M.R.O. 1—77,506—8-6-37.

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CONCERNS BOTH BRITISH INDIA
AND INDIAN STATES.

MADRAS RECORD OFFICE.

Government of Madras.

Public Works **DEPARTMENT.**

G.O. No. 1687-88 Press ~~Mis.~~

437-439

Dated 30- 6. 1873.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department, 30*th June* 1873.

No. 437. Read the following letter from Major W. CHRYSTIE, R.E., for Secretary to the Chief Commissioner of Mysore, Public Works Department, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Bangalore, 26th May 1873, No. 1,030:—

In reply to your communication, No. $\frac{1203}{485}$ of the 28th ultimo, proposing that the Mysore Government depute its Engineers to plan and estimate for the following bridges—

(1.) Over the Honnavully stream on the track between Collegal and Yellandur.

(2.) Over the Benhutty stream on line from Coloor Ghaut, *via* Jaula and Avinhully to Sagur.

While the Madras Government proceed similarly with reference to the bridges—

(1.) Over the Mavinholla on the Sultan's Battery—Goondulpett road.

(2.) Over the Lukshimpura stream on the line connecting Coloor Cuttay with the Coloor Ghaut;

and that the officers of each Government shall carry out their own designs after approval by their own Government, the functions of the other Government being simply to provide its share of the requisite funds without responsibility for the design or execution of the works in charge of the officer of the other Government.

I have the honour, by desire of the Officiating Chief Commissioner, to state that this arrangement has his entire concurrence, subject, however, to the proviso that, subsequent to the adjustment of their respective moieties of the bills for first construction, neither Government be called on to make any payment for future re-construction, restoration, addition or repair of the bridges in question.

2. The Local Administration, I am to intimate, will be prepared to furnish the Government of Madras with the amounts of estimates for both the works falling to its share in time for entry in the Budget of 1874-75.

3. With reference to the bridge over the Mavinholla, payment of the moiety falling to this Administration can at once, if necessary, be met, and may, indeed on other accounts, be more conveniently made within the current official year than later.

4. As regards the proposed bridge over the Lukshimpura stream, the payment will, in any case, have to be deferred till 1874-75, and, in the meanwhile, the Officiating Chief Commissioner is most desirous that a definite conclusion should be arrived at with reference to the site for the work, either by the Madras Government accepting finally the present one with its acknowledged defects, or by adopting such arrangements as will allow of the Range Officers on both sides meeting at the earliest possible date after closure of the monsoon, (the present working season is now too far advanced for convenient arrangements to be made,) of their inspecting the alternative sites with lines of approach, and sending in a joint or separate report as may be deemed most convenient.

5. The present termination of the road on the Mysore side was adopted simply with a view to join on to the Madras line, and nearly Rupees 16,000 has already been laid out in forming road and in constructing bridges and drains: any such radical change of site (some 4 miles to the south) as that suggested by Mr. Assistant Engineer Pringle, must, I am to observe, prove extremely expensive

to Mysore, however advantageous such change might appear as viewed simply from the Madras side. The change might indeed involve so large an extra outlay to Mysore as to render it matter for serious consideration whether, with the other pressing demands on its finances, it would be expedient to proceed at once wit' the additional work.

6. With reference to the longitudinal section of the line from foot of Coloor Ghaut to Lukshimpura, which it appears cannot be furnished, I am to explain that as the object in view was to ascertain, on reliable data, the nature of the difficulties with which wheeled traffic would have to contend, and thence to allow of this Administration determining the standard to be adopted in finishing the line in Mysore, that object can be equally well met by your obligingly stating what is the maximum gradient to be eventually worked out on the ghaut and its approaches; also the general character to be given to the road-way.

7. As observed in paragraph 4 of your letter under reply, the Coloor Ghaut and roads above and below it within Madras limits were no doubt intended to be laid out with a maximum gradient of 1 in 16, but I am to observe that, as now existing, the uppermost portion of the ghaut has for some distance gradients varying from 1 in 10 to 1 in 13 and 14, and that in other portions there are gradients from 1 in 13 to 1 in 15.

8. On the branch line, moreover, leading northward to Benhutty, and which the Mysore Government are desirous of continuing to Avinhully and Sagur, the Chief Engineer on his tour of inspection last January found gradients of 1 in 4 and 5 at one place, 1 in 8 and 9 at another, and a long portion with gradients varying from 1 in 11 to 1 in 13. Also that the road was merely cut out of the earth of the hillside without formation, gravel, or drainage, there in fact being but one small temporary bridge the whole way.

9. As regards the road on the Mysore side from Lukshimpura (although this trace is not approved by the Chief Engineer, during whose absence in Europe it was adopted,) the maximum gradient will be 1 in 17, and can, if necessary, be improved at no very great cost to 1 in 19 or 20. The roadway has a clear width of from 16 to 18 feet, gravelled where necessary. There are 23 bridges and drains varying from 20 feet span to 4 feet, constructed of laterite in mud, many now finished, and most of them far advanced. The two large rivers (the "Sootha" and "Kodachi") which cross the line must for many years to come be left without bridges, although good causeways with easy approaches on each side will be provided. In addition to these there is only one stream (known as bridge No. 12) which may have to be left over next working season, but where an easily traced temporary siding will be made.

10. Under these circumstances, this Administration can guarantee the opening of the line as above indicated by next February or March, and it would be desirable to know if the road on the Madras side will be equally well advanced.

11. On the northern approach to the Coloor Ghaut from Benhutty to Avinhully and Sagur, no work has as yet been carried out on the Mysore side, but there is no very serious difficulty to cart-traffic (most of the line now followed is indeed perfectly easy) excepting at the crossing of the river at Hassermogay, some

six miles north of Benhutty, and for dealing with which an item stands entered in the District Fund Budget of the current official year. The regular opening of this line as a fourth class road will, I am to state, be taken up so soon as the available means admit.

12. From Coloor Cuttay to Anantipore the line is very far advanced, and will, it is hoped, be completely finished as a 4th class road (it is now quite traversable by carts) at the same time as that from Lukshimpura to Coloor Cuttay. From that point also a new line has been traced through Codoor and Benavully to Aynoor, and is being estimated for with a view to entry in next Department Public Works Budget. From Aynoor excellent roads already exist to north-east through Namptee and west through Shemogah, and communicating with all points of the country.

13. From the above it will be observed that the lines of approach to the Coloor Ghaut on the Mysore are equally well if not better advanced than on the Madras side, and the Officiating Chief Commissioner desires me to say that there need be no anxiety on the part of the Madras Government that the money required for working out the Hyderghur Ghaut (a considerable portion of which though in the territory of the latter is being carried out with the funds of this Province) has intefered or can in future interfere with the formation of suitable approaches to the Coloor Ghaut.

14. The subject of constructing a very complete system of roads throughout the Nuggur Mulnad (in addition to the old standing lines) has received the fullest consideration of this Government, and as its full development cannot fail to prove of the greatest importance to the Madras territory below the ghauts, I am to forward the accompanying printed collection, which forms a sequel to that already sent under this office No. 4,778 of 28th July 1869, and fully explains the objects in view.

15. In conclusion, I am to observe, with reference to the impracticability as reported (in the accompaniments to your letter under reply) by Mr. Pringle of making a temporary roadway from the ford at Lukshimpura in the manner previously indicated by the Chief Engineer, that there must be some misapprehension on the part of the Assistant Engineer, as Colonel Sankey last January had a perfectly easy approach traced under his own inspection, and which at any time can be pointed out either by the Executive Engineer of Nuggur or by his Assistant.

No. 438. ORDER THEREON, 30th June 1873, No. 1,687.

CIVIL WORKS, No. 29.

HIS Excellency the Governor in Council receives with satisfaction the assent of the Chief Commissioner of Mysore to his proposal made in letter No. 1,203, of 28th April, for co-operation in the work of facilitating communication between the interior and the seaports. But the proviso added to that assent will require certain modifications in the interests of the different Local Boards concerned.

2. The information promised as to the amounts to be provided for bridging the Honnavully stream between Collegal and Yellandur, and the Benhutty stream

on the line from the Coloor Ghaut *via* Jaula and Avinhully to Sagur, will be forwarded to the Coimbatore and South Canara Local Boards when received. The Executive Engineer in charge of Wynaad will submit plan and estimate for the Mavinhully bridge on the Sultan's Battery, Goondelpett road; and the District Engineer of South Canara for the Lukshimpura bridge on the Coloor Ghaut, Coloor Cuttay line, in the usual course. It is observed that the contribution of the share of the Mysore State for the former is immediately available. The present junction of the Mysore and Canara portions of the road above Coloor Ghaut will be adhered to for the Lukshimpura bridge site. It will be intimated to the Mysore Government that the South Canara Board will probably not be prepared to pay for the Lukshimpura and Benhutty bridges simultaneously, as benefiting one main line of communication which they cannot provide for the exclusion of other claims. But that they will be requested to have the branch line to the latter taken in hand meanwhile, its trace remodelled, and the cost of opening it for traffic ascertained.

(Here enter No. 1,688, dated 30th June 1873.)

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government.

To the Financial Department.
" District Engineer, Coimbatore.
" " Malabar.
" " Canara.
" Executive Engineer, Wynaad.
" Inspecting Engineer for Communications.
" Controller of Public Works Accounts.

Exd. S. T. Austin.

Spare Copies.

PUBLIC WORKS.

PUBLIC WORKS DEPARTMENT,
OOTACAMUND, 30*th June* 1873.

No. 439.

No. 1,688.

FROM

COLONEL G. W. WALKER, R.E.,
Secretary to the Government of Madras,
Public Works Department.

To

THE CHIEF COMMISSIONER OF MYSORE.

CIVIL WORKS, No. 30.

SIR,—I am directed to acknowledge your Secretary's letter No. 1,030, of 26th May, and in intimating the satisfaction of His Excellency the Governor in Council at your acceptance of his proposition for facilitating the communication between Mysore and the Western Ports, to state that the proviso with which such acceptance has been qualified requires modification in the interests of the several Local Boards concerned. For instance, it would have the effect of saddling the Malabar Board for ever with the entire up keep of the Mavinhully bridge while the Coimbatore Board would be for ever free of expense in connection with the Honnavully stream. It would be more consistent with the original proposal to arrange that each bridge should remain under the sole charge of the agency which constructed it; whatever expenditure might be required for re-construction, restoration, addition or repair being planned and carried out by the same agency; on whose estimates and bills half the actual costs incurred would be paid by the other Government concerned.

2. Plans and estimates for the Mavinhully and Lukshimpura bridges have been called for; the latter at the present junction of the Mysore and Canara portions of the approach to Coloor Ghaut from Coloor Cuttay, as requested by you. As the former bridge will probably be constructed of iron girders, the contribution of the Mysore State (which it is supposed will be under Rupees 6,000), promised in the current year, will be conveniently applied to the purchase of the necessary materials in England, and that of the Madras Government to their erection at a date not later than 1874-75. It is not probable that the South Canara Board will be prepared to pay for the Lukshimpura and Benhutty bridges simultaneously, as both benefiting the same main line of communication, while they may have other claims to meet. But they have been requested to have the short branch line to the latter taken in hand, its trace remodelled, and the cost of opening it for cart traffic ascertained.

3. With reference to paragraph 6 of your letter under reply, I am directed to state that 1 in 16 is intended as the maximum gradient to which the Coloor Ghaut and its approaches should be worked out; that the width of the roadway shall be 18 feet, and its surface formation of the laterite gravel generally met with along the line. More expensive metalling does not appear to be called for on roads which are not likely to be much used in the monsoon, the ports to which

they lead being closed in the rains. As before remarked, these lines were laid out and opened for dry weather use a quarter of a century ago; and the inaction of the Mysore State with reference to their extension inland has hitherto deprived this Government of all inducement to work out the imperfections which may here and there occur; but which will doubtless be attended to when the assured prospect of increased cart-traffic calls for such action.

4. I am directed, in conclusion, to observe that His Excellency the Governor in Council has received with interest the additional information furnished as to the lines of traffic through the Nugger Division of Mysore, and the proposals for opening the communication along them for carts, whereby the crying want of that large tract of country will be supplied. The subject of dry weather approaches to the ford of the Lukshimpura river is one that may be left to be duly provided for in correspondence and personal communication between the local agents of the Public Works Department, on each side.

I have the honour to be,

Sir,

Your most obedient servant,

(Signed) G. W. WALKER, Colonel, R.E.,

Secretary to Government.

Exd. S. T. Austin.

Spare Copies.

PUBLIC WORKS

JUNE
No. 435

No 1030.

Mysore Chief Commissioner's Office
Public Works Department.

To

The Secretary to Government
Public Works Department
Fort Saint George.

Sir,

In reply to your Communication No $\frac{1203}{455}$ of the 28th ultimo, proposing that the Mysore Government deputé its Engineers to plan and Estimate for the following Bridges.

(1) Over the Hounavally stream on the track between Collegal and Yellandur

(2) Over the Benkitty stream on line from Coolcor Ghaut viâ Jaula and Avinbully to Sagur

while the Madras Government proceed similarly with reference to the bridges

(1) Over the Mavinhalla on the Sultan's battery - Goondulpett road

(2) Over the Lukshmipoora stream

on the line connecting Coolsor Cutté with the Coolsor Ghaut; and that the Officers of each Government shall carry out their own designs after approval by their own Government, the functions of the other Government being simply to provide its share of the requisite funds without responsibility for the design or execution of the works in charge of the Officer of the other Government — I have the honor by desire of the Officiating Chief Commissioner to state that this arrangement has his entire concurrence subject however to the proviso that, subsequent to the adjustment of their respective moieties of the bills for first construction, neither Government be called on to make any payment for future reconstruction, restoration, addition or repair of the bridges in question.

2. The Local Administration, I am to intimate, will be prepared to furnish the Government of Madras with the Amounts of Estimates for both the works falling to its share in time for entry in the Budget of 1874-75.

3. With reference to the bridge over the Mavinhalla, payment of the moiety falling to this Administration can at once, if necessary, be met and may indeed on other accounts be more conveniently made within the current official year than later.

4. As regards the proposed bridge over the Lakshmipoora stream, the payment will in any case have to be deferred till 1874-75, and in the meanwhile the Officiating Chief Commissioner is most desirous that a definite conclusion should be arrived at with reference to the site for the work — either by the bridge

Government accepting finally the present one with its acknowledged defects, or by adopting such arrangements as will allow of the Range Officers on both sides meeting at the earliest possible date after closure of the monsoon, (the present working season is now too far advanced for convenient arrangements to be made) of their inspecting the alternative sites with lines of approach, and sending in a joint or separate report as may be deemed most convenient.

5. The present termination of the road on the Mysore side was adopted simply with a view to join on to the Madras line and nearly Rupees 6000 has already been laid out in forming road, and in constructing bridges and drains: Any such radical change of site (some 4 miles to the south) as that suggested by Asst Engineer Bungle, must, I am to observe, prove extremely expensive to Mysore, however advantageous such change might appear as viewed simply from the Madras side - The change might indeed involve so large an extra outlay to Mysore as to render it matter for serious consideration whether with the other pressing demands on its finances, it would be expedient to proceed at once with the additional work.

6. With reference to the longitudinal section of the line from foot of Cooloor Ghaut to Kubbaninpoora, which it appears cannot be furnished, I am to explain that as the object in view was to ascertain on reliable data the nature of the difficulties with which wheeled traffic would have to contend, and thence to allow of the Administration determining the standard to be adopted in finishing the line in Mysore, that object can be

equally well not by your obligingly stating what is the maximum gradient to be eventually worked on to the Ghaut and its approaches; also the general character to be given to the roadway.

7. As observed in para 6 of your letter under reply, the Coolcor Ghaut and roads above and below it within Madras limits, were no doubt intended to be laid out with a maximum gradient of 1 in 16; but I am to observe that as now existing, the upper most portion of the Ghaut has for some distance gradients varying from 1 in 10 to 1 in 13 and 14, and that in other portions there are gradients from 1 in 13 to 1 in 15.

8. On the branch line, moreover, leading northward to Bankutty, and which the Mysore Government are desirous of continuing to Avinhully and Dangor, the Chief Engineer on his tour of inspection last January found gradients of 1 in 6 and 5 at one place 1 in 8 and 9 at another, and a long portion with gradients varying from 1 in 11 to 1 in 16 — also that the road was merely cut out of the earth of the hill side, without formation, gravel, or drainage — there in fact being but one small temporary bridge the whole way.

9. As regards the road on the Mysore side from Lakshmipoora (although the trace is not approved by the Chief Engineer during whose absence in Europe it was adopted) the maximum gradient will be 1 in 17, and can, if necessary, be improved at no very great cost to 1 in 19 or 20. The roadway has a clear width of from 16 to 18 ft gravelled where necessary. There are 23 bridges and drains varying from 20' span to 4' constructed of laterite in mud, many now finished, and

most of them far advanced. The two large rivers (the "Sostia" and "Kodachi") which cross the line must for many years to come be left without bridges, although good causeways with easy approaches on each side will be provided. In addition to these there is only one stream (known as bridge No 12) which may have to be left over wet working season, but where an easily traced temporary siding will be made.

10. Under these circumstances, the Administration can guarantee the opening of the line as above indicated by next February or March, and it would be desirable to know if the road on the Mudras side will be equally well advanced.

11. On the northern approach to the Coolor Ghaut from Bonbitty to Avinelly and Sangor, no work has as yet been carried out on the Mysore side, but there is no very serious difficulty to cart-traffic (most of the line now followed is indeed perfectly easy) excepting at the crossing of the river at Vaseringoy, some 6 miles north of Benbitty, and for dealing with which an item stands entered in the District Fund Budget of the current official year. The regular opening of this line as a 4th class road will, I am to state, be taken up so soon as the available means admit.

12. From Coolor Cutte to Anantpoor the line is very far advanced, and will it is hoped, be completely finished as a 4th class road (it is now quite traversable by carts) at the same time as that from Lakshimipoora to Coolor Cutte. From that point also a new line has been traced

through Codoor and Devanelly to Agnoor, and is being culminated for with a view to entry in next B. P. Budget. From Agnoor, excellent roads already exist to North East through Manjeshwar and West through Kumbla, and communicating with all points of the country.

13. From the above, it will be observed that the lines of approach to the Coolcor Ghaut on the Mysore are equally well if not better situated than on the Madras side, and the Officiating Chief Commissioner desires me to say that there need be no anxiety on the part of the Madras Government that the money required for working out the Agnoor Ghaut (a considerable portion of which though in the Territory of the latter is being carried out with the funds of this Province) has interfered or can in future interfere with the formation of suitable approaches to the Coolcor Ghaut.

14. The object of constructing a very complete system of roads throughout the Nuggur District (in addition to the old standing lines) has received the fullest consideration of this Government, and as its full development cannot fail to prove of the greatest importance to the Madras Territory below the Ghauts, I am to forward the accompanying printed Collection which forms a sequel to that already sent under this Office No 4778 of 28th July 1869, and fully explains the objects in view.

15. In conclusion, I am to observe with reference to the impracticability as reported (in the accompaniments to your letter under reply)

No. 8.

NAGAR SUPERINTENDENT'S OFFICE,
CAMP SANTAWERI, 5th *April* 1872.

To

The Secretary to the Chief Commissioner of Mysore,
Public Works Department.

SIR,

The Chief Engineer lately informed me that the Chief Commissioner wished me to submit a complete report on the general course of trade in this Division, in connection with the existing and proposed ghâts, and also the Sringéri, Kalasa and Jágar valleys, and the Soraba Talook.

Being on the eve of leaving for England, however, I have been unable to do so, and even with more time have doubts whether much more information could be given than has already been afforded, unless very extended investigations were made. The trade returns are not reliable, and information has to be collected by tedious enquiries resulting only in approximation; but I am pretty confident that what has already been reported is sufficiently correct for practical purposes.

Modifications of my views will no doubt be found advisable; but the general outlines, I believe, represent the requirements of the country.

I have only therefore been able now to note down what seemed to me wanting in former reports, and have noticed briefly in succession.

	Paras.
The principal ghâts	2 to 13.
The approaches to them	14 to 34.
The minor ghâts	35 to 37.
The Kalasa, Jágar and Sringéri valleys and the Soraba Talook	38 to 48.

I have, &c.,
A. C. HAY,
Superintendent, Nagar Division.

MEMO.

1. So much has been already written on the subject of the Nagar roads, that the wants of the Division are now well known, and action rather than discussion is what is required. As however the Chief Commissioner has desired me before leaving to add to my former reports any additional information that I may have obtained, I shall do so, premising that further enquiry has confirmed me in the opinion that the general outline already laid down is substantially correct.

2. *Ghâts.*—In para 6 of Mr. Bowring's printed memo on the Malnád roads, eleven Passes are enumerated in the Shimoga District, and three in Kadoor. The Bhúnd ghât ought to be added, as it is of very great importance to the traffic of Kadoor, though the head of the ghât is in the Hassan District.

The ghâts actually constructed are, Gérsoppa, Kólúr, Augumbi and Bhúnd ghât; but the Hyderghar ghât has progressed so well, that it may soon be considered as a practicable outlet to the coast. The first question is the relative importance of these ghâts; and second, whether the inland communications leading to them are complete.

3. The first point can only be approximately established at present, as I believe that until all necessary roads leading to the heads of the ghâts have been fairly opened, the permanent distribution of the traffic through the final outlets at the edge of the precipices, cannot be thoroughly decided.

The object of all traffic is to get by as short a route as possible to the tidal streams, on which from time immemorial the Coast ports have been established; and a few facts illustrating the extent of trade at these depôts, will serve to give some idea of their connection with the table-land.

4. Owing to the separation of North and South Canara, the ports of these Collectorates are under Bombay and Madras respectively; and I think it hardly necessary to refer again to the traffic on the Gérsoppa ghât, after what has been already written on the subject.

the value of the quantity given as only that of paddy, which is lower than rice, it amounts to Rs. 16,875, making a total value of Rs. 1,41,215 in Mysore gram for the Kundápúr market. This value is however that of the grain at the price paid to the ryots, and 10 per cent should be added at least for comparison with the port trade returns.

The quantity of dál, gram, coriander seed, &c., brought to Haladi, cannot be worth less than between 30,000 and 40,000 Rs ; with tobacco, chillies, &c., estimated at 9,000 Rs. ; iron and steel at 1,500 Rs. ; 300 Rs worth of jaggory; and cloths Rs. 25,000. In all 65,000 Rs.

8. *Barkúr*—The value of the grain carried to Barkúr by Augumbi has been estimated at nearly the same as that taken to Haladi about Rs 1,40,000 or 1,50,000. The other articles are estimated at Rs. 21,000.

9. *Udapi*.—This place receives much less grain than either of the other two, as it is supposed that not more than $\frac{1}{4}$th of the quantity taken to Haladi and Barkúr is brought to Udapi. On examining the custom-house returns of these ports for eight years terminating in 1867-68, the total value of the imports and exports by sea for eight years is as below :—

	Imports.	Exports.
Kundápúr ..	9,33,419 ..	36,07,707
Barkúr ..	10,28,555 ..	37,56,006
Udapi ..	10,07,087 ..	17,08,139
In 1868-69 they were—		
Kundápúr ..	1,37,791 ..	6,38,029
Barkúr ..	2,06,333 ..	8,74,060
Udapi ..	2,19,843 ..	2,77,253

It is pretty clear from this that, as a market for export produce, Udapi is of less importance than the other two. The value of the Maidán produce, such as is described above, taken to Udapi by Augumbi, is given at about Rs. 17,000.

10. The trade of Mangalore by sea in 1868-69. is stated to have been—

Exports.	Imports.
Rs. 44,97,080	Rs. 24,54,717

But it is more difficult to guess the approximate value of the trade of Mangalore with this Division, than that of the smaller ports mentioned above, as the traffic returns on the Augumbi Ghát do not shew the destination of the article, and I have no information regarding the Bhúnd or other ghats communicating with the ports.

In the year 1800 an estimate was made by the Collector of the inland exports and imports, which he valued at—

Vide Buchanan, Vol. II.

Exports Inland.	Imports from Inland.
Rs. 81,552	Rs. 1,50,220

The value of the trade by sea according to the custom-house returns of that year was—

Exports.	Imports.
Rs. 6,87,708	Rs. 3,37,844

In round numbers, it seems that the trade in 1800, compared with 1869, may be taken at—

By Sea.	Exports.	Imports.
1800 . .	7 Lacs ..	to $3\frac{1}{2}$ Lacs; or 2 to 1.
1868—69 . .	45 „ ..	to 25 „ 9 to 5.

As the total value of the trade of the port in 1868 was Rs. 69,31,797, against Rs. 10,27,552 in 1800, it is now about 7 times as valuable as it was 70 years ago, without any very material alteration in the relative value of the export and import trade.

11. The population of South Canara has risen from 3,96,672 in 1800, to 8,39,688 ; and when the increased facilities of inland communication, and development of agriculture and commerce are remembered, it is not too much to suppose that the inland traffic has increased in much the same proportion as that by sea, and that it must be worth 16 or 17 lacs. Judging by the value of the single item of coffee imported, I should say it was much more.

The late Secretary to the Revenue Board, Madras, kindly gave me a memo, shewing the principle articles of export and import from Mangalore, and the other ports of South Canara, among which are included five small ports in addition to those I have mentioned, and which I need not refer to.

Among the exports [illegible] the most important [illegible] coffee, the value of which [illegible] Mysore [illegible] was [illegible] valued in 1868 at Rs. 11,51,137 of which Rs. 29,000 [illegible]

I may proceed to [illegible] Mysore and Canara trade to the minor ports there mentioned at—

	Rs
Bindúr	75,000
Kundápúr	1,14,245
Barkúr	1,13,000
Udapi	56,150
	Rs. 4,00,395

Of the above [illegible] the grain exported from all ports in South Canara except Mangalore, Mysore produce passed almost entirely through Mangalore with the exception of a small portion from Augumbi which I do not [illegible] The only other port between Udapi and Mangalore is Mulki, to which I do not believe any Mysore produce is taken. I shall hereafter show the total of trade taken to these ports.

No.	Ports.	Grain for export	Other produce for consumption or export.	Total.
1	Paidúr	75,000	44,100	1,19,100
2	Kundapúr	1,14,245	65,000	2,09,245
3	Barkur	1,13,000	21,000	1,66,000
4	Udapi	56,150	17,000	53,150
	Total Rs.....	4,00,395	1,47,100	5,47,495

12. Assuming these figures to be correct as a rough approximation, the conclusion which I have formed is, that it is necessary for the grain trade of North Canara and direct communications should be opened and maintained between these ports and the country above the ghâts, but especially between Nos. 1, 2 and 3.

Referring to para 6
Baidur benefits by Kolúr and Hyderghar.
Kundapur by Hyderghar Ghát and Augumbi.
Barkúr by Augumbi
Udapi by Augumbi.

The Yennahole road is no doubt in many respects very defective. The gradients are steep, and it [illegible] be much improved, and the expense of [illegible] considerable, but by consulting the map it will be seen that the portion commands Udapi, Parkur and Haladi, the aggregate trade of which amounts to Rs. 3,00,000, out of the total of Rs. 5,47,000.

It cannot [illegible] what effect will follow from opening the Hyderghar Ghát, but it is possible that the trade to Haladi may be partially diverted, and if a new ghát were ultimately opened at Kemmanagundi, part of the trade to Udapi might be drawn into it, thus reducing the Augumbi traffic. But at present the ghát must, from its situation, be accepted as one of the most valuable outlets to the coast.

13. Before [illegible] to Mangalore I must point out that generally, the principal trade of Nagar with South Canara comes to the coast practically to all intents and purposes by two divisions. One embraces the trade with all the country to the south of a line drawn from Udapi to Augumbi Ghát, and the other the trade from Mangalore and the neighbourhood to the Bhúnd Ghát. From Agumbi to Jamalabad, the road, descent to the coast is by the impracticable Kemmi or Mohmad Ghát and consequently there is practically no traffic.

It will also open the country above the ghâts to the now inaccessible tract lying between Udapi and Mangalore, containing the port of Mulki, the trade of which is—

Vessels.	Tonnage.	Value of—	
		Export.	Import.
781	10,817	3,18,171	65,472

If this were done, a grain trade might possibly be created; for Haladi is quite a modern market, dating from the opening of the Augumbi Ghát.

Mangalore however supplies a quantity of useful articles to the Malnád and Shimoga, consisting of English cloths, rod and bar iron, cutlery, and a variety of other things, the use of which is rapidly spreading among the population.

14. I shall now proceed to remark on the approaches to the ghâts.

Approaches to the Ghâts.

Gérsoppa.
Kólúr.
Hyderghar.
Augumbi.
The Bhúnd Ghát.

Gérsoppa.—Very little need be said about Gérsoppa.

The principal approaches to it from North Canara and Mysore have either been completed, or are in progress; and provision has been made in the Local Fund Budget for connecting Siddápúr with Soraba, thus closing the gap now existing between the coast and Sirálkoppa, from which also a local-fund road will be continued to the Dhárwár frontier.

15. It has to be borne in mind, that the roads leading to the head of the ghâts are not merely communications for traffic with the coast beyond, but that they are the main arteries of the Malnád, by which its produce is carried away, and by which the inhabitants obtain in return much of what they require.

All the ghâts including even the minor passes from Augumbi to Gérsoppa, are essential for the Malnád grain trade; but inland communications are as necessary, and in some places more so, whence it follows, that however advantageous it may be to open ghâts, it is indispensable that the inland communications should be completed also. For instance, the whole of the supári of the Malnád is carried inland; and though the grain trade to the coast is extensive, the returns are chiefly in money spent in buying articles imported from the Maidán.

16. Sirálkoppa has been connected with Ságara. Communication should be opened between Ságara and the Kólúr Ghát without delay, and the road from Kúlúr Katte to Nagavádi finished.

Kólúr Ghát.

17. This ghát should be connected with Ságara, Shikáripura, and Ainúr, by roads probably converging to Kólúr Katte. I have in former letters given reasons for advocating the two latter lines, but I find that I under-estimated the importance of the line from Ságara to Kólúr Katte; for I heard this year in Nagar, that Ságara would certainly become one of the depôts for the supply of the Nagar Talook, and a great desire was expressed for a road in this direction.

Hyderghar Ghát.

18. I have no doubt that when these ghâts are fully opened to the plain country, a great stimulus will be given to the trade in articles other than grains from the talooks at the head of the ghâts.

By the estimate made above, the value of grain carried to the ports, as compared with other produce, is—

Grain.	Other Produce.
Rs. 4,00,395.	1,47,100.

The reason is, that the cost and risk of carrying anything but grain from the immediate neighbourhood on bullocks, is very nearly prohibitive; and consequently there has hitherto been no trade of these descriptions on the Hyderghar ghát.

B

Kundápúr and the adjacent country being largely supplied by sea from Kumpta, it seems also likely that an import trade in European articles, such as are now taken from Mangalore to Thathalli, will arise between Kundápúr and Nagar, for pepper and betel from Bindúr by Pattanam are very cheap; and it is reasonable to expect that traders will find the advantage of supplying the Nagar and neighbouring talooks from the nearest seaport. At present Thirthahalli is the general depôt for both Maidan and coast trade. Standing as it does on the most practicable line, and intermediate between the Maidan and Canara, it has been created, and has thriven by a monopoly of position, which has enabled it to diffuse throughout Koppa, Kávaledurga, and part of Nagar, the imports from the Maidan on one side, and the coast on the other. A few years ago there were only a few Bunniahs' houses and one or two shops; now, the trade is valued at Rs. 1,60,500, the details of which are given in the margin; and men whom I recollect as keeping small booths, have now large bazars. One of them told me that he sold Rs. 50 worth of things daily, and among his annual sales 500 English rat-traps were included. I have also twice seen ten or twelve carts loaded with glass bangles from Madras, articles which have only been imported since the roads were practicable for carts; and the importation of brass and copper vessels from Hoobly, Dhárwar, &c., is rapidly increasing, as there is a steady demand for them; earthen boxes for sapán, &c., being gradually superseded. If similar markets were established at other points in the Malnad, the advantages would be very great; and I hope that Nagar, Yedahalli and Sringeri will, at some time or other, be developed into trading towns of this character.

		Rs.
Rági	... ...	2,000
Dál	... ...	1,500
Wheat	.. ..	1,500
Vuddu	.. ..	1,500
Hesaru	... ...	3,000
Kadle	.. .	
Ghee	. ...	1,500
Sweet-Oil	... .	6,000
Castor-Oil	... ..	4,000
Chillies	. ..	2,000
Tamarind	.	1,050
Salt	... ...	3,000
Cocanut Oil	... ...	1,000
Cocanuts	... .	1,000
Dry Cocanuts	.	1,000
Karjúr and Gér bija	.	1,000
Sugar Candy	...	
China Sugar		
Dry Grapes	..	4,000
Cloves, Nutmeg, &c.		
Mustard, Coriander, Fenugreek		
Assafœtida		1,000
Piece goods	.	5,000
Chintz, Cambaie and Long Cloths		2,000
Cumblies	... .	4,000
Brass Vessels	. .	8,000
Tobacco	... ...	2,000
Bale (Bangles)		500
Total		1,60,500

19 An additional approach to the Hyderghar ghát will be required through the Yedúr Mágam, the line most desired by the people; there is one running close by Kávaledurga towards Agra. This approach should be linked on at the most favorable point with the present main-line, somewhere near Thirthahalli, where the Hyderghar ghát will be in complete communication with the southern Mahratta country and the Maidan talooks of this Division.

20. This ghát is of such importance that if its maintenance is extravagantly expensive, I think an examination should be made whether a better line cannot be found by following up the course of the stream at Augumbi, and descending by the valley of the Sita.

Augumbi Ghát.

21. The approaches to Augumbi are very defective; the line from Shimoga is badly laid out, and in the 12 miles nearest to Augumbi, there are some very abrupt and severe gradients.

22. The approach from Taríkere is impracticable during greater part of the year, owing to the Tunga and Bhadra which are unbridged; so that even on this ghát opened now for so many years, traffic has not had a chance of full development, and is most obstructed in the direction in which facility of communication is urgently required, not only for the ghát traffic, but for the Talook of Koppa and great part of Lakkuvalli.

23. The Tunga and Bhadra cross the country diagonally from their sources to the points at which they are now bridged, *viz.*, Benkipura and Shimoga.

There is no possibility of evading them; and as obstacles to general traffic, nothing else is at all to be compared to them. They are impassable for months, and the ford of the Bhadra even when the river is low, is so rocky, that carts can scarcely be taken over with safety.

24. For this reason, traders from all sides elect to go round by Shimoga to Augumbi; Koppa is thus supplied by Thirthahalli and even Lambánis carrying away supári, avoid the ford in the made-road and cross the Bhadra between Lakkuvalli and Benkipura.

Shimoga, Benkipura, Taríkere, Bírúr, Chikkamagalúru, and Aldúr, are 5 points in a semi-circle enclosing this tract, through which trade is directed from the circumference of the larger circle of the Maidán talooks of the 3 districts, and the still more remote fields of Dharwar, Bellary, &c.; and except the new line from Aldúr by Basavanakóte, all roads leading to Koppa would tend to unite at Yedahalli. A perfect system of communications would therefore be—

1. Shimoga to Yedahalli.
2. Benkipura to Yedahalli.
3. Taríkere to do.
4. Bírúr to do. *Viâ* Lingadahalli.
5. Chikkamagalúru to do. *Viâ* the valley of the main stream flowing through Jágar.

But if every one of these, as well as the new Basavanakóte road, were made, communication would be less facilitated than it would be if the rivers were bridged—nothing is stronger than its weakest part; and so long as the rivers remain nearly impassable, communication is interrupted, and traffic brought to a stand still.

25. On the contrary, with these rivers spanned, traffic could reach Yedahalli from every point I have named without stoppage, though by rather longer routes than if the system of roads were complete.

26. Mr. Bowring, in the memo to which I have referred, points out that these works are the great want of the Kadoor District; and I would therefore urge that they be recognized as 1st class public works to be undertaken at the earliest possible date, as I feel assured that they will prove of incalculable benefit, and will remain among the best and most lasting memorials of British Administration that could be bequeathed to the country.

27. *Bhúnd Ghát.*—This is now being improved; and the main line from Chikkamagalúru will be partially retraced and the bridges completed.

Bhúnd Ghát.

28. Taking Chikkamagalúru as a terminal point, there are in addition, four sources from which coffee, the principal export, can fall into the main line.

1. From the Kalasa Valley.
2. From the outlet of the Basavanakóte road at Aldúr.
3. From the Jágar Valley.
4. From the Aunúr by the branch road from that place leading to Wastára.

The 2nd and 4th of these are already provided; and the Chief Engineer has lately made an examination of the Kalasa valley and the neighbourhood of Kelgúr. I do not know the neighbourhood well enough to be able to give any useful information; but an outlet here is necessary and should be made.

29. The third line I consider a very important one, as not only opening up Jágar to the Bhúnd ghát, but also to Chikkamagalúru, and connecting the latter place with Yedahalli.

30. The quantity of coffee halated at Chikkamagalúru during an average year, is 20,798 maunds, of which, 15,599 maunds are produced on the Chikkamagalúru side of the Bábábudens.

31. The Lakkuvalli Talook produces 42,861 maunds, of which, 30,879 pass over the Bábábudens, and 2,177 maunds emerge, *viâ* Sirvási, crossing the main stream of Jágar, a short distance above the remarkable gorge by which the stream enters the valley.

By Attigundi	...	25,801
By Sítalmallappana Kanave	...	5,078
		30,879

Of the total quantity of coffee produced in the Kadoor District, which amounts to 1,40,000 maunds, 77,560 maunds are estimated to be exported by the Bhúnd ghát, and the rest to Bangalore.

32. Taking Yedahalli as a starting point, a road should be made *viâ* Hebba up the course of the stream to the gorge, from which two lines should bifurcate, one to Chikkamagalúru, and the other to fall in with the Bhúnd ghát line.

33. By this means the Jágar coffee destined for the Bhúnd ghát could be exported direct without having to surmount the Bábábudens; and a great deal of what is now taken to Chikkamagalúru by the steep passes to Attigundi and Sítalmallappana Kanave, would follow the same route.

34. The road would be of great importance in connecting the Sub-Division of Yedahalli with Chikkamagalúru and admitting to the Jágar valley supplies of every description required by the inhabitants, and by coolies and others collected there in the crop season.

35. The minor ghâts north of Hyderghar have been fully described in the previous correspondence; and considering their local value to the country at the head, they ought not to be neglected. Mr. Bowring proposed that an annual maintenance allowance should be given to keep the old tracks in repair; but in my opinion very little good would come of this. It is most difficult to ensure the proper expenditure of the money, and no permanent good would result, as the money is spent, not on improvements, but in repairs. The Collectors of North Canara have always evinced a wish to co-operate in improving the Hannigundangerri and Hogawádi ghâts; and I think it very desirable that a definite scheme should be concerted for the appropriation of a regular sum annually by Mysore and North Canara.

Minor Ghâts

36. This might be done by a fixed allotment from the local funds of Ságara, Nagar, and Anantapura, the talooks which benefit by these ghâts; and I think that instead of scattering the expenditure over three or four ghâts, one should be selected and a good trace worked out.

37. It is only necessary that the ghât should be easy for bullocks, and the cost would be less in consequence. At Goudengherri, the present ghât ought to be entirely abandoned and a new trace taken down the valley which winds round the drong. I enclose the last letters *on the subject from the Collector of North Canara with my reply.

*From Collector of North Canara, No. 859, dated 20th May 1868.
To Collector, No. 95, dated 16th June 1868.
From Collector, No. 323, dated 15th February 1869 (in original.)

38. I was desired to make any remarks I considered necessary, regarding separate systems of communications in these localities

Soraba Talook.
Kalasa.
Jágar.
Sringéri.

39. The Soraba Talook roads have been reported on in the Local-Fund Budget of 1872—73; and as the funds of the talook are large, and the principle of appropriating them to the talooks where they are raised, has been adopted, the necessary roads will be provided in a few years on the representations of the District Officers.

40. The Kalasa valley is much shut in, and it can never be a thoroughfare for general traffic. I have not been there since my last report on the roads of the Kadoor District was written, and cannot add any thing to what I have already said.

41. The first requirement of Jágar is the construction of the line mentioned in my para 24, connecting Yedahalli and Chikkamagalúr; and it is difficult to say what should be done afterwards. The proposed line is popular with the native coffee growers and merchants, as a ghát leading directly from Chikkamagalúru over the Bábábudens to Jágar by Attigundi, which would be very expensive and require careful examination before it was undertaken.

Jágar.

42. The Sringéri roads need great attention both on account of the engineering difficulties of the country, and because it is possible hereafter, that one or more of the roads through the inám may become Import thoroughfares.

Sringéri.

43. The town of Sringéri must be considered as the centre; and of the roads radiating from it, the line to Bágar should be pushed on, as it has been traced and is already coming into use. Fifteen carts this year reached Sringéri by the trace, and most of them were from Mangalore.

44. Having explained above that Yedahalli is the point to which the general traffic of the open country will converge, that hereafter there is a probability of a ghát to Mangalore being required at Kerra, and that the Augumbi ghát either in its present, or in an improved form, must be kept up,—it is almost superfluous to point out the necessity of so selecting a site for bridging the Tunga, that the bridge will serve both these last lines.

45. This is almost exclusively an engineering question; but from a cursory examination of the country, and from the information given me, I should strongly recommend that a survey be made from Kánúr bridge, direct to the Tunga, as the Koppa ghát would be thus avoided. The general direction mentioned to me is through the limits of the villages on the margin.

Kánúr.
Rabbimgada.
Jág. Maldi.
Hatti Kúm.
Vishnathpura.

46. The Sringéri people moreover prefer a line from Sringéri to such a point rather than one to Hariharapura, as it would come into immediate use for carts, and open up the town both to Bigunzi and Allagéshvar by the new road and to Hariharapura by the unfinished but practicable track from Hariharapura to Augumbi.

47. In the settlement of the Sringéri inám, by the Inám Department, some final decision should be come to regarding the liability of the inám for roads running through its limits. It was considered by the Matt that the imposition of local-funds was derogatory to the dignity of the Swámi; and rather than pay, the Matt agreed to construct the roads that might be determined by Government.

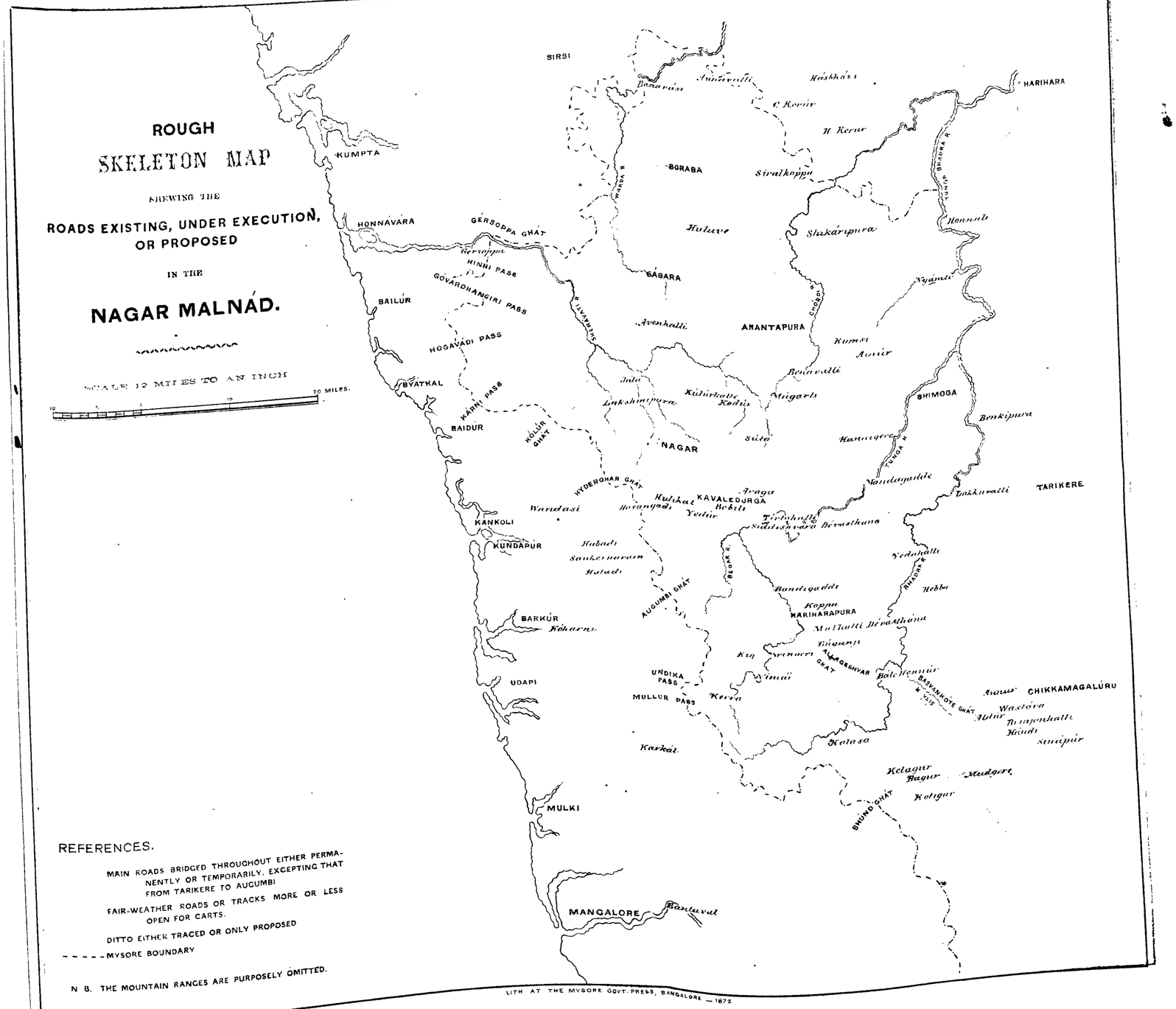
48. But this is a somewhat indefinite arrangement; and it might be advisable to stipulate for the payment of local-funds by the Matt under a guarantee that they should be expended entirely on the Sringéri roads, as the inám is large enough to be regarded as a separate talook entitled to the whole of the funds raised within its limits.

49. I believe the above includes all that I can say with benefit on the subject. The relative allotment of funds from provincial revenue or local-funds for the various works required, is a matter which will have to be determined, and which for want of time I am now unable to enter on.

50. The Hyderghar ghát so greatly wanted in the Shimoga Malnád having happily been undertaken, and having been worked out so admirably as to give promise of its being the best pass in the whole range of the Western ghâts, I hope that the requirement of the Kadoor District will now attract equal attention, and that the bridging of the two rivers may soon be decided on.

51. There are two matters indirectly connected with the subject of roads to which I may as well allude.

One is the necessity of recording traffic tolerably correctly on all the ghâts, which is a very easy matter, if a small establishment be allowed, and is a step which would very much facilitate all enquiries regarding the use made of the routes.



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The other is, whether or not it is advisable to introduce tolls. A large sum is raised in the Bombay Presidency by tolls on roads and ghâts; but from the information I have received from the Collectors of Dharwar and North Canara,* it is evident that the establishment of tolls on roads in the open country is attended with great abuses as regards evasion and extortion. Equally strong objections however do not appear to tolls on ghâts; and it seems to me a very legitimate method of raising special additional funds for their repair, and that tolls on expensive bridges may also equitably be demanded.

* Enclosed are copies of the letters received to (name illegible) Collectors of Canara and Dharwar, No. 537, dated 12th February 1872, from Collector of Dharwar, No. 553, dated 16th March 1872.

52. This is the view taken by the Madras Government in their Proceedings in the Financial Department, No. 377 of 26th March 1872, on the Provincial Budgets of 1871—72 and 1872—73.

53. The Collector of Dharwar states that he proposes a cart-tax for the District—a tax which has lately been generally introduced into Mysore; and it appears to me that the proceeds of this might with great propriety be added to the local funds of each District.

(Signed) A. C. HAY,
Superintendent, Nagar Division.

Note by Lieut-Colonel Sankey, R. E. on Major Hay's Memorandum on the Course of Trade in, and the requirements of, the Nagar Malnád.

In the accompanying memorandum, forwarded under cover of his No. 8 of the 5th ultimo, Major Hay has, on the eve of his departure for England, and at the special request of the Chief Commissioner, reported the results of his further enquiries into the general course of trade in the Nagar Malnád: and it cannot be otherwise than satisfactory to find that his present conclusions, in the main, confirm the scheme for opening that much neglected portion of Mysore, as projected after the discussions of 1867-68.

2. For the sake of clearer elucidation, I append a skeleton map of Nagar, with the roads existing or in progress clearly distinguished from those which are traced ~~or only proposed.~~ Under the latter category I have included some lines which were mentioned to me personally by Major Hay as desirable, (though not given in his present memo), and one or two others, particularly in the Kalasa district, which will probably at some future day have to be worked out. I also append a table of heights above sea-level of various places in the same tract of country, calculated from aneroid observations made during my tour of inspection last January and part of February.

Appended Map and ~~Table of Heights~~

3. The scheme taken as a whole, it must be confessed, is a most formidable one, involving as it does in many instances, the construction of what are practically ghát roads through an extremely mountainous country, for the most part covered with jungle, intersected by deep ravines and paddy flats, with streams which if left unbridged must bar all movement throughout a great portion of the year, with a population so sparse that it is unable to afford supplies of labor, and lastly, with a climate of a notably feverish character.

4. Since serious attention was first drawn to the crying wants of the Nagar Malnád, where, as well observed by Mr. Bowring, "roads are as vital a matter as are irrigation works to the plain districts," a good deal of work has been got through. A system of Local-Fund Roads has been designed, and to some extent worked out in the Soraba, Shikáripura, and Honnáli Talooks; and the Local-Fund Budget for the current official year provides for connecting Soraba with either Siddápúr or Banavási, Aunavatti with Gondi, Sirál koppa with Hurikerrúr, while, as shewn in the accompanying map, all these kasabá towns are linked with each other and with Ságúr and Kumsi (on the main road between Shimoga and Talguppa.) by means of fair-weather lines.

Work executed from Local Funds.

5. The commencement has also been made of a line to connect Anantapura and Kólúr Katte, and a track worked out between Benavalli and Ainúr.

6. Further south, traces have been made from Hariharapura to Sringéri (which probably will have to be abandoned) from Sringéri to Bégárhalla on the Tarikere-Augumbi road, and from the last named place again to Kig and Nímár.

7. A good deal of money has no doubt been thrown away in defective traces, &c., and a large expenditure of funds will be needed before these lines which have already been opened with local funds can be considered in a thoroughly practicable condition even as fair-weather roads, capable of withstanding the wear and tear of cart-traffic, and free from absolute obstructions; still there is residuum

of fairly good work, and the manifestation of an undoubtedly honest effort on the part of District Officers to do what is right. Rules are now being issued under the Chief Commissioner's orders, which will at least ensure in future thoroughly good professional work in the first and most important stages of all such undertakings.

8. Under the Public Works Department, a road has been commenced between Kúlúr Katte and Lakshmipura (estimate Rs. 15,341) which is intended to bring the former place in direct communication with the head of the Kolar Ghát. Traces for roads have also been made from Kulur Katte *viâ* Kodúr to Bennavalli and thence to Ainúr, from which there is direct communication with Honnali to the north-east, and Shimoga to the south-east; also from Kulúr Katte to Nagar and thence to Halikal near the head of the Hyderghar ghát. Between Nagar and Helikal, the trace is now nearly wide enough for the passage of carts; and an estimate (now ready) will be entered in next year's Budget for completing this as well as the next portion between Nagar and Kúlúr-Katte (estimate under preparation) to the standard of a fair-weather road.

Work executed under the Public Works Department.

9. The Hyderghar ghát (estimate Rs. 75,000) which is 7 miles long from the head to Hosa Angadi at the foot, has most of the earth-work completed, and promises under Mr. Stoddard's skilful direction to be the most uniformly easy ghát-road we have in the Province.

10. Between Baggunji and Wastára, Mr. Groves has worked out two admirable traces at the Alagésvara (estimate Rs. 17,000) and Basavankóte (estimate Rs. 11,000) ghats, which are the most difficult portions of this important line of communication. He has also completed a capital short line between Aldúr, near head of the Basavankóte ghát, and Hándi, on the Wastára Bhánd ghát road.

11. Other works undertaken by this Department are, the improvement of the Augumbi Ghát; the bridging of certain streams on the Bhánd ghát and its approach from Madgherri (estimate Rs. 65,517); the construction of a new ghát at Santavéri on the Chikkamagalúru-Tarikere road, and sundry other minor works, traces for roads, &c.

12. On the whole a considerable quantity of work has been got through; and what is of considerable importance, it has all, or nearly all, been thoroughly good, much of it indeed excellent.

13. So far as concerns the general programme now put forward by Major Hay on the additional evidence collected since writing his previous memoranda, there are, as before observed, not many changes in the scheme originally sketched out and approved of by Mr. Bowring; but such as they are, it may be as well here to note them.

14. More prominence is now given to the necessity of connecting Ságara with the Kólúr Ghát and Kúlúr Katte; and I have little doubt that a line might be taken direct south to some point near Avenhalli where it could bifurcate to Jaula (the end of the present Madras road) on one side, and to Kúlúr Katte on the other.

Changes on original programme.

Ságara-Kúlúr Katte road.

15. Major Hay likewise now dwells on the claims for a direct western feeder for the Hyderghar Ghát, which, starting from Hulikal, would pass through Yedúr and over a low saddle south of Kávaledurga by, as I imagine, Bobili, direct to Argau, from which it would be carried on to meet the Anantapura-Thírthahalli line. I have myself only examined personally the proposed line from Nagar direct to Thírthahalli, (which though looked on as desirable, is not considered as of primary importance by either Mr. Bowring or Major Hay) and can therefore only say that the saddle over which the line would pass, is apparently (by barometer) not more than 196 feet above the level of the basement of the Nagar travellers' bungalow; and consequently with the known heights of other points I should conclude, that there is nothing to prevent a fairly level trace being found for Major Hay's proposed line, and which, so far as I can judge, is one that ought undoubtedly to be undertaken, when funds permit.

Hyderghar and Argan road.

Nagar-Thírthahalli road.

16. I may here observe that the line I had myself brought forward between Nagar and Thírthahalli turns out also perfectly feasible. Just after leaving the traveller's bungalow at Nagar, the line ascends 77 feet to a saddle between Kencharé Gudda, and Suldamane Gudda; then descending about 200 feet, and crossing the Hilkunji stream, the valley (full of homesteads and paddy flats) is followed up for 10 miles, and passes over the saddle previously mentioned as only 196 feet above the Nagar bungalow. The terrible ascent to Kávaledurga, along which all traffic has now to pass on coolies' heads, is thus avoided.

17. From Bobili, which lies just beyond the saddle, it is difficult to say whether the line should make direct for Thírthahalli, or proceed along the present track which débouches in the main Tarikeré Augumbi road west of Siddéshvara pagoda. I incline myself to the latter.

Southern continuation of the above.

18. I shall, further on, have to allude to the proposed bridging of the Túnga river somewhere near Mulhalli Dévasthána; and there can be little doubt that when this work shall have been carried out,

the best policy will be to keep the above named road rather to the westward, so as to proceed as directly as possible along the left bank of the Tunga, through Bandi Gaddi and Hariharapura to the future bridge near the Mulhalli Dévasthana. With the completed road from this latter point by the Allegésvara and Basavankóte ghats to Hándi and Wastára, there would then be through-communication between Wastára and the Hyderghar ghát.

19. The next matter regarding which observations appear to be called for, is the Augumbi ghát. Major Hay while recognizing the inherent defects of this work (due mainly to the extremely precipitous nature of the ghát mountains here) still considers the position as so vital to the general requirements of trade, that it might be desirable eventually to construct a new ghát road, if a more favorable site could be found in the immediate neighbourhood.

New line for Augumbi Ghát.

20. I have myself reported in detail on the irremediable defects of the existing work, and that all we can probably do to help out matters is, to ensure that the road shall have a thoroughly good metalled surface, and improve, throughout, the cross section of the road (an estimate for which I hope to be enabled to insert in next Budget); but I much fear that there is no hope of securing a better line for a new ghát; and if even we were enabled to do so, the question would at once arise, as to whether the claims for a new and expensive work here, could stand in comparison with those of a ghát further south, near Kerra. in that case, must unquestionably take the precedence. The matter however is one to which I shall have presently to deal with more at length.

21. My own distinct opinion is (and I fancy it is also that of Major Hay) that the Kerra ghát

22. The necessity of maintaining and of improving as much as possible the Augumbi ghát involves also the maintenance and improvement of its feeders, and especially of such portion of the southernmost one leading direct from Tarikere, as must, under all future changes, remain practically as it is at present. I allude here particularly to the portion of main road between Bégárhalla and Augumbi, as taken with the line (now traced and about to be worked out) between Sringéri and the Bégárhalla, there can be no possible doubt as to the permanent necessity for its maintenance under all circumstances.

Bridging the Bégárhalla and improving road thence to Augumbi Ghát.

23. This directly calls on us to bridge the Bégárhalla, a stream about 90 feet wide, deep, rapid, and unworkable by ferry in the monsoon, and which consequently is a bar to all traffic for probably all but 4 or 5 months in the year. I had provided an item Rs. 20,000 in the current year's Budget for the work; but having lately inspected and determined on a site, I find the design will have to be recast, and will probably require the sanction of the Government of India. As there are moreover several severe gradients on the main road between the Bégárhalla and Augumbi, an estimate will have to be framed for correcting these.

24. Following up Major Hay's further remarks as regards the requirements of trade of the Koppa and Sringéri districts, several important considerations are brought under notice.

Necessity of a new line from Yaddúr to Sringéri.

1st. That the main road from Tarikere to Augumbi is so badly traced, and has such heavy gradients, especially between Yedahalli and Hariharapura, that a radical change is absolutely called for, whether the existing line of main road be adhered to, or not.

2nd. That the general direction of the line is irremediably wrong upon two vital points. It does not pass through Sringéri, which is recognized as the most important mart in this part of the country, and by going north to Augumbi, throws the whole trade with Mangalore altogether out of its normal direction.

3rd. That the Tunga and Bhadra rivers, which cross the country between Tarikere and Sringéri, prove impassable barriers to trade in their present unbridged condition.

25. He moreover shews that the former position of the Talook Cutcherry was at Mulhalli instead of Hariharapura; and that it is to this point the Sringéri people are anxious the proposed road to the eastward should be taken, so as to ensure their connection at once with Baggunji and Koppa.

26. The inevitable conclusion to my mind from these circumstances, is, that we must prepare ourselves for an entire change of the direction of the main-road between Tarikere and Augumbi, and that, unquestionably, the line must in any case be diverted from Yedahalli, cross the Tunga somewhere near the Mulhalli Dévasthána, and be taken thence *viâ* Sringéri to Kerra, and eventually, by a ghát at the easiest point in the range beyond, to Karkal; thus giving the most direct line to Mangalore and complying with all the conditions required for facilitating the export and import trade.

Further extension towards Mangalore.

27. It is desirable that the clear issues in regard to this line should at once be determined, as if nothing else, we must once for all, name the future position of the bridge over the Tunga, a work that

cannot cost much under Rs. 1,80,000. The urgent necessity for this work is again insisted on as secondary only to the bridging of the Bhadra ; and although I entirely concur in the reasons adduced, I cannot conceal from myself that the want of funds must, unless other means be found, prevent the work being executed for some years. This however should not prevent our deciding finally on the site. If, as first proposed, the bridge had been built at Hariharapura, it is clear that a fatal mistake would have been committed.

28. With the object of ascertaining the practicability of taking the proposed line past Kerra to Karkal, I examined the country from Nímár (in company with Mr. Stoddard) to the head of the ghâts.

Extension of proposed line past Kerra.

29. The native track from Nímár to Kerrra, hugs the left bank of the Tunga for some distance, and then crossing the Minchi halla, passes over a high saddle some 350 feet above the stream, and other steep inclines, before Kerra is reached—some 7 miles in all. It is unquestionably a difficult line of country, and very careful tracing, as well as close study of all the features, will be needed. The hills are however mostly bare, and no rocky precipices are likely to be encountered.

30. About 4 miles north-west of Kerra, is the Undá pass, skirting round Wulkungi Betta, and thence taking down a long spur into the low country. Its head cannot, by my calculations, be less than 2,500 above sea-level ; and it is rather badly spoken of by the inhabitants, who still use it for the small local traffic.

Undá Pass.

31. Not at all liking the general form of the ghât range at this point, I visited the head of the old Mullúr pass, some miles south, and found that although now entirely closed, it had formerly been frequented, as evidenced by the ruins of an old tanna at the head.

Mullúr Pass.

32. The village of Tura, which formerly existed near the head, has disappeared ; and by all accounts of the inhabitants, the country has been going back for want of roads, &c. The pass in the estimation of the people was considered much easier than the Undá pass to the north ; and judging from the general features, there would appear every probability of finding a very good line for a cart-ghât at this point.

33. In addition to the whole location of the line from Kerra being much more direct for Karkal, I made the head of the pass only 2,048 feet above sea-level. The distances approximately are:—

From Kerra to head of Pass	..	3½	miles.
" Head of Pass to Mullúr	..	9	"
" Mullúr to Karkal	..	5	"
	Total	17½	"

34. Without attempting here to enter into further detail, I may express my conviction that the construction of a through-line of communication for Mangalore is quite feasible here, and should certainly be examined with a view to making a trace.

35. While agreeing with Major Hay that the first step will be to fix a point for the future Tunga bridge, and work out a line of road thence to Sringéri, I think we should as early as circumstances admit, arrange for a trace being made along the entire line from Yedahalli to foot of the proposed Mullúr ghât ; also that the Madras Government should be addressed in reference to its share of the work.

Trace of through-line desirable.

36. One of the points most strongly urged by Major Hay, is, the bridging of the Bhadra river about 4 miles east of Yedahalli on the Tarikere-Augumbi road, as it forms the most serious bar to traffic in this part of Nagar. It is needless to repeat the arguments employed for this work, the absolute necessity for which must be freely admitted by those acquainted with the circumstances. Its cost which cannot fall far short of Rs. 1,80,000, is the real difficulty, and a very serious one ; for with only 1¼ lakhs to spare yearly for all the requirements of the Nagar Mahád, and the extensive schemes before us for fair-weather roads, it would hamper all general advance to concentrate so large an outlay on a single work. Eleven, out of sixteen, of the original works entered in the current year's Budget, are for roads and bridges in this tract of country ; and the whole proposed outlay is Rs. 1,26,000.

Bridge over Bhadra.

37. The only solution which I can see for the matter, is, that the Chief Commissioner in consideration of the peculiar wants of Nagar, and as quite a special case, might be pleased to move the Government of India to sanction the erection of these much needed bridges over the Tunga and Bhadra rivers, as perhaps a few others, out of the Mysore surplus deposit, which is understood to be reserved for irrigation works. As this however is a very important matter, I shall again advert to it further on.

38. I will now turn to the district about Kalasa, which though producing the finest supári in India, is so enclosed on all sides by mountains, that it is only on men's heads in great measure commodities can circulate. There is not even a single fair-weather road in this tract of country. Everything has to find its way along tortuous and rocky paths, up tremendous mountain sides, over deep rivers, and through dense forests.

Requirements of the Kalasa district.

39. I shall not venture to describe a country, the features of which have been already so graphically depicted by Mr. Bowring ; and it will perhaps suffice therefore for me to say that it appears quite impracticable at present to think of doing more than working out a fair-weather road from Kalasa *viâ* Kelagúr and Bálúr to Kotigar, which is at the head of the Bhúnd ghât.

Road from Kalasa to Kotigar.

40. The bulk of the supári produced in the valley, now finds its way by a very difficult path (on bullock-back chiefly,) which, crossing the Tunga river near Kalasa, hugs the left bank for some miles, and then passing over some very rough country by the Hakki kanave, finds its way to Bále Honnúr.

41. At Bále Honnúr, it has again to cross the Bhadra and finds its way to Wastára by Basavanakóte. Although the new road and ghât at this latter place will materially improve matters, yet it only requires a glance at the map to see that an outlet by Kelagúr must be by far the shortest, as it is also on other grounds now the most important.

42. The fine coffee estates which are now in existence along the greater portion of this route, would, in themselves, be sufficient reason for Government to improve, as far as means admit, the communications ; and of course the reasons become stronger when it is recognized that a line in this direction would also serve in the most effective manner the requirements of the supári trade.

To the advantages thus given to exportable produce, must be further added, those which would be derived by introducing European goods direct from Mangalore by the Bhúnd ghât.

43. The country between Kalasa and Kelagúr is unquestionably difficult, and will need the best attention of a professional officer to select the line. From Kelagúr to Bálúr all is easy ; and already from the latter place, a fair-weather cart-track is open, which necessarily would have to be widened and improved. There is however here no serious obstacle.

44. After examining the country between Kalasa and Kelagúr, my conviction is, that a good trace will be found by making a low saddle on the Marsonigi road the first tie-point. Holding on south east, the line would come out above Anambi ; and then taking south and passing over a saddle near the point marked Kil Sánksála on the map, would wind back north, and emerge by an easy ascending gradient at Kelagúr, from which there is, as above observed, no material difficulty.

45. I have little doubt that ere long it will be essential to open up a road along the line now ~~followed by the supári trade first~~ mentioned, *viz*, from Kalasa to Bále Honnúr, and also probably a connection bifurcating with and leading due north from this line along the valley east of Matti Gudda, taking over a saddle north-east of Basrigatta Dévasthána, and making thence direct for the head of the new Allagéshvara ghât.

Secondary connections required.

46. That these lines would be most useful in opening up this practically closed District, I have little doubt ; and further, that although confessedly difficult of execution, they are those which, from a general study of the features of the country, I should consider the most feasible.

47. Turning now to Major Hay's proposal in reference to the lines required for opening the Jágar valley, I do not find myself in a position to speak with confidence on the engineering points involved, further than as regards the practicability of taking a line from Chikkamagalúru into the Jágar valley.

Lines to open the Jaglur Valley.

48. The tie-points here are the Sitálgherri holla at, say 5 miles north west of Chikkamagalúru, and the saddle about a mile further on, between the Bábábuden and Basgód hill, which forms the head of the Jágar valley at this point. I make the Sitálgherri holla, at the point of crossing, 385 feet above Chikkamagalúru, and the saddle beyond, 814. Though therefore there will be a steady ascending gradient all the way, the differences of level are by no means as serious as one would be led to expect in getting over the Bábábudens, the flank of which would thus be turned by a very fairly direct road. Careful tracing throughout by a professional officer, would of course be essential ; and I have little hesitation in concluding, that as the above mentioned saddle is the highest part of the future road entering the valley, a line with easy descending gradients ought, without much difficulty, to be found to Hebba at the débouchure of the valley to the north.

Chikkamagalúru-Hebba road.

49. The link to connect this line with the Mudgere-Bhúnd ghât road, passing through Aunúr, would, so far as I can judge, have to be almost entirely newly traced, as the existing road from Aunúr to the Berinjahalla is, in many places, far too steep for cart traffic. The general conclusion I have come to as regards these proposed Jágar roads, is, that they are unquestionably essential features in the general scheme for opening the Nagar Mahád ; and further, that they are susceptible of being worked out with easy gradients ; but that even as fair-weather lines, they will probably prove expensive to execute, from the known unhealthiness of this particular tract of country.

Aunúr-Berinjahalla Road.

50. I am not in a position at present to place any reliable estimate before the Chief Commissioner shewing the general financial bearings of this scheme for opening Nagar, and probably some time must elapse before even a fairly approximate statement could be given; but as it is clearly desirable that the cost of the undertaking should be fully taken into consideration in apportioning funds for other portions of the Province,—where the needs, though not so great or pressing as here, still cannot be neglected,—I shall make it one of the first duties of the Executive Officer to frame as reliable an estimate as the materials at command will admit.

Cost of the whole scheme.

51. In the meanwhile, it may be as well for me to state what are the works to which the immediate attention of the Civil and Public Works Officers should be directed.

Present and prospective operations.

52. *First,* in the Shimoga District there will be ample work for some time in making the fair-weather lines between Sirálkoppa and Heri Kerrúr, Aunavatti and Gondi, and Soraba and Banavási, as also in perfecting much that is needed along the various existing lines, made or maintained out of Local Funds. If there be money and agency to spare, the lines of next importance appear to me to be (1) from Ságara to Jála, or the end of the Madras portion of the Kólúr ghát, north approach; (2) from Soraba to Siddápúr in the Bilgi Talook of Bombay; (3) from Avinholla or some other convenient point on the Ságara-Jála line to Kúlúr katte.

From Local Funds, Shimoga District.

53. *Secondly,* in the Kadoor District the Local Fund money may with the utmost utility be devoted to the following lines (1) from Bégárhalla to Sringéri to be in great measure paid for by the Sringéri Matt; (2) from Kalasa *viâ* Mursonigi and Kolagúr to Bágúr and Kotigar; (3) from Chikkamagalúru to Aldúr, a road already supposed to exist, but badly traced and well nigh useless, besides odd jobs to existing lines. There is enough I should say to monopolize the available Local Funds of both Districts for the next two or three years in this programme.

Ditto Kadoor District.

54. As regards the public works (Imperial) grant, there is already an immense amount of work cut out, and the very greatest discrimination must be exercised, so as to insure that the available means are not only employed on works of the most pressing importance, but in a way which shall spread the advantages over the widest possible field in the shortest time. It is no easy matter to exercise a sound judgment here. The claims on all sides are most urgent, as may at once be seen from Major Hay's reports; and some of them are not only urgent, but so really that it becomes a most serious matter to accept or reject them. Great undertakings like those of the bridging of the Tunga and Bhadra rivers, for want of which the traffic is now stopped through a great portion of the year, are of this nature. The bridging moreover of many of the minor streams (which when they cannot either be worked by means of ferries or have causeways thrown across them, stop the way quite as much as the largest rivers) necessarily falls into the same category. Among these may be specified the Bégárhalla (previously alluded to) the Nagar river, Sútan river, Lakshmipura river, the Warada (which by the way will have to be bridged no less than three times on the lines radiating from Soraba, and the cost of which has not as yet been thought of) the Chóardi, the Mávinhalla, and several more.

Urgent necessity of bridges.

55. With these and other distracting claims, the only principle I can recommend for adoption, is, that a line should be drawn between the ordinary construction of fair-weather roads, and the bridging of rivers such as I have alluded to.

56. This distinction being recognized, I would propose that while the net work of fair-weather roads (*i.e.*, with dry-stone tunnels for cross drainage and temporary bridges or causeways for all streams to which such a mode of construction would be applicable) is to be paid for out of the normal Budget grant for the Public Works Department, the cost of the bridges adverted to should be met out of the Surplus Deposit fund.

Cost to be met out of Surplus Deposit Fund.

57. It has now been clearly recognized by Her Majesty's Secretary of State, that the claims of the ancient works of irrigation throughout the Province must be looked upon as paramount to all others, and that the Surplus Deposit fund with other available balance shall be put under requisition for their thorough repair and improvement. There can be no questioning the justice and consideration of this ruling, so far as concerns the Maidán talooks of Mysore; but unfortunately, it leaves the Malnád portion of the country out in the cold; and this is the more unfortunate, as hitherto the revenue derived from the latter has, to a very great extent, gone to improve the condition of the former.

58. It is not too much to say, that an accumulated debt is now owing to the inhabitants of the Malnád; and however just and right the present determination to expend large sums on the irrigation works in the plain country, it only throws the neglect which Nagar has suffered into stronger relief.

59. As before observed, I am not at present in a position to give a reliable estimate for the work before us; but generally speaking, I should say that bridging the Tunga and Bhadra would cost say 3½ lakhs, and the other smaller streams as much more, or in the aggregate 7 lakhs, which sum I therefore venture to propose may be set apart out of the Surplus Deposit fund for the object specified.

60. The iron lattice girders for Sakaléspura which had been got out, and the other shorter plate girders, &c., which were indented for in 1868, before I left for England, have turned out a most successful investment for Government. They are good, cheap, and precisely adapted for Malnád streams, and we cannot do better than repeat this mode of construction. I am therefore perfectly confident, that if the Government adopt the principle I have suggested, we could get through the whole work in a very few years.

Iron bridges desirable.

61. Without some such plan, I need hardly say that whatever we may do in opening ghâts and fair-weather roads, the Malnád must through a great portion of the year, not only remain as absolutely sealed to traffic as it is at present, but administration and Government itself must remain at a stand still. Traffic must in fact cease, and crime must remain unpunished.

62. As regards the actual lines of road which should first engage the attention of the Public Works Department, I have only to say that in the Shimoga District we have now in hand (1) the completion of the Hyderghar ghât, so far as provided for by the present estimate; (2) the opening of the fair-weather road from Kúlúr katte to Lakshmipura; (3) the completion of the Anantapura-Kúlúr katte road (out of Local Funds) for which arrangements are being made; (4) the construction of a fair-weather line (track open and estimate in hand) from the head of the Hyderghar ghât, *viâ* Nagar to Kúlúr katte; (5) the thorough metalling of the Mysore portion of the Augumbi ghât; (6) the construction of a bridge over the Bégárhalla. This will give the Department enough to do for the next two years.

P. W. D. works in order of importance. Shimoga District.

63. The works which should subsequently follow in order of importance, are (1) the continuation of the Hyderghar-Kúlúr katte line, *viâ* Kódúr-Benavalli to Ainúr; (2) the construction of the proposed east approach to the Hyderghar ghât from Hulikal *viz* Yedúr to Argau, and so on as may hereafter be determined.

64. In the Kadoor District we have now in hand (1) the Alagéshvara and Basavanakóte ghâts on the through-road from Wastára to Hariharapura; (2) the completion of the bridging of the main road from Chikkamagalúru to Kotigar, at the head of the Bhúnd ghât; and arrangements are being made for (3) the improvement of the Bhúnd ghât; (4) for retracing and improving the Basavana kanave, and other—at present too steep portions of the Chikkamagalúru-Bhúnd ghât line; (5) for opening a fair-weather line over all the remaining portion of through-line from Wastára to Hariharapura. This, with other work, (chiefly the tracing and estimating for Local-Fund roads,) will give this Department all it can do for the next two years.

Ditto, Kadoor District.

65. Subsequently, it might with advantage take up in succession (1) the new proposed main road from Yedahalli to Mullalli Dévasthána; (2) the proposed line from Chikkamagalúru through the Jagar valley, *viâ* Hebba to Yedahalli; (3) the continuation of the Sringéri road to Kerra and the Mullur ghât; and so on as may hereafter be decided.

66. I have purposely left out the bridging of main streams from the above enumeration, as it must be clear that under a limited Budget allowance (never likely to exceed 1½ lakhs per annum for the Nagar Malnád) the introduction of these would throw out any programme that might be laid down. Every thing in fact depends on whether my proposal to construct these from Surplus Deposit meets with acceptance.

67. Besides the work above enumerated for the Department, the maintenance of all existing main roads necessarily devolves upon it; and with the rules now being laid down for Local Fund roads, all preliminary tracing and estimating will likewise fall to its share. With this press of work, and the constant sickness of many of its members in the Malnád, the Department has even now more duty to cope with than it can fairly perform.

68. Major Hay brings forward the desirability of sanctioning a small establishment for collecting statistics of traffic on the several ghâts and passes. This appears to me very desirable.

Establishment for collecting statistics of traffic.

69. He also brings forward the subject of tolls, considering those on ghât roads to be a very legitimate method of raising special additional sums for their repair, and that tolls on expensive bridges may also be equitably demanded.

Tolls.

70. At present there are no tolls in Mysore, excepting those on the Harihara and Sakaléspura bridges; and consequently the subject may be considered as a new one in this Province. In Madras and Bombay, the reverse is the case. Indeed as regards the former, from the following remarks from the Madras Budget statement of the current official year, the levying of tolls would appear to have been rather overdone.

71. It is observed that "For the ensuing year the Government have abstained from sanctioning "any considerable extension of the system of tolls. The tolls provided "for in the Local Fund Budget are those already existing, principally "in the western districts and on hill ghâts, in addition to which tolls

Tolls in Madras.

"estimated to yield £, 3,472 have been sanctioned under the new law, *viz*, at three places in the Chingleput "District, which is traversed by expensive arterial lines accommodating large external traffic, and con- "verging on the Presidency Town; at the Aiyanúr bridge in the Trichinopoly District, a costly structure "on an important line of road and within easy reach of redress for oppression or fraud on the part of "Toll Collectors; and at Penakonda in Bellary, which is the station of a European and of a Native "Magistrate, on the main road from Bangalore northwards, and lies in a circle the funds of which are "inadequate for its needs."

In Bombay.

72. In Bombay judging from the accompanying letters (submitted by Major Hay) of the Collectors of Dharwar and Canara, tolls appear to be the rule. The first named Officer sends a list of no less than 23 toll-bars in Dharwar, adding however, that he is strongly opposed to tolls as owing to them good roads are often deserted, and as improper exactions are levied. The Collector of Canara gives a list of 10 toll-bars which yielded Rs. 74,136 in 1870—71, observing that the expediency is open to question. Tolls he considers may be good where there is a heavy traffic and a difficult country to be crossed, and may be levied without creating great dissatisfaction; but in the open country evasion is easy.

Objections and Remedies.

73. The main objections to tolls (which is unquestionably the most perfectly equitable mode of raising money for the up-keep of roads) are no doubt, in this country, (1) the improper exactions to which traffic may be subjected; and (2) the probability that the tax falls, not on carriers or traders, but on the cultivators. I cannot however but think, that both these objections may with judicious management be obviated, or in great measure be compensated for.

74. The tolls should only first be placed at a few points such as ghâts or large and costly bridges, and the tariff so conspicuously recorded, that he who runs may read; and at the same time heavy penalties should be fixed on proved extortion. This, accompanied by watchful supervision on the part Officers, should suffice.

75. The second objection appears to have more weight; but admitting its force for a certain number of years, I have little doubt that in time the toll charge would, in the natural course of things, fall on the back of the consumer, or at worst be shared between him and the producer. In any case, as the money found by tolls helps to maintain roads which could not otherwise exist, their benefit, to the cultivator in opening up fresh outlets for his produce, to the general public, and indirectly to the Administration, is unquestionable

Proposed positions.

76. My proposal is therefore, that toll-bars at once be placed at the heads of the Bhúnd and Augumbi ghâts, and at the Shimoga bridge; also at the bridge over the Warda near Sâgara. The subject is however one which hardly falls within my province to discuss.

77. Major Hay appears to advocate a cart-tax. I cannot however but think that this would more or less be a tax on industry. Should this mode of increasing Local-Funds however commend itself to the Chief Commissioner, I have only to remark that the tax should be graduated with reference to the style of wheel employed in the different classes of vehicles, the so called "Madras" pattern being lowest, the "Wadder," next, and the solid incising wheel employed in the large carts of the north-western portion the Province, at least double, if not triple that on the "Madras" wheel.

78. Both of the latter descriptions of wheels should, if possible, be expelled from all made-roads, as they are utterly destructive to their surfaces. The last named wheel simply slices a road into ribbons.

Maintenance allowances for minor passes.

79. The only other point requiring notice in Major Hay's report, is, his declared preference for the appropriation of a regular sum annually for improving such of the minor passes as appear best suited for bullock traffic, in contradistinction to the maintenances for those works proposed by Mr. Bowring. My own idea is, that a certain fixed sum should be entered annually for the general purposes of minor ghâts in the Local Fund Budgets, and that once if possible each year, before the commencement of the traffic season, the passes should be visited by an Officer of the Public Works Department, who would report on the sums respectively required for maintenance or improvement. Very possibly he might see his way to opening an entirely fresh trace with the money at disposal; but however this might be, I have little doubt the money at command would have the best chance of being fully utilized under some such arrangement.

Topographical map required.

80. In conclusion, I would again urge the desirability of having a proper topographical map of all this portion of Mysore; and in the meanwhile, that arrangement should, if possible, be made for multiplying the large Mackenzie maps by photozincography.

As regards the whole contour of the hills, they are extremely defective; but so far as I can judge the drainages, paddy flats, old roads, and names of villages are fairly recorded; and so far their multiplication would be of the utmost utility.

(Signed) **R. H. SANKEY.**

4th May 1872.

Heights of different Points in the Nagar Malnád above Sea-Level.

Place.	Height by my observations.	Remarks.	Place.	Height by my observations.	Remarks.
Tarikere	...	2,235	Bhadra river (1 mile north east of camp)	2,390	
Benkipura	...	1,872	Saravanagaddi holla (on road to Balehonnúr)	2,395	
Shimoga	...	1,895	Top of Madle katté hill (on Yedúr road)	3,271	
Anantapura	2,130	2,101	Saddle to south on Marsongi road	2,960	
Sâgara	...	1,973	Hodagudagihalla (one mile further on same road) ...	2,718	
Talguppa	...	1,956	Saddle above Marsonigi-valley below	2,885	
Gérsoppa	...	1,670	Mallésangudda on Yeddúr road.	2,682	
Mávinahalla (on Kúlúr katté road)	1,870	...	Saddle at Samagi katté (Kalasa Yeddúr road)	2,732	
Kúlúr katté (Inspection lodge).	1,992	1,928	Saddle next to Mallésangudda .	2,658	
Nagar river (Kúlúr katté Lakshmipura road)	1,773	...	Yellandúrhalla (on road to Kelagúr)	2,547	
Nagar Travellers' Bungalow	1,861	1,887?	Stream, 1½ miles further on same road	2,584	
Hyderghar ghât (top of) ...	..	1,896	Armani Talgúr	2,697	
Saddle between Kenchargúdda and Suldumatti gudda ...	1,938	..	Kelagur (camp on paddy flat.)	3,152	Mean of 2 observations.
Saddle east of Kávaledurga on Argau road	2,057		Saddle under Kerrikarrigudda.	3,531	
Thírthalli (Travellers' Bungalow	2,012		Top of Kerrikarrigudda ...	4,674	
Tunga river (opposite Landihalli)	1,972		Saddle at Bálúr	3,553	
Road near Hariharapura, left bank of Tunga	2,017		Hémávati river, Bálúr Kotigar road, 1½ miles from Bálúr ..	3,121	
Foot of Koppadurga ...	1,922		Saddle on same road, 3 miles from Bálúr	3,187	
Top of Koppadurga ...	2,795		Ko'agar (camp at head of Bhúnd ghât	3,083	Mean of 2 observations.
Hariharapura Travellers' Bungalow	2,054		Mudagere (Inspection Lodge).	3,058	
Saddle above Sringéri on Bégárhalla road	~~2,177~~		First saddle ascending Basavana Kanave	3,432	
Sringéri camping ground 20 feet above level of Tunga river	2,067		Second saddle do	3,575	
Augumbi ghât road below the Travellers' Bungalow ...	2,067		Aldúr (camp)	2,367	Mean of 2 observations.
Augumbi Travellers' Bungalow.	2,179		Stream at foot of new Basavana katté ghât	2,456	
Bégárhalla on bank ...	2,077	..	Berinjahalla where crossed on Aldúr Wastára road ...	3,288	
Tunga river at Nímár ...	2,027	Mean of 3 observations.	Top of rise on road to Berinjahalla	3,448	
Minchihalla, 4 miles from Nímár	2,098		Beringahalla (water level) ...	3,261	
Saddle beyond Minchihalla ...	2,478	Mean of 2 observations.	Top of rise on road at 4 miles from Chikkamagalúru ...	3,556	
Kerra Dévasthána	2,181		Chikkamagalúru, Executive Engineer's Office... ...	3,273	Mean of 2 observations.
Top of ridge about 200 feet above head of Undighât ...	2,650		Herrikolhalla, about 5 miles to north west of Chikkamagalúru	3,595	
Thanna at head of Mallúr ghât.	2,048		Saddle between Bábábuden and Basgód hills	4,099	
Kerra (camp)	2,184		Sítalgirihalla (at bottom of gorge)... ...	3,670	
Nímár (camp), bank of Tunga)	2,143		Top of Yerni ghât, Chikkamagalúru-Kadoor road ...	3,343	
Nímár Mégunda road (first stream crossed)	2,143		Sakrépatna (camp)	2,692	Mean of 2 observations.
Saddle over Madelmakki hill ..	2,950		Shigangiri (hill near Aiyenkere tank, top)	4,462	
Shoulder of Kittelgeli hill ...	3,018		Maddak tank (top of bund) ...	2,940	
Mégunda Dévasthána ...	2,772		Aiyenkere tank (sill of waste weir)	2,908	
Yelladantihalla	2,375				
Mégunda (camp)	2,410				
Pétchalla at Mégunda (on Túrau road)	2,340				
Koulhalla do ...	2,156				
Túrau katté (top of ghât) ...	3,765				
Lower Saddle, a little to east of katté	3,557				
Marradahalla (on road to Merti gudda)	3,275				
Merti gudda (top)	5,270	Also called Kalasa hill.			
Kalasa (camp)	2,532	Mean of 2 observations.			

N. B.—The above heights were calculated from the reduced aneroid readings at each place, as compared with those recorded each day at the Observatory, Bowring Hospital, Bangalore, (being the readings taken at 10 A. M. reduced to a temperature of 52°). The several heights given in remark column at the commencement are reductions made by Colonel Williamson in December 1869 and January 1870, believed however to be uncorrected for index error.

(Initialled) R. H. S.

P.W.D. 3118/72.
Mg. 30 June 1873.
S.(3).

P W 1873 Depart.
Mysore Chief Commissioner
Dispatched 26th May 1873
No 1030 Rec'd 27th May 1873
3118.

From The Secy to the Chief Commissioner of Mysore

To The Secretary to Government Public Works Department
Dated Public Works Depart. Fort St. George
Dispatched 26th May 1873
Received 27
Enclosures 1.
Subject

Replies to letter No 1203 / 455 of the 28th ultimo, regarding the construction of certain bridges by Madras and Mysore Governments.

No 437

No. 1687-1688-3 Secy/73

Public Works Department

1687

Proceedings of the Madras Government

Read the following

From The Secy to the Chief Commissioner of Mysore. } No. 1030 of 26th May 1873

His Excellency the Governor in Council receives with satisfaction the assent of the Chief Commissioner of Mysore to his practical proposal made in letter No. 1203 of 28th April for co-operation in the work of facilitating communication between the

the Interior and the
Seaports - But the pro-
-viso added to steal
Assent will require
certain modifications
in the interests of the
different Local Boards
Concerned -

The information
promised as to the amounts
to be provided for
bridging the Honnavully
stream between Collegal &
Gellandur, and the Ben-
-hutty stream on the
line from the Colorr,
Ghaut via Jaula and
Avinhully to Sagur,
will be forwarded to
the

the Coimbatore and
South Canara Local
Boards when received -
The Executive Engineer in
charge of Wynad will
submit plans and es-
-timate for the Manan-
-huttay Bridge on the
Sultan's Battery-Goon-
-delpett Road; and the
District Engineer of
South Canara for the
Lukshimpura Bridge
on the Coloor Ghaut-
Coloor Puttay line, in the
usual course - It is
observed that the
contribution of the share
of the Mysore State for the
former

former is immediately available - The present function of the bye-pass and Canara portions of the road above Colour Chaut will be ordered to for the Lukkhimpoora Bridge site - It will be intimated to the Mysore Government that the South Canara Board will probably not be prepared to pay for the Lukkhimpoora and Benhatty Bridges simultaneously as be- -ing fitting one main line of communication which they cannot provide for to the exclusion of other claims - But that they will be requested to have the branch line to the latter taken in hand meanwhile, its trace remodelled, and the cost of opening it for traffic ascertained

- ed -

To The Finl Secretary
Dr Engrs Combatore
" Mulabar
" Canara
Exe Engrs Wynaad
Inspg Engrs Coimbatore
Cantonment
Supt 7/7/73

H. E. No 1688 dated 30th June/73

To The Chief Commissioner of Mysore -

Sir,

I am directed to acknowledge your Secretary's

Secretary's letter No 1030
of 26th May, and in intimating the satisfaction of His Excellency the Governor in Council at your acceptance of his practical proposition for facilitating the communication between Mysore and the western Ports, to state that the proviso with which such acceptance has been qualified requires modification in the interests of the several Local Boards concerned-

For instance it would have the effect of saddling the Malabar Board for ever with the entire upkeep of the Mavinhalla Bridge while the Coimbatore Board would be for ever free of expense in connection with the Honnavilly stream- It would be more consistent with the original proposal, to arrange that each Bridge should remain under the sole charge of the Agency which constructed it; whatever expenditure might be required for

for reconstruction, res-
-toration, addition or
repairs being planned
and carried out by
the same Agency; on
whose Estimates and
Bills half the actual
costs incurred would
be paid by the other
Government concerned.

Plans and Estimates
for the Arivinkollay and
Lukshimpura Bridges
have been called for;
the latter at the present
junction of the Hagoore
and Cuddapa portions
of the Approach to Colcor
plant

ghaut from Colcor
Cuttay, as requested
by you - As the former
bridge will probably
be constructed of
Iron girders, the contri-
-bution of the
Hagoore State (which
it is supposed will be
under Rs 6,000), pro-
-vided in the Current
year, will be conveni-
-ently applied to the
purchase of the ne-
-cessary materials
in England, and that
of the Madras Govern-
-ment to their erection
at a date not later
than 1874/75 - It is not
probable

probable that the
South Canara Board
will be prepared to pay
for the Lukkakimpura
and Benhutty Bridges
simultaneously, as
both benefitting the
same main line of
communication, while
they may have other
claims to meet - But
they have been request-
-ed to have the short
branch line to the
latter taken in hand,
its trace remodelled,
and the cost of opening
it for cart traffic
ascertained -

With

With reference to
para 6 of your letter
under reply I am
directed to state that
1 in 16 is intended as
the maximum gradi-
-ent to which the Colom
Ghaut and its appro-
-aches should be work-
-ed out; that the width
of the roadway shall
be 18 feet; and its sur-
-face formation of the
Laterite gravel gene-
-rally met with along the
line - More expensive
metalling does not
appear to be called
for on roads which
are not likely to be
much used in the
monsoon

to which the assured prospect of increased Cart traffic calls for such action.

I am directed in conclusion to observe that His Excellency the Governor in Council has received with interest the additional information furnished as to the lines of traffic through the Nugger Division of Mysore and the proposals for opening the communication along them for Cart traffic, whereby the crying

monsoon, the ports to which they lead being closed in the rains — As before remarked these lines were laid out and opened for dry weather use a quarter of a Century ago; and the inaction of the Mysore State with reference to their extension inland has hitherto deprived this Government of all inducement to work out the imperfections which may here and there occur; but which will doubtless be attended

crying want of that
large tract of country
will be supplied - the
subject of dry weather
approaches to the ford
of the Lukshimpúra
River is one that may
be left to be duly pro-
-vided for in Corres-
-pondence and personal
Communication between
the local agents of the
Public Works Department,
on each side -

Dupd 7/7/73

No 3118

of {1873} Madras.

PUBLIC WORKS.

From Financial Dept.
and
Public Commissioner
for Mysore

Encl 1

to Despatch No. 1687-1688.

Nos. 437-438 & 439

Forwarding orders

From the Secy: to
Commissioner &
Regarding the
[illegible] of certain

regarding letter
1873 Regarding the