

(1) Number of Pages.....22
 (2) Date of repair.....25-4-69
 (3) Initials of the Referencer.....25/8

MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No.	<u>1019</u>	Press
B.P. No.		<u>Mis.</u>
Dated	<u>29-7-1876</u>	196 .

Not to be folded or roughly handled

1019

*Proceedings of the Madras Government, Revenue Department,
29th July 1876.*

No. 290. Read the following Proceedings of the Board of Revenue, dated 11th July 1876, No. 1,770:—

Read the following letter from H. W. BLISS, Esq., Acting Collector Madura, to C. A. GALTON, Esq., Acting Secretary to the Board Revenue, dated Periakolam, 7th June 1876, No. 228.

I HAVE the honor to submit the report called for in the Board's Proceedings, Miscellaneous No. 3,677, dated 5th May 1876.

2. I was well aware from a period long anterior to the date of the District Engineer's letter recorded in the above Proceedings that the north-east monsoon had been almost a complete failure; but as after careful inquiry I came to the conclusion that there was no probability that "great distress might prevail in this district this season," I did not think it necessary to trouble the Board or Government with a special report on circumstances with which the ordinary periodical returns must already have sufficiently acquainted them. Prices are slightly higher at present in Madura itself than usual at this time of year, but they show no great tendency to a continuous rise, and in many parts of the district have even a contrary inclination and have recently slightly declined. That the crops were below the average I do not doubt, but I do not think they were so bad as at first I feared they might be. Judging from the persistence (or rather the want of it) with which the people have applied for remissions, I feel sure that the crops were, on the average, by no means as bad as I have several times before, during my service here, known them to be. Crime of the kinds that indicate general scarcity is not on the increase; cholera may be said to have nearly died out, though there are occasional local outbreaks; no increase is to my eye apparent in the number of beggars in the towns. In short, there are, at present, no indications that I can discern that the district is entering on a period of scarcity, much less of "great distress." If there were, it would, I think, have been much to be regretted that, if an officer of the District Engineer's experience thought the contrary, he should not have placed me in possession of his views at the time he wrote to Government.

3. With the remainder of the District Engineer's letter I generally concur. It is quite true that many of the tanks in the district are so shallow that they do not hold enough water to mature a crop. It is also my opinion, though I do not wish to advance it dogmatically, or to say positively more than that I think that there are good grounds for a thorough investigation into the existing state of things, that large sums are annually wasted in the repair of irrigation works which it would be far better to sweep away altogether.

4. I have already brought the irrigational requirements of the district to notice in a general way in my letter recorded in the Board's Proceedings, No. 2,437, dated 30th August 1875. I have also called attention to a particular project (*vide* Board's Proceedings, No. 1,251, dated 12th May 1875, and G.O., dated 1st July 1875, No. 1,836, Public Works Department). I will now, as Government have called for a report on the subject, describe more fully the irrigational state

of the district, the investigations into the existing system of storage of water which seem to me advisable, and the extensions and improvements thereof which I venture to think feasible.

5. There are but two principal rivers in the district, the Shanmuganadi mentioned in the District Engineer's letter under consideration, and the Vigay.

6. The first drains nearly the whole of the Upper Pulny Hills. Its drainage area is estimated by Colonel Fischer at 180 square miles (*vide* his letter recorded in G.O., dated 14th July 1875, No. 12,005, Public Works Department); but from the sheet atlas I should think that this is an under-estimate. I make it 210 square miles south of the road from Pulny to Oodumalpettah. Taking the area, however, at 180 square miles only, and assuming, 1st, that the rainfall thereon does not exceed 36 inches per annum, and, 2ndly, that only one-third of the rainfall runs off, it would appear that the annual discharge of the Shanmuganadi must be at least 180 millions of cubic yards of water. At 6,000 cubic yards of water per acre per annum this discharge should suffice to irrigate 30,000 acres. The ayacut of, and cultivation under, the different tanks and channels in the valley of the Shanmuganadi is, however, only as follows:—

AYACUT.		CULTIVATION.	
Area.	Assessment.	Area.	Assessment.
ACRES. 19,819	RS. 81,629	ACRES. 17,470	RS. 75,188

It may, therefore, I think fairly be argued that the river, if properly treated, will irrigate some 12,500 acres more than it does at present.

7. The whole argument turns, of course, on the rainfall and the proportion thereof which will run off. On both points I submit that the estimates above stated are moderate. I take the rainfall at 36 inches only, but at Mr. Levinge's house at Kodaikanal, which is within the drainage area of the river, the rain-gauge shows the annual rainfall to exceed 60 inches. It has even exceeded 80 inches. I assume that one-third of the rainfall would run off. This is a matter on which I have hardly a right to offer an opinion. But if I am rightly informed that one-third of the rainfall on a given drainage area is usually accepted as a safe estimate of the discharge from it, I am certainly safe in making such an estimate in the case of a drainage area so largely composed of exceedingly steep and very rocky hills as that of the Shanmuganadi.

8. A safer and more accurate estimate could no doubt be arrived at by actually gauging the discharge of the river. This can easily be done if Government will sanction funds for the purpose, and should, in my humble opinion, be done at once, so that the question may be set at rest. There is an excellent site for the establishment of a gauge between the abutments of the fallen bridge on the road from Pulny to Udumalpettah. It is shortly above this point that the Shanmuganadi is formed by the junction of the six rivers whence it derives its name. Below it only the water necessary for the comparatively petty irrigation of the

villages of Manur, Korikodava, and Kiranur is drawn off. The requirements of these villages in cubic yards can easily be ascertained. The remainder of the water which passes the fallen bridge may be held available for the extension of irrigation in other villages. One thing only would I venture to point out, in case it should please Government to order the flow of water in the river to be gauged. This is that nothing but a self-registering gauge will be of any use. I will explain why.

9. As is well known, the south-west monsoon does not regularly affect the Pulny Hills in the same way that it does the Nilgiris. From the beginning of April, however, to the end of October, when the north-east monsoon may be said to set in, the Hills are constantly visited by heavy storms of rain which may be said invariably to fall in the afternoon and evening and during the night. It is not too much, I think, to say, and I have known the Hills a long time, that on no one day during those seven months can any one say with any certainty in the morning that the afternoon and evening will be fine. These storms are often very heavy. A fall of three-quarters to an inch of rain in the course of an hour or two is quite common, and, from the exceeding steepness of the Hills, I feel sure that such a fall, occurring as it always does in the afternoon, would run off and leave no trace, but the wetness of the sand in the river bed, before the man employed to register the height of the water in the river could come to his work the next morning. I think, therefore, that the mere registry so many times during the day of the height of the water in the river at the point I propose would give a very inadequate idea of the river's real discharge. No natives could be trusted to register the discharge regularly, and at frequent intervals, during the night. A self-registering gauge alone therefore will, I submit, secure accurate results.

10. Should his anticipations that the Shanmuganadi discharges far more water than is required for the existing wet cultivation prove correct, the District Engineer proposes to utilize the available surplus as follows.

11. On the right bank of the river there now exists a series of very valuable irrigation works. These comprise Vayaparikolam, Chinnakolam, Sirunaikenkolam, and Papankolam, in the order given, in the Pulny village, and Kothamangalam tank in the village of that name. This series of works is fed from a tributary of the Shanmuganadi, the name of which has at this moment escaped me, through a channel on which considerable expenditure has recently been incurred with very beneficial results, as mentioned in the District Engineer's letter under reference. When this channel and the Kothai anicut at the head of it have been put into good order, I entertain no doubt that an ample supply of water may always be reckoned on for all the tanks I have mentioned. At present this is very far from being the case. Kothamangalam tank is a fine one for this district, but, owing to its being at the end of the series and supplied last of all, it very frequently receives but little water, and remissions constantly have to be granted both for waste and for withered crops in the area it is supposed to irrigate.

12. The District Engineer's views extend, however, further than the mere securing to existing tanks of an adequate water-supply. Beyond Kothamangalam

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tank, and separated from it by a narrow rocky ridge, which it would not be difficult to cut through, lies a broad and flat-bottomed valley across which stretch the ruins of an ancient native bund, no doubt, I think, intended, had the work ever been completed, to receive the surplus from, and to form the last link in the chain of tanks dependant on, the Kothai anicut. This tank the District Engineer proposes to complete. Rough levels already taken show that the scheme is perfectly feasible so far as they go. The only question is, is the supply of water sufficient? Should further investigations prove this to be the case, the following results may be anticipated. Papankolam, a shallow tank and now in bad order, may be abolished altogether, and its area and ayacut irrigated from the new tank. Kothamangalam tank also may be abolished and its area and ayacut irrigated from the supply channel of the new tank and from the new tank itself, respectively. For such further supplies of water as the new tank may be found capable of holding, there is an ample area to be irrigated along the right bank of the Shanmuganadi towards Kiranur.

13. The localities I am speaking of can easily be made out on the sheet atlas. Vayapurikolam is there just south of Pulny town, Kothamangalam tank is there about two miles north of it; both of them with their bunds mistakenly shown on the east instead of on the west of their waterspreads. The bund of the tank the District Engineer proposes to construct would run across the two streams which flow north of Kothamangalam tank and unite about a mile due east of the point where the old road from Pulny to Darapuram crosses the Shanmuganadi.

14. For the left bank of the river, the District Engineer's proposal is to improve an existing anicut on the western main tributary of the river which unites with the eastern main tributary just south of the road from Pulny to Udumalpettah, thence to cut a channel through the high ground immediately north of Agraram (see map), and thereby to fill a large tank to be formed by bunding up the valley east of Thaliooth about the point where the map shows the junction of three small streams about two miles west of the Shanmuganadi.

15. To test the feasibility of this scheme, the District Engineer has had some levels taken which proved satisfactory. He has also calculated the volume of water which such a tank would hold. I forget the amount, but I know it was sufficient for the irrigation of several thousand acres of land.

16. I have been over the ground on both banks of the Shanmuganadi with the District Engineer. In both cases the area to be occupied by the new tanks is land of little value. In both cases I believe his schemes to be perfectly feasible. But I do not wish to insist upon that. All I wish to bring before Government is that such rough calculations as can be made without a special establishment show, first, that the whole water-supply of the river is not utilized; secondly, that suitable sites are available for storing much more water than is stored. In short, I submit that I have shown that there is a case for investigation the means for which I ask Government to supply.

17. One objection only I am anxious to anticipate in conclusion of this part of the subject. This is that the storage of additional large quantities of water

in the Shanmuganadi valley will prejudicially affect the water-supply of the Amravati, on which large areas of cultivation are dependant in the Coimbatore District. I submit that as the water-supply of the Shanmuganadi in the hot weather is so scanty that little or none of it can reach the Amravati, and as the additional storage now proposed to be effected will be made during the wet weather when the Amravati itself is in full fresh and provides more than amply for the irrigation dependent on it, the measures suggested by the District Engineer can in no way injure vested interests lower down. On the contrary, it appears to me that the existence of large reservoirs in the valley of the Shanmuganadi may often, in seasons of drought, be most beneficial to the cultivation under the Amravati channels, the supplies in which there would be no difficulty in supplementing therefrom.

18. I turn now to the subject of the Vigay, for the improvement and extension of the irrigation under which the District Engineer proposes two schemes.

19. On the first of these, the formation of a large tank on the Manjalar, an important tributary of the Vigay which flows into it near Butlagundu, I have already fully reported in my letter printed with the Proceedings of the Board and Government marginally noted. The

Revenue Board's Proceedings; No. 1,251, dated 12th May 1875.

Proceedings of Government, dated 26th May 1875, No. 814, Revenue Department.

proposal was favorably considered both by the Board of Revenue and by Government in the Revenue Department;

and from the remarks of the Chief Engineer for Irrigation, embodied in G.O., dated 1st July 1875, No. 1,836, I gather that, if the means at the disposal of Government had then permitted it, they would have given instructions for the investigation of the project. It is not now necessary, therefore, for me to do more than to call their attention to the previous correspondence above quoted, and respectfully to urge them to reconsider the possibility of sparing an officer for the service in question.

20. The District Engineer's second project for the improvement and extension of the Vigay is to dam up that river itself and to form a large reservoir upon it near Gullapuram, some ten miles E.S.E. of Periakolam. I am not fully acquainted with the details of this scheme. The District Engineer will no doubt be able and willing to supply them. From inquiries I have made, however, I learn that it involves no work of great or unusual difficulty, the proposal being no more than to construct a bund of about a mile in length and about 50 feet in maximum height, with, of course, the necessary sluices and distribution canals. For the construction of the bund, the lie of the ground affords facilities. A natural saddle will obviate the need of the construction of an artificial calingulah. The tank is roughly calculated, I have been told, to contain some 300 millions of cubic yards of water.

21. The first questions which will arise in any inquiry which may be instituted into the feasibility of these projects, will, it seems to me, be—

What is the discharge of the Vigay, and what area does the river now irrigate?

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29th July 1876.*

22. These questions have already formed the subject of the communications from the District Engineer and of the Memorandum by the Chief Engineer for Irrigation recorded in the papers marginally noted. Other communications have also probably passed between Government and the District Engineer on the subject, of which I am not aware.

Board's Proceedings, dated 16th January 1875, No. 87.
G.O., dated 14th July 1875, No. 2,005, Public Works Department.
The District Engineer's letters, &c., recorded in G.O., dated 8th September 1875, No. 2,568, Public Works Department.
G.O., dated 24th March 1876, No. 416, Revenue Department.
G.O., dated 22nd April 1876, No. 533, Revenue Department.

23. Among these papers I would particularly direct attention to Colonel Mullins' Memorandum recorded in G.O., dated 8th September 1875. Not having all the District Engineer's letters therein mentioned before me, I find it difficult to follow exactly his arguments and Colonel Mullins' remarks. So far as I can make out, however, it seems that Colonel Fischer calculates that the water-supply of the Vigay is sufficient to irrigate 200,000 acres and only does irrigate 37,000 (50,000 — 37,000 = 13,000, *vide* paragraph 3 of Colonel Mullins' Memorandum). The latter officer, on the other hand, is of opinion that the Vigay, a very short river (150 miles in length) under the influence of the north-east monsoon only, is not a reliable source of irrigation; that probably its 1,300 square miles of drainage basin would suffice to irrigate 40,000 to 50,000 acres; and that the river is incapable of irrigating more than 50,000 acres in ordinary seasons. I omit some qualifying words used by Colonel Mullins as not affecting the argument. If measures taken by Government enlarge the area of irrigation, it is unimportant whether the land newly irrigated belongs to Government or not. In either case they can and would charge the same water-rate per acre. Similarly, I submit it is of no consequence whether the additional land to be irrigated is commanded by the Peranai anicut so long as it is commanded somehow, *e.g.*, by the tank the District Engineer proposes to construct near Gullapuram above the Peranai anicut.

24. I hope I have accurately stated the facts as they are put by the District Engineer and by Colonel Mullins. If so, they are both in error on the important question of the actual present amount of irrigation. Colonel Fischer puts this at under 40,000 acres, and Colonel Mullins thinks the river with its drainage basin of 1,300 square miles cannot irrigate more than 50,000 acres. But, as a matter of fact, the Vigay and its tributaries irrigate no less than 84,000 acres already in the Government Taluqs and in the Shevagungah and Bodinaikanur Zemindaries, and probably not less than 20,000 acres more in the Ramnad Zemindari, accurate information from which I called for some time ago but have not yet received. In this computation I have not included the area irrigated by any of the rain-fed tanks, of which there are many in the valley of the Vigay, which cut off from it great quantities of water which would otherwise be discharged by it. I believe, therefore, that I am well within the mark in saying that in the valley of the Vigay there are not less than 110,000 acres of land irrigated by the rainfall which runs off its drainage basin.

25. Evidently, therefore, on the one hand, there is nothing like so much room for extension of irrigation as Colonel Fischer supposed; and, on the other, the capabilities of the river have been much under-estimated by Colonel Mullins,

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as I have no doubt he will, with these figures before him, willingly allow. He did not allow probably sufficiently for the fact that much of the area drained by the Vigay is very steep and rocky ground, and that it includes many lofty hills on which the rainfall must be far heavier than in the plains.

26. The question still remains; what are the capabilities of the river? Take its drainage area at 1,300 square miles, and allow for an average rainfall of 3 inches, whereof 12 inches run off, and we have a discharge of 1,300 millions of cubic yards, or sufficient to irrigate over 216,000 acres. Colonel Fischer has computed the discharge at Madura itself, above which the supply for about 45,000 acres is taken off, at nearly 950 millions of cubic yards in October—December, 1874, and at more than 1,200 millions in the same period of 1875. Colonel Mullins says that, in the absence of the requisite data, these calculations cannot be examined. This is a purely professional matter on which I can express no opinion. But I suppose there are means of obtaining the requisite data, and I would respectfully ask Government to order those means to be adopted, and those investigations to be made for which, I think, I may say that I have shown that there are some grounds.

27. In conclusion, I have the honor to submit the following remarks on the character of the irrigation works in the valley of the Vigay and on the waste of its waters by surplusage into other drainages, which are commented on in the District Engineer's letter and the Chief Engineer's Memorandum printed with G.O., dated 14th July 1875, No. 2,005, Public Works Department.

28. Looking at the map, any one who did not know the facts would imagine that the Madura Taluq, part of the Shevagungah Zemindari, and nearly the whole of the Ramnad estate were better supplied with the means of irrigation than most parts of the country. It looks as if the tanks covered nearly as much ground as is left available for cultivation, if not more. Unfortunately, this is almost the fact, and it is because it is so that it is so hopeless a task to do anything for the improvement of most of the Madura (both Government and Zemindari) tanks. The slope of the ground is so gentle that almost all of them are exceedingly shallow. There is many a tank which looks a splendid one, the average depth of which cannot, I feel sure, exceed 4 feet. The soil is soft and crumbling, such as no good bund can ever be made of, and as necessitates constant repairs and leads to frequent breaches. If a tank completely fills, it does so only by the dangerous means of a turfed-up calingulah and with the result that it probably swamps many an acre of good cultivation above it. Whether the tanks fill or not, percolation through their sandy beds and the evaporation from their wide areas of shallow water are, and must be, excessive. All the tanks, I may almost say, are much silted up. No improvement in them seems to me possible except at enormous cost.

29. But the beds of these tanks, which it is so hopeless to think of improving, are first-rate soil. If they were not required for the storage of water, they would sell for cultivation at rates which, I believe, would go far to pay the cost of the construction of works to supersede them. This is the task which the District Engineer proposes to undertake. My belief is that, if the Chief Engineer for Irrigation were to examine the conditions on the spot, he would be the first to

recommend investigations to decide if the District Engineer's proposals are feasible and likely to be remunerative.

30. Then, with regard to the waters of the Vigay which surplus into other drainages, the Chief Engineer says that something more than a mere assertion as to their being wasted is required, and gives instructions as to the steps to be taken to ascertain what becomes of them. As to the fact of such surplusage I do not understand him to doubt; it is notorious to every one who knows the district, and is sufficiently evidenced by a glance at the map (Sheet Atlas, sheets Nos. 62 and 80). As to the amount of the wastage, no precise information can be given without detailed inquiry and observation over a very large tract of country, which, if I may be allowed to say so without disrespect to Government, it appears to me unreasonable to expect the District Engineer either to make himself with all the work he has on his hands, or by means of the existing establishment which every one who has considered the subject has time after time during the last few years pronounced inadequate to the duties already required of it. I may mention, however, that I have been informed that about last November the Gundar, which through the Krithimal river receives nearly half the drainage of Madura Town itself and the surplus of many tanks which are fed from the Vigay above Madura, was running 13 feet deep into the sea for several weeks together. The Vigay may not often reach the sea, but I never heard that the Gundar failed to do so every year; and the same may, I believe, be said of other smaller and less important streams.

31. To ascertain the actual wastage of water thus occasioned, what I may call an irrigation survey of the country is, I think, required—a survey, that is, which would take note of every channel and every tank, which would ascertain and record the mutual relations of all existing works, and would estimate the capacities, actual and possible, of each, and the cost of such improvements as might be considered feasible. Such an investigation obviously can never be made with the existing establishment. It would require the services of an officer, experienced and interested in the subject, who should have no other work to distract his attention and who should be aided by a competent staff. That his investigations might prove the District Engineer's projects for large works on the upper waters of the Vigay unlikely to be profitable, or impracticable except at the cost of vested interests lower down, is no doubt possible. But in that case I am sanguine that other measures would suggest themselves whereby the irrigation of parts of the Shevagunah Zemindari, and of the portion of the Ramnad Zemindari drained by the Gundar, might be greatly improved. I have little doubt that the Shevagunah Zemindari would be glad to adopt any suggestions which promised her an increased income, and to pay her fair share of the cost of investigations within the limits of her estate. If not, inquiries need not be pursued in that direction. The Ramnad estate would, of course, pay its share of the cost of surveys and inquiries, and would be ready to execute, at its own cost, all feasible and profitable improvements.

32. It may be asked why should Government trouble itself about investigations which may turn out to be more for the benefit of Zemindars and their tenants than of the State and its ryots? My answer is that, until these investiga-

tions are made, and no one but Government has the means of making them, no one can possibly tell to what conclusions they may lead; and that the Zemindars' tenants are as much the subjects of the Queen and as much entitled to the care of the Queen's Government as those who hold their lands directly from it. That in case of scarcity they would have to be fed from the public funds, that their condition is capable of much improvement, and that no one hitherto has cared much for them, no one, I think, will deny. Should the ultimate result of the inquiries now recommended be that irrigation is extended and improved in the two great Zemindaries of Ramnad and Shevagunah instead of in the Government Taluqs, I cannot think that Government can do otherwise than gain by the increased wealth, comfort, and contentment which that hitherto neglected part of the country will enjoy.

33. The considerations stated in paragraph 11 of my letter recorded in the Board's Proceedings, No. 2,437, dated 30th August 1875, are my justification for the length of this letter.

MR. BLISS' report on the irrigational capabilities of the Madura District will be submitted to Government with reference to G.O., dated 26th April 1876, No. 959.

2. Mr. Bliss agrees with Colonel Fischer in thinking that there is abundant surplus water in the Shanmuganadi which may be turned to account for improving the irrigation of the country on the right and left banks of that river, and urges the institution of careful investigation to test the actual discharge of the river and the feasibility of diverting its waters to the supply of a chain of tanks on the right bank and to supplement the waters of an anicut across one of the feeders of the river on the left bank with a view to supplying a new tank proposed to be constructed in that neighbourhood. With regard to the Vigay, Mr. Bliss shows that great misapprehensions exist as to the area already irrigated by the waters of that river; he agrees with Colonel Fischer in thinking that numbers of the existing tanks are so shallow and so much silted up as to be hardly worth repair, and also in the opinion that a large quantity of surplus water from the tanks fed by the Vigay is wasted and carried to the sea, not by the Vigay itself, but by the Gundar and other adjacent drainages.

3. Mr. Bliss suggests a regular irrigational survey of the valley of the Vigay, and he points out that such a survey can only be undertaken by an officer specially appointed for the purpose with no other duties to divert his attention from the work.

4. The Board are of opinion that Mr. Bliss has clearly established a case for investigation into the circumstances of both rivers. That for the ascertainment of the capabilities of the Shanmuganadi need not take very long nor be very costly, but the survey of Vigay valley irrigation, involving as it does the interests not only of the Government lands in Madura but also of the land of three large Zemindaries, must needs be a work of much time and labor. The present

time is, however, very suitable for the investigation, as two of the Zemindaries are

Shevagunah.
Ramnad.
Bodinaikanur.

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29th July 1876.*

under the Court of Wards and the proprietrix of the third is anxious for the development of her country and ready to co-operate in any reasonable work of improvement.

(A true Copy and Extract.)

(Signed) C. A. GALTON,
Acting Secretary.

No. 291.

ORDER THEREON, 29th July 1876, No. 1,019.

Irrigation, No. 7.

It is observed that the weekly season telegrams from Madura report very unfavourably of the state of the district,

but up to the present date no mention is made of an apprehension of a scarcity of food.

2. The proposal that the irrigational capabilities of the two rivers mentioned, the "Shanmukhanadi" and the "Vaigai," should be carefully examined will be considered in the Department Public Works.

(True Extract.)

(Signed) D. F. CARMICHAEL,
Secretary to Government.

To the Public Works Department.
„ the Board of Revenue.

Erd. F. R. Bantleman.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 11th July 1876.

Read the following letter from H. W. BLISS, Esq., Acting Collector of Madura, to C. A. GALTON, Esq., Acting Secretary to the Board of Revenue, dated Periakolam, 7th June 1876, No. 228 :—

I HAVE the honor to submit the report called for in the Board's Proceedings, Miscellaneous No. 3,677, dated 5th May 1876.

2. I was well aware from a period long anterior to the date of the District Engineer's letter recorded in the above Proceedings that the north-east monsoon had been almost a complete failure; but as after careful inquiry I came to the conclusion that there was no probability that "great distress might prevail in this district this season," I did not think it necessary to trouble the Board or Government with a special report on circumstances with which the ordinary periodical returns must already have sufficiently acquainted them. Prices are slightly higher at present in Madura itself than usual at this time of year, but they show no great tendency to a continuous rise, and in many parts of the district have even a contrary inclination and have recently slightly declined. That the crops were below the average I do not doubt, but I do not think they were so bad as at first I feared they might be. Judging from the persistence (or rather the want of it) with which the people have applied for remissions, I feel sure that the crops were, on the average, by no means as bad as I have several times before, during my service here, known them to be. Crime of the kinds that indicate general scarcity is not on the increase; cholera may be said to have nearly died out, though there are occasional local outbreaks; no increase is to my eye apparent in the number of beggars in the towns. In short, there are, at present, no indications that I can discern that the district is entering on a period of scarcity, much less of "great distress." If there were, it would, I think, have been much to be regretted that, if an officer of the District Engineer's experience thought the contrary, he should not have placed me in possession of his views at the time he wrote to Government.

3. With the remainder of the District Engineer's letter I generally concur. It is quite true that many of the tanks in the district are so shallow that they do not hold enough water to mature a crop. It is also my opinion, though I do not wish to advance it dogmatically, or to say positively more than that I think that there are good grounds for a thorough investigation into the existing state of things, that large sums are annually wasted in the repair of irrigation works which it would be far better to sweep away altogether.

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REVENUE.

THE PUBLIC WORKS DEPARTMENT.

No. No. No.

Dated July, 29th.

Recd.

Encl.

G.O., 29th July 1876, No. 1,019.

JULY.

Nos. 290-291.

Irrigational capabilities of the Shanmugham and Vaigai, in the Madura District.—Referring for consideration in the Public Works Department the proposal that the—should be carefully examined and observing that, although the weekly season telegrams report very unfavorably of the state of the district, up to the present date no mention is made of an apprehension of a scarcity of food.

5. There are but two principal rivers in the district, the Shanmuganadi mentioned in the District Engineer's letter under consideration, and the Vigay.

6. The first drains nearly the whole of the Upper Pulny Hills. Its drainage area is estimated by Colcnel Fischer at 180 square miles (*vide* his letter recorded in G. O., dated 14th July 1875, No. 12,005, Public Works Department); but from the sheet atlas I should think that this is an under-estimate. I make it 210 square miles south of the road from Pulny to Oodumalpettah. Taking the area, however, at 180 square miles only, and assuming, 1st, that the rainfall thereon does not exceed 36 inches per annum, and, 2ndly, that only one-third of the rainfall runs off, it would appear that the annual discharge of the Shanmuganadi must be at least 180 millions of cubic yards of water. At 6,000 cubic yards of water per acre per annum this discharge should suffice to irrigate 30,000 acres. The ayacut of, and cultivation under, the different tanks and channels in the valley of the Shanmuganadi is, however, only as follows:—

AYACUT.		CULTIVATION.	
Area.	Assessment.	Area.	Assessment.
ACRES. 19,819	RS. 81,629	ACRES. 17,470	RS. 75,188

It may, therefore, I think fairly be argued that the river, if properly treated, will irrigate some 12,500 acres more than it does at present.

7. The whole argument turns, of course, on the rainfall and the proportion thereof which will run off. On both points I submit that the estimates above stated are moderate. I take the rainfall at 36 inches only, but at Mr. Levinge's house at Kodaikanal, which is within the drainage area of the river, the rain-gauge shows the annual rainfall to exceed 60 inches. It has even exceeded 80 inches. I assume that one-third of the rainfall would run off. This is a matter on which I have hardly a right to offer an opinion. But if I am rightly informed that one-third of the rainfall on a given drainage area is usually accepted as a safe estimate of the discharge from it, I am certainly safe in making such an estimate in the case of a drainage area so largely composed of exceedingly steep and very rocky hills as that of the Shanmuganadi.

8. A safer and more accurate estimate could no doubt be arrived at by actually gauging the discharge of the river. This can easily be done if Government will sanction funds for the purpose, and should, in my humble opinion, be done at once, so that the question may be set at rest. There is an excellent site for the establishment of a gauge between the abutments of the fallen bridge on the road from Pulny to Udumalpettah. It is shortly above this point that the Shanmuganadi is formed by the junction of the six rivers whence it derives its name. Below it only the water necessary for the comparatively petty irrigation of the villages of Manur, Korikodava, and Kiranur is drawn off. The requirements of these villages in cubic yards can easily be ascertained. The remainder of the water which passes the fallen bridge may be held available for the extension of irrigation in other villages. One thing only would I venture to point out, in case it should please Government to order the flow of water in the river

to be gauged. This is that nothing but a self-registering gauge will be of any use. I will explain why.

9. As is well known, the south-west monsoon does not regularly affect the Pulny Hills in the same way that it does the Nilgiris. From the beginning of April, however, to the end of October, when the north-east monsoon may be said to set in, the Hills are constantly visited by heavy storms of rain which may be said invariably to fall in the afternoon and evening and during the night. It is not too much, I think, to say, and I have known the Hills a long time, that on no one day during those seven months can any one say with any certainty in the morning that the afternoon and evening will be fine. These storms are often very heavy. A fall of three-quarters to an inch of rain in the course of an hour or two is quite common, and, from the exceeding steepness of the Hills, I feel sure that such a fall, occurring as it always does in the afternoon, would run off and leave no trace, but the wetness of the sand in the river bed, before the man employed to register the height of the water in the river could come to his work the next morning. I think, therefore, that the mere registry so many times during the day of the height of the water in the river at the point I propose would give a very inadequate idea of the river's real discharge. No natives could be trusted to register the discharge regularly, and at frequent intervals, during the night. A self-registering gauge alone therefore will, I submit, secure accurate results.

10. Should his anticipations that the Shanmuganadi discharges far more water than is required for the existing wet cultivation prove correct, the District Engineer proposes to utilize the available surplus as follows.

11. On the right bank of the river there now exists a series of very valuable irrigation works. These comprise Vayaparikolam, Chinnakolam, Sirunaikenkolam, and Papankolam, in the order given, in the Pulny village, and Kothamangalam tank in the village of that name. This series of works is fed from a tributary of the Shanmuganadi, the name of which has at this moment escaped me, through a channel on which considerable expenditure has recently been incurred with very beneficial results, as mentioned in the District Engineer's letter under reference. When this channel and the Kothai anicut at the head of it have been put into good order, I entertain no doubt that an ample supply of water may always be reckoned on for all the tanks I have mentioned. At present this is very far from being the case. Kothamangalam tank is a fine one for this district, but, owing to its being at the end of the series and supplied last of all, it very frequently receives but little water, and remissions constantly have to be granted both for waste and for withered crops in the area it is supposed to irrigate.

12. The District Engineer's views extend, however, further than the mere securing to existing tanks of an adequate water-supply. Beyond Kothamangalam tank, and separated from it by a narrow rocky ridge, which it would not be difficult to cut through, lies a broad and flat-bottomed valley across which stretch the ruins of an ancient native bund, no doubt, I think, intended, had the work ever been completed, to receive the surplus from, and to form the last link in the chain of tanks dependant on, the Kothai anai. This tank the District Engineer proposes to complete. Rough levels already taken show that the scheme is perfectly feasible so far as they go. The only question is, is the supply of water sufficient?

Should further investigations prove this to be the case, the following results may be anticipated. Papankolam, a shallow tank and now in bad order, may be abolished altogether, and its area and ayacut irrigated from the new tank. Kothamangalam tank also may be abolished and its area and ayacut irrigated from the supply channel of the new tank and from the new tank itself, respectively. For such further supplies of water as the new tank may be found capable of holding, there is an ample area to be irrigated along the right bank of the Shanmuganadi towards Kiranur.

13. The localities I am speaking of can easily be made out on the sheet atlas. Vayapurikolam is there just south of Pulny town, Kothamangalam tank is there about two miles north of it; both of them with their bunds mistakenly shown on the east instead of on the west of their water spreads. The bund of the tank the District Engineer proposes to construct would run across the two streams which flow north of Kothamangalam tank and unite about a mile due east of the point where the old road from Pulny to Darapuram crosses the Shanmuganadi.

14. For the left bank of the river, the District Engineer's proposal is to improve an existing anicut on the western main tributary of the river which unites with the eastern main tributary just south of the road from Pulny to Udumalpettah, thence to cut a channel through the high ground immediately north of Agraram (see map), and thereby to fill a large tank to be formed by bunding up the valley east of Thaliooth about the point where the map shows the junction of three small streams about two miles west of the Shanmuganadi.

15. To test the feasibility of this scheme, the District Engineer has had some levels taken which proved satisfactory. He has also calculated the volume of water which such a tank would hold. I forget the amount, but I know it was sufficient for the irrigation of several thousand acres of land.

16. I have been over the ground on both banks of the Shanmuganadi with the District Engineer. In both cases the area to be occupied by the new tanks is land of little value. In both cases I believe his schemes to be perfectly feasible. But I do not wish to insist upon that. All I wish to bring before Government is that such rough calculations as can be made without a special establishment show, first, that the whole water-supply of the river is not utilized; secondly, that suitable sites are available for storing much more water than is stored. In short, I submit that I have shown that there is a case for investigation the means for which I ask Government to supply.

17. One objection only I am anxious to anticipate in conclusion of this part of the subject. This is that the storage of additional large quantities of water in the Shanmuganadi valley will prejudicially affect the water-supply of the Amravati, on which large areas of cultivation are dependant in the Coimbatore District. I submit that as the water-supply of the Shanmuganadi in the hot weather is so scanty that little or none of it can reach the Amravati, and as the additional storage now proposed to be effected will be made during the wet weather when the Amravati itself is in full fresh and provides more than amply for the irrigation dependant on it, the measures suggested by the District Engineer can in no way injure vested interests lower down. On the contrary, it appears to me that the existence of large reservoirs in the valley of the Shanmuganadi may often, in seasons of drought, be most beneficial to the cultivation under the Amravati

channels, the supplies in which there would be no difficulty in supplementing therefrom.

18. I turn now to the subject of the Vigay, for the improvement and extension of the irrigation under which the District Engineer proposes two schemes.

19. On the first of these, the formation of a large tank on the Manjalar, an important tributary of the Vigay which flows into it near Butlagundu, I have already fully reported in my letter printed with the Proceedings of the Board and Government marginally noted. The Revenue Board's Proceedings, No. 1,251, dated 12th May 1875, proposed was favorably considered both by the Board of Revenue and by Government in the Revenue Department; and from the remarks of the Chief Engineer for Irrigation, embodied in G.O., dated 1st July 1875, No. 1,836, I gather that, if the means at the disposal of Government had then permitted it, they would have given instructions for the investigation of the project. It is not now necessary, therefore, for me to do more than to call their attention to the previous correspondence above quoted, and respectfully to urge them to reconsider the possibility of sparing an officer for the service in question.

20. The District Engineer's second project for the improvement and extension of the Vigay is to dam up that river itself and to form a large reservoir upon it near Gullapuram, some ten miles E.S.E. of Periakolam. I am not fully acquainted with the details of this scheme. The District Engineer will no doubt be able and willing to supply them. From inquiries I have made, however, I learn that it involves no work of great or unusual difficulty, the proposal being no more than to construct a bund of about a mile in length and about 60 feet in maximum height, with, of course, the necessary sluices and distribution canals. For the construction of the bund, the lie of the ground affords facilities. A natural saddle will obviate the need of the construction of an artificial calingulah. The tank is roughly calculated, I have been told, to contain some 300 millions of cubic yards of water.

21. The first questions which will arise in any inquiry which may be instituted into the feasibility of these projects, will, it seems to me, be—
What is the discharge of the Vigay, and what area does the river now irrigate?

22. These questions have already formed the subject of the communications from the District Engineer and of the Memorandum by the Chief Engineer for Irrigation recorded in the papers marginally noted. Other communications have also probably passed between Government and the District Engineer on the subject, of which I am not aware. The District Engineer's letters, &c., recorded in G.O., dated 8th September 1875, No. 2,568, Public Works Department. G.O., dated 24th March 1876, No. 416, Revenue Department. G.O., dated 22nd April 1876, No. 533, Revenue Department.

23. Among these papers I would particularly direct attention to Colonel Mullins' Memorandum recorded in G.O., dated 8th September 1875. Not having all the District Engineer's letters therein mentioned before me, I find it difficult

to follow exactly his arguments and Colonel Mullins' remarks. So far as I can make out, however, it seems that Colonel Fischer calculates that the water-supply of the Vigay is sufficient to irrigate 200,000 acres and only does irrigate 37,000 (50,000 — 37,000 = 13,000, *vide* paragraph 3 of Colonel Mullins' Memorandum). The latter officer, on the other hand, is of opinion that the Vigay, a very short river (150 miles in length) under the influence of the north-east monsoon only, is not a reliable source of irrigation; that probably its 1,300 square miles of drainage basin would suffice to irrigate 40,000 to 50,000 acres; and that the river is incapable of irrigating more than 50,000 acres in ordinary seasons. I omit some qualifying words used by Colonel Mullins as not affecting the argument. If measures taken by Government enlarge the area of irrigation, it is unimportant whether the land newly irrigated belongs to Government or not. In either case they can and would charge the same water-rate per acre. Similarly, I submit it is of no consequence whether the additional land to be irrigated is commanded by the Peranai anicut so long as it is commanded somehow, *e.g.*, by the tank the District Engineer proposes to construct near Gullapuram above the Peranai anicut.

24. I hope I have accurately stated the facts as they are put by the District Engineer and by Colonel Mullins. If so, they are both in error on the important question of the actual present amount of irrigation. Colonel Fischer puts this at under 40,000 acres, and Colonel Mullins thinks the river with its drainage basin of 1,300 square miles cannot irrigate more than 50,000 acres. But, as a matter of fact, the Vigay and its tributaries irrigate no less than 84,000 acres already in the Government Taluqs and in the Shevagungah and Bodinaikanur Zemindaries, and probably not less than 20,000 acres more in the Ramnad Zemindari, accurate information from which I called for some time ago but have not yet received. In this computation I have not included the area irrigated by any of the rain-fed tanks, of which there are many in the valley of the Vigay, which cut off from it great quantities of water which would otherwise be discharged by it. I believe, therefore, that I am well within the mark in saying that in the valley of the Vigay there are not less than 110,000 acres of land irrigated by the rainfall which runs off its drainage basin.

25. Evidently, therefore, on the one hand, there is nothing like so much room for extension of irrigation as Colonel Fischer supposed; and, on the other, the capabilities of the river have been much under-estimated by Colonel Mullins, as I have no doubt he will, with these figures before him, willingly allow. He did not allow probably sufficiently for the fact that much of the area drained by the Vigay is very steep and rocky ground, and that it includes many lofty hills on which the rainfall must be far heavier than in the plains.

26. The question still remains; what are the capabilities of the river? Take its drainage area at 1,300 square miles, and allow for an average rainfall of 36 inches, whereof 12 inches run off, and we have a discharge of 1,300 millions of cubic yards, or sufficient to irrigate over 216,000 acres. Colonel Fischer has computed the discharge at Madura itself, above which the supply for about 45,000 acres is taken off, at nearly 950 millions of cubic yards in October—December, 1874, and at more than 1,200 millions in the same period of 1875. Colonel Mullins says that, in the absence of the requisite data, these calculations cannot be examined. This is a purely professional matter on which I can express no opinion.

But I suppose there are means of obtaining the requisite data, and I would respectfully ask Government to order those means to be adopted, and those investigations to be made for which, I think, I may say that I have shown that there are some grounds.

27. In conclusion, I have the honor to submit the following remarks on the character of the irrigation works in the valley of the Vigay and on the waste of its waters by surplusage into other drainages, which are commented on in the District Engineer's letter and the Chief Engineer's Memorandum printed with G.O., dated 14th July 1875, No. 2,005, Public Works Department.

28. Looking at the map, any one who did not know the facts would imagine that the Madura Taluq, part of the Shevagungah Zemindari, and nearly the whole of the Ramnad estate were better supplied with the means of irrigation than most parts of the country. It looks as if the tanks covered nearly as much ground as is left available for cultivation, if not more. Unfortunately, this is almost the fact, and it is because it is so that it is so hopeless a task to do anything for the improvement of most of the Madura (both Government and Zemindari) tanks. The slope of the ground is so gentle that almost all of them are exceedingly shallow. There is many a tank which looks a splendid one, the average depth of which cannot, I feel sure, exceed 4 feet. The soil is soft and crumbling, such as no good bund can ever be made of, and as necessitates constant repairs and leads to frequent breaches. If a tank completely fills, it does so only by the dangerous means of a turfed-up calingulah and with the result that it probably swamps many an acre of good cultivation above it. Whether the tanks fill or not, percolation through their sandy beds and the evaporation from their wide areas of shallow water are, and must be, excessive. All the tanks, I may almost say, are much silted up. No improvement in them seems to me possible except at enormous cost.

29. But the beds of these tanks, which it is so hopeless to think of improving, are first-rate soil. If they were not required for the storage of water, they would sell for cultivation at rates which, I believe, would go far to pay the cost of the construction of works to supersede them. This is the task which the District Engineer proposes to undertake. My belief is that, if the Chief Engineer for Irrigation were to examine the conditions on the spot, he would be the first to recommend investigations to decide if the District Engineer's proposals are feasible and likely to be remunerative.

30. Then, with regard to the waters of the Vigay which surplus into other drainages, the Chief Engineer says that something more than a mere assertion as to their being wasted is required, and gives instructions as to the steps to be taken to ascertain what becomes of them. As to the fact of such surplusage I do not understand him to doubt; it is notorious to every one who knows the district, and is sufficiently evidenced by a glance at the map (Sheet Atlas, sheets Nos. 62 and 80). As to the amount of the wastage, no precise information can be given without detailed inquiry and observation over a very large tract of country, which, if I may be allowed to say so without disrespect to Government, it appears to me unreasonable to expect the District Engineer either to make himself with all the work he has on his hands, or by means of the existing establishment which every one who has considered the subject has time after time during the last few

years pronounced inadequate to the duties already required of it. I may mention, however, that I have been informed that about last November the Gundar, which through the Krithimal river receives nearly half the drainage of Madura Town itself and the surplus of many tanks which are fed from the Vigay above Madura; was running 13 feet deep into the sea for several weeks together. The Vigay may not often reach the sea, but I never heard that the Gundar failed to do so every year; and the same may, I believe, be said of other smaller and less important streams.

31. To ascertain the actual wastage of water thus occasioned, what I may call an irrigation survey of the country is, I think, required—a survey, that is, which would take note of every channel and every tank, which would ascertain and record the mutual relations of all existing works, and would estimate the capacities, actual and possible, of each, and the cost of such improvements as might be considered feasible. Such an investigation obviously can never be made with the existing establishment. It would require the services of an officer, experienced and interested in the subject, who should have no other work to distract his attention and who should be aided by a competent staff. That his investigations might prove the District Engineer's projects for large works on the upper waters of the Vigay unlikely to be profitable, or impracticable except at the cost of vested interests lower down, is no doubt possible. But in that case I am sanguine that other measures would suggest themselves whereby the irrigation of parts of the Shevagungah Zemindari, and of the portion of the Ramnad Zemindari drained by the Gundar, might be greatly improved. I have little doubt that the Shevagungah Zemindari would be glad to adopt any suggestions which promised her an increased income, and to pay her fair share of the cost of investigations within the limits of her estate. If not, inquiries need not be pursued in that direction. The Ramnad estate would, of course, pay its share of the cost of surveys and inquiries, and would be ready to execute, at its own cost, all feasible and profitable improvements.

32. It may be asked why should Government trouble itself about investigations which may turn out to be more for the benefit of Zemindars and their tenants than of the State and its ryots? My answer is that, until these investigations are made, and no one but Government has the means of making them, no one can possibly tell to what conclusions they may lead; and that the Zemindars' tenants are as much the subjects of the Queen and as much entitled to the care of the Queen's Government as those who hold their lands directly from it. That in case of scarcity they would have to be fed from the public funds, that their condition is capable of much improvement, and that no one hitherto has cared much for them, no one, I think, will deny. Should the ultimate result of the inquiries now recommended be that irrigation is extended and improved in the two great Zemindaries of Ramnad and Shevagungah instead of in the Government Taluqs, I cannot think that Government can do otherwise than gain by the increased wealth, comfort, and contentment which that hitherto neglected part of the country will enjoy.

33. The considerations stated in paragraph 11 of my letter recorded in the Board's Proceedings, No. 2,437, dated 30th August 1875, are my justification for the length of this letter.

Mr. Bliss' report on the irrigational capabilities of the Madura District will be submitted to Government with reference to G.O., dated 26th April 1876, No. 959.

2. Mr. Bliss agrees with Colonel Fischer in thinking that there is abundant surplus water in the Shanmuganadi which may be turned to account for improving the irrigation of the country on the right and left banks of that river, and urges the institution of careful investigation to test the actual discharge of the river and the feasibility of diverting its waters to the supply of a chain of tanks on the right bank and to supplement the waters of an anicut across one of the feeders of the river on the left bank with a view to supplying a new tank proposed to be constructed in that neighbourhood. With regard to the Vigay, Mr. Bliss shows that great misapprehensions exist as to the area already irrigated by the waters of that river; he agrees with Colonel Fischer in thinking that numbers of the existing tanks are so shallow and so much silted up as to be hardly worth repair, and also in the opinion that a large quantity of surplus water from the tanks fed by the Vigay is wasted and carried to the sea, not by the Vigay itself, but by the Gundar and other adjacent drainages.

3. Mr. Bliss suggests a regular irrigational survey of the valley of the Vigay, and he points out that such a survey can only be undertaken by an officer specially appointed for the purpose with no other duties to divert his attention from the work.

4. The Board are of opinion that Mr. Bliss has clearly established a case for investigation into the circumstances of both rivers. That for the ascertainment of the capabilities of the Shanmuganadi need not take very long nor be very costly, but the survey of Vigay valley irrigation, involving as it does the interests

Shevagungah.
Ramnad.
Bodinaikanur.

not only of the Government lands in Madura but also of the land of three large Zemindaries, must needs be a work of much time and labor. The present

time is, however, very suitable for the investigation, as two of the Zemindaries are under the Court of Wards and the proprietrix of the third is anxious for the development of her country and ready to co-operate in any reasonable work of improvement.

(A true Copy and Extract.)

Acting Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Collector of Madura.

Exd. W. J. Lewis.

Handed up 10.00.00 to the Collector of the District of Madras on 10.00.00

1876/7

Revenue 1876. 2. 1. 1. 1.

BOARD of Revenue,
MADRAS.

PROCEEDINGS, 11TH JULY 1876, No. 1,770.

20th July 1876

Encl.

Received 21 July 1876

JULY.
No. 1,770.

Irrigational capabilities of Madras District.—Submitting to Government, with Board's views, Collector's report on —, and stating that the present time is very suitable for the investigation into the circumstances of Shanmuganandi and Vijay.

20th July 1876

10th July 1876

20th July 1876

It is observed that the weekly Board's proceedings from Madras report the same information of the state of the district, but up to the present date no mention is made of an expenditure of a security of funds. The proposal that the irrigation capabilities of the district be investigated, the 'Shanmuganandi' is considered 'Vijay' will be carefully examined with its contents. 29th July 1876

8.1.96 95 95 814
— 26 March 1876 533
— 27 April 1876 538
— 27 July 1876 1538
— 17 Sept 1876 1506
— 15 Oct 1876 1990
— 26 Nov 1876 1999
— 25 Dec 1876 1992