs revenue paid to the Darbar.	Payment made in respect of surrendering duty on tobacco.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1915–16	22,125,632	33,402,699	55,528,321	3,46,520	3,20,521	1,60,260	10,500
1916–17	17,288,161	38,398,592	55,686,783	3,88,493	3,58,756	1,79,378	10,500
1917–18	13,690,782	31,265,660	44,956,442	2,47,262	1,98,907	1,00,000	10,500
1918–19	13,857,252	41,765,640	55,625,892	1,34,005	1,07,813	1,00,000	10,500
1919–20	22,990,622	51,584,666	74,575,288	2,88,437	2,36,907	1,18,454	10,500

If on account of the financial co-operation of the Travancore State in the development of the Cochin harbour, that State is to be paid one-third of the customs revenue of the port of Cochin the result will be that India will have to forego a portion of the customs revenue and so also the Cochin Darbar.

4. Attention is solicited to paragraph 2 of the *draft* joint report of the Honourable Member and the Diwans of Travancore and Cochin on 'Cochin Harbour Scheme —Finance' in which the contemplated diversion of one-third of the customs revenue to Travancore is referred to. The draft joint report has yet to be accepted by the Diwans. The action as to the addressing the Government of India on the matter has to be taken up as soon as the draft report is accepted by them.

S.D.S.—7-3-21. R. A. Graham—10-3-21.

Put up the interportal trade conventions with both Travancore and Cochin.

Extract from Honourable Member's notes regarding discussion with Hon'ble Mr. Hailey.

* * * * * *

. . . . the Travancore case should be put up without any further delay. The question whether there was any old correspondence bearing on the proposal that they should be given a third of the Cochin customs revenue on the understanding that they stood in as sharer was raised long ago. Please let me have the papers now. It is likely that there will be points in that connexion also that it is desirable to have explained to Delhi by Mr. Lloyd.

C. G. T[odhunter]—9-3-21.

For interportal trade conventions with Travancore and Cochin please see G.O. No. 339–40, Revenue, dated the 16th February 1865; No. 813, Revenue, dated 10th April 1865 (paragraph 3); No. 845, Revenue, dated 25th April 1865 and No. 1101, Revenue, dated 23rd May 1865. For the text of the Interportal Trade Convention please see below :—

(1) No duties will hereafter be levied whether by the British Government or the Travancore and Cochin States on goods, being the produce or manufacture of British India. on their import, whether by sea or by land excepting tobacco, salt, opium and spirits.

(2) No duty will hereafter be levied by the British Government on goods, the produce or manufacture of the Cochin and Travancore States, on their import into British Indian territory, whether by sea or by land excepting salt, opium and spirits.

(3) Free import will be allowed by the Cochin State into its territories of Tranvancore produce and manufactures and vice versa on the same terms and with the same exceptions as those arranged with the British Government.

(4) The Cochin and Travancore States will adopt the British Indian tariff and rates of import duty on all foreign goods imported into them, tobacco being excepted on import into Travancore.

(5) Foreign goods which have already paid duty on import to British India or to either the Cochin or Travancore State will be allowed to pass free on further transport to any of these territories.

(6) The Cochin State will adopt the British Indian rates of export duty on articles exported to foreign countries, pepper being excepted and charged at Rs. 15 a candy.

(7) The Travancore State will continue for the present to levy export duties not less than those obtaining in British India but not more than Rs. 5 per cent on all ordinary exports, Rs. 10 per cent on timber, Rs. 15 a candy on pepper and betelnut *ad valorem*.

(8) The export duty at the Travancore inland chowkis, viz., those not situated on the backwater will be confined to principal goods only which will be notified from time to time.

(9) British Indian goods passing from Coimbatore through Travancore to the Cochin territories or British Cochin will be exempt from export duty in Travancore. The same exemption will extend to Tinnevelly cloths passing through Travancore.

(10) Goods passing from one port of the Cochin State through Travancore territory to any other port of the former will be exempt from export duty in Travancore.

(11) The Travancore and Cochin States will adopt the British Indian tariff valuations for exports as well as imports.

(12) The Cochin and Travancore States will adopt the British Indian selling price of salt, the rates at inland depots being raised so as to place the salt of Cochin, Travancore and British India on the same footing in the market.

(13) The Cochin and Travancore States will import British Indian salt on the same terms as it is imported into British Indian ports.

(14) The Travancore State will levy import duty on tobacco at rates not exceeding the following :—

	RS.	
On Coimbatore tobacco	40	a candy.
,, Tinnevelly tobacco	85	,,
,, (Kalomany) tobacco	120	,,
,, Jaffna tobacco	120	,,

2. The causes that led to the Interportal Trade Convention of 1865 were as follows :—

By Act VI of 1848, the coasting or port to port trade of British India was freed from all duties, but Travancore and Cochin, as foreign Native States, did not come within the scope of that enactment, and consequently the produce of these territories when landed at British ports was charged with import duty as foreign goods, and similarly the produce of British India when exported to Travancore and Cochin ports was charged with export duty—vide paragraph 5 of note on page 2 of notes to G.O. No. 551, Revenue, dated 1st March 1911. The same was the case with goods passing the land frontier. The Travancore and Cochin Darbars on their part levied customs duties on imports from and exports to British ports.

3. The effect of the above Act was that the trade of the ports of Travancore and Cochin was seriously injured as will be seen from the following :—

(*a*) The Honourable the Court of Directors remarked in 1858 as follows :—

"The Diwan's (of Cochin) complaint was that the abolition of all duties on articles going from one British port to another, while a 5 per cent duty remained on goods conveyed from Cochin ports to British ports, had been ruinous to the Cochin trade. This is highly probable and the extension to the coasting trade from Cochin ports, of the benefit which has been conferred on the trade in British vessels would apparently be consistent with our own laws and would be one of the concessions, which by every consideration of friendship and equity we are bound to offer in consideration of the abolition or relaxation of the monopolies."

Since the receipt of the above remark the duty on the produce of the country was raised from 5 per cent to 10 and 20 per cent and the result was distructive to the legitimate trade of the country.

(*b*) As regards Travancore, the Resident stated in 1860 as follows :—

"From the British port of Cochin, goods exported to Bombay, Calcutta, and other British ports, enter without duty; if exported from Alleppey, they pay 10 and 20 per cent. The temptation therefore to smuggle them into Cochin by the wide back-waters is irresistable and the revenues of the Raja and the commerce of Alleppey suffer alike."

He stated also that it was therefore most desirable that the injury to the legitimate revenue and resources of the country by the suspension of trade, or the action of the smuggler should at once be arrested.

4. The Darbars were desirous that their exports to British Indian ports might be admitted at the latter free. The British Government also had reasons to assimilate the customs arrangements because by the lower import duties levied by the Darbars, trade was diverted from British ports to ports in the Native States and because its salt revenue principally was affected by the cheap salt in Cochin being smuggled into adjoining British territory.

5. So far as Cochin is concerned the final arrangement was as follows :—

(i) The Darbar is not to levy import duty on the produce or manufacture of British India on import into Native Cochin, excepting Salt, Opium and Spirits—vide paragraph 7 of notes on G.O. No. 551, Revenue, dated 1st March 1911.

(ii) Similarly the British Government is not to levy import duty on the produce or manufacture of Cochin on import into British territory excepting Salt, Opium and Spirits.

(iii) Cochin and Travancore are similarly mutually to admit free of duty the respective produce of the States.

(iv) Cochin is to adopt the British Indian Tariff and rates of import duty on all foreign goods imported into the State.

(v) Foreign goods imported into British territory on payment of duty are to be allowed free entry into Cochin and vice versa.

(vi) Cochin is to adopt the British Indian rates of export duty on articles exported to foreign countries.

(vii) Cochin is to adopt the British Indian selling price of salt.

In consideration of the great sacrifices and concessions made by it, it was arranged that the Cochin Darbar should receive the following compensation :—

(1) The whole of the net duty on tobacco levied at the port of British Cochin the British Government guaranteeing to the State a revenue of Rs. 10,500 on this account—paragraphs 6 and 10 of G.O. No. 339, Revenue, dated 10th February 1865.

(2) A moiety of the *net* customs revenue at British Cochin from other sources (salt, pepper and opium excepted) the British Government guaranteeing to the State a revenue of one lakh including the customs dues realized at the ports of he Cochin State—vide paragraph 40 (ix) and (x) of G.O. No. 706, Revenue, dated 23rd April 1864, and paragraph 9 of G.O. No. 339, Revenue, dated 16th February 1865.

6. As regards Travancore, attention is solicited to the following :—

(1) Paragraphs 5 and 6 of G.O. No. 706, Revenue, dated 23rd April 1864, in which the concessions sought from the Native States and the concessions intended to be made in return by the British Government are given.

(2) Paragraphs 42–46 of the same Government Order in which their proposals were examined.

(3) In paragraph 48 of the same Government Order it was stated as follows :—

"The Travancore State declines to take part in any convention for levying the special duties on the excepted articles at British Cochin, and sharing the Customs revenue of that port with the British Government and the Cochin State, in the expectation that the admission of its produce whencever exported into British India free of duty will draw its trade to its own ports.

(4) In paragraph 16 of the letter to the Government of India No. 707, Revenue, dated 23rd April 1864, it was stated as follows :—

"The Travancore Government express their inability to give up their duties on foreign imports and on their own exports. All that can be done at present therefore is to free the coasting trade as far as practicable. The Travancore Government are willing to admit all British Indian produce free of duty excepting cotton, metals, tobacco, opium, salt and spirits. The four last need not be noticed, as they are articles of monopoly, but in regard to the first two the Government consider that the circumstances of the Travancore Government admit of at least a reduction of duty on cotton and cotton goods, and at no distant period, of the free admission of all except the monopoly articles. So far as the Government can judge, the revenue given up by the Travancore Government will be only about Rs. 40,000; while the British Government will give up about twice as much in the form of duties levied on Travancore produce imported into British India and export duties on British Indian produce exported to Travancore. This calculation only includes duties realized in the Madras Presidency and not those which may be realized in Bombay and Calcutta, the balance of advantages is greatly in favour of Travancore, but the circumstances of the State are peculiar and the Government would not defer the present arrangements until more complete reciprocity can be obtained . . ."

(5) The final arrangement was as follows :—

The State had to give up all import duties on British Indian produce (tobacco, opium, salt and spirits excepted), but to claim in the form of a guarantee or drawback, revenues realized in British Indian ports on foreign produce re-exported to Travancore; it had to reduce its export duties to 5 per cent ad valorem on all articles except the three marginally-noted and to diminish the tobacco revenue by Rs. 1,00,000.

Timber 10 per cent—pepper and betel Rs. 15 per candy.

The Government considered that with the various reforms then urgently required, these concessions were as much as the Travancore State could be expected to make then The guarantee amount to be paid by the Government was fixed at Rs. 40,000 and it was held that it would gradually be reduced as the direct trade of Travancore increased.

7. With reference to paragraph 2 of the draft joint report attention is solicited to paragraph 6 (II) of G.O. No. 706, Revenue, dated the 23rd April 1864, in which it was stated that "the Travancore and Cochin duties, so far as the British Government consider them equitable, to be levied on the articles temporarily excepted at British Cochin, and the customs receipts at that port to be shared between the British Government and those States in such proportions as a commission specially named for the purpose may consider just." But as stated in paragraph 6 (3) above it was the Travancore State only that declined to take any share of the customs revenue of the port of British Cochin. Since the Travancore Darbar now desires to be a partner in the scheme of the development of the Cochin Harbour, there seems to be no objection to it being credited with a portion of the customs revenue, which also it desires. It is stated that the Cochin Diwan, on behalf of the Darbar, is prepared to accept the arrangement.

S.D.S.—15-3-21.

Put up a draft to the Government of India and a demi-official to the Diwan of Cochin asking when a reply on the subject of the joint memorandum may be expected.

R. A. Graham—16-3-21.

A draft letter to the Government of India is submitted for approval. As the subject relates to the decision of customs revenue it seems preferable if the letter issues in Finance (Customs) Department. If approved, the file may go to that department.

2. A draft demi-official to the Diwan of Cochin as directed is also submitted.

S.D.S.—21-3-21.

Issue the demi-official to the Diwan. Re-copy and complete the letter to the Government of India, with the tables.

R.A.G.—27-3-21.

XIII-3

Demi-official—from R. A. GRAHAM, Esq., C.S.I., I.C.S., Secretary to Government,
Finance (Marine) Department.
To—M.R.Ry. Rao Bahadur T. VIJAYARAGHAVA ACHARIYA, M.B.E., Diwan of
Cochin.
Dated—the 28th March 1921.
No.—524 IV/21-1.

With reference to the draft joint report of the Finance Member of the Government of
Madras, you and the Diwan of Travancore on the Cochin Harbour Scheme—Finance, a proof
copy of which was sent to you last month, I am desired to request you will kindly let me know
when your remarks thereon may be expected.

The demi-official to the Diwan of Cochin has issued. The draft letter has been
typed and the file is resubmitted.

S.D.S.—1-4-21.

Political for acceptance before circulation.

R.A.G.—1-4-21.

PUBLIC (POLITICAL) DEPARTMENT.

May be accepted in Political.

V.P.E.M.—2-4-21. S.S.—2-4-21.

V. SEKHARA MENON—4-4-21.

R.A.G.—5-4-21.

Demi-official—from M.R.Ry. Rao Bahadur T. VIJAYARAGHAVA ACHARIYA, M.B.E.,
Diwan of Cochin.
To—R. A. GRAHAM, Esq., C.S.I., I.C.S., Secretary to Government, Finance
(Marine) Department.
Dated—Ernakulam, the 31st March 1921.
No.—D. 573-IV.

Please see your demi-official No. 524 IV/21-1, dated 28th March. Raghavayya has been
unable to meet me and discuss the joint report. We have now arranged a meeting for 4th
April at Ernakulam and I hope to be able to send our remarks soon after.

The reply from the Diwan of Cochin to the demi-official No. 524-IV/21-1,
dated 28th March 1921 is attached.

2. For orders as to the issue of the draft letter.

S.D.S.—6-4-21.

R.A.G.—6-4-21.

I am afraid I shall have to ask for some modification of this draft, as well as
for a further examination of the old records.

2. In the first place, it is necessary to be careful in stating the case regarding
the sanction of funds for the scheme, and it may perhaps clear matters up if I stated
my view as to the financial aspects of what we have done and are doing.

3. The ordinary financial arrangements make no provision for the spending of
either Imperial or Provincial money upon harbour works, which are generally to be
carried out by the local bodies at the ports, although, of course, it is possible that
grants may be given to such bodies. In view of the expressed desire to get ahead with
the work at Cochin, we have acted contrary to this principle in 1920-21 by spending
Provincial money on harbour works. In order to regularise that expenditure as far
as possible, I have arranged for a grant to be given to the Local Landing and Shipping
Fees Committee of the amounts spent. In regard to the future, our first attempt was
to make the Government of India take over the works as Imperial. That they have
declined. My next attempt was, as part of the negotiations with the Diwans, to
secure from the engineering authorities an estimate for the first part of the work,
namely, the cutting of a channel through the bar, which could be dealt with as a
separate scheme. If this had been for less than 50 lakhs, it would have fallen
within the sanctioning powers of the Local Government. That effect had failed.

Meanwhile, we have no provision in the budget for direct expenditure upon works.
All the provision we have is for a loan of 5 lakhs which was intended, with equal
contributions from Travancore and Cochin, to make up the first year's expenditure
on the scheme decided upon with the Diwans, but inasmuch as the total cost of the
scheme is more than 50 lakhs, we cannot proceed with that pending the sanction of
the Government of India and the Secretary of State. That being so and as dredging
has been ordered to proceed in spite of there being no provision in the budget, the
only alternative is to treat the experiment in opening the bar as a separate scheme,
to be carried out independently of the big scheme which will not be proceeded with
unless the experiment succeeds, and Mr. Bristow is now preparing a scheme for not
more than 6 lakhs for the experiment. When this estimate is ready, we have to per-
suade the Accountant-General to treat it as for a work within the sanctioning powers
of the Local Government and the Darbars to agree to pay their share. We have then
to persuade the Legislative Council to transfer 2 lakhs or thereabouts of loan
money to public works of permanent utility which are at present provided for out of
revenue and to transfer 2 lakhs of revenue to the Cochin harbour to meet our
share of the definite estimate which Mr. Bristow is preparing.

4. The draft as it stands will at once invite the criticism of the Government of
India that we are proceeding without their sanction with a work which requires
it and it will need careful redrafting to show that what we are doing at present is
experimenting with the opening of the bar with a view to a larger scheme which we
will place before them if the experiment succeeds and after regular estimates have
been prepared.

5. To come now to the question of the customs revenue, I should like to be
sure that the office have really traced all the papers bearing on the matter.
Mr. Raghavayya has spoken to me more than once and I certainly gathered from
him that there had been recent representations from Travancore on the subject
indicating their dissatisfaction with the present arrangements.

6. On the other hand, it seems necessary to examine on our side the justification
for proposing to give Travancore so large a sum as one-third If they have been
satisfied for the last half century with Rs. 40,000, the Government of India may
well ask why they should give them a lakh of rupees now with the prospect of a
large increase hereafter.

7. The whole question was, I think, examined at considerable length when
Mr. Bannerji was Diwan of Cochin and made a claim for an increase in the Cochin
share. Possibly, the notes then made on the subject may throw some light on the
question.

8. Finally, if I remember rightly, the letter of the Government of India which
declines to take over the scheme as an Imperial one gives as the reason the uncertainly
as to the opening of the bar. If this is so, we should make clear in the draft that
we expect them, if the experiment on which we are spending Provincial money is
successful, to take over the financing of the whole scheme in partnership with the
two Darbars as an Imperial matter.

C. G. T[ODHUNTER]—9-4-21.

Please see the notes in G.O. No. 407, Political, dated the 8th July 1905, which
contain a precis of papers showing the arrangements made for the removal of the
fiscal restrictions between the British Government and the Native States of Travan-
core and Cochin. The text of the Interportal Trade Convention then drawn up will be
found in paragraph 18 thereof.

2. Briefly stated, with regard to Travancore, the State had to give up all import
duties on British-Indian produce (tobacco, opium, salt and spirits excepted) but to
claim in the form of guarantee or drawback revenue realized in British-Indian ports
on foreign produce re-exported to Travancore; it had to reduce its export duties to
5 per cent ad valorem on all articles
except the three marginally noted and to
diminish the tobacco revenue by
Rs. 1,00,000. The average receipts were then estimated at Rs. 53,218. The
Government guaranteed against loss from decrease in sea customs revenue up to

Timber	... ...	10 per cent.
Pepper and betel	...	Rs. 15 per candy.

Rs. 40,000, i.e., the Darbar has to be paid any sum by which the actual customs receipts fall short of Rs 53,218 subject to a maximum of Rs. 40,000 per annum. It was expected that this guarantee amount would gradually be reduced as the direct trade of Travancore increased.

In the case of Cochin, the Darbar is entitled to receive the following compensation for surrendering the greater part of its customs revenues:—

(i) The whole of the *net* duty on tobacco levied at the port of British Cochin, the British Government guaranteeing the State a revenue of Rs. 10,500 per annum on this account.

(ii) A moiety of the *net* customs revenue at British Cochin from other sources (salt, pepper and opium excepted) the British Government guaranteeing to the State a revenue of one lakh including the customs dues realized at the ports of the Cochin State.

3. The previous papers were looked up. The cases in which the respective Darbars expressed dissatisfaction in respect of the convention were as follows:—

(*a*) In 1900 the Resident in Travancore and Cochin referred to paragraph 12 of G.O. No. 339, Revenue, dated 16th February 1865, which guaranteed Travancore against loss from decrease in sea customs up to Rs. 40,000 per annum and stated that that figure was taken as three-fourths of Rs. 53,218, the former receipts. He pointed out that in 1895–96 and in 1897–98 the actual collections on foreign articles imported into Travancore were Rs. 17,422–13–9 and Rs. 13,484–4–1, respectively and in paying Rs. 40,000 in those years to the Darbar there was an over payment in those years. In that connexion, he stated that the Diwan of Travancore contended that the arrangement of 1865 was a bad bargain for Travancore and ought not to be strictly enforced. The Board of Revenue, however, agreed with the Resident that there was an overpayment in the years mentioned. It stated as follows:—

"It is true that paragraph 12 of G.O. No. 339, dated 14th February 1865, where the question was finally decided, is not quite free from ambiguity; but looking to the correspondence that preceded the convention and the orders subsequently issued, the Board considers it clear that the State is not entitled to the compensation of Rs. 40,000 year after year whatever the actual receipts may be, as contended by the present Diwan, and can only claim payment of the amount (subject to a maximum of Rs. 40,000) by which the actual receipts from import duty in the State fall short of the amount of Rs. 53,218, the average receipts before the convention." (Page 4 of G.O. No. 673 Revenue, dated 9th July 1900).

Accordingly, with the consent of the Darbar, (Travancore,) the overpayments were deducted from the compensation due for 1899–1900—vide G.O. No. 800, Revenue, dated the 8th October 1900.

(*b*) Under the Interportal Trade convention, the Travancore Darbar agreed to levy export duties not less than those obtaining in British India but not more than 5 per cent on all ordinary exports, 10 per cent on timber and Rs. 15 per candy on pepper, and betelnut ad valorem on page Prior to 1st March 1914 the Travancore Darbar did not levy any export duty on tea. But from the 1st March 1916 simultaneously with the British Government the Darbar levied export duty on tea at the rate of Rs. 1–8–0 per 100 pounds. Owing to freight scarcity on the West Coast the Travancore tea was taken by land to Tuticorin or British Cochin for export therefrom. Thus, the duty had to be paid by the merchants once at Travancore chankis and secondly at the British ports. This produced great hardship to the merchants. The Travancore Government were therefore asked to refrain from levying duty on such tea sent by land to British-Indian ports but to levy it only on tea exported from their own ports. The Diwan of Travancore adduced arguments in justification of the levy of the duty and pointed out that the Darbar was not inclined to forego this revenue as owing to the Interportal Trade Convention their receipts under imports were infinitesimal. As to this contention please see paragraph 8 on page 19 of notes to G.O. No. 845 Separate Revenue, dated 7th October 1916. The Resident was then asked to place before the Darbar the suggestion that only one duty may be collected and the amount so collected be divided between the British Government and the Darbar D.O. No. 512 S. R./16-3, dated 9th May 1916, on pages 16–17 of notes to G.O. No. 845, Separate Revenue, dated 7th October 1916. The Resident replied that the Darbar was not willing to forego

the full export duty, one of the reasons being that the compensation which the Darbar (Travancore) got under the Interportal Trade Convention was inadequate in the circumstances of the day. To quote the words of the Diwan

"Touching again on the Interportal Trade Convention which was entered into over half a century ago when conditions were different in Travancore and the import of European articles for use in the State was very small, I would state that the compensation payable to the Darbar is, in the present day, quite incommensurate with the expansion of trade in the country. It would be hard if, in addition to this, the Darbar has to undergo further loss by giving up a portion of its export duties."

But on this the Resident remarked—

"I gather from the correspondence which led up to the Interportal Trade Convention that it was anticipated that the direct sea borne trade would increase so that in a few years no compensation would be payable; this expansion of direct trade does not seem to have occurred however—partly I suppose owing to the deficiencies of Alleppey as a port and Travancore has had very little benefit out of the import duties imposed by the Government of India since the early nineties."

In regard to the Travancore tea intended to be exported to foreign countries, it may be said that the final arrangement was that the duty should be collected only at the Travancore frontier and the collection should be divided between the British Government and the Travancore Darbar. No duty to be collected on the article intendeded for consumption in India.

(*c*) Coming to Cochin, in 1910 the Government passed orders stating that the cost of protective works at Vypeen should be apportioned between the Cochin Darbar and the British Government in the proportion of 2 : 1.—G.O. No. 546, Political dated 14th October 1913. In that connexion, the Diwan of Cochin (Mr. Bannerji) wrote a lengthy letter to the Resident and in that letter he reviewed the disastrous effect upon Cochin of her agreement under the Interportal Treaty to give up the import and export duties and showed how the State had not been benefited by the development of trade at Cochin port. He stated that Cochin had lost a considerable portion of the revenue which she would have legitimately earned, had she continued to exercise her rights of taxing imports and exports. He said also as follows:—

"The Darbar consider that no more suitable opportunity can be found for re-opening the question of harbour improvement in conjunction with the proposed anti-erosion schemes as well as all matters connected with the modification that must necessarily have to be made in the treaty arrangements and stipulations now existing with reference to the trade at British Cochin, between this Darbar and the British Government. Cochin can in fairness and justice claim to be the leading partner in the scheme, take the initiative, undertake the enterprise and thus derive the fullest benefit from her natural position of advantage which has hitherto been denied to her owing to her own altruistic policy"—vide paragraph 18 on page 17 of G.O. No. 546, Political, dated 14th October 1913.

In another place in the same letter (paragraph 20) he stated as follows:—

"The construction of the harbour will necessarily entail a revision of the terms of the Interportal Trade Convention, and Cochin can legitimately ask for a larger share of the anticipated profits on account of increased customs revenue than had been allotted to her since the date of convention."

The then Chief Secretary (Sir Alexander Cardew) noted as follows:—

"The Darbar finally suggests that the construction of the harbour will entail a revision of the terms of the Interportal Convention and proposes that this and all connected matters should be referred to an expert Commission. This is evidently not a suggestion that can be accepted by this Government who are not prepared to admit Cochin's claim to control, or even participate in the control of, the Cochin harbour, and this also must clearly be decisively negatived"—vide page 22 of notes G.O. No. 546, Political, dated 14th October 1913).

4. The above instance point out that there had been a general dissatisfaction on the part of the Travancore and Cochin Darbars in respect of the Interportal Trade Convention of 1865.

5. In our demi-official letter No. 1353 C-19-2, dated 23rd June 1919, this overnment pointed out to the Government of India that owing to the proposed evelopment of the Cochin harbour the customs revenue at the port of Cochin would be enhanced * and the Cochin Darbar by the present arrangements would receive a half share of those receipts which was not contemplated in 1865 and asked whether the Government of India had any instructions to give or suggestions to make to this Government on the matter. In the Government of India demi-official letter No. 576-S, dated the 30th July 1919, they stated that they had no instructions to ive or suggestions to make.

* By the diversion of trade from the Malabar and South Kanara districts to a large xtent to Cochin port.

6. The Collector of Customs was at the same time asked to give information on he following points:—

(1) what shares of the (i) import and (ii) export duties in the past have been evied at Cochin port on goods whose destination or source is (a) British India, (b) Cochin State and (c) Travancore State.

(2) an estimate of the proportion of the (i) import and (ii) export duties ikely to be levied at Cochin port, if the improvements have been carried out on goods whose destination or source is (a) British India (b) Cochin State and (c) Travancore State. The Collector stated, in reply, that neither bills of entry, shipping bills nor other documents covering customs transactions contain any information as to the ultimate distribution or origin in India of the goods passing through the Cochin port and that no accurate statistics of the kind required could therefore be compiled from Customs records for the past, nor guessed with any degree of satisfaction as to the future. But from certain percentage figures furnished by him, from information supplied to him by the Chamber of Commerce and two leading firms at Cochin, it will be seen that there were a higher percentage of receipt of import duties in the past so far as goods destined to Travancore State are concerned ($62\frac{1}{2}$ per cent) and also a higher percentage of the estimate of the proportion of both dutiable and free exports so far as Travancore State goods are concerned (75 per cent).

He also stated that "it is admitted that there will be a considerable rise in the trade of the port with improved harbour accommodation. But there does not appear to be any likelihood of a change in the proportion of the trade as regards destination of imports and sources for exports internally, at any rate for some years after the main portion of the proposed improvements, have been completed."

6. Since there had been dissatisfaction on the part of both the Darbars in respect of the existing convention and since both the Darbars agree to one-third of the customs revenue, it is submitted that this Government may recommend to the Government of India the giving of one-third of the Customs revenue at Cochin to each of the two Darbars.

S.D.S.—29-4-21.

FINANCE (MARINE) DEPARTMENT.

Paragraphs 5 and 7 of Honourable Member's note, dated 9th April 1921—The representations from the Travancore and Cochin Darbars indicating their dissatisfaction with the terms of the present Interportal Trade Convention will be found in the following papers:—

(1) *Travancore State.*—G.O. No. 673, Revenue, dated 9th July 1900, pages 2-3.

(2) Pages 25-26 of notes to G.O. No. 845, Separate Revenue, dated 7th October 1911.

(3) *Cochin State.*—Mr. Bannerji's letter, dated 24th October 1911, paragraphs 14-19 on pages 11 to 18 of G.O. No. 546, Political, dated 14th October 1913.

2. *Paragraph 6 of C-2's note on page , ante.*—In his letter dated 28th August 1919, on page 10 of G.O. No. 394, dated 22nd October 1920, the Collector of Customs has remarked that no accurate statistics were available in regard to the shares borne by goods whose destination or source is British India Cochin-State and Travancore

State in the import and export duties levied at Cochin port in the past, but that from information obtained from certain leading firms, the apportionment is roughly as follows:—

	Per cent.
Import duties—	
Goods destined to British Cochin	25
Do. Cochin State	$12\frac{1}{2}$
Do. Travancore State	$62\frac{1}{2}$
Exports from the three sources—	
British Indian goods	$6\frac{1}{4}$
Cochin State goods	$18\frac{3}{4}$
Travancore State goods	75

3. A draft letter to the Government of India is submitted for approval.

V.G.K.—1-5-21.

This is quite a good draft, but I think upon the whole that it would be best for the present to pursue the demi-official correspondence which we opened up with Mr. Moscardi's demi-official dated 23rd June 1919. I have put up the draft of a demi-official on these lines which states this fact of the case as I understand it.

C. G. T[ODHUNTER]—29-11-20.

P. L. MOORE—5-6-21.

Demi-official—from P. L. MOORE, Esq., C.I.E., I.C.S., Acting Secretary to Government, Finance (Marine) Department.
To—C. A. INNES, Esq., C.I.E., I.C.S., Secretary to the Government of India, Department of Commerce.
Dated—Fort St. George, the 6th May 1921.
No.—524-IV/21-3.

I am directed to write to you about the question of the division of the customs revenue at Cochin in case of the development of the harbour, which I think has already been discussed with you by Lloyd and which was referred to in Moscardi's D.O. No. 1353 (u.o.) C 119-2, dated the 23rd June 1919, to Ley. In Ansorge's reply, No. 5763, dated 30th July 1919, the Government of India said that they had no instructions to give or suggestions to make regarding the scheme for the improvement of the Cochin harbour, but that they would be glad to be furnished with the detailed proposals which the Government of Madras might desire to put forward on the subject after further investigation and negotiation with the States concerned. The Government of Madras took this to mean that they were authorized to discuss a revision of the Interportal Trade Convention with the States of Travancore and Cochin.

2. The terms of that Convention are, no doubt, well known to you. Prior to its being entered into, the condition of affairs was that both Travancore and Cochin levied their own duties whether on import into or export from their territories, and whether these were by sea or by land. These duties were very heavy in some cases and included special provisions in the case of tobacco and salt. They were found to be a great hindrance to trade on both sides of the frontier, and the main object of the Convention was to secure free trade over the land and backwater frontier. This was secured with Cochin on an understanding that the revenues of the port of Cochin should be equally shared with the Darbar subject to the payment by us of a minimum. In the case of Travancore a few of the import and export duties were retained, but the rest were given up on the understanding that we should pay the State compensation for the loss of revenue in import by land from British territory which was to amount to Rs. 40,000 per annum so long as the duties on the direct imports at Travancore ports amounted to less than Rs. 13,218, but was to diminish as they increased.

3. There has been a good deal of complaint in the past over these agreements. It is unnecessary to trouble about the complaints from Cochin now, since they would be removed by such a development of the port as would develop their customs revenue. The case of Travancore is different. It was anticipated that the fiscal arrangements made in 1865 would have the result of increasing the direct trade of the State ports. This, however, has not been the case, and Travancore, which is by far the largest importer through Cochin, derives no revenue on any of the imports through the port and is very inadequately compensated for its loss of the right to tax these goods as they enter its own territory by the Rs. 40,000 above referred to.

4. The suggestion has been made by the two Darbars that each should be entitled to receive one-third of the future customs revenues in lieu of the present arrangements. This no doubt is an arbitrary figure, but the Madras Government are inclined to think that, upon the whole, it would not be unfair.

5. Before going further, I should say that the States are at the same time ready each to undertake one-third of the cost of the harbour, in which connextion, I think I ought to explain the somewhat complicated arrangements by which, as at present advised, it is proposed to finance the work. In the first place, as everything depends on whether a channel can be dredged through the bar and kept open by dredging, we are sanctioning an estimate for about 5 lakhs for an experiment in this direction in the course of the current and following years. In the next place, as the result of elaborate inquiries, a scheme has been drawn up on the basis that the port must pay for itself and that we cannot at present estimate for a development which would involve a large capital expenditure from Central or Provincial revenues. The amount which we reckon the port could finance is Rs. 57 lakhs, and with this it is thought that it would be possible to carry the scheme through to the stage of bringing vessels inside to discharge at moorings. Detailed estimates for this scheme are under preparation and will be submitted as soon as they are ready to the Government of India. Meanwhile, a special committee convened for the purpose at Cochin has put up the outline of a further scheme (which is still only a stage towards the completion of the harbour) of which our Chief Engineer estimates the cost at Rs. 250 lakhs. It is possible that, after the completion of the 57 lakh scheme, the trade of the harbour may develop in such a way as to indicate means by which money can be found for this further stage. For the present, we see no indication of financing it except by grants or loans without interest, and what the two Darbars offer is to undertake each one-third share of these grants or loans.

6. Thus you will see that what it is proposed that you or we (according as the scheme is finally made central or not) should undertake in partnership with the two Darbars is: in the first place, to risk a sum of about 5 lakhs in an experiment to ascertain whether the further scheme is possible; in the second place, to finance the local Port Trust in a preliminary stage of the scheme which it can pay for; and, in the third place, to undertake responsibility for carrying out the complete development of what will be one of the most important ports in India.

7. You will see that the Provincial Government stands to secure very little direct benefit from this scheme. The revenues derived will be either port dues to be expended for the benefit of the mariner, or harbour dues to be expended on harbour works, or customs dues, which will be divided between the Central Government and the two States. As to the proportions of the division, the present arrangement is, as I have said, a half-and-half share, and the Cochin Darbar have shown their confidence in the scheme by undertaking at the same time to give up a one-sixth share of the revenue while embarking upon one-third of the capital cost. The Travancore State surrounds both British Cochin and Native Cochin on almost all sides and, so far as we can reckon, it consumes $62\frac{1}{2}$ per cent of the goods which pay import duty at the port, and the amount of compensation which it can secure for failing to levy customs duties at its own frontier on these goods, which was fixed in 1865 at a time when the trade was comparatively very small and the tariff limited to a few articles and the rates comparatively low, is altogether out of proportion to what the Darbar could levy now if they were able to reimpose their duties. The share of the Travancore Darbar in the undertaking is likely to be largely a cash share, whereas the other two partners will be able to contribute considerably in kind by having placed to their credit in a *pro forma* account considerable areas of land which they will make over for use to the Trust; and again this Government are of opinion that the offer of the Darbar to take over one-third of the capital cost of the scheme on the understanding that they should be allowed to take one-third of the customs revenue deserves to be considered as an enterprising offer, even if the Government of India are not prepared to *reconsider* the fact that the Darbar made a very bad bargain in the negotiations of 1865.

8. I am to ask that these circumstances may be considered by the Government of India and that if the Government of India approve this Government may be given authority to enter into formal negotiations with the Darbars and to submit formal proposals for revision of the treaty of 1865.

XIV

NOTE FOR MR. MOORE ON COCHIN HARBOUR QUESTIONS.

The opinions of the earlier experts will be found in the first stock file. Those of Messrs. Coode, Son and Matthews, Sir James Bell and Sir George Buchanan in G.Os. No. 508, Marine, dated 13th July 1905, and No. 861 W., dated 29th April 1913, and page 20 of Notes to G.O. No. 394, Marine, dated 22nd September 1919, may be read.

2. This stage of the consideration of the case ends with the report of Messrs. Sir John Wolfe, Barry, Lyster and Partners.

3. The second stage commences with Mr. Bristow's report of the 4th May 1920 in the second stock file. This led to the *ad hoc* committee whose estimate for a first stage of the scheme will be found at pages 19 and 20 of G.O. No. 106, Marine, dated 26th March 1921. That was followed by a financial discussion resulting in a further estimate for 90 lakhs for the opening of the bar only. This has to be worked out in detail.

4. Meanwhile, again, a third estimate for about 5 lakhs for experimenting whether the bar can be kept open by dredging or not is being worked * out, and the work is proceeding in anticipation of sanction.

* A rough estimate has just been received. C.G.T.—28-4-21.

5. From the stage of Mr. Bristow's report of 4th May 1920 (in G.O. No. 808 W., dated 22nd May 1920) onwards, the papers branch out into a financial issue. The Government of the day were very anxious to proceed at once to action on his proposals and sanctioned a sum of Rs. 71,000 for works to be executed by him to be debited for the time being to 45. CIVIL WORKS and subsequently adjusted against the Port Trust. Even prior to this, there were numerous sums of expenditure which had been ordered to be similarly debited, aggregating some 4 lakhs. The constitution of the Trust having been delayed, various attempts were made to regularize this expenditure. The orders finally issued are in G.O. No. 105, dated 26th March 1921, whereby a grant of Rs. 1,49,000 to cover the expenditure in 1920–21 was made to the Landing and Shipping Fees Committee who were asked to pass the sums through their books. A good deal of confusion has arisen through the taking over by Mr. Bristow of works that are not properly speaking harbour works, e.g., the building of the new custom-house which is debited to Imperial Customs and the protection of the Bastion bungalow, which, so long as it is a bungalow in the possession of Government and not appropriated to any department, should be debited to 'Roads and Buildings.' In order to prevent further confusion, it seems necessary to close the estimates for expenditure for 1920–21 and debit the amount spent against the grant made to the Landing and Shipping Fees Committee, and for 1921–22 to separate off the expenditure on the harbour from the expenditure on works chargeable to other heads and start with fresh estimates.

6. As regards the expenditure on the harbour, it is to be noted in the first place that the whole system of marine finance is peculiar. Roughly speaking, there are three classes of dues levied, (1) dues levied on the tonnage of the ship which go to provide what is necessary for the safety of mariners, (2) dues levied on goods which go to provide facilities for the handling of the same, and (3) the customs dues, which are part of the general taxation levied by the Government of India. Dues of the first sort are expended for certain purposes defined in the Indian Ports Act by officers of the Port department; dues of the second sort are expended generally on the ports at which they are levied on the advice of the local bodies, while no expenditure to benefit the ports is incurred out of dues of the third sort except that Customs buildings are debited to the Customs taxation. There is, however, a certain amount of confusion between the administration of dues of the first sort and dues of the second sort inasmuch as the Minor Ports fund lends money to local bodies and maintains vessels for common use, while the staff employed for both purposes is debited to the Minor Ports fund in the first instance and a lump adjustment made at the end of the year.

Meanwhile it is the exception for any grant to be made from Imperial or Provincial funds for harbour works, and there appears to be no precedent for either Government directly undertaking harbour works or having any connexion with them except through a local body. Rightly or wrongly it seems to have been the accepted maxim that ports must pay for themselves by the dues levied on merchandise.

7. In this connexion it is desirable to note briefly the position that at present exists as regards dredging plants in the Presidency. The old arrangements were thoroughly bad. Several local bodies bought their own dredgers, hoppers, etc., generally, it would appear, on bad advice and made no arrangements for docking and cleaning them. The result is that we have a lot of expensive plant on the Coast, much of which is not being used and is deteriorating rapidly in consequence. At the same time, we seem to have more dredgers than we have any use for, since under a proper pooling system one could be made to serve the purpose of two or three ports. One dredger, the *Manar*, does this under terms which are defined in G.O. No. 105, dated 26th March 1921. The Presidency Port Officer has long had under consideration the question of appointing a shipwright surveyor to take charge of all Government vessels Meanwhile the appointment of the Harbour Engineer offers another solution of the difficulty. I have asked the Presidency Port Officer to see if he cannot arrive at a pooling scheme under which the Minor Ports fund should take over all dredging craft from the out-ports and should arrange to construct places for docking them at suitable centres and to lend the plant to the ports which need them from time to time under terms similar to those arranged in the case of the *Manar*. I have suggested that it would be a good thing if the Secretary would discuss the scheme with the Presidency Port Officer and the Harbour Engineer.

8. It being the policy that ports must pay for themselves by the dues levied on merchandise, it seems impracticable to embark upon the scheme of the *ad hoc* committee which is estimated by the Chief Engineer to cost 250 lakhs, or very much more than what the port can afford, nor will the committee's estimate of the amount which the port can afford to borrow bear scrutiny. The result of a careful examination of the matter by the Finance Member in company with the two Diwans led to the conclusion that what the port could at present afford was a scheme costing not more than 57 lakhs, and proposals were drawn up regarding the main items which such a scheme would involve. These proposals, however, are now out of date, especially in regard to the cost of the dredger and the time that would be taken to obtain it.

9. Meanwhile, again, as any scheme for more than 50 lakhs will require the sanction of the Government of India and the Secretary of State, and as it is desirable that no time should be lost in proceeding with the works, a scheme has been prepared, still very much in outline, for about 5 lakhs for an experiment. The Accountant-General, who has asked for information as to whether estimates are under preparation for submission to the Government of India for the larger scheme, has been informed that the expenditure so far incurred was for protection of the foreshore which was necessary apart from the scheme, and that all the works sanctioned are purely for carrying out the experiment which is preliminary to the scheme and not part of it. It is hoped that he will take this as sufficient authority for the sanctioning of the expenditure by the Local Government. Failing his doing so, it will be necessary to ask the Government of India to permit us to proceed.

10. Another side issue that has arisen is the question whether the dredging should be done by a Government department or by contract. The matter is discussed in Mr. Bristow's report of the 4th May 1920. It was then decided to buy a dredger, and the Public Works Department called for a specification and tenders. The replies showed that a dredger would have been very expensive at that time and would have taken some years to complete. Further discussions with the representative of one of the chief makers of dredgers showed that prices were falling and that much quicker delivery could now be expected. It also appeared from this discussion that a particular type of dredger known as a drag suction dredger or one fitted with a 'Fruhling head' would be needed. Finally, Admiral Slade came out as the representative of the Tilbury Dredging Company and said that his company had offered to show the Admiralty that they could do dredging work much cheaper than it could

be done departmentally. The conclusion of the discussion was that he should be given the materials necessary for the framing of an estimate. The proposal of the *ad hoc* committee both to buy a dredger and at the same time to employ a contractor was not accepted.

11. Meanwhile, another financial complication arises out of the fact that one of the prime movers of the whole scheme is the Cochin Darbar which is entitled under the Interportal Trade Convention of 1865 to a half share of the customs revenue. Meanwhile, again, the Travancore Darbar, which is equally interested, but not entitled to any such share, has applied to be admitted to a share, and Cochin have said that they will not object to a division of the customs revenue into three parts, together with a corresponding share in the cost of and responsibility for the scheme. These proposals necessitate the examination at a very early date of the old discussion regarding the division of the customs revenue, in order that, if the proposal is found acceptable, the Government of India may be moved to agree to it. Meanwhile, it seems desirable to secure at once the agreement of the two Darbars to pay their share of the five lakhs on the presumption that the Government of India will agree.

12. This matter of the division raises again the question whether the harbour is to be made to pay for itself. The Darbars seem to have been under the impression that a harbour is in itself a paying proposition and that they would recover a full return on their outlay in the shape of dues. This, of course, is not the case where the harbour is entrusted to a Port Trust which regulates its dues so as to meet its expenditure. The Darbars will, it is true, get a return on their outlay by an increase in their customs revenue, but the Provincial Government will not get any such return. In the discussion with the Diwans the assumption has been that the three Governments concerned should share equally in finding the money which would be lent to the Port Trust. At the same time, it was suggested that there should be opened a sort of *pro forma* account in respect of expenditure already incurred and of lands and buildings, etc., which are handed over to the Trust for use. Thus, the Madras Government has already spent some lakhs of rupees for protection of the foreshore and will hand over very valuable land in the town of Cochin. The Cochin State will in due course also hand over land, and it has been suggested that they might also pay for the reclamation to be made on an island in Cochin territory and having done so hand that over as part of their contribution to the common pool. It is very unlikely that the Port Trust will be able to pay any return on these contributions, and it was therefore suggested that the sum total of them should be treated as loans without interest. If the contribution of any one party is larger than that of the others, the balance could be made up in cash by the others, so that in the case of Travancore there is likely to be a considerable initial contribution in this shape.

13. The financial question being thus sufficiently complex, as it is, it is eminently desirable to avoid further complications by bringing into it questions of expenditure debitable to the Imperial customs head or otherwise.

14. Another side issue that arises in the papers is whether Cochin should not be made a major port. Under the Devolution Rules, major ports are the concern of the Government of India, but they have so far expressed their willingness to take over only Madras. Even in this case, the direct control will be by the local Government. We have urged upon them that they should take over Cochin and Tuticorin on the ground in the former case that Cochin is of Imperial importance, that they are the parties interested in the expansion of the customs revenue and that the question of the political interests involved is also one falling within their sphere. They have declined at present on the ground that it is not yet certain that a port can be made there, in which connexion it may be remembered that Mr. Innes was Collector at the time it was decided to abandon the scheme on Messrs. Coode, Son and Matthew's report. Apparently, the Government of India will be willing to reconsider the matter if the experiment of keeping the bar open by dredging proves a success. If the policy that the ports should pay their way is to be pursued, the matter is not of much importance, but if events prove that we cannot make the port without large grants in addition to what the local body can raise, we shall have to press this matter on their attention again.

15. Another side issue is that which has arisen out of political difficulties due to the fact that the boundary between British Cochin and the State is not definitely settled. A lot has been written about the question of jurisdiction, but I do not personally think that there need be any difficulty if we can arrange for identical laws to be enforced by co-ordinate courts on both sides of the frontier. As regards the boundary, the Diwan says that he has a solution, and it is desirable that an early opportunity should be taken of discussing this matter with him.

16. Finally, as regards the law, it is essential that the draft of a Port Trust Bill should be put up as early as possible. A draft of a sort has been ready a long time but has been unnecessarily delayed. I have noted on this in a separate file and hope that the draft will be ready for introduction at the August session of Council.

C. G. T[ODHUNTER]—28-4-21.

Copy to Mr. Green.

P. L. MOORE—29-4-21.

The following note may be added to the note to Mr. Moore about the Cochin harbour.

The Assistant Secretary has asked me to reconcile the demanding of a share from the two States for the experimental work with the fact that in the second stage the whole of the work to be done is to be financed out of the revenues of the port.

2. The way I look at it is this: The first stage is more or less a gamble. The Darbars think they are going to secure a large increase of revenues from the construction of the port, but they cannot do this unless the experiment is a success. If it fails, all the money spent on it is a loss. It seems to be perfectly clear that the people who expect to gain, if the port succeeds, should be prepared to take a share of the loss if the experiment fails.

3. The second stage provides for what has hitherto been the normal way of developing harbours, namely, making them out of loans raised on their receipts. Whatever the practice of other countries may be, we have not in India any record of incurring capital expenditure out of general revenues for harbour purposes. Therefore in the first scheme which we send to the Government of India, it seems desirable to adhere to the principle hitherto followed. The only sharing that will come at this stage will be a sharing in the lending of money to the port.

4. It is, however, doubtful if this policy can survive. It is quite impossible, for instance, to work out any policy for the combined port and canal at Pamban Island which can be financed out of the revenues of a port which does not exist. Again, if the Cochin harbour scheme succeeds in the way in which its promoters expect it to succeed, it will need, in the first instance, capital expenditure out of all proportion to the revenue for the time being of the Port, and it will be necessary therefore for the co-sharers in the scheme to put down heavy capital expenditure.

5. Thus functions of the co-sharers will be, in the first instance, to share a risk of total loss, in the second to share in finding the money for a loan, and in the third to put up a capital for a great development.

C. G. T[ODHUNTER]—3-5-21.

(i)

Demi-official—from P. L. MOORE, Esq., C.I.E., I.C.S., Acting Secretary to Government, Finance (Marine) Department.

To—M.R.Ry. Rao Bahadur T. RAGHAVAYYA PANTULU Garu, Diwan of Travancore.
M.R.Ry. Rao Bahadur T. VIJAYARAGHAVA ACHARIYAR Avargal, M.B.E., Diwan of Cochin.

Dated—2nd May 1921. *No.*—708-IV/21-2.

Your demi-official of the 15th instant regarding the financing of the Cochin Harbour Scheme.

2. I am desired to enclose a copy of the proceedings of this Government No. 157, Marine, dated the 30th April 1921, from which it will be seen that in addition to the two schemes, or two stages of a scheme, one costing about 57 lakhs and the other about 250 lakhs, there has been evolved a third scheme for an experiment which is a necessary preliminary to either of the other two. In view of the fact that doubts have been expressed in responsible quarters as to the possibility of keeping the bar open by dredging alone, and that if experiment shows that it is not possible to do this, it is useless to go on with any larger scheme as well as of the fact that before a commencement could be made with either of the larger schemes. It would be necessary to secure the approval of the Government of India and the Secretary of State to plans and estimates the preparation of which would itself consume a large amount of time. The Government consider that the first thing to be done is to make an experiment in keeping open a cutting through the bar with the dredging plant which is at present available. The cost of this experiment is estimated at a little over 5 lakhs of rupees, and the Chief Engineer has been asked to prepare at a very early date detailed estimates for this work which will be within the sanctioning powers of the Madras Government. This experiment will be carried through as far as possible prior to the monsoon of 1921 and will be completed in 1922.

3. The Government propose that this expenditure of about 5 lakhs which will be incurred in the current year should be shared equally by the three parties, viz., the Madras Government, the Travancore Darbar, and the Cochin Darbar, on the assumption that the Government of India will agree to divide the customs revenue at Cochin in the same proportion. I am to express the hope that this proposal will be acceptable to the two Darbars.

4. I am sending a similar communication to Mr. Vijayaraghava Achariyar. / Mr. Raghavayya.

(ii)

Demi-official—from P. L. MOORE, Esq., C.I.E., I.C.S., Acting Secretary to Government, Finance (Marine), Department.

To—M.R.Ry. Diwan Bahadur T. RAGHAVAYYA PANTULU Garu, Diwan of Travancore.
M.R.Ry. Diwan Bahadur T. VIJAYARAGHAVA ACHARIYAR, M.B.E., Diwan of Cochin.

Dated—the 22nd June 1921. *No.*—986—IV/21-1.

In continuation of my D.C. No. 708-IV/21-2 of the 2nd May 1921, relating to the financing of the Cochin Harbour Scheme, I am desired to enclose a copy of this Government's Proceedings No. 241, Marine, dated 22nd June 1921. On a scrutiny of the estimates prepared by the Harbour Engineer, it is found that the total cost of the experimental works including the executive and clerical establishment required for the Cochin Harbour works will amount to 5·86 lakhs, or about 6 lakhs. It is possible that the expenditure in the current year, which depends so much upon weather and the early engagement of suitably qualified staff to push forward the work, will exceed Rs. 5 lakhs. If, however, an additional allotment up to one lakh is found absolutely necessary later on, I am to express the hope that the sum will be shared equally by the three parties, viz., the British Government, the Travancore Darbar and the Cochin Darbar.

I am sending a similar communication to Mr. Vijayaraghava Achariyar. / Mr. Raghavayya.

(iii)

Demi-official—from M.R.Ry. Diwan Bahadur T. RAGHAVAYYA PANTULU Garu, Diwan of Travancore.

To—P. L. MOORE, Esq., C.I.E., I.C.S., Acting Secretary to Government, Finance (Marine), Department.

Dated—the 12th July 1921.

I have your D.C. No. 986-IV/21-1, dated the 22nd ultimo, informing me that an additional lakh might be found necessary in connexion with the Cochin Harbour Scheme in the current financial year. This Darbar is prepared to contribute up to 2 lakhs if necessary in the year in question.

XVI

NOTE FOR THE FINANCE COMMITTEE OF THE LEGISLATIVE COUNCIL AS APPROVED BY THE HON'BLE MR. C. G. TODHUNTER, C.S.I., I.C.S.,

COCHIN HARBOUR.

The budget for 1921-22, which has been voted by the Legislative Council, contains a provision of 5 lakhs of rupees as loan to the Cochin Landing and Shipping Fees Committee for improvements to the Cochin harbour. This lump provision was passed by the Legislative Council on the understanding that details are explained to the Finance Committee.

2. *History of the Cochin Harbour question.*—The question of improving the Port of Cochin has been under consideration for the last fifty years, and reports have been received from many Engineers, among others, Mr. Parker of Westminster who designed the original Madras harbour works, Messrs. Coode, Son and Mathews, Sir Alexander Rendel, Mr. J. R. Bell and more recently Sir John Wolfe Barry and Partners, while Sir George Buchanan in February 1919 was good enough to offer some valuable hints on the same subject. The question has quite recently been examined by Mr. R. C. Bristow, Harbour Engineer to Government. The whole Cochin harbour scheme depends on the possibility of dredging the bar to a depth of some 30 feet and keeping open this channel by dredging. Following upon the Harbour Engineer's report, a strong committee was appointed by Government, consisting of representatives of every interest concerned including the Cochin State, to examine and report on the preliminary proposals. This committee recommended the acceptance of the proposals subject to certain modifications. The scheme was estimated to involve an expenditure of 203 lakhs now raised to 250 lakhs. The *ad hoc* committee's report was carefully considered by Government, and the matter was informally discussed with the Diwans of Travancore and Cochin, and the result of the discussions has been the emergence of three schemes, or rather three stages of a scheme, for the improvement of this important harbour.

3. *First stage—Experimental works.*—Doubts have been expressed in responsible quarters as to the possibility of keeping the bar open by dredging alone. It is generally agreed that, if experiment shows that it is not possible to do this, it is useless to go on with any larger scheme. The Government are therefore advised that the first thing to be done is to make an experiment in keeping open a cutting through the bar with the dredging plant which is at present available. The cost of this is estimated at about 5 lakhs.

Second stage.—The next stage is, assuming that the experiment proves successful, to enlarge the opening so as to admit vessels into the harbour to discharge their cargo there in calm water. It is calculated that this part of the scheme could just be paid for with a sum of 57 lakhs which represent the maximum amount which could be raised by a loan on the basis of the present trade of the port.

Third stage.—This is the scheme recommended by the *ad hoc* committee at a cost of about $2\frac{1}{2}$ crores.

4. Either of these two latter schemes needs the sanction of the Government of India and the Secretary of State, which will be accorded only after estimates have been prepared and a complete scheme for financing the works has been got ready. In the meanwhile, the Chief Engineer has been requested to prepare estimates for the scheme costing about 57 lakhs, and the Collector of Malabar has been requested to re-assemble the *ad hoc* committee, and to ask them to prepare a schedule of rates calculated to give a return of about Rs. 2 a ton, and to say whether they are prepared for the early imposition of the revised schedule of rates, the early introduction of the Cochin Port Trust Bill and other connected points. On receipt of these replies, the Government of India will be moved for sanction to the estimate of 57 lakhs, provided the experimental works which are being carried out in the current year give satisfactory results.

5. *Expenditure in 1921-22 on experimental works.*—In view of the expressed local anxiety to ascertain as early as possible whether the scheme is practicable or not, the Government have decided to embark at once upon the experiment of cutting a channel through the bar and observing the extent to which this is silted up in the

monsoon. This experiment will be carried through as far as possible prior to the monsoon of 1921, and will be completed in 1922, so that, if it is successful, it will be possible to proceed with the dredging of the larger channel in 1923. The Chief Engineer's estimate for this amounts to about 5 lakhs, of which it is hoped that Cochin and Travancore Darbars will each bear a share equal to that of the Madras Government. A reference has been made to the two Darbars on the matter, and this distribution is subject to the understanding that the Government of India will agree to a similar distribution of the customs revenue at the Cochin Port (the customs revenue is credited to central revenues).

	RS.
Quarters for the District Forest Officer, Cuddapah	10,000
Construction of offices and workshops for the Agricultural Engineer, Coimbatore	10,000
Acquisition of the Nilgiri library buildings and site, Ootacamund	32,000
Constructing a fly-proof kitchen in the new Central Jail, Vellore	21,500
Quarters for the Assistant Commissioner, Vellore	7,500
Additional rooms for students at the Agricultural College	15,000
Extensions of the Madura Industrial Institute, Madura	30,000
Extensions of the buildings of the Leather Trade School	20,000
Extension of the Ceded Districts College, Anantapur	20,000
Total ..	1,66,000

Assuming that the cost of the experimental works will be distributed equally between the three parties, namely, the Madras Government, the Travancore Darbar and the Cochin Darbar, the expenditure in the current year which will have to be borne by the Madras Government out of their provincial revenues for these experimental works will be about Rs. 1,66,000. It is proposed to find funds by reappropriation from the grant under "41. Civil Works" from the works noted in the margin which will be paid for instead out of loan money.

The sums paid by the three parties on account of this experiment will be made over to the Landing and Shipping Fees Committee, and if the experiment proves successful will ultimately be debited to the capital cost of the harbour.

The approval of the Finance Committee is accordingly requested for the expenditure of Rs. 1,66,000, being the Madras Government's share of the cost of 5 lakhs for the experiment which is a necessary preliminary to the larger scheme connected with the Cochin harbour.

It may be useful in conclusion to add a word of explanation of the present somewhat peculiar arrangements in respect of Marine finance. Roughly speaking, there are three classes of dues levied, viz.—

(1) dues levied on the tonnage of the ship which go to provide what is necessary for the safety of mariners,

(2) dues levied on goods which go to provide facilities for the handling of the same, and

(3) the customs dues, which are part of the general taxation levied by the Government of India.

Dues of the first sort are expended for certain purposes defined in the Indian Ports Act by officers of the Port Department; dues of the second sort are expended generally on the ports at which they are levied on the advice of the local bodies, while no expenditure to benefit the port is incurred out of dues of the third sort except that customs buildings are debited to the customs taxation. It is also to be observed that it is the exception for any grant to be made from Imperial or Provincial funds for harbour works and there appears to be no precedent for either Government directly undertaking harbour works or having any connexion with them except through a local body. Hitherto it seems to have been more or less an accepted maxim that ports must pay for themselves by the dues levied on merchandise.

The Government of India, who were addressed on the question, have stated that they cannot at present declare the port of Cochin to be a major port, and therefore a matter of Imperial concern. They have, however, remarked that if the experiment of keeping open the bar by dredging proves a success, the whole question may require reconsideration.

In connexion with this harbour a total expenditure of 4·38 lakhs has been incurred by this Government in the past, and this sum will ultimately be debited to the capital cost of the scheme.

XVII

NOTE FOR THE FINANCE COMMITTEE OF THE LEGISLATIVE COUNCIL.

Cochin Harbour.

The budget for 1921–22, which has been voted by the Legislative Council, contains a provision of 5 lakhs of rupees as loan to the Cochin Landing and Shipping Fees Committee for improvements to the Cochin harbour. This lump provision was passed by the Legislative Council on the understanding that details are explained to the Finance Committee.

2. *History of the Cochin Harbour question.*—The question of improving the Port of Cochin has been under consideration for the last fifty years and reports have been received from many Engineers, among others, Mr. Parker of Westminster who designed the original Madras harbour works, Messrs. Coode, Son and Mathews, Sir Alexander Rendel, Mr. J. R. Bell and more recently Sir John Wolfe Barry and Partners, while Sir George Buchanan in February 1919 was good enough to offer some valuable hints on the same subject. The question has quite recently been examined by Mr. R. C. Bristow, Harbour Engineer to Government. The whole Cochin harbour scheme depends on the possibility of dredging the bar to a depth of some 30 feet and keeping open this channel by dredging. Following upon the Harbour Engineer's report, a strong committee was appointed by Government, consisting of representatives of every interest concerned including the Cochin State, to examine and report on the preliminary proposals. This committee recommended the acceptance of the proposals subject to certain modifications. The scheme was estimated to involve an expenditure of 203 lakhs now revised to 250 lakhs. The *ad hoc* committee's report was carefully considered by Government and the matter was informally discussed with the Diwans of Travancore and Cochin and the result of the discussions has been the emergence of three schemes, or rather three stages of a scheme, for the improvement of this important harbour.

3. *First stage—Experimental works.*—Doubts have been expressed in responsible quarters as to the possibility of keeping the bar open by dredging alone. It is generally agreed that, if experiment shows that it is not possible to do this, it is useless to go on with any larger scheme. The Government are therefore advised that the first thing to be done is to make an experiment in keeping open a cutting through the bar with the dredging plant which is at present available. The cost of this is estimated at about 5 lakhs.

Second stage.—The next stage is, assuming that the experiment proves successful, to enlarge the opening so as to admit vessels into the harbour to discharge their cargo there in calm water. It is calculated that this part of the scheme could just be paid for with a sum of 57 lakhs which represents the maximum amount which could be raised by a loan on the basis of the present trade of the port.

Third stage.—This is the scheme recommended by the *ad hoc* committee at a cost of about $2\frac{1}{2}$ crores.

4. Either of these two latter schemes needs the sanction of the Government of India and the Secretary of State which will be accorded only after estimates have been prepared and a complete scheme for financing the works has been got ready. In the meanwhile, the Chief Engineer has been requested to prepare estimates for the scheme costing about 57 lakhs; and the Collector of Malabar has been requested to re-assemble the *ad hoc* committee and to ask them to prepare a schedule of rates calculated to give a return of about Rs. 2 a ton and to say whether they are prepared for the early imposition of the revised schedule of rates, the early introduction of the Cochin Port Trust Bill and other connected points. On receipt of these replies, the Government of India will be moved for sanction to the estimate of 57 lakhs, provided the experimental works which are being carried out in the current year give satisfactory results.

5. *Expenditure in* 1921–22 *on experimental works.*—In view of the expressed local anxiety to ascertain as early as possible whether the scheme is practicable or not, the Government have decided to embark at once upon the experiment of cutting a channel through the bar and observing the extent to which this is silted up in the monsoon. This experiment will be carried through as far as possible prior to the monsoon of 1921 and will be completed in 1922, so that, if it is successful, it will be possible to proceed with the dredging of the larger channel in 1923. The Chief Engineer's estimate for this amounts to about 5 lakhs, of which it is hoped that the Cochin and Travancore Darbars will each bear a share equal to that of the Madras Government. A reference has been made to the two Darbars on the matter, and this distribution is subject to the understanding that the Government of India will agree to a similar distribution of the customs revenue at the Cochin Port (the customs revenue is credited to central revenues).

Assuming that the cost of the experimental works will be distributed equally between the three parties, namely, the Madras Government, the Travancore Darbar and the Cochin Darbar, the expenditure in the current year which will have to be borne by the Madras Government out of their provincial revenues for these experimental works will be about Rs. 1,66,000.× It is proposed to find funds by re-appropriation from the grant under "41. Civil Works" from the works noted in the margin which will be paid for instead out of loan money.

A

	RS.
Quarters for the District Forest Officer, Cuddapah	10,000
Construction of offices and workshops for the Agricultural Engineer, Coimbatore ..	10,000
Acquisition of the Nilgiri library buildings and site, Ootacamund	32,000
Constructing a fly-proof kitchen in the new Central Jail, Vellore	21,500
Quarters for the Assistant Commissioner, Vellore	7,500
Additional rooms for students at Agricultural College	15,000
Extensions of the Madura Industrial Institute, Madura	30,000
Extensions of the buildings of the Leather Trade School	20,000
Extension of the Ceded Districts College, Anantapur	20,000
Total ..	1,66,000
Quarters for the Agricultural Demonstrator, Assistant etc at Nandyal	5,000
Additions and improvements to the Rayapuram Medical School	29,000
	2,00,000

A

× Since raised to 2.00 lakhs (vide para of paper XVI infra).

The sums paid by the three parties on account of this experiment will be made over to the Landing and Shipping Fees Committee, and if the experiment proves successful will ultimately be debited to the capital cost of the harbour.

6. The approval of the Finance Committee is accordingly requested for the expenditure of Rs. 1,66,000, being the Madras Government's share of the cost of 5 lakhs for the experiment which is a necessary preliminary to the larger scheme connected with the Cochin harbour.

7. It may be useful in conclusion to add a word of explanation of the present somewhat peculiar arrangements in respect of Marine finance. Roughly speaking, there are three classes of dues levied, viz.:—

(1) dues levied on the tonnage of the ship which go to provide what is necessary for the safety of mariners,

(2) dues levied on goods which go to provide facilities for the handling of the same, and

(3) the customs dues, which are part of the general taxation levied by the Government of India.

Dues of the first sort are expended for certain purposes defined in the Indian Ports Act by officers of the Port Department; dues of the second sort are expended generally on the ports at which they are levied on the advice of the local bodies, while no expenditure to benefit the ports is incurred out of dues of the third sort except that customs buildings are debited to the customs taxation. It is also to be observed that it is the exception for any grant to be made from Imperial or Provincial funds for harbour works, and there appears to be no precedent for either Government directly undertaking harbour works or having any connexion with them except through a local body. Hitherto it seems to have been more or less an accepted maxim that ports must pay for themselves by the dues levied on merchandise.

8. The Government of India who were addressed on the question have stated that they cannot at present declare the port of Cochin to be major port, and therefore a matter of Imperial concern. They have, however, remarked that if the experiment of keeping open the bar by dredging proves a success, the whole question may require reconsideration.

Further note for the Finance Committee of the Legislative Council.

Cochin Harbour.—In continuation of the note, dated 19th May 1921, relating to the expenditure in the current year for Cochin Harbour experimental works circulated on the 2nd June 1921, the Finance Committee is informed that the estimate for the work, including the executive and clerical establishment required by the Harbour Engineer, amounts to about 5·86 lakhs, or about 6 lakhs, instead of 5 lakhs as originally anticipated.

Special steps will be taken to see that the expenditure in the current year is restricted to 5 lakhs. If, however, it is found later on that the entire estimated cost of about 6 lakhs will have to be incurred in the current year, an additional allotment up to one lakh which, it is hoped, will be shared equally by the three parties, viz., the British Government, the Travancore Darbar and Cochin Darbar, will have to be sanctioned.

Grant of Rs. 2 lakhs sanctioned in G.O. No. 842, Finance, dated 16th August 1921.

XVIII

COCHIN HARBOUR SCHEME.

POSITION IN OCTOBER 1921.

Declaring Cochin a major port.—The Government of India have declined to declare Cochin as a major port at present but have added that the decision may require reconsideration if the experiment at Cochin prove a success.

The desirability of declaring Cochin and Tuticorin as major ports in the event of the experiments at the places proving successful has again been brought to the notice of the Government of India. It has been pointed out to them that besides the greater facilities which the Government of India enjoy for raising money than the Government of Madras, there is another and a stronger reason why the two ports should be taken over as major ports, viz., the fact that harbour development is closely bound up with the question of railway extension and improvement and that railway policy will have so to be framed as to give to the development of the ports the fullest co-operation and support.

2. *Participation of Travancore and Cochin in the scheme.*—At the time of signing the joint report, the Diwan of Cochin agreed, on behalf of the Cochin Darbar to the admission of Travancore in the scheme. His Highness the Maharaja of Cochin has however recently demurred to this arrangement. The question is to be discussed by His Excellency the Governor at a conference with the Diwan in November next.

3. *Constitution of a Port Conservancy Board at Cochin.*—The *ad hoc* Committee agreed to the constitution of a Port Conservancy Board and the Presidency Port Officer submitted recommendations. They provided for the Resident in Travancore and Cochin being the chairman and for the nomination of representatives from Travancore and Cochin. The Resident to whom the proposals were referred reported that the Diwan of Cochin was of opinion that the general proposal was unnecessary and in some respects, undesirable. The Resident considered that the issue of orders (as proposed by Government) would be inopportune until after the question of the participation of Travancore was settled. The question now awaits the discussion with the Diwan in November next.

4 *Schedule of Landing and Shipping fees.*—The *ad hoc* Committee were asked to prepare a schedule of rates calculated to give a return of Rs. 2 a ton. The Committee were willing to contribute to the harbour works and raise funds which will, in however small degree, when compared with the probable ultimate requirements, be available when wanted and also provide a stepping stone between the present average rate of 2 annas and the much higher rate that may be necessary when harbour works have to be financed. As however the depressed state of both export and import trade made it inadvisable to make so large an enhancement of rates as Government contemplated they agreed for the present to the rates being raised to an average of Re. 1 a ton. These rates have been sanctioned and will take effect from 1st December 1921.

5. *Constitution of a Port Fund.*—The *ad hoc* Committee have agreed to the constitution of Cochin as a separate port and to the establishment of a separate Port Fund for Cochin. The Presidency Port Officer's remarks have also been received and the proposals are under examination. [A draft notification in regard to the withdrawal of Cochin from the Western group has been prepared; it is proposed to send this to the Presidency Port Officer for acceptance and to call for his detailed proposals about the establishment of a separate Port Fund.]

6. *Constitution of a Port Trust.*—The *ad hoc* Committee have also agreed to the constitution of a Port Trust. The Port Trust Bill is under examination and by the time the results of the experiment are known, the Bill may be ready for presentation to the Legislative Council.

7. *Financing in* 1921–22.—The Harbour Engineer has been asked to keep the expenditure within six lakhs at the most. The Legislative Council has voted a grant of Rs. 2 lakhs and it is expected that Cochin and Travancore will each contribute a like amount. Travancore has agreed and the question of Cochin contributing its share awaits the conference referred to in paragraph 2.

The expenditure will be passed through the books of the Landing and Shipping Fees Committee, Cochin.

The Harbour Engineer has submitted revised estimates for the experimental works amounting to Rs. 6 lakhs. These are under scrutiny.

8. *Dredging.*—The Harbour Engineer has reported that dredging by the dredger "Manar" is proceeding satisfactorily. The question of getting a new dredger has been postponed pending the result of an effort to secure a German dredger, the "Seetief" now at the disposal of the Admiralty. It is not yet clear whether the dredger will be allotted to Madras; the Government of India will be shortly considering the claims of the various applicants.

9. *Second stage of the scheme.*—The intention of Government was that plans and estimates should be got ready in advance of the result of the experiment. But the Harbour Engineer has reported that they cannot be prepared before a decision is reached as to the allocation of the dredger "Seetief."

10. *Customs.*—The Government of India were asked in May last whether they would agree to the sharing of the customs revenue at Cochin with the states of Cochin and Travancore. Their reply has not yet been received. [Meanwhile, the Maharaja of Cochin has demurred to the admission of Travancore in the scheme and this question awaits the decision of the conference referred to in paragraph 2 above.]

S.L.S.—22-10-21. A.S.—25-10-21.