Proceedings of the Madras Government, Public Works Department,
19th September 1876 *No* 2,507.

Read the following papers —

No. 320 From Captain R R E BROCKMAN, R E, District Engineer, Tanjore, to Major-General G W. WALKER, R E, Chief Engineer, Public Works Department, dated Camp at Combaconum, 11th August 1876, No 1,485

In reference to your memorandum, No 1,170, dated. 2nd August 1876, I have the honor to state that there is no letter from the Superintending Engineer to Government bearing No 181 and dated 21st April 1875. This number and date appear to belong to your endorsement transferring for orders in the Revenue Department Colonel Roberts' letter, No 366, dated 21st April 1875; and, presuming that this letter is that meant in your memorandum under reply, I beg to forward herewith a copy of the same.

2. Mr Leggatt's letter, No 682, dated 10th March 1875, to Colonel Roberts' address, was forwarded, in original, with Colonel Oakes' letter to Government, No 964, dated 30th May 1876, and I observe that it is printed with G O, No 1,670, dated 3rd July 1876, in which, however, the addressee is erroneously shown to be Colonel Oakes instead of Colonel Roberts. A copy of that letter taken from the above Government Order is also enclosed

---

From Lieutenant-Colonel R A ROBERTS, R E, Superintending Engineer, Tanjore, to Major-General G W. WALKER, R E, Secretary to Government, Public Works Department, dated Tanjore, 21st April 1875, No 366

Adverting to G O, 19th May 1874, No 99, communicating sanction in the Revenue Department of a temporary establishment for completing the survey of the Vedarniem canal, at a cost of Rupees 160 per mensem for three and a half months, or Rupees 560 in all, I have the honor to inform you that the survey and sections have been very carefully completed, and that the benchmarks have been fixed and accurately noted on the survey

2 The length of the canal surveyed, inclusive of 8 miles of the Adappar, is 32 miles, and it has been found quite impossible for one Surveyor to survey this length of canal, take the frequent cross sections found necessary, and note the benchmarks within the period sanctioned

3 The survey has been exceptionally well got out, and I would strongly urge, therefore, that an additional month's pay be passed to the Surveyor and Draughtsman engaged on the work, viz, one Surveyor at Rupees 70 and one Draughtsman at Rupees 40, or Rupees 110 in all I should mention that this extra sum for which sanction is solicited, by no means represents in fact, is far below the extra time which the Surveyor and Draughtsman have actually given to the work in excess of the period for which the establishment was sanctioned

4 The survey is not forwarded now for inspection, as it will be submitted hereafter with the estimate for the improvement of the canal.

No 320-A From Captain R R E BROCKMAN, R.E, District Engineer, Tanjore, to Major-General G W. WALKER, R E, Secretary to Government, Public Works Department, dated Tanjore, 16th August 1876, No 1,533.

With reference to G O, No 1,670, dated 3rd July 1876, relative to the improvements of the Vedarniem Salt Canal, I have the honor to furnish the information called for therein in paragraphs 1 and 4 respectively.

2 Mr. Phillips was employed as a Surveyor on the Coleroon river survey in the months of April and May 1874, during that short period he did not give satisfaction to Lieutenant Romilly, R E, under whom he was working, and this was reported by that officer in his letter to the District Engineer, No 178, dated 28th August 1874, which gave an account of the progress of the survey work. Before this report came in, however, the then District Engineer, Colonel Roberts, R E, had already appointed Mr Phillips on the survey of the Vedarniem canal in his order No 482, dated 20th July 1874 Mr Phillips was employed on this survey for a period of 7½ months, when the plans were sent in with Mr Leggatt's forwarding letter quoted in the Government Order now under reference After the receipt of Lieutenant Romilly's report, in which it was stated that Mr Phillips had been guilty of scamping his work, no intimation of that fact appears to have been conveyed to Mr Leggatt from this office in order that he might be put on his guard, and to induce him to exercise a careful scrutiny over Mr Phillips' work.

3 I may mention that Mr Phillips had not previously been *dismissed* from the Coleroon survey. He had merely tendered his resignation to Lieutenant Romilly, which that officer accepted on the 6th May previously.

4 With reference to paragraph 4 of the Government Order, I have the honor to forward herewith original tracings, accompanied with a letter from Messrs. Hunter and English, relative to the steam and hand dredges referred to by Colonel Oakes, and which will afford all the information required

5 There is no reason whatever why spoon dredging should not succeed in the Vedarniem canal, as the spoil to be lifted is moreover of so light a quality It has never, however, been attempted, the clearances having been hitherto effected by coolies working under water with a basket and hoe, and the spoil carried by others in attendance and deposited outside or on the banks. In order to carry out more effectually the clearance of the canal with such poor means at disposal, its yearly closure was necessary, a point alluded to in paragraph 11 of Colonel Oakes' letter, No 964, dated 30th May 1876.

6 Whilst on the subject of steam canal dredges, I would respectfully draw your attention to the description of dredges detailed in the Roorkee Professional Papers for July 1876, and patented by J W Barns, Esq, M I C.E, and Superintendent of Canal Irrigation, Bahawalpur State, and which appear to me to be ingeniously and carefully designed

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From Messrs HUNTER and ENGLISH, Engineers and Millwrights, to Lieutenant-Colonel R A ROBERTS, R.E, Superintending Engineer, Tanjore, dated Bow, London, E, 8th January 1875

We now have the pleasure to enclose tracings of dredgers in accordance with the questions submitted by you to Colonel Scratchley, R E

Not having an exact section of the canal, we have been obliged to draw upon our imagination for the shape of the banks and the position of the dredger relatively to them We think that the tracings explain themselves, and would only point out that the steam dredger is proposed to be constructed with an open ladder well, the ladder itself projecting beyond the end of the vessel. The advantage of this method of construction is, that when the dredger is once placed in water where she can float she can cut through a shoal or a bank and make a new channel across country

Proceedings of the Madras Government, Public Works Department,
19*th September* 1876. *No.* 2,507.

To give you the opportunity of judging which dredger is best suited to your requirements, we make our offer in four different ways, viz —

No 1 —We are willing to supply a 10-horse power steam dredger as shown in tracing the hull to be 60 feet long × 12 feet beam, the ladder well in the centre, open to the end, horizontal high-pressure and condensing steam engine, with multitubular boiler, the fore and aft motion worked by the engine and the side chains by small hand winches, the anchors and chains necessary and a shoot spout 45 feet long with pontoon to carry the same for the sum of £2,400, or, if made with a non-condensing engine, £2,200.

No 2 —If the dredger is only made to lift to the usual height necessary for the discharge of the excavated material into punts or barges, which is shown upon the tracing in red ink, the cost will be with a condensing engine £2,080, and with a non-condensing engine £1,880

No 3 —We can supply a hand dredger as shown in tracing, made to deliver the material dredged into punts or barges for the sum of £460 The tracing shows handles, sufficient for about twenty-four men, but the dredger could be adapted for greater number by the addition of about 5 feet in length for every eight men, and an additional expense of about £40 for the same number

No 4 —We can supply a hand dredger with the upper tumbler made high enough to deliver the material excavated into a spout similar to that shown upon the tracing of the steam dredger, and including the cost of the spout and pontoon, for the sum of £700

The steam dredger would be able to lift about 50 tons of sand and sludge per hour, and the hand dredger about one-fourth or one-fifth of that quantity, dependent to some extent upon the number of men you can employ upon the work.

In the case of proposals for a steam dredger, the vessel, engine and machinery, and of the hand dredger, the vessel and machinery would be put together as far as possible here, marked, taken down, the necessary parts packed and the whole delivered alongside in the Thames or Docks

We shall be glad upon hearing from you to give you any further information you may require

We have constructed six of the large dredgers upon the Thames, and several for different small rivers and canals, and think that our long experience would enable us to supply you with a dredger that would give you every satisfaction

---

No 320-B. From W. B. LEGGATT, Esq, A I C E, Officiating District Engineer, Bellary, to Major-General G. W WALKER, R E, Secretary to Government, Public Works Department, dated Camp at Lapatchy, 21st July 1876, No 1,403

I EXTREMELY regret to find from G O, No 1,670, of the 3rd instant, that the work turned out by Mr. Phillips on the Vedarniem canal survey and levels has proved to be so incorrect as pointed out by Colonel Oakes, R.E, and, in obedience to the order calling for an immediate explanation of the part I had taken in the matter, I beg to report as follows

2 Mr. Phillips and his Draughtsman and Lascars were appointed and sent to me by Lieutenant-Colonel Roberts, R E, then District Engineer of Tanjore, for employment on the Vadarniem canal survey work Of course coming from the District Engineer's office, I had every reason to presume that they were competent men, but I soon found out that Mr. Phillips required careful supervision, and that the Draughtsman was such only in name, he was a *Gumastah* in the District Engineer's office at Madura, was

on leave in Tanjore at the time, and had absolutely never plotted any surveys or levels before he came to Negapatam, though he could copy plans fairly well

3 With such tools as these I was ordered to carry on the work, and that at a time, when it required more than one man's time and attention, to get the Negapatam Range and its accounts, out of the state of chaos and confusion into which they had fallen during Mr Hall's regime, a fact not unknown to Government I tried, however, to do the best I possibly could with the Survey Establishment, and gave them *written* instructions in detail as to their work and the mode of carrying it out, which are on record in the Range office Mr Phillips was further supplied with a copy of the Irrigation Chief Engineer's memorandum on the subject I also from time to time (as often as it was possible for me to do so) accompanied Mr Phillips and saw him carry out his work, which, while under my supervision, he did fairly well, and I checked his longitudinal levels as well.

4. From the middle of November 1874 to the middle of February 1875 I was in charge of the Tanjore District, in addition to my range work, and it must have been then that Mr Phillips made a mess of his cross sections and plottings, for it was not possible for me during that period to exercise the check he required, and having my doubts regarding this work, I represented the same verbally to Lieutenant-Colonel Roberts on his next visit to Negapatam, when I also informed that officer that, though the survey and levels had been completed soon after I was relieved of the charge of the district, I had not examined them, and did not know when I could do so, for I was suffering from the effects of sun-stroke at the time He then kindly directed me to send the papers into his office for examination, which I did with my letter, No 682, of the 10th March 1875

5 I cannot see what reason Colonel Oakes had, for inferring from my letter above quoted, that because I had ordered the levels to be reduced to a datum 25 feet below the crown of the jetty at Negapatam, from which the levels were started, that *therefore* I had approved of, if not suggested, the cross sections being plotted 25 feet below the level of the points from which they were taken, utterly regardless of the relative levels of those points

Had Mr Phillips understood his work he would have understood my order

6. I have not seen the Government Order authorizing the bonus of a month's pay being passed to the survey establishment, but I presume that the District Engineer would not have supported the recommendation, had that officer not satisfied himself on an examination of the work sent to him, that there were good grounds for the recommendation.

7. With this explanation, I confidently leave the matter in the hands of Government, trusting they will see that the bad and incorrect work is owing to the incompetency of the survey establishment alone, and not from any want of care or any wilful neglect on my part Unfortunately ill health, coming at the end of the official year when there is an unusual press of work, prevented my examining the Surveyor's work before sending it up to the District Engineer's office, but this I had reported as above stated.

I beg to add that I have no records here to refer to, and, as the order is immediate, I have no time to obtain them.

Proceedings of the Madras Government, Public Works Department,
19th September 1876. *No.* 2,507.

No. 321. ORDER THEREON, 19th September 1876, No. 2,507.

CIVIL WORKS, No 21-A.

THE papers recorded above contain explanations called for as to the survey and levels of the Vedarniem canal, the imperfections of which were commented on in G O, No 1,670, dated 3rd July 1876.

2. It would appear that Mr. Phillips, by whom the surveys were made, was appointed by Lieutenant-Colonel Roberts, R E, on the 20th July 1874.

3. Not long after, or on the 2nd August, Mr. Phillips was reported to Lieutenant-Colonel Roberts as not having given satisfaction to Lieutenant Romilly, R E, on the Coleroon Surveys; Lieutenant-Colonel Roberts appears to have taken no notice of this complaint, and he appointed to the survey party under Mr Leggatt a Draughtsman, who was a mere copyist and had never before plotted any surveys or levels, but was known to Lieutenant-Colonel Roberts as having been a Gumastah in his former office at Madura

4 Mr. Leggatt only took charge of the Negapatam Range in July 1874, when, as he represents, it was much disorganized. He pleads also that he had temporary charge of the district from November 1874 to February 1875 There would be no extenuation in this circumstance had the survey been completed in the time allowed; but the two incompetent men employed did not send in their papers till the end of February 1875, when they were recommended for, and obtained, an extra month's pay as a gratuity on the ground of the excellence of their work.

5 Mr Leggatt says that he verbally made known to Lieutenant-Colonel Roberts his doubts regarding the quality of the work turned out. There is no hint, however, to that effect in his official letter, No. 682, of 10th March 1875, submitting the papers to the District Engineer's office for disposal Mr Leggatt states that he did not examine the papers; yet he expressed doubts as to their accuracy. It would, however, seem from paragraph 3 of his official letter that the papers did come under his observation, on which occasion the fact that the sections had been plotted from independent data, the relative levels of which were unknown, should not have escaped notice.

6. The papers were retained by Lieutenant-Colonel Roberts for upwards of a month, at the end of which he arrived at the conclusion that they were "*very carefully completed*" and "*exceptionally well got up*"

7 Lieutenant-Colonel Roberts, on his return to duty, will be called upon for such explanation of his procedure in this case as he may have to offer. He will fully explain his reasons for the appointment of men known to be unqualified for the work which they were sent to perform, and state the grounds for the opinion of their work which he has expressed A copy of the Proceedings of Government of the 3rd July 1876, No 1,670, will be furnished to Lieutenant-Colonel Roberts.

8. The work should be taken up again without delay; any outlay necessary for revising the existing papers being met from the annual grant of Rupees 5,000 for the up-keep of the canal The estimate for improving the canal called for in G O, No 837, of 13th August 1873, should be P. W No 142-A, dated 18th September 1873 no longer delayed, and an entry on its account should be made in the Salt Budget of 1877-78.

9 His Grace the Governor in Council sees no reason why spoon dredging should not be introduced for the clearance of the Vedarniem canal, and the District Engineer will arrange as early as practicable to give this system a trial; moveable stages or flat boats being used

10. The circumstances now brought to light and on other occasions have suggested the expediency of placing the arrangements in respect to the employment of Surveyors on a more satisfactory footing At present they are on the temporary establishment, being taken on as wanted and discharged or transferred when their work is completed. They are presumed to hold College certificates; but District Engineers are left to their own resources to obtain properly qualified men, and have no published and graded lists to refer to. Under the Government of India Surveyors belong to the Permanent Lower Subordinate Establishment, and are divided into three grades on salaries of Rupees 70,* 45,* and 35,* respectively. Before taking any decided steps, however, in the direction indicated, His Grace the Governor in Council desires to be furnished with a return of the number of Surveyors now employed, the number of these who hold certificates; and the number employed on an average during the past two years. The information will doubtless be available in the Examiner's office, and should be supplied by Captain Conway-Gordon

* As a maximum.

(True Extract)

(Signed) G. W. WALKER, Major-General, R E,
Secretary to Government.

To the Chief Engineer for Irrigation.
„ District Engineer, Tanjore
To Lieutenant-Colonel Roberts, with copy of G O, No. 1,670, dated 3rd July 1876.
To the Examiner of Public Works Accounts.
„ Revenue Department.

Exd. E C. Shunker.
Spare Copies

No. 366

Superintending Engineer's Office
Tanjore 21st April 1875

From,
The Superintending Engineer
Tanjore

To,
The Secretary to Government
P. W. D.

Sir,

Adverting to G. O. 19th May 1874 No. 99 communicating Sanction in the Revenue Department of a temporary Establishment for completing the Survey of the Vedarnium Canal, at a cost of Rs 160 per Mensem for three and a half months or Rs 560 in all, I have the honor to inform you that the Survey and Sections have been very carefully completed and that the Bench Marks have been fixed and accurately noted on the Survey

2 The length of the Canal surveyed inclusive of 8 Miles of the Adappar is 32 Miles; and it has been found quite impossible for one Surveyor to survey this length of Canal, take the frequent cross Sections found necessary and note the Bench Marks within the period sanctioned.

3

3 The Survey has been exceptionally well got out, and I would strongly urge therefore that an additional Months pay be passed to the Surveyor and Draughtsman engaged on the work. viz 1 Surveyor at Rs 70 & 1 Draughtsman at Rs 40 or Rs 110 in all. I should mention that this Extra sum for which sanction is solicited by no means represents in fact is far below the Extra time which the Surveyor and Draughtsman have actually given to the work in Excess of the period for which the Establishment was sanctioned.

4 The Survey is not forwarded now for inspection, as it will be submitted hereafter with the Estimate for the improvement of the Canal.

I have &c &c

(Signed) R. A. Roberts Lieut Col R.E.
Superintending Engineer.
Tanjore

(True Copy)

R Mellonhuan Captain R.E.
District Engineer Tanjore.

P.W.D.
1710/78
N° 682

Copy of Colonel Rollo H. Gillespie's letter No. 73, Government, dated 9th April 1875.

Enclosure in a letter from the Bilitrigiuer, Tanjore to the Chief Engineer Dtd. the 14th, dated 11th August 1876

No. 682,

Negapatam 10th March 1875

From

The Officiating Charge Br. L. Range
Negapatam.

To,

The Superintending Engineer
Tanjore

Sir,

I have the honor to inform you that I have this day despatched by train to your address a tin case containing the Survey plans, viz. of the Vadarniem Canal, and I beg to enclose herein the railway receipt together with a list of bench-marks fixed in connection with the levels taken.

2 I have to explain that, as we were not aware what the Mean Sea level here was when the levels were taken, they were reduced to an assumed datum of 25 feet below the first bench mark on the Jetty at Negapatam, where the levels were started from.

3 After the Sections were plotted, however, to the assumed datum line, and the whole work completed, a list of bench-marks, in reference to Mean Sea level as fixed by the Railway Engineer, was furnished to this Office, and you will

will observe how I have shown this mean Sea level line on the Sections in the plan. It was the only thing to be done, for otherwise to draw the Sections over again would only be waste of time and money.

4 In consideration of this Extra work and of the reasons given in my letter as per margin, I beg you will kindly apply to the Chief Engineer for Irrigation to pass to the Establishment concerned one month's pay as per margin beyond that Estimated for.

1 Surveyor — Rs. 70
1 Draughtsman — 40

I have &c &c

(signed) W. Leggatt A.I.C.E.
Executive Engineer.

Copy taken from G.O. No. 1670
dated 3rd July 1876

A.M. Sorabjee Captain R.E.
District Engineer Tanjore.

P.W.D.
16 AUG 76
No. 13

No. 1485 District Engineer's Office
Camp Combaconum
11th August 1876

From
Captain R.P.E. Brackenbury
District Engineer Tanjore

To
Major General C.W. Walker R.E.
Chief Engineer &c &c

Sir,

In reference to your Memo No 1170, dated 2nd August 1876, I have the honor to state that there is no letter from the Supdg Engineer to Government bearing No. 181 and dated 21st April 1875. This No. and date appear to belong to your Endorsement transferring for orders in the Revenue Department, Col. Roberts' letter No 366, dated 21st April 1875, and presuming that this letter is that meant in your Memo under reply I beg to forward herewith a copy of the same.

2. Mr. Leggatt's letter No 682, dated 10th March 1875 to Col. Roberts' address was forwarded in original with Col. Oakes letter to Government No. 964, dated 30th

30th August 1876. Sir, I observe that it is printed with G.O. No. 1670, dated 3rd July 1876 in which however the address is erroneously shown to be Col. Bates instead of Col. Roberts. A Copy of that letter taken from the above G.O. is also enclosed.

I have the honor to be

Sir

Your most obedient servant

A. Wells Mulvany Capt. R.E.

District Engineer

GB 18-5-73 No 142 of
- 15-5-74 - 99
- 3-7-76 - 1650.

P.W.D.
14/1076
No 1 2 3

No 320

From
Messrs Ditchburn
Dredging
To
The Chief Engineer
Public Works

Dated 11 August 76.

No 21

Forwards Copy of
Col Roberts Letter No 320
dated 21st Ultimo
& Tracings thereto.
Pio 1652, dated 10
March 1875

Rec'd 19.9.76
Recd. 13.9.76
Recd - 9.9.76 Orded 10.9.76
cir - 25-8.76 Rtd 2-9-76
Dupe to Ord 15-9-76.

ENGLISH MILLWRIGHTS

Bow - London E

January 8th 1875.

17

Colonel Roberts. R. E.,

Sir,

We now have the pleasure to enclose tracings of Dredgers in accordance with the questions submitted by you to Colonel Scratchley. R. E.

Not having an exact section of the Canal we have been obliged to draw upon our imagination for the shape of the banks and the position of the Dredger relatively to them. We think that the tracings explain themselves and would only point out that the Steam Dredger is proposed to be constructed with an open Ladder Well, the Ladder itself projecting beyond the end of the Vessel The advantage of this method of construction is, that when the Dredger is once placed in water where she can float she can cut through a shoal or a bank and make a new channel across country.

To give you the opportunity of judging which Dredger is best suited to your requirements, we make our offer in four different ways. viz.

No. 1. We are willing to supply a 10 H.P. Steam Dredger as shewn in tracing the Hull to be 60 feet long x 12 feet beam, the Ladder Well in the centre, open to the end, horizontal high-pressure and condensing Steam Engine, with multitubular Boiler, the fore and aft-motion worked by the Engine and the side chains by small hand winches, the Anchors & Chains necessary

In the case of proposals for a steam Dredger, the Vessel, Engine and Machinery and of the hand Dredger, the Vessel and Machinery would be put together as far as possible here, marked, taken down, the necessary parts packed and the whole delivered alongside on the Thames or Docks.

We shall be glad upon hearing from you to give you any further information you may require.

We have constructed six of the large Dredgers upon the Thames and several for different small Rivers and Canals, and think that our long experience would enable us to supply you with a Dredger that would give you every satisfaction.

We are, Sir,

Your obedient Servants,

Bruce & Ruglin.

Superintending Engineer,

Tanjore,

Madras.

P.W.D.
19 10376
No

and a shoot about 40 feet long with pontoon to carry the same for the sum of £2'400 (two thousand, four hundred pounds). or if made with a non-condensing Engine £2'200 (two thousand, two hundred pounds).

No 2. If the Dredger is only made to lift to the usual height necessary for the discharge of the excavated material into punts or Barges, which is shewn upon the tracing in red ink, the cost will be with a condensing Engine £2'080 (two thousand and eighty pounds) and with a non-condensing Engine £1'880. (one thousand, eight hundred and eighty pounds

No 3. We can supply a hand Dredger as shewn in tracing, made to deliver the material dredged into punts or Barges for the sum of £480 (four hundred and sixty pounds). The tracing shews handles sufficient for about 24 men, but the Dredger could be adapted for greater number by the addition of about 5 feet in length for every 8 men, and an additional expense of about £40. (forty pounds). for the same number.

No 4. We can supply a hand Dredger with the Upper Tumbler made high enough to deliver the material excavated into a spout similar to that shewn upon the tracing of the Steam Dredger and including the cost of the spout and pontoon, for the sum of £700. (seven hundred pounds).

The Steam Dredger would be able to lift about 50 tons of sand and sludge per hour and the hand Dredger about one fourth or one fifth of that quantity, dependent to some extent upon the number of men you can employ upon the work.

No 1533

5

District Engineer's Office
Tanjore 6th August 1876

From

Captain R.E. Brockman R.E
District Engineer, Tanjore

To

Major General G.W Walker R.E
Secretary to Government,

Sir,

With reference to G.O. —
No 1670, dated 3rd July 1876, relative
to the improvements of the Vedaranien
Salt Canal, I have the honor
to furnish the information called
for therein in paras 1 to 4 respectively.

Mr Phillips was employed
as a Surveyor on the Coleroon River
Survey in the months of April and
May 1874; during that short period
he did not give satisfaction to
Lieutenant Connilly R.E under
whom he was working, and
this was reported by that Officer

in

in his letter to the District Engineer No. 178 dated 28th August 1874, which gave an account of the progress of the Survey work. Before this report came in however the then District Engineer Col. Roberts had already appointed Mr. Phillips on the Survey of the Vedaranniem Canal in his order No. 482 dated 20th July 1874. Mr. Phillips was employed on this Survey for a period of 7½ months when the plans were sent in with Mr. Leggatt's forwarding letter quoted in the G.O now under reference. After the receipt of Lieutenant Nowell's report in which it was stated that Mr. Phillips had been guilty of scamping his work, no intimation of that fact appears to have been conveyed to Mr. Leggatt from this Office in order that he might be put on his guard, and to indicate him to exercise a careful scrutiny over Mr. Phillips work.

I may mention that Mr. Phillips had not previously been dismissed

dismissed from the Coleroon Survey. He had merely tendered his resignation to Lieutenant Nowell which that Officer accepted on the 6th May previously.

With reference to para 4 of the Government order, I have the honor to forward herewith original tracings accompanied with a letter from Messrs Hunter and Inglish relative to the Steam and Hand Dredges referred to by Colonel Cotes, and which will afford all the information required.

There is no reason whatever why Spoon dredging should not succeed in the Vedaranniem Canal, as the Spoil to be lifted is moreover of so light a quality. It has never however been attempted, the clearances having been hitherto effected by Coolies working under water with a basket and hoe, and the Spoil carried by others in attendance and deposited outside or on the banks. In order to carry out more effectually the clearance of

of the Canal with such temporary N—— 1
at disposal its yearly closure was
necessary, a point alluded to in
para 11 of Col Cotes letter No. 984,
dated 30 May 1876:

Whilst on the subject of
Steam Canal dredges, I would
respectfully draw your attention
to the descriptions of dredges detailed
in the Roorkee Professional
Papers for July 1876, and patented
by J. W. Barnes Esqr M. I. C. E
and Superintendent of Canal
Irrigation, Bahawalpur State,
and which appear to me to be
ingeniously and carefully
designed.

I have the honor to be
Sir
Your most obedient Servant

Wells Mahon Captain R.E
District Engineer

1st 320a

G.O. 3-7-76 No 1670

P.W.D.
19 AUG 76
No 5[illegible]

From
The District Engineer
Tanjore

To The Secretary to
Govt. Public Dept
No 1533

Dated 16 August 76
Rec'd

Rec'd 2.10
x 2 Plans given to Librarian
Furnishing information
called for in para 10th
of G.O. No 1670, dated
3rd July 1876, relative
to the improvements
of the Vedaraniem
Salt Canal.

Retd 19.9.76
Recd - 13.9.76
Recd - 2-9-76 Rtd 10.9.76
Cir - 25-8-76 Rtd 2-9-76
Despd to Govt 19-8-76 R 21-[illegible]-76

No 1403

District Engineer's office Tanjore
Camp Kapistalum
21st July 1876.

From,

W B Leggatt Esquire A.I.C.E.
Offg District Engineer
Tanjore

To,

Major-General G. Walker R.E.
Secretary to Government
P.W. Department

Sir

I extremely regret to find from G.O. No 1670 of the 3rd instant, that the works turned out by Mr Phillips on the Vedaraniem canal surveys and levels, had proved to be so incorrect as pointed out by Colonel Oakes R.E. and in obedience to the order calling for an immediate explanation of the part I had taken in the matter, I beg to report as follows:—

2. Mr Phillips and his draughtsman and bazaar were appointed and sent to me by Lieut-Colonel Roberts R.E., then District Engineer of Tanjore, for employment on the Vedaraniem canal surveys work—

Of course coming from the District Engineer's office. I had every reason to presume that they were competent men, but I soon found out that Mr. Phillips required careful supervision and that the draftsman was such only in name — he was a Tyrmaistah in the District Engineer's office at Chadiria, was on leave in Tanjore at the time and had absolutely never plotted any surveys or levels before he came to Negapatam, though he could copy plans fairly well.

3. With such tools as these I was ordered to carry on the work, and that at a time, when it required more than one man's time and attention, to get the Negapatam Range and its accounts, out of the state of chaos and confusion into which they had fallen during Mr Stalls regime, a fact not unknown to Government. I tried, however, to do the best I possibly could with the Survey Establishment and gave them written instructions in detail as to this work and the mode of carrying it out — which are on record

record in the Range office. Mr Phillips was further supplied with a copy of the Irrigation Chief Engineer's Minute on the subject. I also from time to time (as often as it was possible for me to do so) accompanied Mr Phillips and saw him part out his work, which while under my supervision, he did fairly well and I checked his longitudinal levels as well.

4. From the middle of November 1874 to the middle of February 1875, I was in charge of the Tanjore District, in addition to my Range work, and it must have been then, that Mr Phillips made a mess of his cross sections and plottings, for it was not possible for me during that period to exercise the check he required, and having my doubts regarding this work, I represented the same verbally to Lieut-Colonel Roberts on his next visit to Negapatam, when I also informed that officer that though the Survey and levels had been completed soon after I was relieved of the charge of the district I had not examined them

time, and did not know what I could do; for I was suffering from the effects of pen-stroke at the time. He then kindly directed me to send the papers into his office for examination which I did with my letter etc. 682 of the 10th March 1875.

5. I cannot see what reason Colonel Baker had, for inferring from my letter above quoted, that because I had ordered the levels to be reduced to a datum 25 feet below the crown of the jetty at Negapatam, from which the levels were started, that therefore I had approved of, if not suggested, the cross sections being plotted 25 feet below the level of the points from which they were taken, utterly regardless of the relative levels of Rule points.

And Mr. Phillips understood his work, he would have understood my orders.

6. I have not seen the Government order authorizing the

the bones of a month's pay being passed to the Survey Establishment; but I presume that the District Engineer would not have supported the recommendation, had that officer not satisfied himself on an examination of the work sent to him, that there were good grounds for the recommendation.

7. With this explanation, I confidently leave the matter in the hands of Government, trusting they will see that the bad and incorrect work is owing to the incompetency of the survey establishment alone, and not from any want of care or any wilful neglect on my part. Unfortunately ill health, coming at the end of the official year, when there is an unusual press of work prevented my examining the surveyor's work before sending it up to the District Engineer's office; but this I had reported as above stated.

I beg to add that I have no records here to refer to and as the order is immediate I have no time to obtain them.

I have the honor to be
Sir
Your most obed.t Servant

E. Leggatt A.D.C.G.
Offg Deputy Assist. Engineer
Bellerophon

13

33

Ed-7-76 No 1670.

P. W. 1876 Dept
No 5317

From
The Offg Asst Engineer
Kurnool

To
The Secretary to Govt
Public Works Dept
Fort St George

Kurnool 11th Augt 1876

Memo No 1170 dated 2nd Aug 1876

Madrassiana Camp
Station Dist. Kurnool
Augt 28th 1876

Sir

I have the honor to request that you will be pleased to forward to the Superintending Engineer Southern Circle Cuddapah for the information of the Executive Engineer Kurnool Sub-Division No 1 a copy of the letter noted in the margin from the Secretary to Government Public Works Department Fort St George dated 11th Augt 1876 No 1670 on the subject of the Kurnool Cuddapah Canal.

I have the honor to be
Sir
Your most obedient Servant
(Signed) H. St Ball Lieut
Offg Asst Engineer

The District Engineer, Sangore, is requested to forward copy of Mr Degatti's letter to Lieut. Col Roberts No 682 of the 10th March 1875 with which were submitted rough Survey and levels taken by Mr. Phillips. A copy of the Superintending Engineer's letter to Government No 181 dated 27th April 1875 is also required.

(Signed) H. St Ball Major R.E.
Offg Chief Engineer S. W.

Cuddapah
2nd Augt 1876

To the Dist Engr., Sangore

No 320 B

Rect 19.9.76.
Relin - 18.9.76
Recd. 2-9-76 Rd 10-9-76
Cir - 25-8-76 Rd 2-9-76
Dispd to Ct 27-7-76

Cos put up with Cir No. 5976
5563 & 5317 —
Lr. No. 10 Septr 73 - No 142 &
19 May 74 - 99.
11 May 76 - No 76 Original.
3 July — 1670

Letter from the District Engineer Sangore No 1485 of 11th Augt 76
" " " Do " Do " Do " 1533 " 16th do "
" " " District Engineer Bellary " 1403 " 21st do

FOR ORDERS.

It would appear that Dr. Phillips was appointed by Lieut-Colonel Roberts R. E. on 20th July 1874 to carry out the Survey of the Vedavathy Canal for which an Establishment had been sanctioned in Revenue Department Order No: 821 of 1st May 1874 for 3½ months as follows:

Surveyor Rs 70
Draftsman " 40
Laskris &c " 50
Rs: 160.

besides Rs 720 for Bench Marks

It appears since that Mr Roberts is responsible for Dr Phillips engagement continuance after Colonel Romilly's report: for non communication thereof & for suggesting that Survey should be very carefully completed - explanatory call for &c - He should be called on to explain this statement & procedure

Bench Marks upon dredging

2 Not long after &c on

20th August 1874 Mr Phillips was reported to Lieut Col Roberts as not having given satisfaction to Lieut Romilly R.E on the Coleroon survey. Not only did not Lieut Col Roberts take no notice of this, but Mr Leggatt complains that the draftsman appointed by him, was a mere copyist who had never plotted any survey or levels before, but was known to Lieut Col Roberts as having been a Jemadar in his former Office at Madura.

3. Mr Leggatt only took Charge of the Negapatam Range in July 1874; when, as he represents, it was in a Chaotic state owing to the mismanagement of Mr Asst Engineer Hall, whose services were dispensed with in consequence. He pleads also that he had temporary Charge of the District from November 1874 to February 1875. This ought to be no offset had the Survey been completed in the time allowed, but the two surveyors employed did not apparently send in their papers till the end of February 1875; when they were recommended for ~~and~~ got an extra months pay.

4. Mr Leggatt says that he verbally made known to Lieut Col Roberts his doubts respecting the quality of work turned out, there is no hint to that effect in his Official letter No 682 of 15th March 1875 sending them up to the District Engineers Office for disposal. He says he did not examine the papers, as it is not clear on what his doubts of them were founded. Moreover para 3 of his Official letter regarding them shows he did something to them; while doing which it is remarkable that he did not

Should be systematically tried — it is pointed in the Thames for 6 per frequently — may remain be worked from slopes or flat boats

I think this should be tried

The general question of Surveyors had better be discussed as a separate question — but in connection with the present returns of number now in employ — number actually certificated — and average number for say 2 last years

I have long been of opinion that our present system of employing ab hap-hazarded Surveyors not forming part of the regular Establishment is very wasteful and that we had better adopt that of India system. I moved Debt as preliminary to change obtain the information supported by G. the Mr. — MM

not find out that the sections had been plotted from independent data, the relative levels of which were unknown to any how, after keeping them by him for upwards of a month Asst Engt Robert is responsible for having stated the papers to have been "very carefully compiled" and "exceptionally well got up".

5. Some alteration of present arrangement regarding employment of Surveyors would appear to be necessary. At present they are on the temporary Establishment, being taken on as wanted, and discharged or transferred when their work is done. They are permitted to hold College Certificates, but District Engineers are left to pick them up as they can, there being no published and

graded list of them. Under the Government of India they belong to the Permanent Provincial Subordinate Establishment in 3 Grades on Salaries of Rs 70, 45 and Rs 35 respectively. It is submitted that it would be better economy to add to the per centage of existing Establishment Charges than to continue the present haphazard system.

6. The work should be taken up again at once, any necessary cost of reviving the existing papers being met from the Annual Grant of Rs 6,000 for up-keep of the Canal. And the Estimate for improving the Canal called for in G. O. No. 837 of 13th August 1873 should be no longer delayed; and an entry on its account should be made in the Salt

+ as a maximum.

Budget for 1877-78.

7. The Roorkee papers alluded to by Captain Brackman, are pointed. But the Government have already stated that they are not prepared to approve of the introduction of Steam Dredges. Orders regarding the Hand Dredge Plan submitted are solicited.

Lt. Walker Major-Genl. R.E.
Secretary to Govt. P.W.D.

X^o attd.

Govt of India
Extract from the P.W. Code. Chap: I. Sec: 1. para. 7.

The Officers of the first three of these Establishments are divided into Classes and Grades as follows . . . . . :

Lower Subordinate Establishment.	Minimum.	Quinquenial increase	Maximum.
Sub. Overseer and Sub. Surveyor. 1st Grade	Rs 50	Rs 10	Rs 70
do do 2nd do	" 35	" 5	" 45.
do do 3rd do	" 25	" 5	" 35.

N.B. The increase of pay for length of Service is only to be given to deserving men.

24/8

14 14

No. 2507 Public Works Department

15

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the 19th Septr 1876.

READ the following:—

From

The District Engineer Tanjore } (No No 1485 of 11th Augt 1876)
" Do Do Do (" " 1533 " 16th do
" Do Do Bellary (" " 1493 " 21st July

The papers recorded above contain explanations called for as to the surveys and levels of the Vedaranem Canal, the imperfections of which were commented on in G O No. 1670 dated 5th July 1876

It would appear that Mr Phillips by whom the surveys were made was appointed by Lieut-Colonel Roberts R E on the 20th July 1874

Not long after, or on the 2nd August, Mr Phillips was reported to Lieut-Colonel Roberts as not having given satisfaction to Lieut Bonilly R. E on the Coleroon surveys

Lieut-Colonel Roberts appears to have taken no notice of this Complaint; and he appointed to the Survey party under Mr. Leggatt a Draftsman who was a mere Coolie just and had never before plotted any Surveys or Levels, but was known to Lieut-Colonel Roberts as having been a Gomastah in his former Office at Madura

Mr. Leggatt only took charge of the Negapatam Range in July 1874; when, as he represented, it was much disorganized. He pleads also that he had temporary charge of the District from November 1874 to February 1875. There would be no extenuation in this circumstance had the Survey been completed in the time allowed; but the two incompetent persons employed did not send in their papers till the

end of February 1875, when they were recommended for and obtained an extra months pay as a gratuity on the ground of the excellence of their work

Mr. Leggatt says that he verbally made known to Lieut. Colonel Roberts his doubts regarding the quality of the work turned out. There is no hint however to that effect in his official letter No 682 of 10th March 1875 submitting the papers to the District Engineers Office for disposal Mr. Leggatt states that he did not examine the papers; yet he expressed doubts as to their accuracy. It would however seem from para 3 of his official letter that the papers did come under his observation on which occasion the fact that the sections had been

plotted from independent data, the relative levels of which were unknown, should not have escaped notice.

The papers were retained by Lieut. Colonel Roberts for upwards of a month, at the end of which he arrived at the conclusion that they were "very carefully completed" and "exceptionally well got up"

His Grace the Governor in Council requires to call on Lieut. Colonel Roberts through the Under Officer, for such explanation of his procedure in this case as he may have to offer — Lieut. Colonel Roberts will fully explain his reasons for the appointment of men known to be unqualified for the work which they were

I cannot rest upon Lt Col Roberts I cannot say Lt Col Roberts on his return to duty will be called upon for explanation

P. W. No. 142 A dated 18 September 1873.

sent to perform, and state the grounds for the opinion of their work which he has expressed. A copy of the Proceedings of Government of the 30th July 1876 No. 1670 will be furnished to Lieut Colonel Roberts.

The work should be taken up again without delay, any outlay necessary for securing the existing papers being met from the Annual Grant of Rs. 5000 for the up Keep of the Canal. The Estimate for improving the Canal called for in G.O. No 837 of 13th August 1873 should be no longer delayed, and an entry on its account should be made in the Budget of 1877-78.

His Grace the Governor in Council sees no reason

Why upon dredging should not be introduced for the Clearance of the Vidarnieu Canal, and the District Engineer will arrange as early as practicable to give this system a trial. Movable stages or flat boats being used.

The Examinations now brought to light and on other occasions have suggested the expediency of placing the arrangements in respect to the employment of Surveyors on a more satisfactory footing. At present they are on the Temporary Establishment, being taken on as wanted and discharged or transferred when their work is completed. They are presumed to hold College Certificates, but District Engineers are

I am not sure whether the work is such as can with advantage be given out on contract, but I believe Mr. Wooley if he gets the Canal [illegible] with which he has tendered with yet out dredges. Perhaps he might be asked if he will tender for this canal

Ans

left to their own resources to obtain properly qualified men, and have no published and graded lists to refer to. Under the Government of India Surveyors belong to the Permanent however subordinate Establishment, and are divided into three grades on salaries of Rs 70, 45 and 35, respectively. Before taking any decided steps, however, in the direction indicated His Grace the Governor in Council desires to be furnished with a return of the number of Surveyors now employed; the number of these who hold Certificates, and the number employed on an average during the last two years. The information will doubtless be available in the Examiner's Office, and should

*As a minimum

Ahmednuggur

to Secretary to Govt

Be supplied by Captain Conway-Gordon.

No 320/21

Chief Engr for Irrigation.
District Engineer, Sangore.
Lieut Col Roberts with
Copy of G. O. No 1670 dd 3 July 1876
Exam. P.W. Accounts
Revenue Dept.
Desp 5/10/76

(x after return from Quetta. R.P.)

x Attd

Govt. of Madras. 1876.

PUBLIC WORKS.

To The Chief Engr & Secy to Govt

Dated

Issued

Recd Encl.

G O. 19th Sept 1876, No 2507

Nos. 320/21

23-9-76

Pedarnicum Canal, Tanjore

1st — Passing Orders on papers containing Estimate. Sanction called for as to the imperfect survey and Estimate taken of the —— by Mr Phillips

Secy to Govt

Despo 5/10/76