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MADRAS RECORD OFFICE

Government of Madras

Public Works

DEPARTMENT

G.O. No.	256	Press	<i>Original</i>
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Dated	29. 1.	195	
		1875	

Not to be folded or roughly handled.

*Proceedings of the Madras Government, Public Works Department,
29th January 1875.*

No. 527. Read the following endorsement of the Chief Engineer for Irrigation, dated Camp at Carryputty, 19th December 1874, No. 1,071 :—

From J. W. RUNDALL, Esq., District Engineer, Tinnevely, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Palamcottah, 9th December 1874, No. 135.

I REGRET to have to report the occurrence of a heavy fall of rain with a flood in the Tambrapurni, and that considerable damage has been thereby occasioned to the channels, tanks, and river banks in this district.

2. During Wednesday the 26th and Thursday the 27th ultimo, 10½ inches of rain fell at this place, and 12 inches at Shermadevi, and 6·80 inches at Puthugudi. There had been some good showers before this, and the channel-fed tanks were mostly full, and the rain-fed tanks had received supplies.

3. The rain was not accompanied by any atmospheric disturbance, and was much lighter in the northern part of the district.

4. The river at Palamcottah rose to 23 feet on the gauge of Sulochenum bridge. In the flood of 1869 the Range Officer reported to Government that the height at this point was 26 feet, but the regular register kept by the Collector shows only 25 feet as a maximum. The water, therefore, was lower at Palamcottah than in 1869. But as during the re-construction of the bridge the river bed (consisting of soft limestone rock) was levelled, and the floors under several arches lowered, the gauge on the bridge does not afford a correct comparison. At the Aryanaigapuram Anicut, I learn that the water was one foot lower than in 1869. I also learn from Mr. Spalding, Assistant Engineer, South Indian Railway, that the Chittar was 2 feet 6 inches below the level of the 1869 flood, recorded in the level section of his district.

5. At Strivigundam, however, the river was 2 inches higher, *viz.*, 16 feet 8 inches on the head sluice floor, the lower bed being quite full, there was scarcely a ripple on the line of anicut.

6. In the Cannadien channel there are several breaches, but none of them serious, and they are being closed.

7. In the Kodagan channel there are many breaches, the most serious being opposite the proposed Melakallar tank. There is also a considerable breach in the Suttamalli Periakulam supplied by the Kodagan channel.

8. In the Pauliem channel there are some very serious breaches, one at Gopalasamudram, about 3¼ miles from the head, occurred at a place where there was a breach in 1869; and the present breach resulted, I think, from the careless manner in which the former breach had been closed. A mass of rough stone had been thrown in, the bank being formed over it. The water was well below the top of bank at this point; no breach should have happened except from a defect in the bank.

9. The worst breaches are at the Pachiar, where the bank between two surplus weirs, known as the Anju Mathugu and Khan Sahib's Mathugu, was swept away for 84 yards. The wing of the easternmost escape opposite the village was also thrown down and a breach caused. Even after the construction of the head sluice for the Pauliem channel, I think there will not be sufficient escape for the flood waters of the Pachiar. I find from Major. Prendergast's report, recorded

with G.O., No. 187, of the 17th January 1870, that in 1869 exactly the same thing happened, and I shall therefore, at the earliest possible date, send in estimates for an extra length of surplus weir with sand sluices. The removal of the dam stones in the Khan Sahib's Mathugu is also of importance, as I found that this weir was almost closed by straw and brushwood, which had accumulated round the dam stones with which it is furnished. Below Tharuvei there are no serious breaches, but at the Pachiar itself the whole channel was completely choked with sand to a depth of 4 feet 6 inches.

10. The Tinnevely channel is breached in several places, but the breaches are not large, and they will soon be closed. The combined waters of the Kodagan and Tinnevely channels, together with those from the Kariselkulam Odei (on which line of drainage several tanks were breached), found their way into Tinnevely town, and would undoubtedly have breached the Nainakulam lying at the north-east corner of the town, had not the banks of this tank been cut as a precautionary measure to prevent the parts of the town just above it being flooded by the water when it rose to the top of the tank bank. The early cutting of the bund prevented, I believe, the breaches from being as serious as they otherwise would have been.

11. The town of Tinnevely will, however, be subject to a flood of this kind whenever the river is in flood and there is rain at the same time; as long as these two channels (one of which runs above, and the other in two branches through, the town) are unprovided with head sluices. When, as in the present case, the tanks above and below the town are full, and when heavy rain falls, portions of the town will, I think, always be liable to inundation to some extent. The head sluice for the Kodagan channel has already been sanctioned, and I hope sufficient funds will be given next year to ensure the completion of this work. This channel from its size, its greater fall, and from its commanding the Tinnevely channel, is that which it is most important to protect first. I think it is also a question whether, even after both channels are provided with head sluices, we have surplusing power enough to dispose of all the land drainage that might come into the town through the channels and from the Kariselkulam Odei. This question will be more fully inquired into and reported on.

12. Part of the calingulah of the Kristnaperi tank was carried away and two small breaches occurred in the Kandiaperi tank lying west and north-west of the town respectively. The breaching of the Nainakulam swamped the paddy-fields and road between Tinnevely and the Collector's house, but the crops have not suffered.

13. The Mardur Melakal was breached in one place near Sedimganallur just above the Thutagudi calingulah, (297 feet) long at that place. The bank was high, and had the five under sluices in this calingulah been opened, the chances of damage would have been considerably lessened. In addition to the river water, however, a large volume of water entered the channel at this point from the Ponnakudi channel (from the Pachiar); several of the tanks on this line breached, but not the Ponnakudi Periakulam inspected by you on the 19th October last. I have calculated from observed water-marks that at one time 1.07 million cubic yards per hour were passing over this surplus weir. Lower down the channel not less than

400,000 cubic yards were passing over the Vellore west calingulah. The Vellore villagers breached the Kuni Marugal or low level vent in their east calingulah to save the tank; the same was done at the Tenkarei calingulah, and the water from the latter all passed down to the Kadamba tank.

14. Mr. Hughes, Assistant Engineer, was at Puthugudi. The river bund between Karankulam and the Adichanallur Hill was breached in numerous places; all the fields were submerged, and the road was extensively damaged. Mr. Hughes endeavoured to prevent the river breaching in at the bridge over the Vellore surplus, but was unable to do so. As soon as the water rose against the river banks in the second mile from Puthugudi, numerous leaks appeared, which the villagers endeavoured to stop but without success, and the bank breached in several places. All this water went down to the south channel, breached its right bank, and though the head sluice was closed, there was at one time 12 feet of water on its rear floor.

15. A breach likewise occurred at the west end of Alwar Tinnevely (Alwar Tirunagari) at a place where there were some mud huts on the bank. The water rushing through this breached the left bank of the south channel, and the combined waters have considerably damaged the left bank of the channel from the Kulasegarapatnam road bridge eastwards. The river bank at Alwar Tinnevely must have been too low I think; but, as it is actually in the village, a little precaution and energy on the part of the villagers would, I believe, have prevented the breach. There are still some mud huts on the bund (built before it was recently raised) which must all be removed. The south channel is not, however, much silted, and will easily be put to rights.

16. The two most serious breaches on the south side happened alongside the Attur channel. One about 200 yards below the old Attur head sluice, just above the aqueduct on the new channel. This breach is 146 yards long with a hole in one place $2\frac{1}{2}$ yards deep. I could not find any mark to indicate that the water had been higher than 4 feet from the top of the bund. But Mr. Hughes has since informed me that he has found that the water rose to 1 foot 9 inches from the top of the bund. The bank was two yards on top with two to one slopes. The breach I believe to be due to the bad soil of which the bund is composed. The soil all around is the same, a sandy loam, containing a large proportion of sand. A breach occurred at the same point in 1869, and I think special precautions will have to be taken to prevent its recurrence. I think also the bank should be revetted or otherwise protected. As you have seen the place and know the sort of soil we have to deal with, please favor me with your instructions.

17. The Attur old and new channels have been breached in many places, and considerably silted by the flood entering at this and the lower breach.

18. The second breach was at Saythukuvoithan (about half a mile east of the point where we got on to the river bund when riding recently from Attur to Puthugudi), and is also very serious, being 186 yards long with a hole $7\frac{1}{2}$ yards deep. A breach occurred here in 1869, but the new bund was high and made of the best soil obtainable. Special protective works will be required. The cost of closing these two breaches and repairing Attur channel will be considerable. Estimates are under preparation.

19. Owing to the influx of water from the south channel and from the Tenkarei tank surplus, the water in the Kadamba tank rose to 7 feet on the Puriur head sluice floor. The lower tanks being all full the Puriur sluice shutters had been closed on the 26th. The Delta Superintendent, Pothimuthu Pillay, who was on the spot, wisely refused to comply with the wishes of the Tentriperi villagers to open the sluice. He cut the bund between the head sluice and the calingulah, and thus saved the tank breaching in any other and more dangerous place. This portion of the bank will easily be set right, none of the tanks on the south side, nor any masonry works, have been damaged.

20. On the north side of the river also the damage has, I regret to say, been extensive.

21. The water at the Mardur anicut rose to a height of 6.63 above mean crest (it was stated to have been 8.16 above mean crest in 1869, or 85.42 + mean sea level), and although the front wings of the Kilakal head sluice were not topped, a little water got over the lower wings. These will all during next season be raised according to your recent instructions.

22. The river, however, got into the Kilakal channel, west of the village of Kaliavur, by topping the old bund, and has caused some serious breaches in it. Two rain-fed tanks lying above the channel at Kaliavur and Valanad also breached, and their contents added to the flood already in the channel.

23. The most serious breach in the Kilakal bank is about $1\frac{1}{2}$ miles from the head at a surplusing sluice. A breach occurred here also in 1869. One breach, a few hundred yards below the surplusing sluice just alluded to, has exposed an old surplusing calingulah, which has been breached through and covered in at some previous time. As apart from river floods the Kilakal must receive considerable land drainage, the restoration of this work is, I consider, desirable. The whole tract between the river and Kilakal was flooded, the Tuticorin road where it passes through the Nanjei was washed away, and the flood combining with water entering through Cusavanodei at Tholapenpannei swept on down to Strivigundam, where it breached the river bank from *inside*, also the road joining the town and the Periakulam supply channel (part of road No. X.). The whole body of water passing through the breach in the road about 300 yards long, passed on over the Strivigundam Nanjei, washed away all the roads through it, and swept down to Yeral, when it caused great destruction. Nearly the whole of the Periakulam surplus bunds from the new bridge to the syphon sluice has been washed away. The syphon sluice has been somewhat damaged, the two side walls on the south having been carried away, and at the north end the west wall of the cistern has been injured. The body of the work is, I hope, intact. The north main channel south bank from Korkei head sluice to within 20 yards of the bridge and calingulah has been washed away, and there are some smaller breaches to the west of the Korkei sluice. The banks of the Tail Race channel below the syphon sluice have been obliterated. The cost of repairing the damage thus done will be considerable, as there is a difficulty in obtaining earth.

24. A breach in the river bund also occurred close to Strivigundam village. The bund here was high and strong, at least 4 feet above the flood, but the Tahsildar who was on the spot says that the breach was caused by a rat-hole in the bank. The bank commenced to leak through this rat-hole, and while he was

having it stopped with straw, the bank gave way and the breach gradually widened out to about 60 yards. This water all went down the north channel, the head sluice of which had been closed, and although much damage has not been done on the upper part of the channel, this water assisted in causing the destruction of the embankments at Yeral.

25. The Korkei tank was breached, but the Arumugamangalam and other tanks are not injured. A breach occurred in the Korampallam tank west of the Tuticorin sluice, washing away the bank of the supply channel in the deep part about half a mile below the sluices.

26. The result of this flood is to show that the river embankments in the Tenkarei taluq are quite ineffective; I will, as soon as possible, have complete levels taken, and propose a scheme for their being put into thorough order.

27. In the Tenkasi taluq the damage has been small, the Maranthi tank has been breached, and a few other works injured.

28. In the Ambasamudram taluq there were a few breaches in the Cannadien channel already alluded to, and in a few tanks.

29. In the Nanguneri taluq a few channels and tanks were breached, but no serious damage was done.

30. The cause of the breaches will in each case be investigated, and estimates for any extra works necessary will be prepared as early as possible.

31. It is certain that, although the flood was somewhat less in the Tambrapurni than in 1869, and considerably less in the Chittar, less also at Mardur immediately below their junction, yet that at Karankulam, Strivigundam and Attur it was somewhat higher. At Alwar Tinnevely and Attur probably nine inches to one foot higher. The reason of this I believe to be due, *first*, to the extensive planting of the padugays by the Revenue Department, and the erection of cross fences to protect the trees planted; and, *secondly*, the encroachment on the bed in many places of nanel. The nanel has increased much of late years, because the villagers have been prevented by the Revenue Officers from grazing it. The destruction of nanel in the river bed will have to be systematically taken up, and I will request the Collector to have the padugays so cleared that the obstructions may be lessened.

32. The breaches are being closed, and estimates for repair of damage are under preparation, and I will as soon as possible let you know what addition I shall require to my Agricultural Repair allotment, but I shall certainly want about Rupees 20,000.

SUBMITTED for the information of Government.

It is much to be regretted that the construction of head sluices to all the Tambrapurni channels has not been taken up more promptly. It was decided in 1869 that these were absolutely necessary, but the subject appears to have been left unattended to for two or three years, and the first two out of six, exclusive of the two channels from the Kodamelalaghiyen anicut at Papanassum, have only been commenced during the present year, while two more have been sanctioned for construction in 1875-76. All of them might have been finished by this time if their importance had been sufficiently appreciated by the local officers. Changes in the charge of the district no doubt account to a considerable extent for such

matters being overlooked. The damage now sustained would have paid for the sluices many times over.

2. It will be necessary to revise altogether the arrangements where the Pachair enters the Pauliem channel. There should be, in addition to surplus weirs without upright stones, a very powerful and efficient set of under sluices on the line of the river in the left bank of the channel, or in one of the surplus weirs. These sluices should be powerful enough to discharge the whole of the water of ordinary freshes, say one-eighth of an inch an hour from the catchment basin, the sills should be placed 2 or 3 feet below the bed of the channel, which should be revetted on both sides of the passage or depressed bed leading to the sluices, and the shutters should be arranged so as to be worked with facility, so that all surplus up to the limit of their capacity may be discharged through them; the top of the shutters should be on the level of full supply in the channel.

3. Adequate means of disposing of the surplus of the Kariselkulam Odei should be provided as soon as possible; this appears to fall into the Kodagan and Tinnevely channels successively. It should either be taken under the channels wholly or partly under, and partly through, or altogether through, by sufficient inlets and outlets, according to the levels and circumstances.

4. The damage to the Maradur West channel is reported to have been materially enhanced by the omission to open the under sluices of the Thutagudi calingulah. The District Engineer should see that, 1st, the means of working the shutters are all that is necessary; 2ndly, that if there is no proper establishment for attending to this duty, application for sanction for one is duly made. Arrangements must be reasonably effective if preventable damage and waste of money in repairing it are to be avoided.

A very large area of country drains towards the Tambrapurni from the westward, its out-fall being across the Maradur channel or into the Vellore and Tenkarei tanks. There are a great many tanks in this area, and they all need to be attended to and placed in a complete state of efficiency and safety, and the Ponnakudi channel should be brought under regulation if it has no head sluice.

5. The river embankment (right side) below the Striviguntum anicut has been very materially improved since 1869, but it was apparently overlooked that the complete repair of the embankment above the anicut was still more necessary. The omission to attend to this was recently pointed out, but the warning came too late. Of course the embankment must be made water-tight. If the soil at the spot either here or elsewhere be porous, it will be requisite to put in a core or wall of clay that will prevent percolation. It is good economy to do things once for all, so that they will answer their intended purpose. The cost of repairing the breaches would have made the banks safe in the first instance, and the worst of it is that banks of bad material may go any where at any time of trial. If an embankment be from the direction of the axis of the river liable to a set, a revetment of stone may be necessary, but from the effects of wash or current, even in exposed places, a nancel plantation would be generally a sufficient protection.

6. The prompt and effective action of the Delta Superintendent, Pothimuthu Pillay, in providing additional means of escape to the water in the Kadamba

tank, with, as it appears, considerable judgment and success, deserves, it is thought, recognition, and a donation of a month's pay is recommended.

7. A point very noticeable in the District Engineer's report is the frequent intimation that breaches have occurred in November 1874 at the places where similar accidents occurred in 1869. It should be considered of primary importance that another repetition should not be allowed to take place. Breaches are due for the most part to causes which can be traced and provided against, and very commonly it is much cheaper to make such provision than to allow accidents or damage to recur.

The east channel from the Maradur anicut, like the west channel, crosses a lot of drainage, and this should not be any longer ignored, but dealt with completely and effectually. As at the Ellore canal, in a range formerly held by Mr. Rundall, little additions here and there are of little good. The difficulty should be faced and dealt with completely. Tanks above should be made not to breach, and the utmost quantity of water than can drain off the land should be taken into account. It is not always that this need involve much expense. At one part of the Ellore canal in the Kistna District floods are to be allowed to pass unobstructed throughout a mile or more; the banks here were a mistake, and natural drainage unobstructed will do very little damage. Elsewhere great lengths of regular outlet must be allowed, and anywhere that channel water and ground level are nearly the same, these outlets cost very little. A simple wall with raised ends and a few feet of rough stone apron will often suffice, and 500 or 600 feet of this sort of outlet can be built for an insignificant sum. The restoration of the old buried surplus work, referred to in paragraph 23, may be very desirable, but it should further be ascertained whether this is enough, or whether rather five, or six, or ten, times as much waterway as it will afford be not required.

8. The extensive damage detailed in the latter part of paragraph 23 on the north channel from the Striviguntum anicut near Yeral is a great matter of regret. A large increase of waterway on that allowed originally was provided, and the banks were certainly very strong. It should now be determined, first, what part of the drainage which caused the damage should have had its outfall elsewhere; secondly, what increase, if any, of discharging capacity to that given by the syphon and at the surplus sluices (called bridge and calingulah) is requisite. As the syphon sluice discharges into the Korkei tank, and as the banks of the tail race were, it is believed, formed from spoil, possibly their restoration is not a necessity. It will be seen also from paragraph 24 that a great deal of the water in the north channel was due to a breach in the river bank at Striviguntum, and that, of course, added to the flood to be discharged lower down.

9. The anicut at Striviguntum would probably account for some difference in the water level there and for a short distance above, and the duration of high freshes influences the levels at particular points. The District Engineer in paragraph 5 gives the level of the water on the head sluice sill at Striviguntum, and he mentions that there was hardly a ripple to mark the line of the anicut, but he has not stated what the level of the water below the anicut was, and the difference is the afflux, which would show how far the anicut was the cause of a rise in the flood level.

9.B.

*Proceedings of the Madras Government, Public Works Department,
29th January 1875.*

10. The regulation of the river bed, the planting of nanel where it is required, and its extirpation elsewhere are very important matters, and were discussed recently with the District Engineer, as it was noticed that a very great deal of nanel was growing in the bed proper of the river, where one blade should not be permitted to remain. The padugay plantations should, as noticed by the District Engineer, be so limited as to prevent their acting injuriously in any way, and when they materially reduce waterway which is really required, their removal will be a necessity.

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

No. 528. ORDER THEREON, 29th January 1875, No. 256.

IRRIGATION, No. 57.

THE Governor in Council has read with much concern the District Engineer's report of the floods of the end of November last in Tinnevelly, and of the extensive damage caused thereby. It was hoped that the long list of disasters which have marked the current year from May onwards had been closed; but in Tinnevelly, as in so many other districts, the monsoon has been heavy, and the usual result has followed.

2. The remarks of the Chief Engineer for Irrigation should receive careful attention, pointing as they do to the removal of causes of damage, which subject is clearly of the greatest importance, and should be taken up in earnest immediately that emergent work has been attended to.

3. The construction of head sluices to the Tambrapurni channels must be carried out with the least possible delay. It appears that of the six old channels for which head sluices are clearly essential, for two* sluices are under construction, estimates† for two more have been sanctioned, while for two others, the Nathiyuny and Tinnevelly channels,

* Cannadien.
Mardur Milakal.
† Kodagan.
Pauliem.

estimates have yet to be submitted. In order that these latter works may no longer be postponed, Rupees 5,000 for each will be entered in the Budget of 1875-76, and the District Engineer will be requested to expedite the submission of the plans and estimates.

4. Delta Superintendent Pothimuthu Pillay's conduct in providing for the safety of the large Kadamba tank is noticed with satisfaction.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Chief Engineer for Irrigation.
.. District Engineer, Tinnevelly.
.. Controller of Public Works Accounts.
.. Revenue Department.
Exd. E. C. Shunker.
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PUBLIC WORKS.

To

THE CHIEF ENGINEER FOR IRRIGATION.

&c, &c.

Dated January 29th.

Recd.

Encl.

G. O., 29th January 1875, No. 256.

JANUARY.

Nos. 527 528

Floods, Tinnevely District.—Passing orders on the report submitted by the Chief Engineer for Irrigation on the damages done to works by the floods of November last.

No 135 District Engineer's Office Tinnevely
Palamcottah 9th December 74.
From J. W. Rundall Esquire
To District Engineer Tinnevely
Lieut Colonel J. Mullins RE
Chief Engineer for Irrigation.
I regret to have to report the occurrence of a heavy fall of rain with a flood in the Tambapurni, and that considerable damage has been thereby occasioned to the Channels, Tanks and River Banks in this District.
2. During Wednesday the 26th and Thursday the 27th Ultimo, 10¹/₂ inches of rain fell at this place, and 12 inches at Permadev and 6.80 inches at Puthingudi. There had been some good showers before this, and the channel fed Tanks were nearly full, and the rain fed Tanks had received supplies.
3. The rain was not accompanied by any atmospheric disturbance, and was much lighter in the Northern part of the District.
4. The River at Palamcottah rose 5.23 feet on the gauge of Subocherum Bridge. In the flood of 1869 the Range Officer reported to Government, that the height at this point was 26 feet, but the regular Register

Register kept by the Collector shows only 25 feet as a maximum. The water therefore was lower at Palamcottah than in 1869. But as during the re-construction of the Bridge, the River bed (consisting of soft limestone rock) was levelled, and the floors under several arches lowered, the gauge on the Bridge does not afford a correct comparison. At the Aranaigapuram Anicut, I learn that the water was 1 foot lower than in 1869. I also learn from Mr. Spalding, Assistant Engineer South Indian Railway, that the Chittar was 2.6" below the level of the 1869 flood recorded in the level section of his District.

5. At Chirungundam however the River was 2 inches higher, viz, 16.8" on the Head Sluice floor, the lower bed being quite full there was scarcely a ripple on the line of Anicut.

6. In the Camradin Channel there are several breaches, but none of them serious and they are being closed.

7. In the Rodagan channel there are many breaches, the most serious being opposite the proposed Melakallur Sank. There is also a considerable breach in the Suttamalli Perikulam supplied by the Rodagan Channel.

Introductions to water level below

Head sluice
down to 100 feet
Construction

As but will
be construction
in 1875-76
work will be done

Station
Dametam
575-76

8. In the Paulim Channel there are some very serious breaches, one at Gopalsami. Dam, about 3 3/4 miles from the head, occurred at a place where there was a breach in 1869, and the present breach resulted, I think, from the carelessness in which the former breach had been closed: a mass of rough stones had been thrown in, the bank being formed over it. The water was well below the top of bank at this point, no breach should have happened except from a defect in the Bank.

9. The worst breaches are at the Pachar where the Bank between two surplus Weirs known as the Arjun Mathur and Khan Sahib Mathur was swept away for 84 yards. The wing of the easternmost escape opposite the Village was also thrown down, and a breach caused. Even after the construction of the Head Sluice for the Paulim Channel, I think there will not be sufficient escape for the flood waters of the Pachar. I find from Major Pennington's report recorded with G.O. No. 187 of the 17. January 1870, that in 1869 exactly the same thing happened, and I shall therefore at the earliest possible date send in Estimates for an extra length of surplus Weir with sand sluices. The removal of the drain stones in the Khan Sahib Mathur

Dimensions of
Along set of
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Mathur

Mattugw is also of importance, as I found that this Weir was almost closed by straw and brushwood, which had accumulated round the dam stones, with which it is furnished. Below Thariver there are no serious breaches, but at the Pachiar itself the whole channel was completely choked with sand to a depth of 4'-6".

10. The Sumervelly Channel is breached in several places, but the breaches are not large, and they will soon be closed. The combined waters of the Rodagan and Sumervelly Channels together with those from the Kariselkulam Odee (on which line of drainage several Tanks were breached) found their way into Sumervelly Town, and would undoubtedly have breached the Namakulam dyke had not the banks of this Tank been cut, as a precautionary measure to prevent the parts of the Town just above it, being flooded by the water when it rose to the top of the Tank Bank. The early cutting of the bund prevented I believe the breaches from being as serious as they otherwise would have been.

11. The Town of Sumervelly will however be subject to a flood of this kind whenever the river is in flood, and there is rain at the same time, as long as these two Channels (one of which runs above and the other in two branches thro' the Town) are

unprovided with Head Sluices. When as in the present case the Tanks above and below the Town are full, and when heavy rain falls, portions of the Town will I think always be liable to inundation to some extent. The Head Sluice for the Rodagan channel has already been sanctioned, and I hope sufficient funds will be given next year to ensure the completion of this work. This Channel from its size, its greater fall, and from its commanding the Sumervelly Channel is that which it is most important to protect first. I think it is also a question whether even after both Channels are provided with Head Sluices, we have surplus power enough to dispose of all the land drainage that might come into the Town thro' the Channels and from the Kariselkulam Odee. This question will be more fully enquired into and reported.

12. Part of the Calingula of the Kristna-peri Tank was carried away and two small breaches occurred in the Randiaperi Tank lying West and North West of the Town respectively. The breaching of the Namakulam swamped the paddy fields and Road between Sumervelly and the Collector's House, but the crops have not suffered.

13. The Mardur Melakal was breached in one place near Sedunganallur just above the Shutagudi Calingula (297) long at

that place. The Bank was high and had the 5 Under Sluices in this Calingula been opened, the chances of damage would have been considerably lessened. In addition to the River water however, a large volume of water entered the Channel at this point from the Ponnakudi Channel (from the Pachiar) several of the Sauts on this line breached, but not the Ponnakudi Periakulam inspected by you on the 19. October last. I have calculated from observed water marks that at one time 1.07 Million ^{Cubic Yards per hour} were passing over this surplus Weir. Lower down the Channel not less than 40000 Cubic yards were passing over the Vellu west Calingula, the Vellu Villagers breached the Kuris Marugal or low level vent in their ^{East} Calingula to save the Saut; the same was done at the Sankarai Calingula, and the water from the latter all passed down to the Kadamba Saut.

14. Mr. Hughes Assistant Engineer was at Puthingudi. The River Bank between Karankulam and the Adichanallur Hill was breached in numerous places, all the fields were submerged, and the Road was extensively damaged. Mr. Hughes endeavored to prevent the River breaching in at the Bridge over the Vellu surplus, but was unable to do so. As soon as the water rose against the River Bank

leaks appeared, which the Villagers endeavored to stop but without success, and the Bank breached in several places. All this water went down to the South Channel breached its right Bank, and though the Head Sluice was closed there was at our time 12 feet of water on its rear floor.

15. A breach likewise occurred at the West end of Alwar Timmervelly (Alwar Timmervelly) at a place where there were some mud huts on the Bank. The water rushing thro' this, breached the left Bank of the South Channel, and the combined waters have considerably damaged the left Bank of the Channel from the Kulasegarapatnam Road Bridge eastwards. The River Bank at Alwar Timmervelly must have been too low I think, but as it is actually in the Village a little precaution and energy on the part of the Villagers would I believe have prevented the breach. There are still some mud huts on the Bank (built before it was recently raised) which must all be removed. The South Channel is not however much silted and will easily be put to rights.

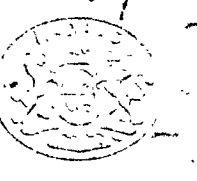
16. The two most serious breaches on the south side happened along side the Attur Channel. One about 200 yards below the old Attur Head Sluice, just above

the Aqueduct on the New Channel. This breach is 146 yards long with a hole in our place $2\frac{1}{2}$ yards deep. I could not find any mark to indicate that the water had been higher than 4 feet from the top of the Bund. But Mr. Hughes has since informed me that he has found that the water rose to 1-9 feet from the top of the Bund. The Bank was 2 yards on top with 2 to 1 slopes. The breach I believe to be due to the bad soil of which the Bund is composed. The soil all around is the same, a sandy loam, containing a large proportion of sand. A breach occurred at the same point in 1869, & I think special precautions will have to be taken to prevent its recurrence. I think also the Bank should be retted, or otherwise protected. As you have seen the place and know the sort of soil we have to deal with, please favor me with your instructions.

17. The Attur old and new Channels have been breached in many places and considerably silted by the flood entering at this and the lower breach.

18. The ^{second} breach ^{was} at Saythukurtham (about $\frac{1}{2}$ mile east of the point where we got on to the River Bund when riding recently from Attur to Puttugudi) and is also very serious, being 186 yards long with a hole $7\frac{1}{2}$ yards deep. A breach

2-30



occurred here in 1869, but the new Bund was high and made of the best soil obtainable. Special protective works will be required. The cost of closing these two breaches and repairing Attur Channel will be considerable. Estimates are under preparation.

19. Owing to the influx of water from the South Channel and from the Sen-Karai Tank surplus, the water in the Kadamba Tank rose to 7 feet on the Purur Head Sluice floor. The lower Tanks being all full the Purur Sluice shutters had been closed on the 26. The Delta Superintendent Pothumithu Pillay who was on the spot, wisely refused to comply with the wishes of the Sinterpin Vellagers to open the sluice. He cut the Bund between the Head Sluice and the Calugula and thus saved the Tank breaching in any other and more dangerous place. This portion of the Bank will easily be set right, none of the Tanks on the South side, nor any masonry works have been damaged.

20. On the North side of the River also, the damage has been I regret to say been extensive.

21. The water at the Mairdur Ancient rise to a height of 6.63 above mean crest

crest (it was stated to have been 8.16 above mean crest in 1869 or 85.42 + mean sea level) and although the front wings of the Kelakal Head Sluice were not topped, a little water got over the lower wings. These will all during next season be raised according to your recent instructions.

22. The River however got into the Kelakal Channel, west of the Village of Kaliavar, by topping the old Bund and has caused some serious breaches in it. Two rain fed Tanks lying above the channel at Kaliavar and Talanar also breached, and their contents added to the flood already in the channel.

23. The most serious breach in the Kelakal Bank is about $1\frac{1}{2}$ miles from the Head at a surplus Sluice. A breach occurred here also in 1869. One breach a few hundred yards below the surplus Sluice just alluded to has exposed an old surplus Calingula, which has been breached thro' and covered in at some previous time. As apart from River floods the Kelakal must receive considerable land drainage, the restoration of this work is consider desirable. The whole tract between the River and Kelakal was flooded, the Laticorn Road where it

pages thro' the Nanjeri was washed away and the flood combining with water entering through Cusavunodei at Tholapannar swept on down to Thirigundam where it breached the River Bank from inside, also the Road joining the Town and the Periakulam supply channel (part of Road N^o 5). The whole body of water passing thro' the breach in the Pond, about 300 yards long, passed on over the Thirigundam Nanjeri, washed away all the Road thro' it, and swept down to Yeral, when it caused great destruction. Nearly the whole of the Periakulam surplus Bund from the New Bridge to the Syphon Sluice has been washed away. The Syphon Sluice has been somewhat damaged, the two side walls on the South having been carried away, and at the North end, the West wall of the Cistern has been injured. The body of the work is I hope intact. The North main channel South Bank from Korkai Head Sluice to within 20 yds of the Bridge and Calingula has been washed away, and there are some smaller breaches to the west of the Korkai Sluice. The Banks of the Tail race Channel below the Syphon Sluice have been

been obliterated. The cost of repairing the damage thus done will be considerable as there is a difficulty in obtaining earth.

24. A breach in the River Bund also occurred close to Strigundam Village. The Bund here was high and strong, at least 4 feet above the flood, but the Tahsildar who was on the spot says, that the breach was caused by a rat hole in the Bank. The Bank commenced to leak thro this rat hole, and while he was trying it stopped with straw, the Bank gave way and the breach gradually widened out to about 60 yds. This water all went down the orti Channel, the Head Sluice of which had been closed, and although much damage has not been done on the upper part of the Channel, this water assisted in causing the destruction of the Embankments at Goral.

25. The Korki Tank was breached, but the Arumangamangalam and other Tanks are not injured. A breach occurred in the Koriampallam Tank west of the Lutterin Sluice, washing away the Bank of the supply channel, in the deep part about $\frac{1}{2}$ mile below the Sluice.

26. The result of this flood is to show that

that the River Embankments in the Tenkasi Taluk are quite ineffectual. I will as soon as possible have complete levels taken and propose a scheme for their being put into thorough order. In the Tenkasi Taluk the damage has been small, the Maran-
the Tank has been breached, and a few other works injured.
27. In the Ambudamudram Taluk there were a few breaches, in the Cannadren Channel already alluded to, and in a few Tanks.
28. In the Nangunen Taluk a few Channels and Tanks were breached, but no serious damage was done.
29. The cause of the breaches will be investigated, and in each case be investigated, and estimates for any extra works necessary will be prepared as early as possible.
30. It is certain that although the flood was somewhat less in the Tan-
brapuri than in 1869, and considerably less in the Chittar; less also at Mardur immediately below their junction, yet that at Karunkulam, Strigundam and Attur, it was somewhat higher. At Alwar Timmvely and Attur probably 9" to 1' higher. The reason of this, I believe to be due, first to the extensive planting of the Paungy by

The Ancient works
under a different
at Strigundam
the same distance
above.

by the Revenue Department, and the
erection of crop fences to protect the
trees planted, and secondly the encroach-
ment on the bed in many places of
Kānel. The Kānel has increased much
of late years, because the Villagers have
been prevented by the Revenue Officers
from grazing it. The destruction of
Kānel in the River bed, will have to
be systematically taken up; and I
will request the Collector to have the
Paragays so cleared that the obstruc-
tions may be lessened.

32. The breaches are being closed, and
Estimates for repair of damage are un-
der preparation; and I will as soon
as possible let you know what ad-
dition I shall require to my Agri-
cultural Repair Allotment, but I
shall certainly want about Rupees
20,000.

I have the honor to be
Sir
Your most Obedt Servt

J. W. Rendall
District Engineer

From *Dist. No. 2352*
Recd
The District Engineer
Tinnevely

To
The Chief Engineer
for Irrigation
No. 135

Dated 9th December/74
Re 14th

17/12/74

Report on the
damage caused by the
heavy rains & flood of
the 26. & 27. Novem-
ber 1874.

No. 8014 B/74.

No. 1071. 27/12

8

Submitted for the information of Government

It is much to be regretted that the construction of head sluices to all the Tambraparni channels has not been taken up more promptly. It was decided in 1869 that these were absolutely necessary, but the subject appears to have been left unattended to for 2 or 3 years, and the first two out of six, exclusive of the two channels from the Kodamalahaghiyen Anicut at Papanasam, have only been commenced during the present year, while 2 more have been sanctioned for construction in 1875-76. All of them might have been finished by this time if their importance had been sufficiently appreciated by the local officers. Changes in the charge of the District no doubt account to a considerable extent for such matters being overlooked. The damage now sustained would have paid for the sluices many times over.

2 It will be necessary to revise altogether the

the arrangements where the Pachiyaur enters the Piliem channel. There should be, in addition to surplus weirs without upright stones, a very powerful and efficient set of under sluices on the line of the river in the left bank of the channel, or in one of the surplus weirs. These sluices should be powerful enough to discharge the whole of the water of ordinary freshes, say $\frac{1}{8}$ of an inch an hour from the catchment basin - the sills should be placed 2 or 3 feet below the bed of the channel, which should be revetted on both sides of the passage or depressed bed leading to the sluices, and the shutters should be arranged so as to be worked with facility, so that all surplus up to the limit of their capacity may be discharged through them - the top of the shutters should be on the level of full supply in the channel.

3 Adequate means of disposing of the surplus of the Kariselkulam oday should be provided as soon as possible: this appears to fall into the Kodagan and Tinnevely channels successively. It should either be taken under the channels wholly, or partly

under and partly through, or altogether through by sufficient inlets and outlets, according to the levels and circumstances.

4 The damage to the Maradur West channel is reported to have been materially enhanced by the omission to open the under sluices of the Thutagudi Calingulah. The District Engineer should see that 1st the means of working the shutters are all that is necessary, 2nd that if there is no proper establishment for attending to this duty, application for sanction for one is duly made. Arrangements must be reasonably effective if preventable damage and waste of money in repairing it are to be avoided.

A very large area of country drains towards the Tambapurny from the westward, its out-fall being across the Maradur channel or into the Vellore and Tenkaree tanks. There are a great many tanks in this area, and they all need to be attended to and placed in a complete state of efficiency and safety, and the Ponnakudi channel should be brought under

under regulation, if it has no head sluice.

5. The river embankment (right side) below the Striviguntam Anicut has been very materially improved since 1869, but it was apparently overlooked that the complete repair of the embankment above the anicut was still more necessary. The omission to attend to this was recently pointed out, but the warning came too late. Of course the embankment must be made water-tight. If the soil at the spot either here or elsewhere be porous it will be requisite to put in a core or wall of clay that will prevent percolation. It is good economy to do things once for all so that they will answer their intended purpose. The cost of repairing the breaches would have made the banks safe in the first instance, and the worst of it is that banks of bad material may go any where at any time of trial. If an embankment be from the direction of the axis of the river liable to a set, a revetment of stone may be necessary, but from the effects of wash or current, even in exposed places, a navel plantation

District Engineer's
remarks at
end of para 16.

plantation would be generally a sufficient protection.

6. The prompt and effective action of the Delta Superintendent, Pothimuthu Pillay, in providing additional means of escape to the water in the Kadamba Tank, with as it appears considerable judgment and success deserves, it is thought, recognition, and a donation of a month's pay is recommended.

7. A point very noticeable in the District Engineer's report is the frequent intimation that breaches have occurred in November 1874 at the places where similar accidents occurred in 1869. It should be considered of primary importance that another repetition should not be allowed to take place. Breaches are due for the most part to causes which can be traced and provided against, and very commonly it is much cheaper to make such provision than to allow accidents or damage to recur.

The East Channel from the Maradur Anicut, like the West Channel, crosses

a lot of drainage, and this should not be any longer ignored, but dealt with completely and effectually. As at the Ellore Canal, in a Range formerly held by Mr. Rundall, little additions here and there are of little good. The difficulty should be faced and dealt with completely. Tanks above should be made not to breach, and the utmost quantity of water than can drain off the land should be taken into account. It is not always that this need involve much expense. At one part of the Ellore Canal in the Krishna District floods are to be allowed to pass unobstructed through out a mile or more; the banks here were a mistake, and natural drainage unobstructed will do very little damage. Elsewhere great lengths of regular outlet must be allowed, and any where that channel water and ground level are nearly the same these outlets cost very little. A simple wall with raised ends and a few feet of rough stone apron will often suffice, and 500 or 600 feet of this sort of outlet can be built for an insignificant sum. The restoration

37 11
restoration of the old raised surplus work, referred to in para 23, may be very desirable, but it should further be ascertained whether this is enough, or whether rather 5 or 6, or 10, times as much waterway as it will afford be not required. The extensive damage detailed in the latter part of para 23 on the north channel from the Striviguntum. Anicut near Yeral is a great matter of regret. A large increase of waterway on that allowed originally was provided, and the banks were certainly very strong. It should now be determined 1st what part of the drainage which caused the damages should have had its outfall elsewhere, 2nd what increase, if any, of discharging capacity to that given by the Syphon and at the surplus sluices (called bridge and Balingulah) is requisite. As the Syphon sluice discharges into the Korkei tank, and as the banks of the tail race were, it is believed, formed from spoil, possibly their restoration is not a necessity. It will be seen

seen also from para 24 that a great deal of the water in the north channel was due to a breach in the river bank at Striviguntum and that of course added to the flood to be discharged lower down.

9. The Anicut at Striviguntum would probably account for some differences in the water level there and for a short distance above, and the duration of high freshes influences the levels at particular points. The District Engineer in para 5 gives the level of the water on the head sluice sill at Striviguntum, and he mentions that there was hardly a ripple to mark the line of the Anicut, but he has not stated what the level of the water below the Anicut was, and the difference is the afflux, which would show how far the Anicut was the cause of a rise in the flood level.

10. The regulation of the river bed, the planting of navel where it is required, and its extirpation elsewhere are very important matters, and were discussed recently with the District Engineer, as it was noticed that

that a very great deal of navel was growing in the bed proper of the river, where some blades should not be permitted to remain. The padugay plantations should, as noticed by the District Engineer be so limited as to prevent their acting injuriously in any way, and, when they materially reduce water way which is really required, their removal will be a necessity.

Camp at
Camp Priethy
19 December
1871

Wimberley

Chief Engineer for Irrigation

To
The Secretary to Government
P. W. D.

1-28 Dec 1871

P. W. 1874-Dept.
No: 8014 B.

From The Chief Engineer
for Migration

To The Secretary
to Govt Mr D

N-1071

Dated 19th Dec 1876
Recd 22nd

Encl 1

Replies

Submitted with re-
marks report by
the D. S. Tinnervelly
on the damage caused
by the heavy rains
& flood of the 26th
& 27th Nov 76.

GP No. 256. 29-1-75.

No 527

Proceeding of the
from the Chief Engineer
for 1876

Madras Government
Read the following

N. D. No. 1071 of 19th Dec
1876

256

The Governor in Council
has read with much concern
the District Engineers report
of the floods of the end of
November last in Tinnevely,
and of the extensive damage
caused thereby. It was hoped
that the long list of disas-
ters which have marked
the current year from May
onwards had been closed,
but in Tinnevely, as in so
many other Districts, the
monsoon has been heavy,
and the usual result has
followed.

2 The remarks of the Chief Engineer for Irrigation should receive careful attention pointing as they do to the removal of causes of damage, which subject is clearly of the greatest importance, and should be taken up in earnest immediately that emergent work has been attended to.

3 The construction of head sluices to the Tambapurny channels must be carried out with the least possible delay. It appears that of the 6 old channels, for which head sluices are clearly essential, for two sluices are under construction, estimates for two more have been sanctioned, while for two others, the Nathiyung and Limevelly channels estimates

* Cammadien
Maradur Melakal
* Kodagan
Paliam.

have yet to be submitted. In order that these latter works may no longer be postponed Rupees 5000 for each will be entered in the Budget of 1875-76, and the District Engineer will be requested to expedite the submission of the plans and estimates.

4. The donation of a month's pay to Delta Subintendant Pottimuttu Pillay is sanctioned, and his conduct in providing for the safety of the large Kadamba Tank is noticed with satisfaction.

Disapprove of special reward given to an ~~camp~~ dog-killer. And notice with satisfaction that D.E. knows there is a man with sense of an emergency with no dull-hermeneutic turn

4/11/75
The Chief Engineer for Irrigation
District Engineer Limevelly
Controller of P.W. Accounts
Revenue Dept
Sept 11/2/75

4/12/75
P.M.

35

8014 B

Govt. of (1874) Madras.
PUBLIC WORKS.

^{2c} 
The Chief Engineer
for Irrigation

Dated

Recd.

Encl. /

O. O. 29 January, No. 156

Nos. 527-528.

Floods — Tanjavur R.

Passing orders on
the Report submitted
by the Chief-Eng. for
irrigation on the damages
done to works by the
floods of November
last —

35
21
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