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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

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Dated	5.-10.(8)74	196

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department, 5th October 1874.

No. 45. Read the following Proceedings of the Board of Revenue, dated 22nd August 1874, No. 2,350 :—

Read again the following papers :—

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In the first Proceedings quoted above, the Board disposed of that part of Dr. Ratton's report which relates to the general system of Salt manufacture in the Northern Districts of the Madras Presidency, leaving Dr. Ratton's remarks on individual works to be dealt with subsequently.

The report in question treats of all the Salt Divisions in the several Districts of Ganjam, Vizagapatam, Godavery, Kistna, Nellore, and Chingleput.

2. The Ganjam District where Dr. Ratton commenced his investigations, has four Salt Divisions, viz., Ganjam, Itchapur, Nowpada, and Womeravilly; he arrived at Ganjam, the most northerly, on the 8th February 1872.

GANJAM.—The works here are much scattered, and, although near the sea in a direct line, the brine is supplied by a canal taken off from the river some two miles from its mouth, and is considerably weakened by land drainage. The chief difficulty, however, in respect of brine-supply lies in the fact that the pans are on high ground, and the water has to be lifted some five feet; it is only at high tides that the canal can be filled, and the bund by which it is retained is leaky and imperfect. This canal forms part of the navigable canal connecting the Chilka lake with Ganjam and, if the project for completing it on a high level by the construction of locks at each end is adopted, the supply of brine to the pans will be secured. In the meantime measures should be taken to render the retaining bund as water-tight as possible.

The construction of the ullum is said to be superior to that of most other districts, and the cost of manufacture to the ryots, if Dr. Ratton's calculations are correct, unusually low. The system is defective in so far that no proper escape for the mother liquor is provided, and this should have the attention of the Deputy-Collector.

3. *Itchapur.*—This station is further from the sea than Ganjam, but being on a lower level the pans are more readily supplied with brine. Dr. Ratton, however, points out that the supply is often deficient : this, it is believed, has been partly remedied by the construction of an outer ditch as a relief work in 1872, but the matter should receive attention at the hands of the Deputy-Collector, and be remedied if necessary. The process is the same as at Ganjam, and the mother liquor is here also allowed to remain in the beds. Endeavours should be made to raise some kind of screen on the windward side of the pans to check the sand drift, and a sluice at the head of the canal should be provided.

4. *Nowpada.*—This Division, the largest in Ganjam, lies five miles from the sea, and, owing to the frequent silting of the mouth of the creek, the supply of brine is often insufficient. The mouth of the creek being small, and exposed to the action of the surf, cannot be kept permanently open, but the channels of supply leading from the creek to the pans could probably be enlarged, and so enabled to carry and to store a larger body of brine, and the entrance to them might be fitted with a sluice. These points should receive attention. The sub-soil is a stiff clay and very favorable for the production of salt ; indeed, except as regards brine supply, Nowpada is in all respects admirably suited for salt works.

5. *Womeravilly*—Both in respect of water-supply and soil this is inferior to the other divisions in Ganjam, and the salt produced is also of poor quality. Much may be done by care and attention to Dr. Ratton's suggestions to improve matters here : there are great facilities for shipping salt for export, but there has never been any great demand.

6. Of Ganjam generally, Dr. Ratton speaks in terms of commendation; the ryots are more careful and attentive than elsewhere, and consequently reap a larger return from their labor.

Dr. Ratton thinks that the employment of the "Picottah" would be more economical than the use of the swinging baskets for raising water. The Deputy-Collector might induce a few of the ryots to try the plan as an experiment at Ganjam, where the lifts are high; it is probable that it may prove successful.

7. *Kuppili.*—Passing on to Vizagapatam, the first division is Kuppili. Dr. Ratton describes the pans here as bad in every way, so bad as to be beyond hope of improvement: he recommends that they should be closed. This cannot be done at present, as the supply throughout the north of Vizagapatam is not equal to the demand, and Kuppili must still make as much salt as it can. Some improvements in the arrangement of the pans and in the mode of working them may be accomplished, and the Deputy-Collector should give his best attention thereto.

8. *Bimlipatam.*—The Salt Pans at this station are shown to possess many great advantages. The site is well sheltered; the brine supply is plentiful and of good density; and the pans are well laid out. They are also well situated for the export of salt by sea; but the produce is small, as there are difficulties in extending the beds owing to the scarcity of labor, the demand for the work of the port absorbing all that is available.

The attention of the Deputy-Collector should be given to improving the quality of salt made, and to remedying the evils caused by the monopoly of manufacture resting with a few influential men. The channels between the reservoirs should be more carefully prepared, and the escape of the bitterns provided for. More care requires to be given to the rejection of inferior salt, and Dr. Ratton's suggestion that samples in sealed bottles should be kept as standards is worthy of consideration. The possibility of providing a sufficient supply to meet the wants of shippers for export should be considered, but the first necessity is to provide a sufficiency for the inland trade, which is likely to increase largely, now that the duty on salt entering the Central Provinces has been removed. Bimlipatam is one of the nearest salt divisions to the frontier and has a good road leading direct into Jeypore *viâ* the new ghaut near Satur.

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10. *Dalcherroo* only seven miles distant, in many respects resembles Karassa; the pans here have only been recently re-opened and require careful supervision.

11. *Pentacotta.*—These pans were established only a few years back and have never been fully utilized; owing to the want of a road to connect them with the Trunk road, the demand for salt has been small. The Collector's attention should be given to completing this road as soon as possible. The pans are well laid out, and with care the supply may be both improved and increased.

12. Godavery District.—*Pennagudurru.*—At the time of Dr. Ratton's visit this was the only division in the Godavery District. The Mogultoor Pans have since been re-opened. It is within a few miles of Cocanada, on the banks of the Coringa Bay. The soil is said to be good, better than is usually the case; the brine supply being also good; but the salt is poor in crystal, and no improvement seems to have taken place since Mr. Clarke's visit in 1864. With this solitary division to attend to, it is scarcely creditable to the Deputy-Collector that such a state of affairs should exist. The importance of this division will greatly increase should the trade which is anticipated spring up with the Central Provinces. It seems certain that the Godavery District must supply all the southern parts of those provinces with salt by way of the river before long. But unless more zeal and energy is displayed, the salt will be short in quantity and deficient in quality. The Collector's earnest attention is called to this matter.

13. Kistna District.—*Pandraka.*—The most northerly Salt division is that of *Pandraka* sometimes called *Bantomilly*. There is no manufacture properly so called here; but salt spontaneously formed in the swamps is largely collected. This salt was in former years greatly prized by the "Lambadies," who carried it for sale into Hyderabad and into parts of the Nagpore country, on account of the hardness of its crystal and its capability of bearing transit. The inhabitants of the Kistna District dislike it; the reasons for this dislike suggested by Dr. Ratton in paragraphs 7 and 8 are probably correct. Dr. Ratton points out at paragraph 8, page 83, that by a little attention it is possible to ensure the collection of perfectly pure salt at this place. His instructions should be carefully followed. Eventually, when the Kistna canal navigation system is more perfect, this salt may be transported by water into the interior.

14. *Manginapudi.*—This division is within five miles of Masulipatam. The soil and process of making are described as fairly good; all the brine is derived from pits, although the sea is within 500 yards and the pans are two feet below its level. The cost of manufacture would be diminished, and other improvements would follow if a supply of brine direct from the sea could be obtained. Dr. Ratton suggests at paragraph 11, page 84, that an experiment should be made. The Collector should, in consultation with the District Engineer, endeavour to effect this: it is possible that a supply might be obtained by means of pipes laid under the sand. Owing to the great density of the brine procured from the pits, the use of reservoirs is almost dispensed with, and the process is somewhat different from that pursued elsewhere. Dr. Ratton points out certain defects in paragraphs 21 and 22, page 86, which should receive the attention of the Deputy-Collector. The matter of removing the mother liquor, alluded to in paragraph 26, should also be noted.

15. *Nizampatam.*—These pans lie south of the Kistna, and at the extremity of the canal leading from the Kistna at Bezwara to the port of Nizampatam. They are admirably situated, therefore, for supplying the wants not only of the interior of the district but of a part of the Hyderabad country also. Dr. Ratton points out several wants and deficiencies, some of which may be readily supplied. The supply canal described in paragraph 6, page 87, should be commenced without any unnecessary delay, and the District Engineer should be communicated with regarding it. The defect in the floors pointed out in paragraph 7 can be easily remedied, and should be at once attended to. The arrangement of the condensers and pans (paragraphs 12 and 13,) is clearly faulty, and the Deputy-Collector should explain this to the manufacturers and assist them in rectifying it. This division is of exceptional importance from its position with respect to the canal, and every endeavour should be made to supply salt in abundance and of good quality.

16. *Chinna Ganjam*—This large division lies at the extremity of the district. The pans are very extensive and the salt is good: there are certain defects which perhaps admit of a partial remedy, but as the pans are very old, it is probable that the manufacturers are so wedded to their customs that it will be difficult to get them to change. The system is much the same as at Manginapudi, and this is accounted for by the fact, (not mentioned by Dr. Ratton,) that the manufacturers at Manginapudi, which has been but recently established as a Salt Factory, were chiefly emigrants from the neighbourhood of Chinna Ganjam. The chief want of Chinna Ganjam is a good road over the sand ridge which separates it from the interior of the district, and the Collector's attention should be given to supplying it as soon as possible.

In his general remarks on the district, Dr. Ratton points out that the salt is generally better than in the two districts immediately north of it; he points out, however, certain defects in the system of manufacture generally pursued, paragraph 15, page 92, which the Deputy-Collector may find it in his power to rectify. His suggestion in paragraph 19 for preventing the formation of swamp salt is worthy of a trial.

17. Nellore District.—*Kanuparti.*—The first pans in Nellore are only a few miles south of Chinna Ganjam, and the system pursued is very similar, the water-supply being mostly from pits. The small size of the ullums here is noted by Dr. Ratton who explains at paragraph 11, page 95, that with ullums of the size here used, profit is almost impossible. The attention of the Deputy-Collector should be given to this point, and he should endeavour to induce the people to combine two or three into one.

18. *Padarti.*—The water-supply is said to be very defective; the Deputy-Collector should consider how it can best be remedied; the canal might probably be deepened and widened, and supplied either with a sluice or an earthen bund so that it might act as a reservoir. If possible some vegetation should be encouraged on the windward side of these works and those at Kanuparti, as they are both much exposed. For the other defects, bad soil and poverty of the workers, there is, it is to be feared, no remedy; it is the more incumbent therefore that those wants which can be supplied should be met in a liberal spirit. The trade is clearly an important one.

19. *Pakala.*—The state of affairs here is more satisfactory than at the two last named places; but the brine supply, although good, is scarcely sufficient; the Deputy-Collector should consider whether it cannot be supplemented by a canal from the sea. The pans are greatly exposed to the injurious influence of strong winds and, if possible, plantations should be formed on the weather side. The smallness of the ullum is prohibitive of any high rate of profit, which might otherwise be obtained here.

20. *Tummalapenta.*—These pans seem to possess some natural advantages; they are protected, and have an abundant, though weak, supply of brine. More pits should be dug, and this no doubt the Deputy-Collector can arrange. The soil forms clean beds and the salt is white, but the neighbourhood of a fresh water stream seems to cause a certain amount of fresh water to percolate and retard the condensation of the brine. Dr. Ratton says the cost to the manufacturer can be reduced by puddling the beds with clay, and the Deputy-Collector will do what he can towards effecting this and towards increasing the size of the ullums.

21. *Iskapilly.*—Dr. Ratton points out that great care is requisite here in forming the pans to render them water tight; at present they are very porous. Manufacture has been conducted but thrice in ten years, as the demand both for export and inland trade has declined, but at one time large quantities of salt were made here.

22. *Kistnapatam.*—The pans here are favorably situated and well arranged; the brine from pits is of great density, so much so that late in the season it requires dilution. A canal was being dug from the backwater which will remedy this defect. There seems to be an unusual quantity of sulphate of magnesium deposited at times. Dr. Ratton has shown that this ought never to be allowed to form in the pans, and here in paragraph 7, page 103, points out how it may be got rid of when it has been allowed to form. The arrangements on the platform, etc., are all good.

23. *Dugarazapatam.*—These pans are supplied entirely from the Pulicat Lake, and the brine is said to be very weak. The salt is poor in quality and the beds badly arranged; the whole matter requires attention; the station is well situated for inland trade, as a road leads from it direct to the Northern High Road at Gudur, and the East Coast Canal passes it on the east.

24. *Tada.*—This division, situated on the western banks of the Pulicat Lake, is on the whole very favorably reported on. The brine is chiefly supplied from pits, but it is sometimes diluted by the weak brine from the lake. Dr. Ratton points out that a good condensing tank might be formed on the foreshore of the lake; paragraph 3, page 106. This should be considered, and estimates framed if thought desirable. The absence of all reservoirs and condensers is no doubt a drawback, and must cause a certain amount of impurity to be deposited with the salt. Mr. Plunkett should endeavor to remedy this. The suggestion in paragraph 9 should also have his attention. The division is on the whole favorably mentioned and the manufacture capable of extension if needed.

25. *Sunnapagunta.*—This is the last division in charge of the Nellore Deputy-Collector; it is within the limits of the Chingleput District, only a few miles from Pulicat. The situation is very good with the high road on one side and the lake on the other. Dr. Ratton condemns everything connected with it, and it is a question whether it should not be abandoned. The Collectors of Nellore and Chingleput should in communication consider and report whether these pans might not be closed, and the wants of the population supplied by establishing a sale depôt at one of the other stations in the Chingleput District. The general state of the works in Nellore is very satisfactory. Dr. Ratton, however, points out that the large number of divisions in this district

Proceedings of the Madras Government, Revenue Department,
5th October 1874.

is an obstacle to close supervision, there is no doubt that the duties of the Nellore Deputy with nine divisions under his charge, scattered over some 140 miles of Coast, are most arduous.

26. Chingleput District.—There are no less than five Salt divisions north of Madras, all the produce of which is, as a rule, brought for storage to the depôt at the Madras Cotaurs. The system pursued at the different pans is very much the same throughout, and they are all situated on the banks of the Northern branch of the East Coast Canal from whence they draw their supply of brine. They extend over a distance of some twelve miles in length, the most northerly division, Kattur, being within a short distance of Pulicat, and the most southerly, Vullur, lying opposite to Ennore, about twelve miles from Madras. The salt manufactured is of fairly good quality, but capable of much improvement; the ullums are small, and there is said to be a considerable variety in the quality of salt produced in different ullums. Dr. Ratton believes the difference to arise from the greater or less skill and labor used in the manufacture rather than from any inherent difference in quality of soil or advantage of situation. The Deputy-Collector should urge his Superintendents to work up the inferior ullums to the level of the better classes.

The salt is carried away for storage to Madras, but owing to the large quantities requiring transport, it often has to wait several weeks, heaped on the banks of the channels, waiting for boats Here it is exposed not only to deterioration from dust and to wastage from rain, but also to absolute destruction on the occurrence of a storm of unusual severity. Just before Dr. Ratton's visit in 1872 the cyclone had caused an inundation and destroyed all the salt lying unprotected at the time, and again in May of the present year the storm wave raised by the cyclone flowed completely over the Salt Pans and destroyed much that had been heaped ready for transport. The salt is at the ryots' risk until delivered at Madras, so the direct loss to Government may have been small, but the loss to the ryots was very heavy and much might be done to protect the salt thus lying exposed if storing platforms were constructed at intervals along the channel banks. These might be gradually formed at no great cost, if all the mud taken from the channels during the annual clearances were systematically placed so as to form platforms. The Collector is requested to take steps in this direction, and to provide annually in his Salt Budget for the improvement and extension of storage room along the channels. Dr. Ratton also points out that if some of the supplying channels were furnished with sluices, the water instead of ebbing and flowing with each tide might be retained and allowed to condense in the channel. This point should also receive the attention of the Collector and his Deputy.

27. South of Madras there are three divisions, the first *Vadasamanjeri*, being situated on the South Coast Canal. Owing to the distance from the openings through which the sea water finds its way to the canal the brine is very weak. The soil, too, is porous and bad, and the beds very leaky, it is not therefore surprising that the salt is small and badly formed; it is nevertheless said to be liked by the merchants because it is light in proportion to bulk. It is stored at the Homes' Gardens Depôt. The Collector should consider and report in due course how far the manufacture can be improved, or whether the locality should be abandoned and fresh pans opened elsewhere.

28. *Covelong.*—The pans here are laid out on both sides of the canal, and being near the openings from the sea at Covelong, the brine is fairly good; they are also supplied from pits. The salt manufactured is partly stored at Homes' Gardens and partly exported by sea; a small quantity is also stored for local sale. The soil is good, and there are many advantages of situation, but Dr. Ratton describes the salt as very inferior in quality. The Board request the Collector's serious attention to this and to the other wants of Covelong. It is true that salt sold for export does not contribute to the revenue of the Madras Presidency, but it is nevertheless desirable that a healthy trade should be fostered; it provides remunerative employment for a large number of the poor, and the pans are, it is believed, looked on as valuable property and maintain a good selling price. It is, moreover, very important that the character of Madras salt should be well represented at almost the only port from which it is exported. With this view, every effort should be made to improve the quality and to lower the cost to the exporter. The road from the pans to the export

platform should be put in *thorough repair*, and the subject of controlling the boatmen should receive careful attention.

29. *Cheyur.*—This is the last division in Chingleput, and its system and circumstances differ from every other. The brine is derived partly from a backwater, which communicates with the sea only during a short time every year (the bar closes about January), and partly from pits. The supply is, therefore often very deficient. The system pursued is to bale water into the condensers and reservoirs and to allow it to evaporate to a great density; it is thence run into the beds, the irrigations being continued one after another until the entire supply of salt for the season is made and lies in a mass some three inches thick. It is then scraped up and stored: it comes from the beds in large irregular blocks, but these in the course of storage are broken up, and the salt in the heaps is no larger in crystal than elsewhere. The system is condemned by Dr. Ratton and, besides being very hazardous, seems to have nothing to recommend it; probably the people are so wedded to custom that they will not readily adopt a better system, but an experimental ullum on the plan recommended by Dr. Ratton should be established so that the comparative merits of the two systems may be clearly seen. Dr. Ratton's hints on the destruction of salt in paragraph 19, page 124, are worthy of attention. Measures should also be taken for enlarging Maclean's channel, as suggested in paragraph 20.

30. In conclusion, the Board commend to the careful attention of Collectors and their Deputies the remarks and observations of Dr. Ratton on all the various phases of salt manufacture which have passed under his notice. There are many other matters of detail pointed out by Dr. Ratton which it is unnecessary to recapitulate here, but which may be usefully studied by the Deputy-Collectors. It may not be possible to introduce all the improvements suggested at once, but the more glaring defects can be remedied, and a great advance in the quality of salt is certain to follow if careful attention to their causes is given.

No. 46.

ORDER THEREON, 5th October 1874, No. 1,269.

Separate Revenue, No. 4.
Salt.

RECORDED.

(True Extract.)

(Signed) C. G. MASTER,
Acting Secretary to Government.

To the Board of Revenue.

Exd. G. A. Turton.

1269
K

Govt. of 1874 Collection

REVENUE.

To

THE BOARD OF REVENUE.

Dated October 5th.

Read.

Encl.

G. O., 5th *October* 1874, No. 1,220.

OCTOBER.

Nos. 45-46.

Salt manufacture in Northern Districts of Madras Presidency.—Recording Board's Proceedings upon Dr. Ratton's report on the same, and conveying orders with reference to certain remarks of Dr. Ratton in his report on —.

No. 2,350.

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12. Godavery District.—*Pennaguduru.*—At the time of Dr. Ratton's visit this was the only division in the Godavery District. The Mogultoor Pans have since been re-opened. It is within a few miles of Cocanada on the banks of the Coringa Bay. The soil is said to be good, better than is usually the case; the brine supply being also good; but the salt is poor in crystal, and no improvement seems to have taken place since Mr. Clarke's visit in 1864. With this solitary division to attend to, it is scarcely creditable to the Deputy-Collector that such a state of affairs should exist. The importance of this division will greatly increase should the trade which is anticipated spring up with the Central Provinces. It seems certain that the Godavery District must supply all the southern parts of those Provinces with salt by way of the river before long. But unless more zeal and energy is displayed, the salt will be short in quantity and deficient in quality. The Collector's earnest attention is called to this matter.

13. Kistna District.—*Pandraka.*—The most northerly Salt Division is that of *Pandraka* sometimes called *Bantomilly*. There is no manufacture properly so called here; but salt spontaneously formed in the swamps is largely collected. This salt was in former years greatly prized by the "Lambadies," who carried it for sale into Hydrabad and into parts of the Nagpore country, on account of the hardness of its crystal and its capability of bearing transit. The inhabitants of the Kistna District dislike it; the reasons for this dislike suggested by Dr. Ratton in paragraphs 7 and 8 are probably correct. Dr. Ratton points out at paragraph 8, page 83, that by a little attention it is possible to ensure the collection of perfectly pure salt at this place. His instructions should be carefully followed. Eventually when the Kistna canal navigation system is more perfect this salt may be transported by water into the interior.

14. *Manginapudi.*—This division is within five miles of Masulipatam. The soil and process of making are described as fairly good; all the brine is derived from pits, although the sea is within 500 yards and the pans are two feet below its level. The cost of manufacture would be diminished and other improvements would follow if a supply of brine direct from the sea could be obtained. Dr. Ratton suggests at paragraph 11, page 84, that an experiment should be made. The Collector should, in consultation with the District Engineer, endeavour to effect this: it is possible that a supply might be obtained by means of pipes laid under the sand. Owing to the great density of the brine procured from the pits, the use of reservoirs is almost dispensed with, and the process is somewhat different from that pursued elsewhere. Dr. Ratton points out certain defects in paragraphs 21 and 22, page 86, which should receive the attention of the Deputy-Collector. The matter of removing the mother liquor, alluded to in paragraph 26, should also be noted.

15. *Nizampatam.*—These pans lie south of the Kistna and at the extremity of the canal leading from the Kistna at Bezwara to the Port of Nizampatam. They are admirably situated, therefore; for supplying the wants not only of the interior of the district but of a part of the Hyderabad country also. Dr. Ratton points out several wants and deficiencies some of which may be readily supplied. The supply canal described in paragraph 6, page 87, should be commenced without any unnecessary delay and the District Engineer should be communicated with regarding it. The defect in the floors pointed out in paragraph 7 can be easily remedied and should be at once attended to. The arrangement of the condensers and pans (paragraphs 12 and 13,) is clearly faulty and the Deputy-Collector should explain this to the manufacturers and assist them in rectifying it. This division is of exceptional importance from its position with respect to the Canal and every endeavour should be made to supply salt in abundance and of good quality.

16. *Chinna Ganjam*—This large division lies at the extremity of the district. The pans are very extensive and the salt is good: there are certain defects which perhaps admit of a partial remedy, but as the pans are very old it is probable that the manufacturers are so wedded to their customs that it will be difficult to get them to change. The system is much the same as at Manginapudi, and this is accounted for by the fact, (not mentioned by Dr. Ratton,) that the manufacturers at Manginapudi, which has been but recently established as a Salt Factory, were chiefly emigrants from the neighbourhood of Chinna Ganjam. The chief want of Chinna Ganjam is a good road over the sand ridge which separates it from the interior of the district, and the Collector's attention should be given to supplying it as soon as possible.

In his general remarks on the District Dr. Ratton points out that the salt is generally better than in the two districts immediately north of it; he points out, however, certain defects in the system of manufacture generally pursued, paragraph 15, page 92, which the Deputy-Collector may find it in his power to rectify. His suggestion in paragraph 19 for preventing the formation of swamp salt is worthy of a trial.

17. Nellore District.—*Kanuparti.*—The first pans in Nellore are only a few miles south of Chinna Ganjam, and the system pursued is very similar, the water-supply being mostly from pits. The small size of the ullums here is noted by Dr. Ratton who explains at paragraph 11, page 95, that with ullums of the size here used profit is almost impossible. The attention of the Deputy-Collector should be given to this point and he should endeavour to induce the people to combine two or three into one.

18. *Padarti.*—The water-supply is said to be very defective; the Deputy-Collector should consider how it can best be remedied; the canal might probably be deepened and widened, and supplied either with a sluice or an earthen bund so that it might act as a reservoir. If possible some vegetation should be encouraged on the windward side of these works and those at Kanuparti, as they are both much exposed. For the other defects, bad soil and poverty of the workers, there is, it is to be feared, no remedy; it is the more incumbent therefore that those wants which can be supplied should be met in a liberal spirit. The trade is clearly an important one.

19. *Pakala.*—The state of affairs here is more satisfactory than at the two last named places; but the brine supply, although good, is scarcely sufficient; the Deputy-Collector should consider whether it cannot be supplemented by a canal from the sea. The pans are greatly exposed to the injurious influence of strong winds and, if possible, plantations should be formed on the weather side. The smallness of the ullum is prohibitive of any high rate of profit, which might otherwise be obtained here.

20. *Tummalapenta.*—These pans seem to possess some natural advantages; they are protected and have an abundant though weak supply of brine. More pits should be dug, and this no doubt the Deputy-Collector can arrange. The soil forms clean beds and the salt is white but the neighbourhood of a fresh water stream seems to cause a certain amount of fresh water to percolate and retard the condensation of the brine. Dr. Ratton says the cost to the manufacturer can be reduced by puddling the beds with clay, and the Deputy-Collector will do what he can towards effecting this and towards increasing the size of the ullums.

21. *Iskapilly.*—Dr. Ratton points out that great care is requisite here in forming the pans to render them water tight; at present they are very porous. Manufacture has been conducted but thrice in ten years, as the demand both for export and inland trade has declined, but at one time large quantities of salt were made here.

22. *Kistnapatam.*—The pans here are favorably situated and well arranged; the brine from pits is of great density, so much so that late in the season it requires dilution. A canal was being dug from the backwater which will remedy this defect. There seems to be an unusual quantity of sulphate of magnesium deposited at times. Dr. Ratton has shown that this ought never to be allowed to form in the pans, and here in paragraph 7, page 103, points out how it may be got rid of when it has been allowed to form. The arrangements on the platform, etc., are all good.

23. *Dugarazapatam.*—These pans are supplied entirely from the Pulicat Lake, and the brine is said to be very weak. The salt is poor in quality and the beds badly arranged; the whole matter requires attention: the station is well situated for inland trade as a road leads from it direct to the Northern High Road at Gudur, and the East Coast Canal passes it on the east.

24. *Tada*—This division, situated on the western banks of the Pulicat Lake, is on the whole very favorably reported on. The brine is chiefly supplied from pits but it is sometimes diluted by the weak brine from the lake. Dr. Ratton points out that a good condensing tank might be formed on the foreshore of the lake, paragraph 3, page 106. This should be considered, and estimates framed if thought desirable. The absence of all reservoirs and condensers is no doubt a drawback, and must cause a certain amount of impurity to be deposited with the salt. Mr. Plunkett should endeavor to remedy this. The suggestion in paragraph 9 should also have his attention. The division is on the whole favorably mentioned and the manufacture capable of extension if needed.

25. *Sunnapaguntа.*—This is the last division in charge of the Nellore Deputy-Collector; it is within the limits of the Chingleput District only a few miles from Pulicat. The situation is very good with the high road on one side and the lake on the other. Dr. Ratton condemns everything connected with it and it is a question whether it should not be abandoned. The Collectors of Nellore and Chingleput should in communication consider and report whether these pans might not be closed, and the wants of the population supplied by establishing a sale depôt at one of the other stations in the Chingleput District. The general state of the works in Nellore is very satisfactory. Dr. Ratton, however, points out that the large number of divisions in this district is an obstacle to close supervision; there is no doubt that the duties of the Nellore Deputy with nine divisions under his charge scattered over some 140 miles of Coast are most arduous.

26. CHINGLEPUT DISTRICT.—There are no less than five Salt divisions north of Madras, all the produce of which is, as a rule, brought for storage to the depôt at the Madras Cotaurs. The system pursued at the different pans is very much the same throughout, and they are all situated on the banks of the Northern branch of the East Coast Canal from whence they draw their supply of brine. They extend over a distance of some twelve miles in length, the most northerly division Kattur being within a short distance of Pulicat, and the most southerly Vullur lying opposite to Ennore about twelve miles from Madras. The salt manufactured is of fairly good quality, but capable of much improvement; the ullums are small and there is said to be a considerable variety in the quality of salt produced in different ullums. Dr. Ratton believes the difference to arise from the greater or less skill and labor used in the manufacture rather than from any inherent difference in quality of soil or advantage of situation. The Deputy-Collector should urge his Superintendents to work up the inferior ullums to the level of the better classes.

The salt is carried away for storage to Madras, but owing to the large quantities requiring transport, it often has to wait several weeks heaped on the banks of the channels waiting for boats. Here it is exposed not only to deterioration from dust and to wastage from rain, but also to absolute destruction on the occurrence of a storm of unusual severity. Just before Dr. Ratton's visit in 1872 the cyclone had caused an inundation and destroyed all the salt lying unprotected at the time, and again in May of the present year the storm wave raised by the cyclone flowed completly over the Salt Pans and destroyed much that had been heaped ready for transport. The salt is at the ryots' risk until delivered at Madras so the direct loss to Government may have been small, but the loss to the ryots was very heavy and much might be done to protect the salt thus lying exposed if storing platforms were constructed at intervals along the channel banks. There might be gradually formed at no great cost, if all the mud taken from the channels during the annual clearances were systematically placed so as to form platforms. The Collector is requested to take steps in this direction and to provide annually in his Salt Budget for the improvement and extension of storage room along the channels. Dr. Ratton also points out that if some of the supplying channels were furnished with sluices the water instead of ebbing and flowing with each tide might be retained and allowed to condense in the channel. This point should also receive the attention of the Collector and his Deputy.

27. South of Madras there are three divisions, the first *Vadasamanjeri*, being situated on the South Coast Canal. Owing to the distance from the openings through which the sea water finds its way to the canal the brine is very weak. The soil, too, is porous and bad and the beds very leaky, it is not therefore surprising that the salt is small and badly formed; it is nevertheless said to be liked by the merchants because it is light in proportion to bulk. It is stored at the Homes' Gardens Depôt. The Collector should consider and report in due course how far the manufacture can be improved, or whether the locality should be abandoned and fresh pans opened elsewhere.

28. *Covelong.*—The pans here are laid out on both sides of the canal, and, being near the openings from the sea at Covelong, the brine is fairly good; they are also supplied from pits. The salt manufactured is partly stored at Homes' Gardens and partly exported by sea; a small quantity is also stored for local sale. The soil is good and there are many advantages of situation, but Dr. Ratton describes the salt as very inferior in quality. The Board request the Collector's serious attention to this and to the other wants of Covelong. It is true that salt sold for export does not contribute to the Revenue of the Madras Presidency, but it is nevertheless desirable that a healthy trade should be fostered; it provides remunerative employment for a large number of the poor, and the pans are, it is believed, looked on as valuable property and maintain a good selling price. It is, moreover, very important that the character of Madras salt should be well represented at almost the only Port from which it is exported. With this view every effort should be made to improve the quality and to lower the cost to the exporter. The road from the pans to the export platform should be put in *thorough repair* and the subject of controlling the boatmen should receive careful attention.

29. *Cheyur.*—This is the last division in Chingleput, and its system and circumstances differ from every other. The brine is derived partly from a back water, which communicates with the sea

only during a short time every year (the bar closes about January), and partly from pits. The supply is, therefore often very deficient. The system pursued is to bale water into the condensers and reservoirs and to allow it to evaporate to a great density ; it is thence run into the beds, the irrigations being continued one after another until the entire supply of salt for the season is made and lies in a mass some three inches thick. It is then scraped up and stored : it comes from the beds in large irregular blocks but these in the course of storage are broken up, and the salt in the heaps is no larger in crystal than elsewhere. The system is condemned by Dr. Ratton and, besides being very hazardous, seems to have nothing to recommend it ; probably the people are so wedded to custom that they will not readily adopt a better system, but an experimental ullum on the plan recommended by Dr. Ratton should be established so that the comparative merits of the two systems may be clearly seen. Dr. Ratton's hints on the destruction of salt in paragraph 19 page 124, are worthy of attention. Measures should also be taken for enlarging Maclean's channel, as suggested in paragraph 20.

30. In conclusion, the Board commend to the careful attention of Collectors and their Deputies the remarks and observations of Dr Ratton on all the various phases of salt manufacture which have passed under his notice. There are many other matters of detail pointed out by Dr. Ratton which it is unnecessary to recapitulate here, but which may be usefully studied by the Deputy-Collectors. It may not be possible to introduce all the improvements suggested at once, but the more glaring defects can be remedied and a great advance in the quality of salt is certain to follow if careful attention to their causes is given.

(A true Extract.)

Acting Sub-Secretary.

To the Acting Secretary to Government, Revenue Department.
" Dr. J. J. L. Ratton, on Special duty.
" all Collectors of Salt Districts.
" all Police Superintendents of Salt Districts.
Copy to all other Collectors.
" to the Surgeon General, Indian Medical Department.
" to all Salt Deputy-Collectors.
" to the Inspector General of Police.

Exd. G. A. Turton.

Board of Revenue,
MADRAS.

PROCEEDINGS, 22ND AUGUST 1874, No. 2,350.

AUGUST.
No. 2,350.

Salt manufacture—in Northern Districts of Madras Presidency.—Orders passed with reference to remarks of Dr. Ratton in his report on—