

(1) Number of pages 30
(2) Date of repair _____
(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 929	Press
181-82	~~Mis.~~
Dated 29. 4.	1871 ..

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
29th March 1871.*

Read the following papers :—

No. 681. From R. SMITH, Esq., Executive Engineer, on special duty, Madura District, to the Chief Engineer for Irrigation, dated Madura, 8th March 1871, No. 415 :—

I HAVE the honour to submit the usual Monthly Report showing the progress
1 Table of Rain-fall and Discharge of Perryaur. made with the Perryaur investigations
1 Diagram of do. do. during February 1871.

2. All work connected with the detailed examination of sites Nos. 2 and 3 has been completed. Lieutenant Greer, who was in immediate charge of the operations in the hill tracts, returned to Madura on the 7th ultimo, and has since been engaged in working out the cost of the water-shed tunnel and lake embankment at different levels.

3. During my visit to the Perryaur, at the close of last year, I resolved on having the water-shed and country adjacent to the Goodalore Ghaut examined, before submitting the estimate and designs for the head works, and assigned this duty to Lieutenant Christie.

4. The results of this examination indicate that the reservoir embankment should be constructed some 8 or perhaps 10 miles below our present proposed sites.

5. As the unhealthy season was close at hand, Lieutenant Christie's investigations were necessarily very cursory, but you will, I presume, consider from what has been ascertained that further investigation is necessary.

6. According to Lieutenant Christie's levels the fall in the bed of the Perryaur, from the present camp to the embouchure of the stream on the right bank of this river, in longitude $77^{\circ} 13'$ is 35.19 feet; and from this point to about 3 miles farther down there is very little, if any, slope. From the end of this level reach Lieutenant Christie took a section about a mile in length, and found the fall to be 10 feet in this distance. He also examined the river for a mile or so lower down, and reports that there will be no difficulty in finding a suitable site for the lake embankment in that locality.

7. Lieutenant Christie makes the crest of the water-shed near Goodalore, 49.75 feet lower than it is in the line of the present proposed out-fall from sites 2 and 3.

8. If the detailed investigations confirm the above results, the head works will probably cost less than they would do higher up. The risk during construction and subsequently will be considerably reduced by having the reservoir in this comparatively flat country, and the increased area of the catchment basin will make the supply of water much more certain.

In November last experiments were made by Lieutenant Greer, at my request, to ascertain the proportion of silt brought down by the Perryaur during floods. Annexed are the results :—

State of River.	Level of River.	Weight of silt brought down by one cubic foot of water.	Specific gravity of silt.	Cubical contents of silt brought down by one cubic foot of water.
Flood rising	5 feet.	12 grs.	2	0.02 inch.
Top of flood	10 "	22 "	2	0.04 "
River falling	5 "	7 "	2	0.01 "

*Proceedings of the Madras Government, Public Works Department,
29th March 1871.*

10. The table and diagram showing the rain-fall at the Perryaur camp, and the discharge of the Perryaur during February 1871, accompany this report.

11. Fair progress has been made with the designs for the works on the north of the Vigay, and with the survey of the distribution channels. Subjoined is an abstract of the field-work done in the plains during the month under review:—

... during the month under review :—				
Lineal miles of country surveyed.	LEVELLING OPERATIONS.		Number of permanent bench-marks fixed.	Number of trial-pits sunk to the full depth.
	Aggregate length of longitudinal and transverse sections in miles.			
122	81		21	113

12. In conclusion I

12. In conclusion, I have to add that Lieutenant Christie has volunteered to remain on the Perryaur staff, for a time, in the event of your considering it desirable to resume the investigations lately conducted by him, and I feel sure the Government will appreciate the spirit that prompted this offer and allow him to continue on special duty.

PERRYAUR PROJECT.
Table of Rain-fall and Discharge of Perryaur during February 1871.

Date.	Rain-fall at Perryaur Camp.	Hours.	Water level in feet.	DISCHARGE.	
				Cubic feet per second.	1,000 Cubic yards per day.
1st February...	Inches. 0-00	6 A. M.			
2nd do. ...	0-00	6 P. M.	0-30	396	1,286
3rd do. ...	0-00	6 A. M.	0-30	396	1,286
4th do. ...	0-00	6 P. M.	0-25	384	1,223
5th do. ...	0-00	6 A. M.	0-20	372	1,173
6th do. ...	0-00	6 P. M.	0-15	361	1,101
7th do. ...	0-00	6 A. M.	0-10	349	1,037
8th do. ...	0-00	6 P. M.	0-05	339	995
9th do. ...	0-00	6 A. M.	0-00	328	979
10th do. ...	0-00	6 P. M.	-0-04	320	954
11th do. ...	0-00	6 A. M.	-0-08	312	915
12th do. ...	0-00	6 P. M.	-0-09	310	909
13th do. ...	0-00	6 A. M.	-0-10	308	983
		6 P. M.	-0-12	304	964
		6 A. M.	-0-14	300	
		6 P. M.	-0-16	296	
		6 A. M.	-0-20	289	
		6 P. M.	-0-23	283	
		6 A. M.	-0-21	287	
		6 P. M.	-0-25	281	
		6 A. M.	-0-28	279	
		6 P. M.	-0-29	273	
		6 A. M.	-0-30	271	
		12 NOON.	-0-30	269	
		6 P. M.	0-42	426	1,126
			0-15	361	

*Proceedings of the Madras Government, Public Works Department,
29th March 1871.*

Table of Rain-fall and Discharge of Perryaur, etc.—(Concluded.)

Date.	Rain-fall at Perryaur Camp.	Hours.	Water level in feet.	DISCHARGE.	
				Cubic feet per second.	1,000 Cubic yards per day.
14th February...	Inches. 0-00	6 A. M.	0-30	396	1,286
15th do. ...	0-00	6 P. M.	0-35	408	1,102
16th do. ...	0-31	6 A. M.	0-15	361	1,107
17th do. ...	0-00	6 P. M.	0-00	328	1,026
18th do. ...	0-08	6 A. M.	0-20	372	1,069
19th do. ...	0-00	6 P. M.	-0-04	320	1,058
20th do. ...	0-00	6 A. M.	-0-16	296	1,096
21st do. ...	0-00	6 P. M.	0-08	315	954
22nd do. ...	0-00	6 A. M.	-0-16	296	890
23rd do. ...	0-00	6 P. M.	-0-20	289	851
24th do. ...	0-00	6 A. M.	0-10	349	803
25th do. ...	0-00	6 P. M.	-0-08	312	787
26th do. ...	0-02	6 A. M.	-0-20	289	733
27th do. ...	0-40	6 P. M.	-0-14	300	749
28th do. ...	0-20	6 A. M.	-0-16	296	842
		6 P. M.	-0-23	283	
		6 A. M.	-0-28	273	
		6 P. M.	-0-30	269	
		6 A. M.	-0-33	263	
		6 P. M.	-0-39	251	
		6 A. M.	-0-40	249	
		6 P. M.	-0-43	243	
		6 A. M.	-0-50	229	
		6 P. M.	-0-50	229	
		6 A. M.	-0-52	225	
		6 P. M.	-0-43	243	
		6 A. M.	-0-33	263	
		6 P. M.	-0-33	263	
Total...	1-01				27,784

Depth run off from Catchment Basin of 250 square miles = 1-29 inches.

Mean Discharge ... { 992,285 Cubic yards per diem.
41,345 " " per hour.
310 " " feet per second.

Cubic yards.
Discharge of Perryaur in February 1871 ... 27,784,000
Do. of do. in do. 1870 ... 25,566,000

Difference—Excess in February 1871 ... 2,218,000

MADURA,
8th March 1871.

(Signed) R. SMITH,
Executive Engineer on special duty.

No. 631 A. Memorandum by the Chief Engineer for Irrigation, dated Fort Saint George, 11th March 1871, No. 72.

THE result of the examination of the water-shed near the Goodalore Ghaut is such as to render it necessary to make a further examination next season, and it is quite possible, though as yet not at all clear, that it may be found advisable to adopt the lower, rather than the higher, site for the works for bunding the

Proceedings of the Madras Government, Public Works Department.
29th March 1871.

Perryaur and turning its waters into the Madura District. Possible alterations in the future need not, however, interfere with the completion of the estimates for the project in the form for which the necessary investigations have been made, and it will then rest with the Government to decide whether, on a comparison of the amount of the estimates and the returns expected from the outlay, it will be advisable to apply to the Government of India for the sanction of these estimates, or to wait until it has been ascertained whether a cheaper project can be worked out at a site 8 or 10 miles lower down the river.

2. Several considerations, besides the difference of height of embankment at the river or depth of cutting at, or length of tunnel under, the water-shed, will have to be taken into account, and among them facilities for silting will take a very important place. Apart from this there will no doubt be several advantages in selecting a site which will not only utilize a larger catchment basin, but which, lying below a comparatively open part of that basin, would secure a given quantity of storage capacity with a smaller depth of water.

3. Should the relation between the estimates for the upper sites and the revenue returns prove satisfactory, there would, in my opinion, be no objection to the submission of the former to the Government of India for sanction, in anticipation of the completion of the investigation of the lower site; because, if the latter should be ultimately adopted, it will only be so on the ground of its superiority, and when once the feasibility of the project and its value have been ascertained, it will be of great advantage not to delay the commencement of the execution of the works. The scheme will require the sanction of the Secretary of State as well as the approval of the Government of India, and the requisite references will take time, during which there will be an opportunity of finishing the examination of the lower site, and deciding whether it should be preferred to that estimated for. Probably one or two seasons would be gained by the adoption of the course suggested.

(Signed) J. MULLINS, Major, R.E.,
Chief Engineer for Irrigation.

No. 682.

ORDER THEREON, 29th March 1871, No. 923.

IRRIGATION, No. 56-A.

The Government approve of the proposals made by the Chief Engineer for Irrigation, in connection with the recently ascertained fact that the water-shed near the Goodalore Ghaat is relatively to the Perryaur about 15 feet lower than the saddle at which it has been hitherto intended to pass Perryaur water into the Surulyaur.

2. His Excellency the Governor in Council has noticed with satisfaction the wish of Lieutenant Christie to continue his employment on special duty until the completion of the further investigations, which have now been shown to be desirable; but, looking to the difficulty that would be felt in the Railway Department by his prolonged absence from his duties in the Consulting Engineer's Office, His Excellency considers that it will be better that this officer should join the latter as soon as the work on which he is at present engaged is finished. Should

Proceedings of the Madras Government, Public Works Department,
29th March 1871.

Mr. R. Smith require the services of another Assistant Engineer at the commencement of the next healthy season on the hills, the Government will endeavour to make one available.

(True Extract.)

(Signed) J. G. RYVES, Captain, R.E.,
Acting Joint-Secretary to Government.

To the Superintending Engineer, 8th Division.
To R. Smith, Esq., Executive Engineer.
To the Chief Engineer for Irrigation.

Etd. S. T. Augustin.

Govt. of Madras.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER.

SIR,

Madras.

Dated March 23rd.

No. 691.

G. O. 1100 of 1871.

MARCH

Nos. 691-692

Permanently. Pending on the part of the Government for the purpose of the Irrigation on the Periyar project for 1871.

No. 415

From,

Special Executive Engineer's Office
Madras 8th March 1871.

R. Smith Esquire
Executive Engineer, On special duty
Madras District

To,

Major J. Mullins R.E.
Chief Engineer for Irrigation.
Madras

Enclosures - 2
1 Table of Rainfall
2 Diagrams of
1 Diagram of the
1 Diagram of the

I have the honor to submit the usual monthly Report showing the progress made, with the Periyar investigations, during February 1871.

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engaged in working out the cost of the Watershed tunnel and lake embankment at different levels.

3. During my visit to the Terras; at the close of last year, I resolved on having the Watershed and Country adjacent to the Goodaloor Plant examined, before submitting the estimates and designs for the Head works, and assured this duty to Lieutenant Christie.

4. The results of this examination indicate that the Reservoir embankments should be constructed some 8, or perhaps 10, miles below our present proposed sites.

5. As the unhealthy season was close at hand, Lieutenant Christie's investigations were necessarily very cursory but you will, I presume, consider from what has been ascertained that further

91 2
investigation is necessary.

6. According to Lieutenant Christie's levels the fall, in the bed of the Perryaur, from the present Camp to the embouchure of the stream on the right bank of this river, in longitude $44^{\circ}13'$, is 35.19 feet; and from this point, to about 3 miles farther down, there is very little if any slope. From the end of this level reach,

Lieutenant Christie took a section, about a mile in length, and found the fall to be 10 feet in this distance. He also examined the River for a mile or so lower down, and reports that there will be no difficulty in finding a suitable site for the Lake embankment in that locality.

7. Lieutenant Christie makes the crest of the Watershed, near Goodaloor, 49.75 feet lower than it is in the line of the present

present proposed outfall from sites 2 and 3.

8. If the detailed investigations confirm the above results the head work will probably cost less than they would do higher up - the risk during construction and subsequently will be considerable reduced by having the Reservoir in this comparatively flat country and the increased area of the Catchment basin will make the supply of water much more certain.

9. In November last experiments were made by Lieutenant Greer at my request to ascertain the proportions of silt brought down by the Perryaur during floods and annexed are the results:-

State of River	Depth of River	Weight of silt brought down per cubic foot of water	Specific Gravity of silt	Weight of silt per cubic foot of water
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Top of Flood	10 "	22 "	2	0.04
River falling	5 "	7 "	2	0.01

10. The table and diagram showing the rain-fall, at the Perryaur Camp, and the discharge of the Perryaur, during February 1871, accompany this Report.

11. Fair progress has been made with the designs for the works, on the North of the Vigay, and with the survey of the Distribution Channels. Subjoined is an abstract of the field-work done in the Plains, during the month under review:-

Linear miles of Country surveyed	Leveling operations: Aggregate length of Longitudinal and Transverse sections in miles	Number of permanent bench marks fixed	Number of trial pits sunk to the full depth
122	81	21	113

12. In Conclusions I have to add that Lieutenant Christie has volunteered to

to remain on the Vermont Staff, for an

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V
C^t, Esq^r
East India Company
for Siragapatam
Madras

David S.
Capt. J. T. ...
Received ... March 1861
11 Jan 1861
Chelmsford. 2.

Submits the Monthly
Report showing the progress
made with the Tennessee
investigations, during February
1841.

Perrault Project

Perryaur Report
Table of Rainfall and Discharge of Perryaur during February
1871.

Date	Rainfall at Kanyan Camp.		Water level in feet	Discharge		Date	Rainfall at Kanyan Camp.		Water level in feet	Discharge	
	inches	Hours		Cubic feet per Second	1000 Cubic yards per day.		inches	Hours		Cubic feet per Second	1000 Cubic yards per day.
Dec 1.	0.00	6 a.m. to 6 p.m.	0.30	396	1267	15	0.00	6 a.m. to 6 p.m.	0.15	361	1102
2	0.00	6 a.m. to 6 p.m.	0.30	396	1267	16	0.31	6 a.m. to 6 p.m.	0.20	372	1107
3	0.00	6 a.m. to 6 p.m.	0.25	384	1228	17	0.00	6 a.m. to 6 p.m.	-0.04	320	1026
4	0.00	6 a.m. to 6 p.m.	0.20	372	1173	18	0.00	6 a.m. to 6 p.m.	-0.16	296	1069
5	0.00	6 a.m. to 6 p.m.	0.15	361	1101	19	0.08	6 a.m. to 6 p.m.	-0.08	349	1058
6	0.00	6 a.m. to 6 p.m.	0.10	349	1037	20	0.00	6 a.m. to 6 p.m.	0.10	312	1096
7	0.00	6 a.m. to 6 p.m.	-0.04	320	995	21	0.00	6 a.m. to 6 p.m.	-0.20	289	954
8	0.00	6 a.m. to 6 p.m.	-0.08	312	979	22	0.00	6 a.m. to 6 p.m.	-0.14	300	890
9	0.00	6 a.m. to 6 p.m.	-0.10	308	954	23	0.00	6 a.m. to 6 p.m.	-0.16	296	857
10	0.00	6 a.m. to 6 p.m.	-0.12	304	915	24	0.00	6 a.m. to 6 p.m.	-0.23	283	803
11	0.00	6 a.m. to 6 p.m.	-0.14	300	909	25	0.00	6 a.m. to 6 p.m.	-0.28	273	787
12	0.00	6 a.m. to 6 p.m.	-0.16	296	883	26	0.00	6 a.m. to 6 p.m.	-0.30	269	733
13	0.00	6 a.m. to 6 p.m.	-0.20	289	864	27	0.00	6 a.m. to 6 p.m.	-0.33	263	749
14	0.00	6 a.m. to 6 p.m.	-0.23	283	826	28	0.40	6 a.m. to 6 p.m.	-0.39	257	842
15	0.00	6 a.m. to 6 p.m.	-0.21	287	803				-0.39	257	
16	0.00	6 a.m. to 6 p.m.	-0.24	281	787				-0.39	257	
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29	0.00	6 a.m. to 6 p.m.	-0.30	269	733				-0.33	263	
30	0.00	6 a.m. to 6 p.m.	-0.30	269	733				-0.33	263	

Total. 1.01

Total 27.7846

Depth runs off from Catchment Basins of 250 square miles = 1.29 inches
 992,285 cubic yards per diem

Mean Discharge — { 992, 285 Cubic yards per diem
41, 345. — " — " — " — hour
310. — " — " — " — Second

Discharge of Perry and co. February 1871. ————— ^{Public works} 27,484,000

Discharge of — D^o — in: February 1840 — 75,566,000

Differences-Excess in February 1871. — 2,218,000

S/pl Executive Engrs Office.
Madura, 8th March
1841

Y. M. T.
Occasional Engineer
No special duty Celladusa Court

The result of the examination of the watershed near the Gordalar ghaut is such as to render it necessary to make a further examination next season, and it is quite possible, though as yet not at all clear, that it may be found advisable to adopt the lower, rather than the higher, site for the works for bunding the Pryaur and turning its waters into the Madina District.

Possible alterations in the future need not however interfere with the completion of the estimates for the project in the form in which the necessary investigations have been made, and it will then rest with the Government to decide whether, on a comparison of the amount of the estimates and the returns expected from the outlay, it will be advisable to apply to the Government of India for the sanction of these estimates, or to wait until it has been ascertained whether a cheaper project can be worked into at a site 8 or 10 miles lower

down

I enclose herewith a letter from
the President of the Board, on the
Special duty of Madras, dated
8th March 1891.

Yours
S. S. S.

to Mr. Chief Engineer
for Irrigation,
Madras.

1891/14/6/71
Engineer-in-Chief

Office of the Secretary and
in charge of the Irrigation
during the absence of the
Secretary.

down the river.

2. Several considerations, besides the difference of height of embankment at the river or depth of cutting at, or length of tunnel under, the water shed, will have to be taken into account, and among them facilities for siting will take a very important place. Apart from this there will no doubt be several advantages in selecting a site which will not only utilize a larger Catchment basin, but which, lying below a comparatively open part of that basin, would secure a given quantity of storage capacity with a smaller depth of water.

Should the relation between the estimates
for the upper sites & the Penine returns prove sa-
tisfactory, there would, in my opinion, be no objec-
tion to the submision of the former to the Govern-
ment of India for sanction, in anticipation of
completion of the investigation of the lower site;
because, if the latter should be ultimately adopted
it will only be so in the ground of its superiority,
and when once the feasibility of the project and
its

its value have been ascertained, it will be of great advantage not to delay the commencement of the execution of the works. The scheme will require the sanction of the Secretary of State as well as the approval of the Government of India, and the requisite references will take time, during which there will be an opportunity of finishing the examination of the lower site, and deciding whether it should be preferred to that estimated for. Probably one or two seasons would be gained by the adoption of the course suggested.

Fort St George
11th March 1871

Voluntarily Major. G.
Chief Engineer for Singapore
To
The Secretary to Government
P. M. S. P.

Public Works Department
 No 929
 Proceedings of the Madras Government
 Read the following

From
 The Chief Engineer
 for Irrigation } (H. E. 1142 of 11th March 1871.)

The Government
 approve of the proposals
 made by the Chief Engineer
 for Irrigation, in con-
 -nection with the re-
 -cently ascertained
 fact that the water
 level near the Gooda-
 -loor Ghaut is rela-
 -tively to the Perryam
 about 15 feet lower
 than the saddle at
 which it has been
 hitherto

N.

Per 1871, 11th March 1871.
 The Chief Engineer

for Irrigation

to
 The Secretary
 to Govt. of M. B.

Per 11th March 1871
 1871/13
 Per 13th March 1871

Per 13th March 1871

Per 13th March 1871

Per 13th March 1871

Per 13th March 1871

Per 13th March 1871

Per 13th March 1871

10.5.1884/11/24/1884

hitherto intended to
pass Dryanar water
into the Sanyaur.

2 His Excellency
the Governor in Council
has noticed with sa-
tisfaction the wish of
Lieutenant Christie
to continue his em-
ployment on special
duty until the com-
pletion of the further
investigations, which
have now been shown
to be desirable; but,
looking to the difficulty
that would be felt
in the Railway De-
partment by his
prolonged

27th 9
prolonged absence
from his duties in
the Consulting En-
gineers' office, His
Excellency considers
that it will be better
that this Officer should
join the latter as soon
as the work on which
he is at present en-
gaged is finished.
Should Mr. P. Smith
require the services
of another Assistant
Engineer at the
commencement of
the next healthy
season on the hills,
the

the Government will
endeavour to make
one available.

by 13/3/71

C. H. B.

Per 6 March 71 W 120-121

27/1

Further Pro. No. 1400 of 22-5-71

Despatch 30/3/71

To
The Supy Engr
of the S. Dist

To P. Smith Esq.
Ex: Engineer
" the Chief Engineer
for Irrigation
" C. Engr for Railways

6/12/71 Pro. 1600

No Government will

1/12/11
Govt. of Madras.

PUBLIC WORKS.

The Superintending Engr
8th Division

Dated

Recd.

G. O. 29th March 11. No. 929.

Nos. 681-682

Revenue Branch. Making order
on the Memo. in the
Eng. for Bridge on the pr.
rep report of the Surveyor
Project for Dec '71.