From

William Parkes Esqre. M. Inst. C.E.
Civil Engineer.

To

The British Resident
in Travancore

Quilon Harbour

Quilon 19th April 1882

Sir,

As instructed by the order of the Government of Madras No. 612. Mv. dated 9th March 1882, I have inspected the Port of Quilon, with the view of forming an opinion as to its capabilities for the formation of a first class Harbour and have now the honor to report to you the result.

2. I was furnished with a "sketch chart" of the Road made by Captain A. D. Taylor I.N. in 1858, with corrections to 1879. the latter being based upon a partial survey made by Mr Rhode Commercial Agent to the Government of Travancore. This chart is a insufficient basis for the conclusions which I am now about to offer, but the details of the exact position of the works to be recom-

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mended and of their cost must be reconsidered with the assistance of a more complete marine survey of the locality which must be taken as a necessary preliminary to the submission of a complete design.

3. On my arrival at Dulon on the 13th Instant, I was met by Mr Rhodes, who afterwards accompanied me in all my examinations and furnished me with much valuable information both on the physical features of the locality and on the trade of this and the neighbouring ports.

4. I enclose a copy of Captain Taylor's chart, on which I have shewn in red the position of certain works which would in my opinion convert the bay immediately to the southward of Tangacherry Point, into a harbour sheltered from the only seas which at present cause any disturbance in the bay and make the same available for carrying on the landing and shipping of cargoes under shelter in which the largest class of vessels could lie with little or no interruption at any season of the year.

5. The deep water approaches very close to the shore at Dulon, and judging by the indications presented by the sandy beach of the bay, I should think that the seas raised by the south west Monsoon must fall upon it very heavily much more so, than at the Ports of Cochin and Alleppy where the shallow water extends a long distance from the shore.

6. There is however a partial shelter afforded by a reef, which extends for three quarters of a mile in a South Easterly direction from Tangacherry point or parallel to the general line of shore, on which the heavy westerly and south westerly seas break before reaching the main shore. The effect of this is seen in the level of the summit of the sandy beach being lower near the point than at a mile to the southward.

7. This reef which is probably formed by a continuous substratum

of Laterite work, though generally covered with sand, except at its extremity, has a depth of 3¼ fathoms upon it, while between it and the shore is a depth of upwards of 4 fathoms. At the end the rock is bare, and has a depth of 2 fathoms on it.

8. If this partial shelter were made complete by the construction of a break-water from the point along the summit of the reef for a length of about 1400 yards, a harbour would be formed capable of accomodating two or three of the largest class of steamers and a considerable number of smaller vessels of all sizes and at least half a mile of smooth water beach would be provided.

9. The access from seaward would be easy there being a depth of five - - - - - - - - - - - fathoms close to the end of the proposed breakwater with no dangers within three quarters of a mile

10 This would be only a small harbour, but it would accommodate a large trade upon the present system, under which large ships remain only a few hours, or at most a day or two to discharge and receive cargoes. At any time however it could be enlarged by extending the breakwater to any required length in the direction shown by the dotted lines.

11. A less extent of breakwater than what I have shown by a continuous red line would be of little use, as the deep water necessary for large ships would not be sheltered, and the approach to the shallower water would be bad in consequence of the confused sea which would be thrown over the end of the reef.

12. Such a harbour as I have described however would be of comparatively little practical use unless some additional facilities were provided for the landing and shipping of goods. The mere provision of still water would do little to attract trade to the Port of

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of Quilon, though its existence would no doubt give it a great advantage compared with other neighbouring ports- These facilities however would be given very completely by the formation of a canal of about a mile in length from the head of the proposed harbour to the backwater-

13. The formation of the harbour is necessary for the protection of the seaward end of the canal from the constant disturbances caused by the shifting of the sand under the influence of the waves- With this cause of disturbance removed the canal would afford an uninterrupted means of communication between the Backwater and the Shipsside- There would be a lock in the canal, the gates of which would be closed except for the passage of boats, when the level of the Backwater is above that of the sea

14. Any Estimate made with the materials at present in my possession must be subject to revision after a more complete survey has been made, but I think the sum of Twenty seven Lakhs of Rupees may be taken as a safe basis for the consideration of the question- This will provide for a breakwater of more massive construction than those of Madras. for though Quilon may be taken as exempt from Cyclones, the ordinary monsoon seas are evidently much heavier than those at Madras-

15 I need hardly say that the present trade of Quilon alone offers no basis whatever for the suggestion that the above expenditure would be reproductive- But I think if the question of the equivalent for the outlay be considered upon a more enlarged basis, the conclusion will be inevitable that the establishment of such a harbour as I have described at Quilon will effect a gradual and beneficial revolution

in the system of the Export and Import trade of the State, which will justify the sacrifice of a portion at least of the return which would be expected from a purely reproductive undertaking.

16. The State of Travancore has a length of seaboard from Cannakapure in the South, to the coast abreast of Areacooly on the North of 168 Statute miles. Along this length there are about 17 places upon the coast at which goods are landed and shipped and Customs dues are collected. Besides these there is Areacolly on the Backwater through which a considerable amount of merchandise to and from the Shipping at Cochin 8 miles distant passes. Through these numerous places the present seaborne trade of Travancore export & import is carried on.

17. For about two thirds of the whole length of the seabord there exists a feature which is I believe almost peculiar to Travancore namely a continuous inland water communication parallel with the coast, and at a distance from it varying from a few yards to 7 miles, yet having no communication with the sea of sufficient depth for the navigation of even small cargo boats. All goods for export therefore through pass to pass along the whole length of 110 miles of backwater Canals can only be shipped by being carried over the strip of land which separates the backwater from the sea, and then reloaded into sea Cargo boats, or by being sent to Cochin 8 miles beyond the Northern extremity of the Travancore territory, where the first navigable communication with the sea and that a very imperfect one exists.

18. There are 10 places between Trivandrum and Areacolly at which trade is occasionally carried on, Alleppy the most Northern being the only one at which any considerable amount of Capital has been expended, and the only one at which the steamers of the British Indian Company call regularly; and even here the disadvantages of its position are so great that for every 100 tons of goods shipped at Alleppy three pass it along the backwater for shipment at Cochin.

19. yet Alleppy is by far the most favorably situated of all the Travancore Ports partly by reason of the facilities which have been given by the formation of a canal from the

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backwater is within 100 yards of the shore and of a screw pile pier on the shore itself, and partly by the existence of the well known mud bank which ensures calm water and practicable communication with shipping during the South West Monsoon. The cost of conveying a ton of goods from the backwater Boat to the ships side is 18 annas, at Quilon it is R1-8 and at the minor ports it is considerably more, though I have not been able to ascertain the exact amount.

20 Besides the expense of this process there is a serious amount of damage to goods when the sea is at all rough and there is the absolute stoppage of all trade except at Alleppy and there it is carried on at nearly double the cost and under other great disadvantages during three months of the South West monsoon.

21. Some of the above evils are partially avoided at Cochin but some remain especially the interruption for three months of the year. It is also to be borne in mind that Cochin is 8 miles beyond the extreme Northern point of Travancore territory and therefore involves the maximum distance of backwater conveyance.

22. Such being the present difficulties and obstacles which hamper the seaborne trade of Travancore I would now beg to point out what would be the system if an still water harbour available all the year round and with a free boat communication with the Backwater were established at Quilon.

23. Quilon is situated 40 miles from Trivandrum the present southern extremity of the Backwater and 70 miles (by sea) from Anjengo the northern extremity of the Travancore territory. I need hardly say that the substitution of a central port for one at the extremity of the Backwater will effect a substantial saving in the Cost of Backwater transport. It may be taken approximately at an average of 6 annas per ton.

24. As compared with the present open roadstead ports the cost of backwater transport would of course be increased for that of transport from the backwater to the ships side might be entirely saved and this even as compared with long backwater navigation is a much heavier item. Thus a ton of goods could be conveyed from the merchants godowns at Alleppy the most Southern port to the ships side at Quilon for 10½ annas while to convey the same ton to the ships side at Alleppy

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now costs 18 annas. In the case of the Inner ports the contrast would be still more striking at Quilon itself a ton of goods brought by backwaters at present costs 24 annas additional before it reaches the ships side. With the harbour complete it might be delivered alongside the ship for the same money as alongside the wharf in the backwaters and the whole 24 annas would be saved.

25. Practically however some deduction must be made from these savings as most of the articles exported from Travancore require some treatment such as cleaning pressing packing &c at the merchants godowns before shipment and this necessitates an extra handing reloading and lighterage to the harbour. But even with this allowance which would vary with different descriptions of goods the saving would be considerable

26. If a sufficient amount of trade could be immediately secured for Quilon to make the savings to be effected in the above and other ways equal to the interest on the cost of the harbour, the argument in favor of the undertaking would I imagine be complete; but this is not likely to be the case for many years to come, and it would simply be misleading to base the justification for the outlay on any such ground.

27 A harbour however may be a very profitable undertaking to the country generally even though it may not be self supporting by means of the trade carried on in it, and how far this is the case must depend upon considerations which require a more intimate knowledge of the circumstances of the country than I possess, I may be permitted however to indicate a few points which appear to have a bearing upon the question.

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28 When the trade of a country is increasing which I am informed is the case in Travancore, it may be wise to anticipate it in such a way as to direct the application of private enterprise into the most advantageous channels. Thus if the Government shewed a determination to develope the resources of Quilon as a central port, private capital would be attracted towards it rather than towards the minor ports, which might otherwise shew some temporary advantages.

29. The relative advantages of one central port or several minor ones, depend in great measure upon the circumstances of the country. In the case of Travancore the along shore inland navigation is a very important element. It gives the advantages of both systems. The produce is collected at numerous points on the Backwaters, and these are connected by cheap and easy water communications with the one central seaport for exportations.

30. Among the advantages of a central sea-port the following may be named
-1st In the present system of Coasting trade by steamers there can be no doubt of the preference which must be given to the landing and shipping of say 500 tons at one port rather than divided among three or four, and this preference must tell on the rate of freight — — —
2d The same argument applies in a modified form to smaller craft which may make the port a terminal one. Rates of freight are materially affected by the facilities for obtaining return freight, and these must be greater where trade is concentrated than where it is divided among half a dozen places of more or less difficult access landward and seaward. 3d By the Concentration of Establishments public and private economy must be promoted. 4th The expenditure of private Capital in permanent works will be more advantageous at one large port

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port than at several small ones, and will therefore be encouraged.

31. I may add that the position and surroundings of Quilon appear to me to be more than ordinarily well adapted for a place of Considerable trade in the following respects.

1 The harbour I have suggested having been constructed as a first step, it is capable of extension at a Cost Commensurate with the requirements whenever an increased trade calls for it.

2. The proposed Canal to the Backwaters will give sea communication with very advantageous sites for factories godowns, boat wharfs &c for all which purposes the superiority of Backwaters over sea side sites is very marked

3. The ground varies in level without abrupt declivities and is therefore more available for varied purposes than either hilly or swampy sites

4 Quilon possesses advantages as a residential neighbourhood over any place on the coast for a long distance in either direction, which is also available for trade.

32. I have thought it right to place on record these few impressions of my own in favour of Quilon without pretending that they have any authority. Whether they are sufficient to justify the expenditure of a quarter of a million sterling, which will be only partially directly reproductive, is a question on which it would be presumptuous in me to give an opinion. It will be for others more conversant than myself with local conditions to enlarge the basis of the argument and suggest a decision.

33 I would beg briefly to recapitulate my conclusions as under.

1st A harbour sufficient to give accommodation for landing and shipping operations in good shelter at all seasons of the year, with a canal communication with the Backwater, may be made for the sum of twenty seven lacs of rupees, and that on a scale sufficient for the probable trade for many years to come.

2nd That the harbour can be enlarged at a proportionate cost when required.

3rd That the saving in the cost of the landing and shipping and other direct advantages afforded by the harbour will not, with the trade which can reasonably be anticipated for some years to come, justify the imposition of dues sufficient to make the undertaking a directly reproductive one.

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4th That the Collateral advantages to the trade of the territory generally of a centrally situated port such as Quilon would be, are such as to compensate to an extent which I am myself incompetent to estimate, for the want of direct returns.

34. It may be as well to add that so far as my information extends there is no other place which could in any way compete with Quilon for the purposes referred to in this report. A fine harbour might undoubtedly be made at Cochin, which if made might render expenditure at Quilon inexpedient, but the cost would be three times that required at Quilon and the benefits for present purposes no greater.

I have &c.

/Sgd W. Parkes

/True Copy/

A Bowlby Capt.
Ag. Asst. Gen.
Resident.

Enclosure

C.A.W.

Before returning the Chart, I should like a copy to be obtained, of the proposed breakwater, &c. marked thereon.

There is however a more recent & larger survey of Quilon Roads, dated I think 1883, which should also be obtained.

The latest charts of all ports in the Madras Presidency should be obtained, for reference.

You can probably ascertain where such charts can be got, & make necessary application

W.S.

17-12-84

Old Enl 10682/82

Coll 1328/84

Office Note
No. 2794

From

The Chief Secy

To The Secy to Govt
P.W.D.

As requested in your office note of the 2nd instant, I send you copy of Mr. Parkes Report on the Quilon Harbour together with copy of Captn. Taylor's chart therein referred to. Kindly return the latter when done with.

I have &c
15/12/84

To

The Chief Secy

Captn Taylor's Chart

Desd 19.12.84 with thanks returned

Captain Taylor's Chart.

19-12/84 I have &c J.S.

Very urgent

For ~~C. No.~~ Secretary

MEMORANDUM.

Requested for reference the under-mentioned papers:-

A copy of the Report with order thereon by Mr. W. Parkes on the Quilon Harbour. The Report is ~~understood to be~~ dated 19th April 1882 and was probably dealt with in the Marine or Political Dept.

R. Sarson
C.A.W.

Government Office.
P.W. Department,
8 November 1884.

To The Chief Assistant Public Works Dept. Fort

Fort. The W. prks dept

C.A.W. Is not here – Was returned to
the Resident on June 14/82 –
I send the file to show
(in case there might be doubt)
that the report returned on
June 14th was Mr Parker's of
April 19th.
See list of papers at End
of Mr Harrington's letter –
The telephone exchange is closed, so
I could not telephone this [illegible]
15/6

Sow/ The report seems

To W

It will be seen from the attached letter that Mr Parkes' report on the Quilon harbour has not been placed on the records of the Madras Govt

K.S

15-11-84

Noted W.

15-11-84

To W

Please get the report from R.O. Office.

Ill

14-11-84

Rev: No 1018 R 22-9-03

To W. Submitted

K.S

Where is Mr Parkes' report on Quilon Harbour. Dated 19-4-82.

14/11/84

To W The report seems

I

To W (1882-83) there are some remarks on Quilon harbour by the Secretary of Travancore in connection with the proposed railway from Trivandrum westward.

Please get the report from R.O. Office.

Ill

14-11-84

to have been submitted direct to the Treasurer Govt. There is no copy on record in this Dept. Application was made yesterday to the Chief Secretary's office, and an urgent reminder has been sent today.

R.S.
15.11.84

Let me see this report when received.

JS
29.11.84

JoW

Please see the accompanying reply from the Chief Secretary's office - received on the 15th Inst.

R.S.
29.11.84

G.O. A 612 A Way 9-3-82
" B 1553 Way 20-6-82
G.O. A 2192 Way 9-8-83
" 1018 Ry 22-9-83

No. 2158 D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 2nd December 1884.

OFFICE NOTE.

From

The Secretary P. W. Dept.

To

The Chief Secretary.

In G.O. 612 A.W. of 9th March 1882, Mr Parkes was authorised to report on the Quilon harbour. His report was, it is understood, submitted direct to the Travancore Government. Will you please obtain, for use in this department, a copy of the report? If the original is sent, a copy can be taken in my office.

2/ J.S.

Depd. 2-12-84.

1-12-84

22ND SEPTEMBER 1883, No. 1018 R., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following paper :—

From W. LOGAN, Esq., Acting British Resident in Travancore and Cochin, to the Joint Secretary to Government, Public Works Department, Railway Branch, dated Trivandrum, 15th August 1883, No. 92.

In reply to your letter, No. 60, of 23rd February 1883, I have the honor to submit, herewith, the reply of the Travancore Government on the three points connected with Railway extension to Travancore on which an expression of opinion was desired.

2. The reply is to the effect that—

I. His Highness' Government desire to see the South Indian Railway extended to Travancore.

II. Of the two routes, the one which in the papers forwarded to me you have designated as the Northern Route is the one which His Highness' Government would select.

III. His Highness' Government consider that the best arrangement to make will be to entrust the construction of the line to private enterprise on such terms as may be reasonable and on the condition that power be reserved to His Highness' Government to take over the line, some years after it has been in working order, on such reasonable terms as might be agreed upon.

3. It will, I think, be unnecessary for me to dwell at any length in this letter on the reasons which have swayed His Highness' Government in adopting the views set forth in the reply on the second of the points. I concur most fully in the Dewan's views which will be found in detail in his letter * (paragraphs 4 to 27) which, with its enclosures in original, is herewith forwarded. Travancore (like Malabar and the Western Coast generally) pays for the grain consumed by its people in special products such as cocoanut produce, pepper, areca nuts, coffee, ginger, &c., and this trade will be best served by tapping the magnificent system of backwaters and canals which collect and distribute the produce—not at its extreme end where there is no harbour which the alternative route would do—but at some central spot possessing such facilities as Quilon undoubtedly has for an extensive trade. The Dewan's letter treating of the capabilities of Quilon as a harbour, and the extracts with which he backs up his opinion, are deserving, it seems to me, of the greatest consideration.

* No. 2237-P 188, dated 13th instant.

4. The information already on record will probably suffice to enable the Company to lay before His Highness' Government definite proposals for constructing the line, but, if any further information is wanted, I shall be glad to render all assistance in procuring it.

ENCLOSURES.

From the Hon. V. RAMIENGAR, C.S.I., Dewan of Travancore, to the Acting British Resident of Travancore, dated Trivandrum, 13th August 1883, No. 2237-P. 188.

I have the honor to reply to Colonel Shaw-Stewart's letter to you, dated 23rd February last, No. 60, forwarding copies of certain Proceedings of the Madras Government relating to the reports of the South Indian Railway authorities upon the lines which have been surveyed for the proposed extension of Railway communication from Tinnevelly to Quilon and Trivandrum.

2. An expression of opinion is called for on the following points :—

(1) Whether His Highness' Government desire the extension of the South Indian Railway into Travancore ;
(2) If so, which of the two routes that have been surveyed meets with approval, and,
(3) What arrangements commend themselves to the Travancore Government for securing the construction of the approved line.

3. On the first of these points I may say that His Highness' Government will be very glad to see the South Indian Railway extended to Travancore.

4. As there is a great divergence of opinion on the second point among those who have already expressed their views upon it, it will be necessary to weigh carefully the relative advantages and disadvantages of the two alternative lines which have been surveyed before arriving at a decision. The two lines proposed are—

Route No. I.—From Tinnevelly *viâ* the Arienkavu Pass to Quilon with a branch to Trivandrum.

Route No. II.—From Tinnevelly *viâ* the Aramboli Pass and Nagercoil to Trivandrum.

5. Mr. David Logan, who has partially surveyed both the routes, decidedly prefers the latter for the following reasons :—

First.—Because the length of the British part of the line by that route will be only 33 miles, whereas by Route No. I it will be 47 33 miles.

Second.—Because, the cost of the British portion of the line by Route No. II will be 14 lakhs less, and the Travancore portion 8¾ lakhs less, or taking the whole line, Route No. II will cost only 58½ against nearly 81 lakhs which is the estimated cost of Route No. I, leaving out of account the branch to Trivandrum.

Third.—Because the engineering difficulties will be less in the case of Route No. II than in that of No. I. In the matter of gradients, although the maximum is the same in both cases, the ascent to the Arienkavu Pass on Route No. I is a long succession of steep gradients. It is said that in the last 5 miles this line rises 350 feet, the total height reached being 1,037 feet above mean sea level compared with 348 feet on Route No. II.

Fourth.—Because it is considered possible that by carrying the line by Route No. II from Nagercoil to Trivandrum nearer the coast, a gradient of 1 in 100 might be obtained, and that, if this could be done, the superiority of Route No. II would be fully established.

Fifth.—Because the total exports and imports by Route No. II aggregate (inclusive of duty) about 18 lakhs of rupees against 9¾ lakhs of rupees by Route No. I, and that therefore a Railway line by the former route would keep to the natural course of traffic, and all goods for the north of Trivandrum could be carried by canal at rates with which no Railway could successfully compete.

Sixth.—That from Nagercoil to Trivandrum the country which Route No. II will traverse is populous and cultivated, whereas from Shencottah to Yarur along Route No. I the country is for the most part covered with dense jungle, and is, at certain seasons of the year, almost uninhabitable owing to deadly jungle fever. That from Yarur to Quilon the country is but thinly inhabited and poorly cultivated, whereas the people of South Travancore present a great contrast to this by their comparative enterprise, energy and wealth.

Seventh.—Because Travancore, being long and narrow like a leaf, would be best served by a Railway working through it laterally and not transversely ; that Route No. II would work along a well cultivated and populous belt of country, and would touch on the canal system at Trivandrum, the Railway and canal forming the mid-rib of the leaf from which good roads branching out laterally would effectually circulate traffic, and that this on the face of it seems a better arrangement than running across the leaf through a tract of country not capable of being much developed.

Eighth.—Because there seems to be no great reason for traffic to go to Quilon rather than to Trivandrum, unless it be for shipment at a port, and it is stated that this purpose could be equally well served by touching the port of Colachel with the southern line or by running out a short branch to it.

Thus it is urged that Route No. II *viâ* the Aramboli Pass would be shorter, cheaper to make, and much less expensive to work and maintain, while it would serve on the whole a more populous territory than Route No. I *viâ* Arienkavu.

6. Now let us see what the recommendations of Route No. I are in the opinion of those who have advocated it in preference to No. II. Writing in 1876, Mr. Barton, the then Chief Engineer to the Travancore Government, and who had an intimate knowledge of the country, was of opinion that it would be a mistake altogether to bring the Railway into Travancore *viâ* Aramboli. His reasons were—

First.—That the Arienkavu line (Route No. I) would bring the Railway much nearer to the centre of Travancore and at once within easy reach of such important places as Quilon and Alleppey, which would hardly be beneficially influenced if the extension were by Route No. II.

Second.—That, although the existing traffic through Aramboli (by Route No. II) exceeds that through the Arienkavu Pass, and the country along that route is much more highly cultivated than that through which Route No. I lies, still, the valuable forests lying unexplored along Route No. I, and the central position of Arienkavu with the several roads converging upon it, would tend ultimately to develop much heavier traffic along Route No. I.

Mr. Puckle, who was long Collector of Tinnevelly and thoroughly acquainted with that district, also strongly advocates the line through Arienkavu. He says :—

(1) That this line will pass up the rich Támbraparni Valley for 35 miles from Tinnevelly ;
(2) That it would carry on immense passenger traffic, as every village from Tinnevelly to Tenkási is a town ;
(3) That it would tap the granary of Tinnevelly ;
(4) That it would carry the timber and bamboos of the Pooliara Pass ;
(5) That it would communicate with the military station and seaport of Quilon ;
(6) That the coarse cloths worn by the common people of Travancore and the live-stock and dry grains for the troops and followers at Quilon are now taken through the Pooliara Pass ;
(7) That the two great places of pilgrimage, Pápanásam and Kuttálam, will be touched by the line in question.

7. Mr. McGregor, late Resident of Travancore and formerly Sub-Collector of Tinnevelly, shares Mr. Puckle's opinion as to the advantages of the river valley line.

8. Such are the opposite opinions on record as to the relative advantages of the two routes. It is clear that they cannot both be correct, and it becomes necessary therefore to examine them closely by the light of such local knowledge as can be brought to bear upon them, before arriving at a final decision.

9. And, first, as to the arguments adduced in favor of the Aramboli route. That the length of the British part of the line by Route No. II, and consequently its cost, would be less than that of the corresponding portion by Route No. I may be admitted. At the same time the difference in the nature of the country through which the alternative lines are proposed to be carried, and the difference in traffic which that implies, should not be lost site of. The northern line would traverse perhaps the richest part of Tinnevelly, and would pass through such places as Shermádevi, Culladakurchi, Veeranalloor, Ambásamudram, Pápanàsam, Kadayen, Kuttálam and Tenkási, while the southern line would run along a dry, poor, uncultivated and sparsely peopled tract, with no town or village of any importance, unless Nángunéri is considered as such.

10. Mr. Logan next says that the engineering difficulties will be less in the case of Route No. II than of Route No. I. This will undoubtedly be the case ; but, perhaps, on closer exploration and a more complete survey of Route No. I (for the line has as yet been only partially surveyed), an easier line might be found than that indicated as the result of the partial survey which Mr. Logan has been able to make. He says indeed, that in laying out either line for construction no doubt improvements could be made, and it is added with reference to Route No. II that, by carrying the Railway nearer the coast, the gradient might be improved, but I fear that if this were done, while the more important places which are likely to supply traffic to the Railway would be avoided on the one hand, there would be the greater difficulty and expense of bridging the Coolithoray and Neyattinkaray rivers on the other, which spread out as they near the sea.

11. We next come to Mr. Logan's statement that, as the total trade by Route No. II amounts at present to 18 lakhs against 9¾ by Route No. I, a Railway line by the former route would keep to the natural course of the traffic, and all goods for the north of Trivandrum could be carried by canal at rates with which no Railway could successfully compete. It seems to me that, in considering this part of the question, it is not sufficient to take the existing traffic for one year on either line and to deduce any conclusion from it either way. I append two statements * showing the exports and imports as between Travancore and Tinnevelly (1) by Aramboli and (2) by the Arienkavu Pass for the last 21 years. As the present road from Shencottah to Quilon by

* A and B.

Arienkavu was opened for traffic in 1047, the statement gives the goods traffic for a period of ten years both prior and subsequent to that event.

12. Examining first the statement of traffic through Aramboli, we find that, previous to 1047, the average annual exports amounted to Rs. 8,58,424, while that for the last decade it is Rs. 7,98,526. The difference is not large and is probably due to ordinary fluctuations of trade. The trade in exports may, therefore, be said to have been almost stationary during the last 21 years.

13. Turning to the imports, the average for the ten years from 1037 to 1046 was Rs. 3,48,148, while that for the last decade from 1048 to 1057 has been Rs. 5,28,317. Here there is an increase of Rs. 1,80,000 in the traffic during the ten years subsequent to the opening of the Shencottah road as compared with that of the ten years anterior to it, but the increase is due entirely to the drought which occurred in South Travancore in 1056 and 1057, and to the larger quantities of rice and paddy which were consequently imported in those years from Tinnevelly to supplement the deficient local harvests. If we strike out the increase due to this exceptional cause, we find that the import traffic has, like the exports, been also stationary during the period referred to, and this notwithstanding that the import trade with British India was freed from all shackles by the abolition of import duties in 1041 under the Interportal Convention. It is important to note this fact with reference to what follows.

14. Let us now examine the statement showing the state of the traffic through the Arienkavu Pass during the same period. Prior to the opening of the Shencottah and Quilon road, there was only a footpath through Arienkavu, practicable for foot passengers and pack-bullocks only, and through this path, we find that in the ten years from 1037 to 1046, there was an export trade in areca and sundries which averaged Rs. 58,796 or little more than half a lakh of rupees in value; but in the ten years since the opening of the road, this traffic, it will be seen, has expanded to upwards of 4 lakhs or Rs. 4,31,926 a year, *i.e.*, in other words it has increased more than *seven* times. In like manner, if we take the imports, it will be observed that, while the traffic under this head averaged only Rs. 53,736 a year in then ten years preceding the opening of the road, it has since gone up to Rs. 6,46,039 a year or, in other words, increased *twelve* times, or, taking the out-going and in-coming trade together, it has increased nearly ten times, while, as we have seen, that *viâ* Aramboli is stationary. This fact seems to me to point to the superiority of the line through Arienkavu as a trade route. The rapid development of traffic upon it which we have noticed has taken place in spite of the many disadvantages with which traffic has to contend at present on that route. The existing road is unmetalled, and, owing to heavy rainfall and the nature of the country, the surface material, such as it is, is washed away by the heavy rains of this coast, and the carts, even in the dry seasons, have to struggle along a rutty road. But in spite of such drawbacks the existing traffic has sprung up in ten years.

15. Mr. Logan, as already stated, taking the figures for one year, namely, M.E. 1,057 states that the traffic by the Aramboli route amounts to 18 lakhs against $9\frac{3}{4}$ lakhs by the Arienkavu Pass. If we refer again to Statements A and B, it will be seen that in the last two years of the period comprised by those statements, namely, 1056 and 1057, owing, as already stated, to the drought in South Travancore, larger quantities of rice and paddy were brought to it from Tinnevelly than is ordinarily the case, and that, in consequence of this exceptional cause, the total value of the exports and imports in those years reached a figure never attained since 1047 or within the past ten years. If we exclude these two years, the average annual traffic amounts only to Rs. 12,07,066, or, if we take the average of the ten years including those two years, to Rs. 13,26,844 and not 18 lakhs.

16. On the other hand no such exceptional circumstance has affected the traffic on the Shencottah and Quilon line through the Arienkavu Pass. Still, the average annual traffic for the last ten years, since the opening of the road, amounts to Rs. 10,77,965. The correct figures, therefore, are not 18 against $9\frac{3}{4}$ lakhs, but only Rs. 13,26,844 against Rs. 10,77,965, or a difference of Rs. 2,48,879 only.

17. But even this trade of, say, $13\frac{1}{2}$ lakhs of rupees worth on the Aramboli Route is entirely of a local character and is not likely to expand to any great extent on the construction of a Railway. The goods chiefly brought from Tinnevelly by this route are—

(1) Rice, paddy and pulses,
(2) Thread, cotton and piece-goods,
(3) Cattle,
(4) Currystuffs,

and they are consumed by the people of South Travancore. The returns furnished do not show that any of these articles find their way to the north of Trivandrum. Similarly, the chief articles of export are—

(1) The produce of the cocoanut tree,
(2) Fish,
(3) Tamarind,
(4) Jaggery,
(5) Timber,
(6) Hides,
(7) Coffee,
(8) Pepper,
(9) Arecanut,
(10) Dry ginger.

Here too, with the exception of perhaps the last three articles, the rest are the produce of the country south of Trivandrum. The trade routes of North Travancore lying east and west, the

produce of that fertile tract finds an outlet by the ports on the coast on the one hand and by the mountain passes which open into the Tinnevelly and Madura Districts on the other. By the same openings the articles required for local consumption find their way into the country and are distributed by the net-work of navigable rivers, canals and backwaters which intersect that part of Travancore in all directions, so that very little, if any, of the trade of North Travancore passes south of Trivandrum.

18. That such is the case will be gathered from the accompanying returns* which have been submitted by the Peishkar of Quilon and his Assistant as the result of careful inquiries made on the spot under instructions from this office. The statements show that there is not only an established and, as already noticed, a rising trade between Tinnevelly and Quilon, but also that a very considerable interchange of goods is taking place between Kayencollum and Chunganachery (which are also important centres of trade in North Travancore) and Tinnevelly and Madura.

* Marked C and D.

19. If, therefore, the trade between British India and Travancore through the Aramboli Pass is limited, and has been nearly stationary during the last 21 years; if, further, that trade is of a local character confined to the exchange of articles needed for local consumption on either side of the frontier and presents no reasonable prospect of any considerable expansion by the opening of a Railway through that part of the country; if, on the other hand, a trade between the countries on either side of the ghâts has sprung up within the last 10 years to the north of Trivandrum through the Arienkavu Pass, and has reached in that short period the proportions which we find it has assumed; if the chief centres of trade, viz., Shencottah, Quilon, Alleppy, Cochin, Kayencollum and Chunganachery, lie also in North Travancore, connected by an unbroken system of water communication in all directions calculated to circulate traffic quickly and cheaply; if the staple articles of the country are produced in abundance there and find a ready outlet without passing south of Trivandrum; and if the bulk of foreign articles required for inland consumption also find a ready market in the northern marts, it seems very questionable whether a Railway, so remote, as one through the southern pass will be from the most fertile portion of Travancore, will prove a remunerative undertaking.

20. The Chief Engineer to the South Indian Railway indeed observes that Travancore, being long and narrow like a leaf, would be best served by a Railway working through it laterally and not transversely; that Route No. II would work along a well cultivated and populous belt of country and would touch on the canal system at Trivandrum, the Railway and canal forming the mid-rib of the leaf from which good roads would effectually circulate traffic, and that this on the face of it seems a better arrangement than running across the leaf through a poor tract of country not capable of being much developed. I have already endeavoured to show that the goods traffic passing through Aramboli is of a local character, and that, as a matter of fact, little of it, if any, goes beyond Trivandrum. The Railway touching the canal system at Trivandrum will, therefore, not influence the trade of the country, which is principally confined to North Travancore. It is a noteworthy fact that not one of those large cargo boats which ply in the backwaters in the north is to be seen south of Quilon. If South Travancore was not a narrow strip of country only 50 miles long and, excluding the hills, 15 miles broad in its broadest part, with the Western Ghâts within 10 miles on the east and the sea within 5 miles on the west of the proposed line of Railway with no outlet of any importance for its produce on either side except one port,† which, however, has no pretensions to a harbour, and if the existing trade, such as it is, was not limited, and of a local character, a Railway such as Mr. Logan describes would perhaps be of advantage in the absence of any water communication such as exists in North Travancore; but, taking things as we find them, a line of rail through Aramboli is not likely to attract to itself such traffic as to make it ever remunerative so long as the physical features of the country remain what they are, and so long as the chief ports and centres of trade lie in North Travancore, too far removed and too abundantly provided with facilities for the circulation of traffic nearer home, to be influenced to any appreciable extent by a Railway in the very south. Such a Railway would not even help to carry to the only port of shipment, Colachel, the coffee grown on the Asambu Hills as it would run at right angles to the road from the hills to the sea.

† Colachel.

21. North of Trivandrum, a line of Railway which ran along "the mid-rib of the leaf" would be entirely out of place, as running parallel to the through-water communication which, commencing from Trivandrum, extends to the northernmost limits of the State. There, one across the "leaf" will be most in keeping with the surrounding conditions, and, unquestionably, the Arienkavu Pass seems to offer the best route for such a Railway. Its advantages may be summed up as follows:—

(*a*) As admitted on all hands this line on the British side would pass through a populous and richly cultivated tract of country along the Tambraparni Valley, and would almost certainly prove remunerative in itself.

(*b*) The line would abut on the existing system of inland water communication and directly connect the district of Madura and the richest parts of Tinnevelly with the most fertile portion of Travancore.

(*c*) That the line will have the advantage of connecting with the East Coast a rising sea-port like Quilon on the West Coast. The sea-borne trade of Quilon has risen, as shown in the margin,* since the opening of the road to it through Arienkavu.

	* Value of Imports and Exports. Rs.
1047	53,790
1048	63,752
1049	42,619
1050	42,358
1051	71,226
1052	81,410
1053	1,71,580
1054	1,40,879
1055	2,46,152
1056	2,80,027
1057	3,75,962

(*d*) That Quilon, which Mr. Logan describes † as "a comparatively dangerous port owing to the existence of extensive reefs and detached rocks which extend seaward from Tangacherry point for some three miles to the south and for seven miles north," is thus reported on by Mr. Parkes, who, at the request of the Travancore Government, examined the port only last year with reference to its capabilities for the formation of a first-class harbour.

† *Vide* paragraph 14 of his report recorded in G.O., dated 6th June 1882, No. 367 R., P. W.

Mr. Parkes writes ‡:—"So far as my information extends, there is no other place which could in any way compete with Quilon" for the purposes of a harbour. He adds:—

‡ *Vide* his report, dated 19th April 1882.

"The position and surroundings of Quilon appear to me to be more than ordinarily well adapted for a place of considerable trade in the following respects:—

"1*st*.—The harbour I have suggested having been constructed as a first step, it is capable of extension at a cost commensurate with the requirements whenever an increased trade calls for it.

"2*nd*.—The proposed canal to the backwater will give sea communication with very advantageous sites for factories, godowns, boat wharfs, &c., for all which purposes the superiority of backwater over sea-side sites is very marked.

"3*rd*.—The ground varies in level without abrupt declivities, and is therefore more available for varied purposes than either hilly or swampy sites.

"4*th*.—Quilon possesses advantages as a residential neighbourhood over any place on the coast for a long distance in either direction, which is also available for trade."

(*e*) Captain Taylor, Master Attendant of Madras, who visited Quilon about the beginning of this year reports:—"There is in my opinion no site in South India but that of Quilon that offers a safe solution of the harbour question. At Quilon the great rocky Tangacherry reef keeps off the sand currents, and also makes a safe base for the wall as the Isane reef does at Colombo, but Quilon possesses one great advantage over Colombo, in that its mouth is turned to the quiet south-east where neither storm-wave nor ground-swell can enter."

(*f*) That it is not improbable that an effort will be made to construct an artificial harbour for which Quilon presents such great facilities according to competent authorities, and that this will very largely increase the importance of the port and consequently of the Railway.

(*g*) That Quilon and the country along the Shencottah road are likely to become the seat of new industries. An enterprising American merchant who has established himself now for many years at Alleppey has already imported the necessary plant and machinery for a cotton mill with 20,000 spindles, and it will be seen from the accompanying copy § of a letter from him that he has an offer from capitalists in London to put up two more mills if his own pays over ten per cent. per annum, and that three mills of 20,000 spindles each would require 400 to 500 bales of cotton per week. A similar cotton mill has, I believe, already been established at Pápanásam on the British side along the route which a Railway through Arienkavu would take.

§ Enclosure E.

(*h*) It is also in contemplation to establish a paper factory by a private company at Ponnalore, which is situated about midway between Shencottah and Quilon on the present road, and through which the Railway would also run according to Mr. Logan's survey. The place is eligible for such an industry owing to a perennial supply of pure water being available in the river which runs close by.

(*i*) That while a Railway through Aramboli would not, as already shown, in any way help the transport of the coffee produced in South Travancore to the port of Colachel, to which it is now conveyed in carts, all the coffee produced in the Arienkavu and Colathurpulay ranges of hills would be conveyed by a Railway through Arienkavu to Quilon for curing and shipment as it already is by the existing road. Last year 12,512 cwts. were exported at Colachel, while 13,971 cwts. were exported at Quilon. But last year's crop was extraordinarily poor. The crop of an average good season is three and four times last year's outturn. It is true that the coffee industry is in a depressed condition, but tea and chinchona are taking its place, and a Railway through Arienkavu would directly tend to stimulate this industry by the cheap means of transport it would furnish to Quilon for shipment.

(*j*) A large trade in timber, bamboo and firewood may be expected to spring up by the opening of a Railway through the Arienkavu Pass, as the line will run through a region rich in such products, whereas in South Travancore there is no jungle or forest within 15 or 20 miles of the route along which a Railway would run.

Referring to the question of the supply of firewood to Trivandrum and its suburbs, Mr. Barton wrote in 1876 that "the supplies purchased by Government for the Oottuperas or feeding-houses, as shown by official records, was 7,200 cart-loads or, say, 3,600 tons per annum." "The fort, town and suburbs of Trivandrum," he added, "contain 12,000 houses and a population of 70,000 inhabitants. The average quantity of fuel consumed in each house is estimated at one cart-load* per month, or over 70,000 tons per annum. At present the whole of the supply (200 tons per day) is brought in from all directions and from long distances by boat, by cart and on coolies' heads. The bazaar price is about 4 rupees per ton; the felling and splitting cost 1 rupee per ton, leaving 3 rupees per ton for porterage; but the jungle and forest land round Trivandrum is being taken up so fast, and the jungle cleared and the ground cultivated, that the collectors of firewood are driven far and wide, and there is no question it would be cheaper to bring firewood in by Railway from the forests alongside the line, than to depend on the present desultory method of supply."

* This, I think, is an over-estimate. Half a cart-load a-month all round, or 36,000 tons a year, will be nearer the mark.

If this was true in 1876, it is still more so in 1883, when the available supply of firewood within 12 miles of Trivandrum is being rapidly exhausted. And what is true of Trivandrum is in a great measure applicable to Quilon, where, too, firewood has now to be brought from a considerable distance. Once landed at Quilon at 1 rupee 8 annas per ton from a distance, say, of 30 miles, the transport to Trivandrum by water will be only a matter of another 8 annas per ton, or 2 rupees together, against 3 rupees a ton now by cart. Supposing Quilon to consume half as much again as Trivandrum, and that the whole of Tinnevelly would take in as much as the towns of Trivandrum and Quilon together, we shall have a lac of tons of firewood alone conveyed by rail annually. Notwithstanding the heavy cost of carriage at present, a good deal of timber and firewood even now finds its way to the district of Tinnevelly from the Shencottah forests.

(*k*) That the existence of timber for sleepers and firewood for the engines within easy reach of the Arienkavu route, and the fact that the land through which the Railway would run is mostly jungle and uncultivated land at the disposal of Government, would *pro tanto* reduce the cost of construction and working the line, whereas this would not be the case with the Aramboli line, which would pass through a cultivated country with no timber or forests available within 15 or 20 miles, and with land commanding a high price in the market, and which would require a large expenditure in the shape of compensation.

(*l*) His Highness' Government at present annually transport by carts about 130 tons of salt to the outlying district of Shencottah, which would be conveyed by a Railway to Quilon.

(*m*) A Railway through Arienkavu would directly fulfil what has been stated to be the main object of the proposed extension of the South Indian line into Travancore. Major-General Green writes:—"It is well known that the monsoons blow alternately from north-east and from south-west, and in the former winds the Coromandel Coast is shut up, while the Malabar Coast is open, and when the south-west monsoon blows, it closes the Malabar Coast and leaves the Coromandel ports open. An extension of the South Indian Railway that shall bring the two coasts so situated into communication cannot be other than a most important desideratum." And this desideratum, it will be gathered from what has been said, will be supplied by a line through the Arienkavu Pass, as it would connect by almost a straight line the port of Tuticorin on the East Coast with Quilon on the west.

Vide Juland Danvers' Report on Railways for 1879-80, paragraph 20.

22. While Major-General Green's remarks from which I have quoted thus apply with great force to an extension through the Támbraparni Valley and Shencottah to Quilon, it is curious that, as a matter of fact, he advocated the adoption of the route by Aramboli, on the ground of the greater advantages which he thought it would afford "as a means of working the traffic of the country in connection with the system of backwaters and canals now existing there." He appears to have written this on the supposition that an uninterrupted line of water communication is available to the south of Trivandrum; for he observes that "the main object should be to tap the great waterway by the most practicable and inexpensive route, and as the canal called the Victoria Canal has been extended 15 miles south of Trivandrum, and is to be carried 30 miles further in the direction of Cape Comorin, it may be considered that the canal has come to meet a Railway by the coast 45 miles south of Trivandrum.

23. Writing on the same supposition, Colonel Shaw-Stewart † likewise recommends the same route, observing that "if, as stated by Major-General Green, the navigation system is continued south of Trivandrum, the line might, if thought desirable, be stopped at Colachel; and the Travancore Government would thus have the benefit of Railway construction at a very low cost." There exists, as a matter of fact, no such water communication as is thought south of Trivandrum. It is true that some years ago what is called the Ananta Victoria Marthanda Canal was cut at a cost of upwards of six lakhs of rupees

† *Vide* his note, dated 7th February 1883, recorded in G.O., 23rd February 1883, No. 168 R., P.W.

from Puvai to a little beyond Colachel, a distance of 17 miles, and that subsequently an attempt was made to prolong this canal northwards towards Trivandrum, but the whole project has been a signal failure owing apparently to faulty construction. The present condition and the prospect of the future extension of the A. V. M. Canal are dealt with in the accompanying paper* which the Chief Engineer, Mr. Jacob, has drawn up at my request.

*F.

24. If the foregoing considerations are of any force, there seems to me to be a great preponderance of advantage in favor of an extension through the rich Támbraparni Valley, up the Arienkavu Pass, and along the present road to Quilon, notwithstanding the greater length and the greater engineering difficulties, and consequently the greater cost of such a line compared with a line through Aramboli. The present Shencottah and Quilon road and the important branch from Ponalore to Kayencollum, unmetalled and partially unbridged as they are, already carry a large and increasing traffic, and a railroad, by cheapening the cost of transit, would greatly increase that traffic; it would bring Tinnevelly and Madura into direct communication with the system of inland navigation in the fertile tracts of Central and North Travancore; it would connect the chief entrepôts of trade on either side of the hills; it would, if our experience of the effect of Railways elsewhere may be relied on, contribute to develop the resources of the now backward tract of country between Shencottah and Quilon, on which the South Indian Railway authorities lay so much stress; and it would eminently fulfil the main object, according to Major-General Green, of Railway extension into Travancore, by directly connecting the East and West Coasts, and rendering Tuticorin and Quilon by turns available for the trade now held in check by the effects of the monsoons on either coast.

25. One great danger, however, which will have to be most carefully guarded against in the event of the Arienkavu route being adopted is the probability of the destruction of the forests which now clothe the country on either side of that route. Strict and close conservancy will be necessary to prevent the indiscriminate denudation which has unfortunately but too often followed on the construction of Railways elsewhere.

26. In the foregoing remarks I have left out of consideration the proposed branch from Ayur to Trivandrum (35 miles), as it is not a pressing necessity, as its construction would considerably add to the expenditure without any prospect of corresponding returns, as Quilon is already within a night's run of Trivandrum by canal, and as a cheap light Railway can at any time be constructed hereafter should the traffic require and justify such an extension.

27. Similarly, it would be desirable perhaps hereafter to connect by a light Railway Trivandrum with Nagercoil and Kotar in the south for the benefit of local traffic.

28. The Madras Government inquire what arrangements commend themselves to the Travancore Government for securing the construction of the approved line. His Highness' Government presume that the best arrangement to make will be to entrust the construction of the line to private enterprise. In anticipation of the South Indian Railway being extended to Travancore, several applications have reached me from parties interested in the matter, containing definite proposals. One company offers to undertake to make the Railway and provide rolling stock, if the Government guarantee 4 per cent. interest on the estimated cost, *plus* such further sum as may be found necessary for working capital.

29. Another company demand a guarantee of 3½ per cent. interest for fifteen years.

30. A third offer to construct one or more lines without any guarantee of interest on capital, all the concession the syndicate ask for being the necessary land and permission to construct the Railway.

31. The Government would not be disposed to undertake the work as a State Railway, but would allow a private company to do it on such terms as may be reasonable. They would at the same time reserve to themselves the option of taking over the line, some years after it has been in working order, on such reasonable terms as might be agreed upon.

A.
Aramboly.

Year.	Dutiable Imports. Price.	Non-dutiable Imports. Price.	Total. Price.	Total of Dutiable and Non-dutiable Exports and Imports. Price.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1037	3,47,931 8 2	...	3,47,931 8 2	8,91,931 4 10
1038	3,32,775 7 0	...	3,32,775 7 0	9,21,569 9 3
1039	4,07,076 2 3	...	4,07,076 2 3	12,19,373 15 5
1040	3,47,367 1 7	...	3,47,367 1 7	13,54,228 14 11
1041	10,160 0 0	...	10,160 0 0	8,82,833 0 0
1042	11,686 5 9	...	11,686 5 9	7,88,716 7 5
1043	11,112 5 4	...	11,112 5 4	9,80,648 11 0
1044	14,047 7 10	...	14,047 7 10	11,66,763 4 10
1045	16,681 10 5	7,74,045 0 0	7,90,726 10 5	17,05,236 0 3
1046	15,007 8 0	11,93,598 15 6	12,08,606 7 6	21,54,438 0 4
Total ...	15,13,845 8 4	19,67,643 15 6	34,81,489 7 10	1,20,65,739 4 3
Average for ten years ...	1,51,384 8 10	1,96,764 6 4	3,48,148 15 3	12,06,573 14 10
1047	22,196 4 6	8,17,055 10 0	8,39,251 14 6	18,92,521 1 2
1048	18,893 2 8	6,43,919 12 0	6,62,812 14 8	16,09,716 14 9
1049	20,618 10 6	4,21,167 6 0	4,41,786 0 6	13,52,307 13 2
1050	23,830 2 10	3,23,880 13 0	3,47,710 15 10	12,24,937 10 0
1051	24,175 5 1	3,19,524 4 0	3,43,699 9 1	11,41,034 7 9
1052	28,447 5 4	1,82,314 8 0	2,10,761 13 4	9,20,166 13 8
1053	28,039 0 6	2,40,527 4 0	2,68,566 4 6	9,20,231 3 2
1054	34,302 10 0	3,80,572 0 0	4,14,874 10 0	10,69,512 11 0
1055	31,424 15 0	5,83,439 8 0	6,14,864 7 0	14,18,622 14 4
1056	25,830 0 0	8,71,805 0 0	8,97,635 0 0	17,61,829 9 6
1057	26,864 5 6	10,53,598 15 0	10,80,463 4 6	18,50,083 2 6
Total ...	2,62,425 9 5	50,20,749 6 0	52,83,174 15 5	1,32,68,443 3 10
Average for 10 years ...	26,242 8 11	5,02,074 15 0	5,28,317 7 11	13,26,844 5 2

Year.	Dutiable Exports. Price.	Non-dutiable Exports. Price.	Total. Price.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
1037	5,43,999 12 8	...	5,43,999 12 8
1038	5,88,794 2 3	...	5,88,794 2 3
1039	8,12,297 13 2	...	8,12,297 13 2
1040	10,06,861 13 4	...	10,06,861 13 4
1041	8,72,673 0 0	...	8,72,673 0 0
1042	7,77,030 1 8	...	7,77,030 1 8
1043	9,69,536 5 8	...	9,69,536 5 8
1044	11,52,715 13 0	...	11,52,715 13 0
1045	9,14,509 5 10	...	9,14,509 5 10
1046	8,90,729 14 10	55,101 10 0	9,45,831 8 10
Total ...	85,29,148 2 5	55,101 10 0	85,84,249 12 5
Average for ten years ...	8,52,914 13 0	5,510 2 7	8,58,424 15 7
1047	10,35,997 6 8	17,271 12 0	10,53,269 2 8
1048	9,21,208 10 1	25,695 6 0	9,46,904 0 1
1049	8,86,218 4 8	24,303 8 0	9,10,521 12 8
1050	8,58,069 5 2	19,157 5 0	8,77,226 10 2
1051	7,81,860 14 8	15,474 0 0	7,97,334 14 8
1052	6,95,833 0 4	13,572 0 0	7,09,405 0 4
1053	6,37,397 6 8	14,267 8 0	6,51,664 14 8
1054	6,45,749 1 0	8,889 0 0	6,54,638 1 0
1055	7,90,471 3 4	13,287 4 0	8,03,758 7 4
1056	8,49,449 13 6	14,744 12 0	8,64,194 9 6
1057	7,51,026 14 0	18,593 0 0	7,69,619 14 0
Total ...	78,17,284 9 5	1,67,983 11 0	79,85,268 4 5
Average for 10 years ...	7,81,728 7 4	16,798 5 11	7,98,526 13 3

B.

Arienkavu.

Year.	Dutiable Exports. Price.	Dutiable Imports. Price.	Non-dutiable Imports. Price.	Total. Price.	Total of Dutiable and Non-dutiable Exports and Imports. Price.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1037	43,059 0 0	74,286 1 7	...	74,286 1 7	1,17,345 1 7
1038	44,429 0 0	67,598 7 5	...	67,598 7 5	1,12,027 7 5
1039	62,592 0 0	1,52,657 15 0	...	1,52,657 15 0	2,15,249 15 0
1040	57,617 0 0	1,22,726 5 0	...	1,22,726 5 0	1,80,343 5 0
1041	63,117 0 0	...	...	...	63,117 0 0
1042	53,158 0 4	...	...	8 9 4	53,166 9 8
1043	66,304 10 4	...	...	2 2 4	66,306 12 8
1044	66,230 12 8	...	...	...	66,230 12 8
1045	45,858 3 4	92 9 4	27,310 9 6	27,403 2 10	73,261 6 2
1046	85,193 6 4	39 2 7	92,648 0 0	92,687 2 7	1,78,288 5 11
Total ...	5,87,559 1 0	4,17,411 4 7	1,19,958 9 6	5,37,369 14 1	11,25,336 12 1
Average for ten years ...	58,755 14 6	41,741 2 1	11,995 13 9	53,736 15 10	1,12,533 10 10
1047	1,35,079 2 0	924 11 11	3,51,935 0 0	3,52,859 11 11	4,91,046 8 11
1048	2,38,258 12 4	254 8 8	5,55,667 0 0	5,55,921 8 8	7,97,806 6 6
1049	4,17,128 0 0	353 10 10	2,02,626 13 0	2,02,980 7 10	6,26,372 4 10
1050	3,68,095 11 8	389 0 11	7,54,485 5 11	7,54,874 6 10	11,23,359 3 6
1051	4,01,254 7 6	598 14 4	15,02,445 12 0	15,03,044 10 4	19,04,952 1 6
1052	4,18,725 3 0	626 8 8	7,74,990 10 0	7,75,617 2 8	12,59,958 9 8
1053	4,43,741 7 4	951 7 10	6,37,729 14 0	6,38,681 5 10	10,84,556 10 2
1054	4,06,461 10 8	207 13 9	7,20,413 12 0	7,20,621 9 9	11,27,826 4 5
1055	5,01,844 11 0	1,056 8 9	5,19,515 0 0	5,20,571 8 9	10,23,901 11 9
1056	5,22,629 7 8	460 15 0	4,12,530 0 0	4,12,990 15 0	9,37,337 14 8
1057	5,15,599 11 0	1,246 12 11	3,73,839 15 0	3,75,086 11 11	8,93,580 10 11
Total ...	42,33,739 2 2	6,146 5 8	64,54,244 1 11	64,60,390 7 7	1,07,79,651 13 11
Average for ten years ...	4,23,373 14 8	614 10 2	6,45,424 6 7	6,46,039 0 9	10,77,965 3 0

Year.	Dutiable Exports. Price.	Non-dutiable Exports. Price.	Total. Price.
	RS. A. P.	RS. A. P.	RS. A. P.
1037	43,059 0 0	...	43,059 0 0
1038	44,429 0 0	...	44,429 0 0
1039	62,592 0 0	...	62,592 0 0
1040	57,617 0 0	...	57,617 0 0
1041	63,117 0 0	...	63,117 0 0
1042	53,158 0 4	...	53,158 0 4
1043	66,304 10 4	...	66,304 10 4
1044	66,230 12 8	...	66,230 12 8
1045	45,858 3 4	...	45,858 3 4
1046	85,193 6 4	407 13 0	85,601 3 4
Total ...	5,87,559 1 0	407 13 0	5,87,966 14 0
Average for ten years ...	58,755 14 6	40 12 6	58,796 11 0
1047	1,35,079 2 0	3,107 11 0	1,38,186 13 0
1048	2,38,258 12 4	3,626 1 6	2,41,884 13 10
1049	4,17,128 0 0	6,263 13 0	4,23,391 13 0
1050	3,68,095 11 8	389 1 0	3,68,484 12 8
1051	4,01,254 7 6	652 15 8	4,01,907 7 2
1052	4,18,725 3 0	65,616 4 0	4,84,341 7 0
1053	4,43,741 7 4	2,133 13 0	4,45,875 4 4
1054	4,06,461 10 8	743 0 0	4,07,204 10 8
1055	5,01,844 11 0	1,485 8 0	5,03,330 3 0
1056	5,22,629 7 8	1,717 8 0	5,24,346 15 8
1057	5,15,599 11 0	2,894 4 0	5,18,493 15 0
Total ...	42,33,739 2 2	85,522 4 2	43,19,261 6 4
Average for ten years ...	4,23,373 14 8	8,552 3 7	4,31,926 2 3

C.

TRADE which comes to Kayencollum from the Tinnevelly side *viâ* Arienkavu.

No.	Articles.	Probable Quantity per Annum.	Approximate Value.	Place or places from which imported.	Remarks.
		CANDIES.	RS.		
1	Gingelly oil ...	180	18,000	Shencottah and Tenkási.	
2	Black gram ...	192	3,840	Shencottah and Tinnevelly.	
3	Green gram ...	12	360	Do.	
4	Rice	192	3,840	Do. ...	Trade in this article varies with the state of the local crop. Much larger quantities would be imported when there is a failure of crop in the country.
5	Paddy	100	...	Do. ...	
6	Native cloths ...	CART-LOADS. 100 / CANDIES. 200	70,000	Tenkási, Ambásamudram, Veranallore, Cadeyanallore, Srívilliputur, &c.	
7	Coriander	100	2,000	Shencottah and Tinnevelly.	
8	Dried chilly ...	200	7,000	Do.	
9	Garlic	12	420	Do.	
10	Onions	850	6,300	Do.	
11	Gingelly seed ...	60	2,000	Do.	
12	Margosa oil ...	3	...	Do.	
13	Castor oil ...	4½	...	Do.	
14	Cotton seed ..	10	...	Do.	

Note.—Dholl, jaggery and other minor articles are also occasionally imported in small quantities.

TRADE which goes from Kayencollum to Tinnevelly and other places *viâ* Arienkavu.

No.	Articles.	Probable Quantity per Annum.	Approximate Value.	Place or places to which exported.	Remarks.
		CANDIES.	RS.		
1	Pepper	1,800	1,00,000	Tinnevelly District.	
2	Vetupak	1,200	1,20,000	Do.	
3	Cocoanuts	324	4,000	Do.	500 cocoanuts are taken to represent one candy.
4	Cocoanut oil ...	500	34,000	Do.	
5	Punnaka oil ...	500	30,000	Do.	
6	Croton seed ...	25	3,000	Do.	
7	Cheyaka	50	1,750	Do.	
8	Molasses	150	...	Do.	This is not exported every year.
9	Salt fish	200	6,500	Do.	
10	Silk cotton ...	12	180	Do.	
11	Dried ginger ..	25	...	Do.	
12	Hides	240	36,000	Do.	
13	Ginger	50	500	Do.	
14	Yam and other roots.	...	...	...	

TRADE which comes to Kayencollum from the North.

No.	Articles.	Probable Quantity per Annum.	Approximate Value.	Places from which brought.	Remarks.
		CANDIES.	RS.		
1	Molasses	240	4,800	Alleppey and Cochin.	
2	Molakuvathel ...	600	30,000	Do.	These articles come from Pálghat and Coimbatore.
3	Garlic	300	9,000	Do.	
4	Coriander	600	12,000	Do.	
5	Sugar	240	18,000	Do.	
6	Cummin seed, mustard, vengayam, &c., and other spices.	...	18,000	Do.	Half the quantity comes from Pálghat and other places and the other half from Bombay.
7	Saltpetre ...	15	12,000	Do.	
8	Sulphur ...	6	240	Do.	
9	Dholl, green gram and other minor grain.	...	6,000	Do.	This is mainly from Bombay.
10	Piece-goods ...	...	3,60,000	Do.	From Bombay and Europe.
11	Thread	...	6,000	Do.	Do.
12	Stationery ...	...	6,000	Do.	Do.
13	Rice	...	8,000	Do.	From Bombay.
14	Paddy	...	2,000	Do.	Do.

TRADE which goes from Kayencollum to the North.

No.	Articles.	Quantity per Annum.	Probable Price.	Place or places to which exported.	Remarks.
		CANDIES.	RS.		
1	Coppra	10,000	5,00,000	Alleppy and Cochin.	These are simply the ports of export.
2	Pepper	1,800	1,80,000	Do.	
3	Karuvapu ...	120	7,200	Do.	
4	Ponnumpinampu...	180	18,000	Do.	
5	Canjiramkuru (Nux-vomica).	1,200	12,000	Do.	
6	Nellicka (Gooseberry).	1,200	6,000	Do.	It appears these articles are taken to Madras by sea.
7	Karandakathumkuru.	12	120	Do.	
8	Cotton seed ...	120	1,200	Do.	
9	Kacholom ...	24	1,100	Do.	
10	Cocoanuts ..	5,000	50,000	Do.	500 cocoanuts are taken to represent one candy.
11	Punnaka seed ...	60	...	Do.	
12	Arecanuts (raw) ...	50	...	Do.	
13	Coir	25	...	Do.	
14	Horse gram, green gram and other grains.	500	...	Do.	
		NO.			
15	Hides	1,200	...	Do.	
		CANDIES.			
		25			
16	Mat	...			
17	Kolinchee ...	30	6,000	Do.	
			6,000	Do.	

TRADE which comes to Kayencollum from the South or Quilon side.

No.	Articles.	Quantity per Annum.	Value per Annum.	Place or places from which imported.	Remarks.
		CANDIES.	RS.		
1	Native cloths ...	...	60,000	Kottar, Eraniel, Connavilay Kaliyakavillay	
2	Palmyra jaggery.	24	600	Quilon	
3	Betel	...	2,400	Quilon, Kottarakarray	
4	Tapioca vattel ...	...	12,000	Quilon	
5	Tamarind ...	200	2,700	South Travancore.	
6	Palmyra cadjan ...	...	170	...	This is imported only in some years.
7	Horse gram ...	...	...	...	
8	Fish	600	...	Quilon, &c.	
9	Ragi	240	...	Do.	
10	Millet	120	...		

TRADE which goes from Kayencollum to the South.

No.	Articles.	Quantity per Annum.	Value per Annum.	Place or places to which imported.	Remarks.
		CANDIES.	RS.		
1	Arecanuts ...	...	30,000	Trivandrum, Kalikolay, Kottar	
2	Plantains ...	...	12,000	Quilon and Trivandrum ...	
3	Rice	1,500	...	Do.	
4	Paddy	750	...	Do.	
5	Peroompire ...	450	...	...	
6	Fish	...	4,200	...	
7	Mats	...	1,200	Quilon and Trivandrum	

TRADE which comes to Chunganacherry *viâ* Alleppey and Cochin.

Number.	Articles.	Quantity imported per Annum.	Place or places from which imported.	Remarks.
		CANDIES.		
1	Chillies	500	Pálghat and Coimbatore.	
2	Onions	100	Do.	
3	Garlic	100	Do.	
4	Mustard	150	Pálghat and Bombay.	About 100 candies come from Bombay.
5	Cummin seed ...	75	Do. do.	About 50 from Bombay.
6	Venthayam ...	50	Do. do.	About 25 from Bombay.
7	Black gram ...	500	Pálghat and Coimbatore.	
8	Green gram ...	250	Do.	
9	Dholl	50	Do.	
10	Sugar	300	Do.	
11	Gingelly oil ...	50	Do.	
12	Margosa and Castor oil.	50	Do.	

Trade which comes to Chunganacherry *viâ* Alleppy and Cochin—*cont.*

Number.	Articles.	Quantity imported per Annum.	Place or places from which imported.	Remarks.
		RS.		
13	Piece goods ...	100,000 worth.	Bombay and Europe.	
		CANDITS.		
14	Cadala	100	Pálghat and Coimbatore.	
15	Coriander	100	Do.	
16	Medicinal drugs ...	50	Pálghat and Bombay.	
		RS.		
17	Jars, dishes, &c. ...	50,000 worth.	Bombay and Europe.	
18	Iron and other metals.	50,000 worth.	Do.	

TRADE which comes to Chunganacherry from British India *viâ* Arienkavu and Peermade.

Number.	Articles.	Quantity Imported per Annum.			Place or places from which imported.	Remarks.
		Via Arienkavu.	*Via* Peermade.	Total.		
1	Chillies	CANDIES. 250	CANDIES. 200	CANDIES. 450	Tinnevelly and Madura.	
2	Onions					
3	Garlic	300	100	400	Do.	
4	Cummin seed	75	25	100	Do.	
5	Mustard	25	25	50	Do.	
6	Venthayam	25	25	50	Do.	
7	Black gram	50	25	75	Do.	
8	Green gram	500	..	500	Do.	
9	Dholl	250	..	250	Do.	
10	Gingelly oil	150	..	150	Do.	
11	Margosa and Castor oil ..	150	..	150	Do.	
12	Piece goods (Country) ..	500	..	500	Do.	
13	Thread	600	..	600	Do.	A candy is taken to represent 350 rupees' worth of piece goods, the total value of piece goods imported being 2 lakhs of rupees.
14	Iron	50	50	100	Do.	
15	Gingelly seed	..	10	10	Do.	
16	Mochakotta	200	..	200	Do.	
17	Coriander	25	..	25	Do.	
18	Jaggery	100	..	100	Do.	
19	Oranges, limes, &c. ..	100	..	100	Do.	
20	Medicinal drugs ..	..	100	100	Do.	
		50	..	50	Do.	

I.—Trade which comes to Quilon from the Trivandrum Side.

Articles.	Quantities per Annum.	From which places.	Remarks.
	CANDIES.		
Coppra	5,000	Trivandrum, Perumathura, Anjengo and Sheraingil.	
Coir	1,000	Ianathura, Perumathura, Anjengo and Paravoor.	
Cocoanut oil	250	Perumathura, Anjengo and Sheraingil.	
Jaggery	600	Kotar and Kaliyakavila.	
Green gram	100	Kotar.	
	RS.		
Cloths of country manufacture.	1,00,000 worth.	Do.	
	CANDIES.		
Margosa oil	30	Do.	
Do. seed	50	Do.	
Tamarind	1,000	Kaliyakavila and Sheraingil.	
Punnaka oil	50	Kotar, Trivandrum, Virculiay and Sheraingil.	

II.—Trade which goes from Quilon to the Trivandrum Side.

Articles.	Quantities per Annum.	To which places.	Remarks.
	CANDIES.		
Rice	12,000	Trivandrum.	
Paddy	20,000	Do.	
Cotton thread	600	Do.	
	RS.		
Cloths of country manufacture.	4,00,000 worth.	Do.	
	CANDIES.		
Iron	2,500	Do.	
Copper	500	Do.	
Zinc	500	Do.	
Molasses	1,500	Do.	
Timber	1,000	Do. (Monthly from Sircar property.)	
Pepper	150	Do.	
Arecanut	100	Do.	
Dry ginger	1,000	Do.	
Coppra	2,000	Do.	
Turmeric	100	Do.	
	RS.		
Chena root	1,500 worth.	Do.	
	CANDIES.		
Pulse	200	Do.	
Chempaga	200	Do.	
Wheat	100	Do.	
Spices	150	Do.	
Mustard	250	Do.	
Cummin seed	150	Do.	
Sugar	500	Do.	
Venthayem	200	Do.	
Lead (two kinds) ...	200	Do.	
Bengal gram	200	Do.	
Saltpetre	100	Do.	
Sulphur	40	Do.	
Gram	1,000	Do.	
Salt fish	500	Do.	
Garlic	50	Do.	

III.—Trade from the East to Quilon *viâ* Shencottah.

Articles.	Quantity per Annum.	From which places.	Remarks.
	CANDIES.		RS.
Rice	10,000	Tenkási, Tinnevelly and Shencottah.	Cart-hire from Tinnevelly to Shencottah 2
		Do.	
Paddy	5,000	Shencottah	Do. do. do. to Quilon 8
Gingelly-oil	250	Tinnevelly and Shencottah ...	
Green-gram	100	Do. ...	Do. do. Shencottah to Quilon. 6
Pulse	500	Do. ...	
Dholl	50	Do. ...	
Cummin seed... ...	15	Do. ...	
Timber	2,000	Do. ...	
Onions	1,200	Do. ...	
Garlic	50	Do. ...	
Castor-oil	100	Do. ...	
Sandal-wood	25	Do. ...	
Sugar-candy ...	10	Do. ...	

No. III—Trade from the East to Quilon *vid* Shencottah—*cont.*

Articles.	Quantities per Annum.	To which places.	Remarks.
	RS.		
Cloths of country manufacture.	3,00,000 worth.	Tinnevelly and Shencottah ...	
	CANDIES.		
Coriander	200	Do. ..	
Dry chilly	500	Do. ...	
Castor seeds	100	Do. ...	
Margosa oil	25	Do. ...	
Ghee	25	Do. ...	
Cotton seed	10	Do. ...	

IV.—Trade from Quilon to the East.

Articles.	Quantity per Annum.	To which places.	Remarks.
	CANDIES.		RS.
Pepper	500	Tinnevelly	Cart-hire from Quilon to Tinnevelly 8
Arecanut	750	Do.	
Cocoanut	100	Do.	Do. do. do. to Shencottah ... 6
Do. oil	50	Do.	
Dry ginger	200	Do.	Do. do. Tinnevelly to Shencottah ... 2
Saltfish	1,500	Do.	
Hides	150	Do.	
	RS.		
Wooden kitchen vessels.	500 worth.	Do.	

V.—Trade from the North to Quilon.

Articles.	Quantity Per Annum.	From which places.	Remarks.
	CANDIES.		
Rice	3,000	Cochin and Alleppey.	
Paddy	5,000 ...	Do.	
Cotton thread ...	600 ...	Do.	
	RS.		
Cloths of country manufacture ...	1,00,000 worth.	Do.	
	CANDIES.		
Copper	50	Do.	
Zinc	50 ...	Do.	
Iron	1,500 ...	Do.	
Mustard	100 ...	Do.	
Cummin seed	20 ...	Do.	
Venthayem	100 ...	Do.	
Dholl	50 ...	Do.	
Garlic	50 ...	Do.	
Pulse	100 ...	Do.	
Green gram	50 ...	Do.	
Molasses	150 ...	Cottayam, Coimbatore and Salem.	

V.—Trade from the North to Quilon.

Articles.	Quantity Per Annum.	From which places.	Remarks.
	CANDIES.		
Sugar	50 ...	Cochin and Alleppey.	
Wheat	100 ...	Do.	
Dry chilly	100 ...	Pálghat and Cochin.	
Ghee	20 ...	Cochin.	
Dry ginger	25 ...	Do.	
Turmeric	200 ...	Do.	
Saltpetre	51 ...	Do.	
Sugarcandy	50 ..	Do.	
Bengal gram ...	25 ...	Do.	
Karum	50 ...	Do.	
Sulphur	5 ...	Do.	

VI.—Trade from Quilon to the North.

Articles.	Quantity Per Annum.	To which places.	Remarks.
	CANDIES.		
Coppra	6,000 ...	Alleppey and Cochin.	
Coir	6,000 ...	Do.	
Pepper	500 ...	Do.	
Cocoanut-oil	50 ...	Do.	
Onions	1,000 ...	Do.	
Arrowroot	100 ...	Do.	
Kanjera-root	200 ...	Do.	
Gram	400 ...	Do.	
	RS.		
Mat	10,000 worth ...	Do.	
	CANDIES.		
Coffee	20 ...	Do.	
Pulse	100 ...	Do.	
Timber	4,000 ...	Do.	
Saltfish	500 ...	Do.	

D.

TRADE which goes from Chunganacherry to British India and other places.

No.	Articles.	QUANTITY EXPORTED PER ANNUM. *Via.* Alleppey and Cochin.	*Via.* Peermade.	*Via.* Arienkavu.	Total.	Place or places to which exported.	Remarks.
		CANDIES.	CANDIES.	CANDIES.	CANDIES.		
1	Vettupak ..	..	100	400	500	Tinnevelly, &c.	
2	Pepper	1,200	..	600	1,800	Do. and Europe.	
3	Forest ginger ..	500	..	..	500	Do.	
		NO.		NO.	NO.		
4	Hide	1,30,000	..	70,000 (280 CANDIES.)	2,00,000	Do.	
5	Cheyaka ..	..	..	160	160	Tinnevelly.	
		CANDIES.					
6	Arrowroot flour ..	1,500	..	..	1,500	British India and Europe.	
7	Kanjirom seed ..	360	..	..	360	Do.	
8	Karuveppu ..	200	..	..	200	Do.	
9	Pollakkuru ..	200	..	..	200	Do.	
10	Croton seed ..	350	..	50	400	Do.	
11	Molasses ..	500	..	500	1,000	Do. and Native Cochin.	1,000 candies are sent to Trivandrum.
12	Saltfish ..	..	100	..	1,000	British India.	
13	Cocoanuts ..	..	800	..	800	Do.	
14	Cocoanut oil ..	..	100	..	100	Do.	
15	Copra	2,500	..	..	2,500	Do.	
16	Cottapaku ..	50	..	..	50	Do.	
17	Tapioca vattel ..	400	..	..	400	Do.	
18	Plantains ..	..	100	..	100	Do.	
19	Yams and other roots.	..	50	..	50	Do.	

TRADE which comes to Chunganacherry from the South.

No.	Articles.	Quantity per Annum.	Place or places from which imported.	Remarks.
		CANDIES.		
1	Palmyra jaggery	2,200	Kottar and Calikkavilay.	
2	Horse-gram	500	Quilon, Cottaracurray &c.	
3	Black-gram	300	Do.	
4	Green-gram	500	Do.	
5	Chamay (Millet)	800	Do.	
6	Ranjapoollu	800	Do.	
7	Rice	600	Kayencollum.	
8	Punnaka-oil	120	Quilon.	
9	Cocoanut-oil	120	Do.	
10	Gingelly-oil	200	Do.	
11	Do. seed	200	Do.	
12	Tamarind	300	Do.	
		NO.		
13	Hides	25,000	Do.	

E.

From J. DARRAGH, Esq., to the Dewan of Travancore, Trivandrum, dated 21st March 1883.

The Engineer for the Cotton Mill has arrived, and he is now at Quilon looking about for a site. Would the Sircar have any choice of place? If so, you might ask the Peschar to report upon the ground which he thinks would be the most suitable.

I would like very much if I could see the surveys for the Railway—the northern route *vid* Arienkavu—for, if I knew where the station was likely to be situated, it might be well to have the mill close by. Can you give me any information about when you expect the surveys to be completed? I would wait a month or two before buying the land, if there was any prospect of the site for the Railway terminus being fixed.

I have an offer from good parties in London of capital sufficient to put up two more mills, if the one I am about erecting pays over 10 per cent. per annum, which I have no doubt it will do; so that, within the next five or seven years, Quilon might become such a manufacturing place that it would be quite a help towards making the road pay, as considerable quantities of the raw cotton would come from Coimbatore and Tinnevelly and a good portion of the manufactured goods would go back by the rail to the same districts. Three mills of 20,000 spindles each would want 400 to 500 bales of cotton per week.

Memorandum on the proposed Southern Line of Water Communication from Trivandrum towards Cape Comorin called the Ananda Victoria Marthanda Canal and the work already done.

The extension of water communication from Trivandrum southward, as far as Managoody near Cape Comorin is a scheme which was under consideration for very many years. So far back as 1829 records show it in contemplation along with the cutting through the Wurkally Barrier, and thus to establish a navigable canal from the extreme north of Travancore to its southern limit. Then it was estimated that the southern line, said to be 40 miles, but near 45, in length, would cost but 10 lakhs of rupees to open to a navigable canal, and it was stated that the chief obstructions were but some laterite hills 150 to 180 feet in altitude.

2. Nothing, however, was actually done towards the execution of this scheme till July 1860, when His Highness the then Rajah appears to have cut the first sod at Colachel and the work was then fairly started.

3. It was at that time intended to undertake only the cutting of about 38 out of the 45 miles, leaving the Covalum Barrier and the link up as far as Trivandrum (7 miles altogether) to be worked upon as soon as the Wurkally Barrier was cut through, a work which was admittedly of prior importance. This 38 miles of canal was estimated to cost but 3 lakhs of rupees in construction; the Covalum link to Trivandrum of 7 miles, 7 lakhs; and it was considered that this 38 miles of canal could be opened in two years.

4. The work was started without any detailed plans or estimates; the approximate estimates above quoted appear to have been of the roughest nature and prepared many years before. However, contrary to the opinion of the then Engineer, work was pushed forward with an entirely incommensurate establishment.

5. Instead of the whole 38 miles being laid open for traffic by July 1862 as at first hoped, in November 1861 it was anticipated that but 24 miles, the section from Cuddeaputnam (5 miles south of Colachel) to Kurachel (11 miles south of Trivandrum) would be completed by the end of 1862. However, by the end of 1863 no part of this section had been thrown open to traffic, work having been confined to a length of but 17 miles, namely, from 3 miles south of Colachel to Pooar. It was thought then that this section could be completed by the end of 1864, but even this anticipation was not realized, for only that portion lying between Tengapatnam and Pooar (4 miles) as well as the piece 4 miles south of Colachel were made navigable. Not, however, till 1867, do the whole 17 miles above noted, from south of Colachel to Pooar, appear to have been thrown open to traffic.

6. No proper estimate appears to have been submitted for the work from the first, and the cost of opening this 17 miles of canal was just 6½ lakhs or 3½ lakhs in excess of what the opening of 38 miles was at starting supposed to cost.

7. A small quantity of work costing Rs. 19,000 was done on the section between Pooar and Kurachel, an estimate for which, amounting to nearly 1½ lakhs, had been sanctioned; but at this stage the whole further work of cutting the A. V. M. Canal was abandoned, and operations transferred to the Wurkally Barrier Works.

8. The total original expenditure on the scheme was exactly Rs. 6,62,582, which, for 15 miles of actual cutting, gives a rate of over Rs. 44,000 a mile, against the original approximate estimate of somewhat over Rs. 5,000.

9. The further prosecution of this work then seems to have been deferred *sine die*, but ostensibly only till the Wurkally Barrier was completed. It appeared to be acknowledged on all sides that the scheme was a most unfortunate and unproductive one, and, even at a reasonable cost, would not prove a paying concern.

10. The 17 miles of canal were, on completion, thrown open to traffic; this traffic was found, as might have been expected, exceedingly small; probably not more than half a dozen boats of the fourth class (carrying say 5 or 6 candies) passed daily, the goods carried being fish and other local produce, between Colachel, Tengapatnam and Pooar. To maintain this section of 17 miles, after throwing it open to traffic, was found to be a very heavy item of expenditure; no less a sum than Rs. 54,000 was absorbed in this work during 5 years after construction, showing an annual outlay of nearly Rs. 11,000 or nearly 800 a mile per annum. This alarming rate was due to the clearance of enormous volumes of silt carried into the canal by the numerous streams discharging therein. These streams pass through districts of blown sand and other very friable material exceedingly easy of detrition under the influence of running water. No provision had been made against this obviously fatal contingency; the streams laden with solid matter discharged over calingulahs into the bed of the canal instead of being carried over or under with aqueducts or under-sluices according to circumstances, the silt going out to sea. With even the above heavy expenditure, navigation was rendered intermittent and difficult. In view of this most unproductive expenditure, the maintenance of the canal was abandoned in 1874, till something was permanently done to obviate the initial errors made in construction. Since then the matter has been left in abeyance.

11. The canal is now completely silted up between Colachel and Tengapatnam; the section from Tengapatnam to Pooar is still kept open for traffic, but it is a question whether the cost of maintenance on that section is justified by the small use made of the line.

12. To restore traffic between Colachel and Tengapatnam would cost probably three-fourth of a lakh. Adding, then, these further charges to the above section of open canal, we arrive at a total expenditure, before rendering the section fit for traffic, of—

Original Cost.		Maintenance.		Calingulahs and Silt Clearing.		
6,63,000	+	54,000	+	75,000	=	7,92,000

little short of 8 lakhs, or a mileage rate of about Rs. 53,000—a sum that would easily cover the cost of a Railway over the same ground.

13. The cost of extending the southern canal to the limits first proposed is difficult to arrive at with present information. Sections have been taken over the greater part, but apparently no trial shafts have been sunk along the line, and it is a matter of conjecture what material would be met with below the surface on excavation.

14. From the end of the present canal south of Colachel to the Vulliar would probably cost Rs.10,000 to open. Close to the Vulliar we meet the Mootum Barrier, the piercing of which, a very formidable piece of work, would necessitate a tunnel of about 5,000 feet in length at a cost of about nine lakhs. The whole section from the Vulliar through the Mootum Barrier and to Rajakamangalam would cost probably ten lakhs at least, and from Rajakamangalam to Managoody would probably cost another one and a half lakhs. So that the extension from Colachel southward might be roughly estimated at, say, twelve lakhs. From Pooar northward the section to Kurachel would cost about two lakhs. As regards the Covalum Barrier, which would also have to be tunnelled, I am not in a position to speak at all definitely as I have no sections, but taking the least that the extension to Trivandrum from Kurachel would cost, a less figure than twelve lakhs

would be unsafe to quote, making fourteen lakhs extension from the existing canal at Pooar northwards.

15. The opening of the whole line from Trivandrum to Managoody might therefore be roughly estimated as follows:—

Trivandrum to Kurachel			12 lakhs.
Kurachel to Pooar			2 ,,
Pooar to 4 miles beyond Colachel ...	already worked upon	...	6½ ,,
Improvement to this Section ...		...	¾ ,,
Maintenance already expended ...		...	½ ,,
Beyond Colachel to Rajakamangalam			10 ,,
Rajakamangalam to Managoody			1½ ,,

or a total of, say, 33 lakhs for the whole scheme. But, supposing that the section from Colachel southward be not taken into calculation, 11½ lakhs could be deducted from the above, leaving about 15 lakhs still to be spent in joining Colachel with the Capital.

16. Rajakamangalam would apparently be the most suitable southern terminus of the coast canal as far as traffic with Tinnevelly is concerned, but the incommensurate cost of the extension to that place entailed by the piercing of the Mootum Barrier would preclude the consideration of the work. The opening of a direct road from Nagercoil to Cuddeaputnam north of the Mootum Barrier, to which point the canal could be extended southward from Colachel without great cost, would no doubt save a few miles of road in dealing with Tinnevelly traffic, but, considering that Colachel is a populous place and a seaport and would in every way make a good terminus for the canal, the extension would not appear desirable. It is indeed difficult to understand why a continuation of the canal beyond Colachel was ever contemplated, considering even the then anticipated cost of the work; there would be nothing but local traffic, the country southward is not highly cultivated nor thickly populated, nor are the fishing villages along the coast very frequent or extensive. It seems, however, to have been a recognised and accepted doctrine that water communication from end to end of Travancore should be established, the productiveness or difficulties of the enterprise never having been fully discussed or realized.

17. Presuming then that Colachel is the fittest southern terminus of the canal, an attempt may be made to determine what benefit would accrue to through traffic from Tinnevelly by the complete opening of the whole line of canal to the Capital. The 37th mile of the main southern road is the point of junction with the Colachel branch; this branch is about 9 miles in length, so that tapping continuous water communication with Trivandrum at Colachel would only save 28 miles of road, against which we should have cost of shipment at Colachel and 32 miles of water journey.

18. The quantity of goods and passengers passing between Tinnevelly and Trivandrum might roughly be taken at 150 carts a day, or 75 each way. 150 cart-loads would represent about 15 boat-loads, taking an ordinary boat to carry 10 candies, which is a small estimate, so that the through traffic from British territory would only represent a service of about 7 or 8 boats each way per day. It is therefore pretty evident that, for this traffic and a saving of but 28 miles of road against a water journey of 32 miles, the cost of a canal should be very small indeed to justify such a work being undertaken.

19. It is difficult to speak with any definiteness concerning the local traffic that would use the canal, but, considering the small saving of land journey against the greater length of canal transit, it would appear that comparatively little use would be made of the canal. A glance at the map of South Travancore will show that the principal centres of trade are Nagercoil, Pulpanabhapoorum, Eraneel, Coolithoray and Neyattinkaray. Nagercoil would save by the cutting of the through canal 28 miles of land journey, Pulpanabhapoorum about 25, Eraneel about 30, Colithoray 16 and Neyattinkaray 5 miles, against a first land journey to the canal of varying lengths, transhipment of goods, and water journey of 38 miles for the three first named districts, 30 miles for Coolithoray and 17 miles for Neyattinkaray, besides further transfer of goods from boat to cart at the Capital and carriage to the several depôts of trade there.

20. It might, under these circumstances, be fairly assumed that the local traffic of the canal would certainly not exceed the through traffic from Tinnevelly, in which case the number of boats using the canal per day would be fully estimated at twenty boats per day.

21. The country through which the proposed canal passes is, for Travancore, barren and unproductive; the only purely local traffic would be in connection with the coast fishing villages. No timber nor firewood, which form heavy items in the traffic between Neyattinkaray and Trivandrum, would be carried. Fish would form the chief local traffic and this would be comparatively inconsiderable. The carriage of salt by Government would, no doubt, be reduced in cost by the construction of the canal, but probably not very materially below present prices. So also would the cost of the carriage of paddy from the south to some extent.

22. It appears difficult to understand how an expenditure of even 10 lakhs, the sum originally anticipated to be expended on the whole line, could be justified by the advantages to be secured. The line is totally different in its character from the canals north of Trivandrum;

there, innumerable water feeders from the centre of the country join the main coast line, which becomes the great highway carrying the whole of the traffic. In the south no water feeders exist, and the line which runs through a comparatively unproductive country, where local traffic is exceedingly limited, would be solely fed by goods carted from the interior, necessitating on the whole a greater distance of carriage, though at a less cost where water was available.

23. It might be suggested that much advantage could be gained by leaving the Covalum barrier to be crossed by a road as Wurkallay was previously, the canals being carried up at each side to render the land journey as short as possible. This would reduce the cost of the canal as above arrived at by, say, 12 lakhs, leaving a sum of about 3 lakhs still to be expended to connect Colachel with the Capital, save 4 or 5 miles of land journey over the Covalum impediment. To this further expenditure must be added the cost of maintenance, which would probably come to at least Rs. 200 a mile all through, equivalent to an annual charge for 28 miles of Rs. 5,600, which, with interest on an expenditure of 3 lakhs, would bring the annual cost to about Rs. 20,000, and this would be a low estimate.

24. As it would obviously be entirely out of the question spending 12 or 15 lakhs in the piercing of the Covalum Barrier, this last mentioned is the only alternative worthy of consideration, but the question whether it would be worth even incurring an expenditure of 3 lakhs and an annual outlay of Rs. 20,000 should, considering the advantages to be gained, be answered in the negative.

25. No doubt, over 7 lakhs have already been sunk in the scheme with absolutely no benefit to the Government; but even to realize some good from this heavy outlay it would be extremely doubtful policy to incur the further expenditure necessary to this end.

26. The impediment of the Covalum Barrier transit, consisting of the breaking of bulk, the transfer from boat to cart and from cart to boat, the damage to goods from exposure to weather and detention, would all be very serious drawbacks in the transit of goods and passengers, and the difficulties pointed out in paragraph 19 connected with the distance to be traversed by land before the water was reached would all tend to tax the traffic using the canal.

27. It is difficult to say how the opening of the canal would affect the traffic on the main road, probably not very materially. There is now a total of between 250 and 300 carts entering and leaving Trivandrum from the south; from this number about 100 might represent the decrease if the canal were opened, though it is probable it would not be so great.

(Signed) A. H. JACOB,
Chief Engineer.

4th August 1883.

ORDER—dated 22nd September 1883, No. 1018 R., Public Works.

In letter dated 23rd February 1883, No. 169 R., the Resident in Travancore was requested to obtain an expression of opinion from His Highness the Maharajah's Government respecting the following points in connection with the two routes which have been roughly surveyed for the proposed extension of the South Indian Railway from Tinnevelly to Quilon and Trivandrum:—

(1.) Whether His Highness' Government desire the construction of an extension of the South Indian Railway into the territory of Travancore.

(2.) If so, which of the two routes that have been surveyed meets with approval, viz.:

No. I, or northern route, from Tinnevelly to Quilon *viâ* Shencotta and the Arienkavu Pass.

No. II, or southern route, from Tinnevelly to Trivandrum *viâ* the Aramboly Pass.

(3.) What arrangements commend themselves to the Travancore Government for securing the construction of the approved line.

2. The letter from the Dewan of Travancore, printed in these Proceedings, furnishes the information asked for, as follows:—

(1.) His Highness' Government desire to see the South Indian Railway extended into Travancore.

(2.) Of the two routes, His Highness' Government give the decided preference to the northern route.

(3.) His Highness' Government would not be disposed to undertake the work as a State Railway, but would allow a private Company to do it on such terms as may be reasonable. They would at the same time reserve to themselves the option of taking over the line, some years after it has been in working order, on such reasonable terms as might be agreed on.

3. In forwarding the Dewan's letter, the Resident endorses the reasons urged by His Highness' Government for the preference given to the northern route; and, so far as British territory is concerned, there is every reason to believe that that route will serve a richer tract of country than the southern one.

4. With the information now before the Government, His Excellency the Governor in Council is of opinion that the extension of railway communication into Travancore should take the line indicated by the Dewan, viz., up the Támbraparni Valley *viâ* the Arienkavu Pass to Quilon; and the Directors of the South Indian Railway Company will be informed that the Government take this view.

5. The Directors are already aware that Her Majesty's Secretary of State is not prepared to include the projected extension into Travancore within the terms of their existing contract; and they will be invited, through their Agent, to state whether they are prepared to take any action in the matter, outside such agreement, and, if so, to submit definite proposals for the consideration of the Madras Government and that of His Highness the Maharajah.

6. The Agent of the South Indian Railway Company will be requested to convey to Mr. D. Logan the thanks of the Government for the time and trouble which he has devoted to the survey, and for the interesting information which he has laid before Government.

7. These Proceedings, as well as the previous ones under date 6th June 1882, No. 367 R., and 23rd February 1883, No. 168 R., will be published as an Appendix to the *Fort St. George Gazette*, and placed at the disposal of the Press.

8. The following letter will be addressed to the Government of India.

(Here enter No. 1019 R., dated 22nd September 1883.)

(True Extract.)

(Signed) C. J. SMITH, Lieut.-Col., R.E.,
Ag. Joint Secy. to Govt., P.W.D.,
Railway Branch.

To the Consulting Engineer for Railways.
" Examiner, Railway Accounts.
" Political Department.
" Revenue "
" Superintendent, Government Press.

Exd. E. Fernandez.
Spare Copies

RAILWAY.

Govt. of {1883} Madras.

PUBLIC WORKS.

Dated September, 22nd.

Recd. *Encl.*

G.O., 22nd Sept. 1883, No. 1018 R.

SEPTEMBER.

South Indian Railway Extension into Travancore

Passing orders on the subject of the proposed — from Tinnevelly.

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

READ—the following papers:—

From Captain J. HEXT, R.N., Director of the Indian Marine, to the Chief Secretary to Government, dated Bombay, 3rd July 1883, No. 2763.

I have the honor to forward, for the information of the Government of Madras, a copy of the programme of work laid down with the sanction of the Government of India for the Indian Marine Survey Department for the season 1883-84.

2. I would ask that Port Officers and others concerned may be directed to afford every facility to the officers of the Marine Survey in carrying out the work prescribed.

ENCLOSURE.

RECOMMENDATIONS FOR CARRYING OUT THE MARINE SURVEY OF INDIA FOR THE SEASON 1883-84.

[A Chart illustrating the places to be surveyed accompanies this Report.]

"INVESTIGATOR."

1. The *Investigator* should receive her crew and proceed to sea during the second week in October, and I would recommend that the months of October and November be spent in making a fresh survey of the port of Cochin. This was called for by the Madras Government and was about to be undertaken some four years ago, but, owing to the death of the officer in charge of the Party, both this and the Beypore survey fell through.

This survey should be made on a scale of six inches to a mile.

2. Continuous complaints have been received as to the extension of the banks, silting of channels and general alterations in the hydrography of the Rangoon river. This survey is a difficult one, and will require the presence of a ship to move about from place to place independently of camping-places and local assistance. The *Investigator* should therefore proceed to Rangoon, taking a line of deep sea soundings across the Bay of Bengal *en route* between Dondra Head of Ceylon and that port.

A complete survey of Rangoon should be made on a scale of two inches to the mile, and local authority should be consulted as to the extent up river or inland to which the survey should be carried, the Grand Trigonometrical data being used as the basis for the survey.

This survey should be completed by the end of January.

3. In February, March, and part of April the island of Cheduba and Strait, with the Ramree Roadstead, on a scale of two inches to the mile, should be carried out on a scale of one inch to the nautical mile.

The *Investigator* should return *viâ* Pamban passage to Bombay during the latter part of April, taking the channel at entrance to Palk's Bay southward of the Pedro shoals. (This year the channel south of Calimere Point was the one used and checked.)

No. 2 Boat Party.

4. If the Steam Cutter *Greenwich* has been successfully repaired at the Government Dockyard, Calcutta, the Officer in charge of No. 2 Boat Party should proceed overland, with his subordinates, to that place on the 1st of October, engage his crew and proceed by British India steamer to Akyab and complete the survey of that port in November and December.

It is considered that an artificial breakwater extending to the east and north from the Dolphin's Head would give protection to excellent anchorage, safe for ten months of the year, or from January to October inclusive.

The probability of a railway being constructed from this port to the heart of the country points to the necessity of a proper harbour terminus.

A survey, therefore, on a scale of six inches to a mile should be made during the months of January, February, and March.

No. 2 Boat Party might undertake this on the completion of Akyab, proceeding by British India steamer with stores, boats and appliances to Vizagapatam at the latter end of December.

No. 1 *Boat Party.*

5. During October, November, and December No. 1 Boat Party should be engaged in the survey of Quilon, the officers, stores, and instruments being carried thither in the *Investigator* prior to commencing Cochin.

The Travancore Government has informed the Indian Government of its anxiety to construct a deep water harbour at Quilon, there being no other harbour on the Travancore sea board. The locality offers facilities for an artificial harbour open only to the south-east, from which quarter strong winds seldom or never blow.

Quilon is centrally situated; backwaters extend forty miles to the southward and sixty miles to the northward, admitting of boat traffic up to the base of the hills.

A thorough survey on a scale of four inches to the mile, with the enclosed harbour on six inches, might be completed by the end of December.

6. One of the Indian Government troopships or a British India steamer should then convey No. 1 Boat Party to the nearest port of call to Mowa (Maháwa) bay and creek, on the Káthiáwár coast. The owners of the coasting steamers have asked for a large scale survey of this place, which should be carried out on six inches to the mile.

The weather in this neighbourhood during the months of January, February, and March is at its finest.

Time permitting, the same party might then undertake a survey of the anchorage inside Sálbet island. The interior of the country here is being developed by roads; in the course of time railways may be expected, and the Thákor of Bhávnagar, to whom the land belongs, is desirous to attract commerce to what is now an almost unknown port.

No. 1 Boat Party should return to Bombay, possibly being conveyed to that port early in May by the *Investigator*.

7. The plan of bringing the whole of the surveying parties together during the recess will, I feel convinced, be found well-judged, giving the officer in charge of the survey a better opportunity of marking progress, inclination and zeal.

BOMBAY,
30*th April* 1883. (Signed) L. S. DAWSON, Commander, R.N.,
In charge of the Marine Survey of India.

No. 1321.

Referred to the Master Attendant for any remarks he may wish to make prior to the issue of orders to the Civil and Marine authorities.

13*th July* 1883. (Signed) E. F. WEBSTER,
Acting Chief Secretary.

From J. H. TAYLOR, Esq., Lieut., R.N.R., Master Attendant, Madras, to the Acting Chief Secretary to Government, dated Madras, 19th July 1883, No. 7061.

Administrative Department.

In returning the programme of work laid down for the Indian Marine Survey Department for 1883-84, I have the honor respectfully to draw attention to the concluding paragraph of the work denoted for No. 2 Boat Party. This refers to a survey of Vizagapatam, for which work a large sum has already been allotted from Port Funds, the survey to be carried out under the direct orders of the Executive Engineer. It is evident that both cannot be required, and looking to the great advantages possessed by the Marine Survey Department in boats, instruments and appliances, which are not available locally, nor indeed in the Presidency, I would suggest that the order in the Public Works Department sanctioning the survey be cancelled.

2. A survey was made of Cochin Bar by Lieutenant Hammond in 1877, but the great changes that obtain continually among the sand banks and on the coast line render surveys of less value than in more settled regions, and the constant observation of Port Officer and Pilots supply their place.

3. Almost the only danger that requires attention and careful placing on the charts of this Presidency is the Sacramento shoal, south of Gordeware point, and somewhere off Bendamurlunka river.

No. 1404.

Referred to the Public Works Department with suggestion that the departmental survey of the Vizagapatam Harbour should be abandoned.

2. Early orders on the subject are requested by this Department.

(Signed) E. F. WEBSTER,
Acting Chief Secretary.

24*th July* 1883.

No. 244-E.

Under the circumstances explained in these papers, the survey of the Vizagapatam Harbour by the Public Works Department will be abandoned.

OOTACAMUND,
25*th July* 1883. (Signed) R. H. SANKEY, Major-General, R.E.,
Secy. to Govt., P.W.D.

To the Marine Department, with papers returned.
" Superintending Engineer, First Circle.

ORDER—dated 27th July 1883, No. 393, Marine.

The programme of work for the Marine Survey Department will be communicated to the Master Attendant and to the district officials concerned.

2. The Government desire that every assistance be given to the officers carrying out the surveys.

(True Extract.)
E. F. WEBSTER,
Acting Chief Secretary.

To the Master Attendant, Madras, with one enclosure.
" Collectors concerned.
" Public Works Department.
" Resident in Travancore and Cochin.

ENDORSEMENT—dated 27th July 1883, No. 394, Marine.

Copy to the Director of Indian Marine.

E. F. WEBSTER,
Acting Chief Secretary.

Exd. J. Wright.

Govt. of {1883} Madras.

MARINE.

Issued

Recd. *Encl.*

G.O., &c., 27th July 1883,
Nos. 393, 394.

No. 2192 dated 9th August 83

JULY.

Communicated to
S. Es Concerned in view to
every assistance required
being given to Survey Officers

Secy to Govt
Mar Dept

Secs 1st & 6th Circles

Indian Marine Survey Department.

Communicating to the Master Attendant and to the district officials concerned the programme of work for the — for the season 1883-84.