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Southern India Canal System

The Deccan Junction Canal of Navigation

246 9/1

Sir Arthur Cotton's evidence

When Sir Arthur Cotton was giving evidence before the Select Committee on East India (Public Works) on the 27th of June 1878 he was asked the following question by Mr Childers "Have you formed a complete scheme for navigation & irrigation canals for the whole of India?" the rejoinder was "As to navigation canals I have a complete scheme of the main lines in my head" as for the irrigation plans they would require to be examined in detail". "The first thing of all that I would do would be to give about 10000 miles of main line navigation which I reckon would cost about thirty millions pounds."

No finished canal in the South

2 There is not a well finished canal solely designed for navigation, if not in the whole of India, at any rate in the South. But this South abounds in part-completed enterprices of the kind. First there is the Upper Godavery navigation scheme, on which after an outlay of many lakhs of rupees work has for 24 years past been abandoned, but would provide water transport from the Central Provinces direct to the Bay of Bengal.

The Upper Godavery navigation

The West Coast Canal

Again the long, but only partially opened West Coast Canal practicable for small boats for some 200 miles already, and with a break of only twenty two miles near Cannanore and some 190 more miles in North & South Canara (unmade but easy to make) would, if properly completed reach from South Travancore to the Bombay frontier.

Thirdly, the Buckingham Canal, on which a great deal of work remains undone open however to intermittent traffic from the Kistna river to Vedarniam in Tanjore and capable of being extended in flat land all the way round Cape Comorin to join in South Travancore, the West Coast Canal.

? with a break from Sadras to Negapatam

Lastly, that constructed at a cost of £ 1600000, sterling by the late Madras Irrigation Company from Kurnool to Cuddapah, at present cut off from the sea, terminating in no great centres of traffic, and passing through a rather thinly inhabited part of the country.

2469/2

3. The rudiments therefore exist here in the disjointed mileage of part-completed water communication (said to total to upwards of 1300 miles in length), of a very extensive and much longer navigable canal system for the south of India.

4. The want is 1st, a line of navigable canal connecting all the portions; and 2d. their completion so as to make them resemble in all respects such works as canals are in Great Britain, the Continent, and North America, under which circumstances [it is] alone they can be expected to pay.

5. The object of the Deccan junction Canal now projected, is to provide for the first of these necessities, by connecting the Irrigation Company's Kurnool-Cuddapah Canal with a point on the Upper Godavery Navigation near Chandah. This done and the original idea of extending the Company's Canal to the sea carried out, there remain the schemes, requiring separate consideration, of taking the Buckingham Canal

[illegible]

through the flat Coromandel plains round Cape Comorin to join the Travancore and West Coast Canals: also cutting the missing links on the latter up to the Bombay frontier while re-modelling the whole of the Canals already formed on these routes so as to make them really finished works; a Canal half done and ending nowhere in particular, being an almost valueless piece of State property.

2469/3

Difficulty about water.

6. The great difficulty in designing an Indian Canal for the interior is to get enough water at the various summit levels to feed the Canal at all seasons of the year.

Sources of supply for the Deccan [illegible]

7. The sources of water in the case of the new Deccan Canal, will be the three rivers across which it is taken, namely the Tungabhadra, the Kistnah & the Godavery.

[illegible]

8. A point, Valvapur, near where the Southern Mahratta railway crosses the Tungabhadra is a principal summit level, at which that river coming from a thickly forested tract always maintains a moderate volume of water in the dry months.

Eastward

9. From this point the Canal can be taken in both directions, through fairly open country eastward to the town of Bellary and thence by Adoni to Kurnool. This section promises to be 170 miles long and will require attention in the alignment to make it pass as much as possible through or near traffic centres.

Westward,

10. From the Tungabhadra crossing Westward the Canal has to be taken along the contour line of the country to a point on the river Kistna, on which route it will pass through part of the cotton growing district of Dharwar and past Bejapur

to Sholapur, which is on the same level as Bellary. There is always some water in the Kistna, sufficient in the driest weather to supply still water navigation.

Continued to the [illegible] [illegible]

11. After Sholapur, the canal will in a very similar manner run on the contour line in the best populated localities to a new summit level on the main stream of the Godavery, where a large supply of water will be obtainable. It will then join the head of the Upper Godavery navigation and thus when the scheme for rendering the Godavery navigable is completed as originally designed, the communication by canal will be in the form of a loop reaching far into the interior and having all along the outer margin large populations and much black soil adapted to cotton growing.

2468/4

The sections of the Deccan Junction Canal

12. The Deccan junction canal will accordingly be in the following four sections, namely

1st.	Kurnool to the Tungabhadra	170 miles
2d.	The Tungabhadra to Sholapur	195 — do.
3d.	Sholapur to the Godavery	175 — do.
4th.	The Godavery to Chandah	145 — do.

Hyderabad branch Canal

13. A branch canal 180 miles long might be made to the city of Hyderabad, with an extension of 140 miles more to join the Upper Godavery navigation.

Railway levels indicate the [illegible]

14. Besides the information obtained at different times by travelling over many of the portions of territory through which the Deccan junction canal would pass, there are the Railway levels forming a network giving a sufficient number of relative heights to lay down a rough approximation to the best line.

The Kurnool Canal gives actual data

There is also the invaluable experience of the 189 miles of the Kurnool Canal actually carried out.

The features of the projected canal can therefore be easily followed on the accompanying sketch map & longitudinal section, without for the present any explanatory description.

The soil in which it would be cut is mainly decomposed gneiss rock on the surface, with the live rock lying only a few feet below and coming occasionally to the surface. There is therefore comparatively little alluvial soil of any great depth. But there will be few works of an unusually heavy description except at the crossing of the large rivers.

The model to follow seems that of the Gotha Canal in Sweden - a beautiful work in full operation, striking boldly across country, and with its connections giving facilities for steam navigation all the way from Stockholm to Gothenburg. That is the canal should have a bottom width of say 50 feet and side slopes 45°, with a depth of water of 10 feet. The locks to have a length of 120 feet & breadth of 24½ feet

It is very important in making an inland canal in India where water is scarce in the hot season, to give depth and reduce width as much as possible. For evaporation is brisk - a ¼ of an inch a day - ; and percolation active in such a porous soil as decomposed gneiss.

The Deccan Junction Canal is of course purely intended for navigation. When canal construction was first entered upon in 1847 the idea was very naturally entertained of combining irrigation and navigation and it was prevalent down to even 1860 when the Kurnool Canal was begun. Experience in the deltas however showed, what, the state of the traffic on the Ganges Canal also proves that the demand of boats for still water and of native cultivators for a strong current, cannot be met in a single canal any more than will a single line railway carry trains both ways without sidings.

Opinion as [illegible] against com[illegible] [illegible] Canals

20. Canal Engineers - the late Colonel J. C. Anderson for example - came to the conclusion that if there is to be extensive irrigation it must be from an entirely distinct canal from that to be navigated.

But in seasons of famine a body of water along [illegible] land will be invaluable.

21. But as the Deccan junction Canal will run through the heart of a tract of country having a light rainfall and peculiarly subject to drought, there will be occasions when the canal will be of great use, and even at ordinary times the population may be allowed to take water as they do in Egypt by lift, paying for the amount so taken, as long as too much surface current is not produced.

Still must be from separate and distinct [illegible]

22. It is a matter for calculation how far it will answer to give the canal extra width for this purpose.

Cost of the Canal per mile

23. Seeing that the Gotha Canal would according to Mr. Hughes cost £8500 per mile if made at the present day and the Kurnool Company's Canal cost Rs 92,470 per mile, that of the projected Deccan junction Canal can scarcely be less than one lakh of rupees per mile

Le 69/7

The rough estimate for sections of the Canal

24. The estimate for each section will theref roughly stand as below:-

1st Section - Kurnool to Tungabhadra	170 miles at 1 lakh	170000
2d —do— Tungabhadra to Sholapur	195 miles at 1 lakh	195000
3d —do— Sholapur to the Godavery	175 miles at 1 lakh	175000
4th —do— Godavery to Chandah	145 miles at 1 lakh	145000.
For the Deccan junction Canal	Rs	6850000
Add - Hyderabad branch 320 miles	at 1 lakh	3200000
Extension Cuddapah to the Buckingham Cana	88 miles at 1 lakh	8800000

Deccan Junction Rs 68500 000

Hyderabad branch Rs 320 00 000

Cuddapah Extension Rs 8800 000

Amount to Rs 109300000 in Silver Currency.

We thus reach a total of Rs 1093,00,000 for the Deccan junction lines of Communication, excluding any Northern Extension to Nagpore & beyond.

Furnishing the Kurnool Canal Rs 4700 000.

25. An additional amount will be required for improving the Kurnool Canal to make it retain a depth of 8 feet of water, of let us say Rs 4700000.

Completing the Upper Godavery navigation Rs 22000 000.

26. Besides, this opening up the Deccan thoroughly by Canal navigation involves the completion of the Upper Godavery navigation, on which Rs 4800000 have already been spent. This will cost at least Rs 22000000 more.

The whole line up to the interior and down to the sea will cost Rs 131300000 in Silver Currency

27. So that the whole navigation scheme up from the Bay of Bengal and down again may be estimated at Rs 131300000 or Rs 93700 per mile over the entire route which is 1400 miles in length.

Drawbacks to navigating the [illegible]

28. The Upper Godavery navigation however has the drawback of being necessarily in a river current, the fall being computed at

1 ft. in a mile making it a quick transit down stream but a matter of several days going up. In addition there is a deficiency of water for at least half the year, which cannot be provided except by an expensive series of lake reservoirs.

Junction canal from Nagpore to Allahabad therefore advisable

29. So that a canal taken so near Nagpore will inevitably have to be extended north through the Central Provinces, Rewah & Bundelkhand to the Jumna at Allahabad which may be considered the head of the Ganges navigation and an easy water communication with Calcutta. The canal, Nagpore to the Jumna would be 540 miles long.

Little difficulty about water

30. There is no difficulty caused either by the lay of the ground, or the levels, in making this northern extension and not much in obtaining water, first from the Godavery and then from the Nerbudda and the Soane.

Canals do not conflict with railways.

31. That there is room for canal side by side with railway transport, is amply clear from the experience of Great Britain and other countries. A canal is not only able to carry bulky goods at a much lower charge than a railway, but single or for that matter double lines of rails cannot carry all the traffic of so vast a territory as India. Mr Hughes says with reference to Sweden "competing railways have not caused the abandonment of any canal. On the contrary the business of canals has increased with the increase of railways."

Railways cannot carry the whole traffic [illegible] [illegible] of the traffic

On the contrary railways benefit the canals

G. I. P. Railway nearly double Gotha canal rates

32. He computes the charges for all classes of goods at 13 2/5 pies per ton a mile on the Great Indian Peninsula Railway against 7 1/3 pies per ton a mile charged on the Gotha canal with steam traction.

33. On the Madras canals, which are very

much understocked with boats & appliances, goods are conveyed at rates beginning from as low as 2 pies per ton a mile, when large cargo boats are used in still water. An ordinary rate is 3 pies and it may exceptionally reach 6 pies per ton a mile, while 12 pies per ton a mile is the lowest rate on the Madras railway.

On the Upper Godavery Navigation, the charge owing to its difficulties is for boat carriage as high as 17½ pies per ton a mile down stream, and 22 pies up the river.

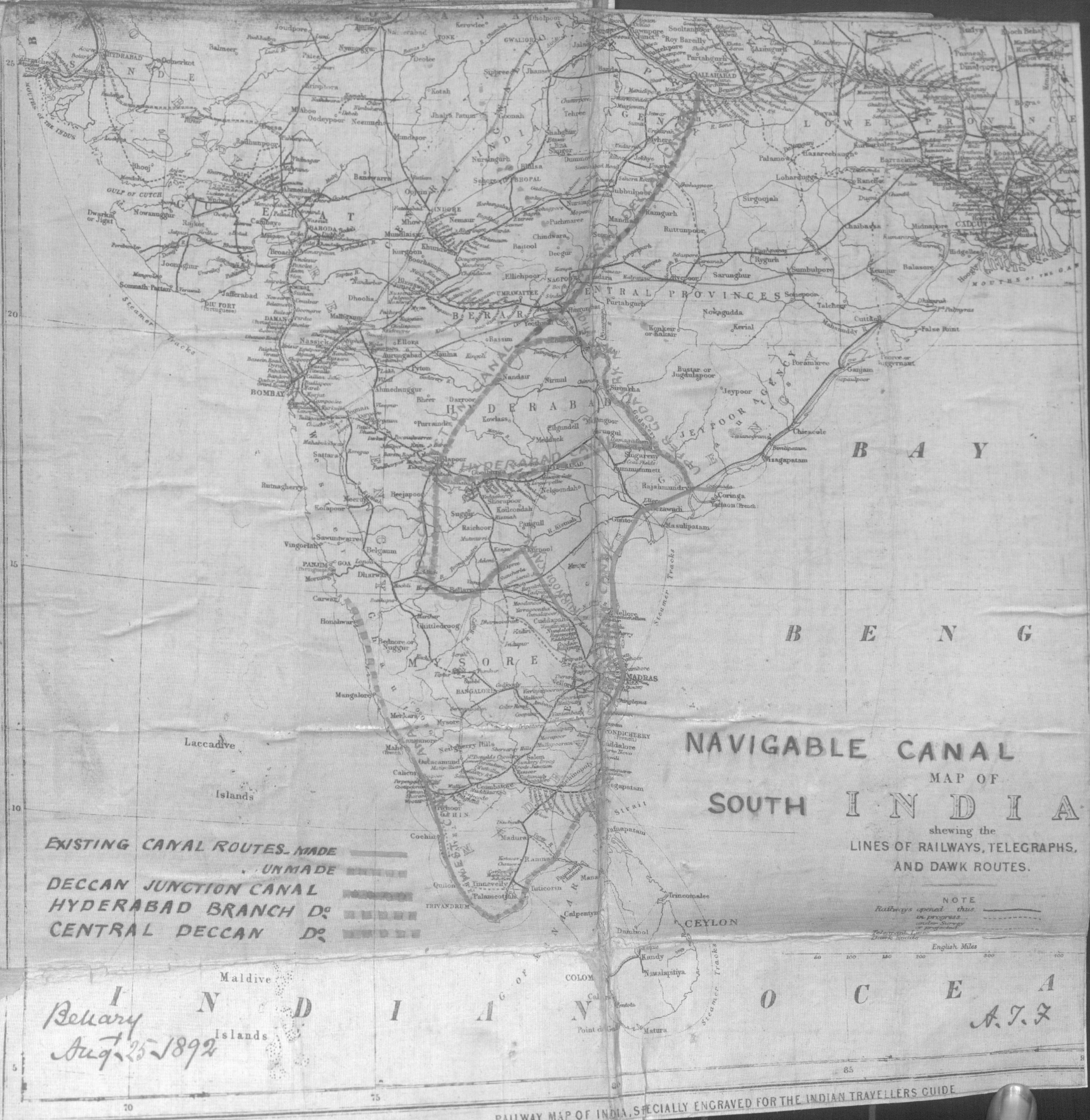
26/9

A T Fraser
Col R.E.

Bellary
August 25 1892

With a Map & Section

2469/10



NAVIGABLE CANAL
MAP OF
SOUTH INDIA
shewing the
LINES OF RAILWAYS, TELEGRAPHS,
AND DAWK ROUTES.

NOTE
Railways opened thus
in progress
under Survey or projected
Telegraph Lines
Dawk Roads

EXISTING CANAL ROUTES_MADE ▬
. UNMADE ▬
DECCAN JUNCTION CANAL ▬
HYDERABAD BRANCH D^o^ ▬
CENTRAL DECCAN D^o^ ▬

Bellary
Aug^t^ 25 1892

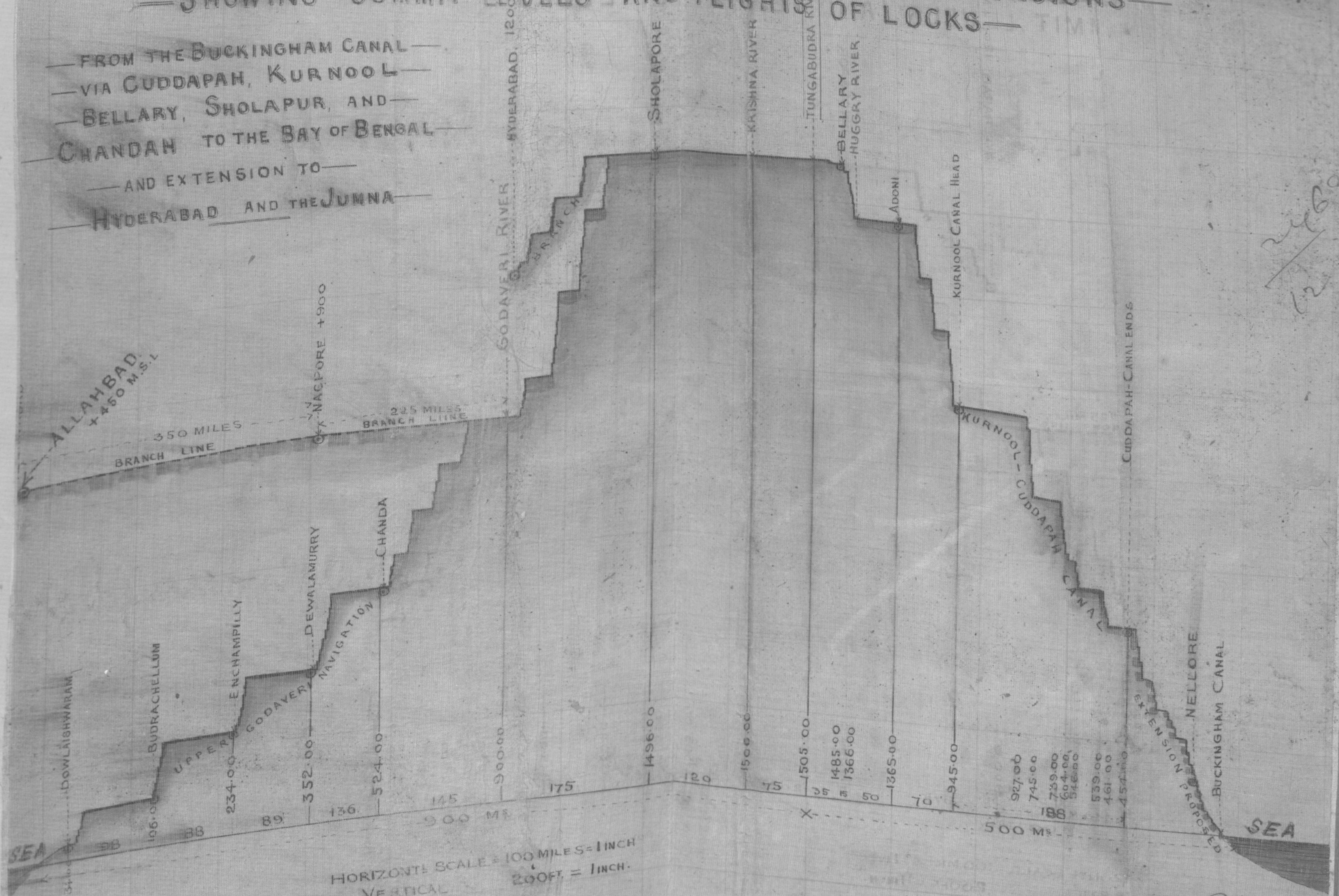
A. T. T.

RAILWAY MAP OF INDIA, SPECIALLY ENGRAVED FOR THE INDIAN TRAVELLERS GUIDE

—SECTION OF THE DECCAN JUNCTION CANAL AND EXTENSIONS— —SHOWING SUMMIT LEVELS AND FLIGHTS OF LOCKS—

—FROM THE BUCKINGHAM CANAL—
—VIA CUDDAPAH, KURNOOL—
—BELLARY, SHOLAPUR, AND—
—CHANDAH TO THE BAY OF BENGAL—
—AND EXTENSION TO—
—HYDERABAD AND THE JUMNA—

2469/12



HORIZONTL SCALE = 100 MILES = 1 INCH
VERTICAL 200 FT. = 1 INCH.

Augt. 25. 1892

AVF.

4. The importance, however,
embodying a body of deep water in the

From

Colonel A. T. Fraser R.E.
Superintending Engineer
III circle

To

The Chief Engineer P.W.D. &
Secretary to Government

2469/13

Bellary
August 25. 1892

Sir

I have the honour to forward a short memoir on a Deccan Junction Canal (with its extensions) to connect the Kurnool Canal, via Bellary, Sholapur, with the upper Godavery navigation, so as to make if possible both of these schemes a success as lines of inland navigation, with map and section, for such consideration as the subject may be given.

2. Canal Expenditure seems to have special bearing on the question of falling Exchange, as if Government were to embark upon an extensive system of navigable Canals by means of loans raised in Silver bullion which could be coined into rupees and used on remunerative work of a nature that involves no heavy remittances, it must have a sensible effect on the price of Silver.

3. The Memoir is based partly on travelling recollections and such railway levels as are obtainable but the data are not at hand to carry the matter beyond the most preliminary stage.

4. The importance, however, of establishing a body of deep water in the

heart

heart of the districts which may most need it, can hardly be overrated.

I have the honor to be
Sir
Your Most obdt Servant

A. Fraser Col. R.E.
Supg Engineer
Scinde

2469/14

14

P. W. CURRENT No. 8683

From

The Superintending Engineer
III Circle

To

The Chief Engineer P.W.D.
Secretary to Government
Madras

Dated
Recd: 26-8-92

OVB
29.8.92

No 1626 Enc 3
(+2 plans)

Subject.

Forwarding for orders a Memorandum with map sketch on a Deccan Junction Canal (with its Extensions) to connect the Kurnool Canal with the Upper Godavary Navigation via Bellary & Sholapur.

0/26/8

25.9.92

P. W. D

Letter from Colonel A. T. Fraser, R.E., Supdg Engineer III Circle dated August 25. 1892 No 1626.

2469

Note by Chief Engineer P. W. D:—

I am not sure whether I am justified in submitting these papers to Government at all, as it is perfectly impossible to take seriously a proposal to spend thirteen hundred lacs of rupees on a canal for navigation only, which for the greater part of its length runs parallel and close to existing lines of railway.

2. Colonel Fraser's time would be better occupied in the administration of his circle, where there is plenty of useful work to be done than in the elaboration of visionar

schemes such as the one now submitted

Ew

Ootacamund
August 29. 1892

P. W. Department.

Read the following :—

Letter from Col. A. J. Fraser R.E., S.E. III Circle, No. 1626 d/25.8.92
Note by the Chief Engineer P. W. D. d/29.8.92

FOR ORDERS.

2469/16

W 30-8

I quite agree in the remark in para 2 of E.C.'s note, & would communicate it to Col. Fraser.

HLS
30 Aug.

W
1 Sep

The Hon. Sir Henry

His Excellency the G

FOR ORDERS.

O.S. 182–8
H.M. 30–8
A.E. 31–8
M 2–9

From [illegible]

PUBLIC WORKS DEPARTMENT.

No. 2469 W d/5 September 1892

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

Letter from Col: A. T. Fraser R.E.
Supdg Engr III Circle (R.E. No. 1626 d/25.VIII.92)
Note by the Chief Engr P.W.D. (d/29.VIII.92)

2/69
17

His Excellency the Governor in Council concurs in the remark in paragraph 2 of the Chief Engineer's Note which will be communicated to Colonel Fraser

S.E. III Circle d/5/9

2.9

2.9.92

R.S.

Nº 2489 w d/5 september 1894

⑰

J°/8/9.