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Local & Munl. (1895) Department.

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[Despatch Abstract.]

Inspection Notes.

Recording, with remarks, Sanitary Commissioner's---on the Cuddapah Municipality.

## BACK PAPERS.

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GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following paper:—

From M.R.Ry. C. CHELLAYA PILLAY, Avergal, B.A., B.L., Chairman, Municipal Council, Cuddapah, to the Chief Secretary to Government (through the Collector of Cuddapah), dated Cuddapah, 17th November 1894, No. 855.

I have the honour to submit herewith the inspection notes of the Sanitary Commissioner for Madras on the town of Cuddapah with the remarks of the Council duly entered as per G.O., dated the 23rd December 1893, No. 1765, Local and Municipal.

ENCLOSURE.

INSPECTION Notes of the Sanitary Commissioner for Madras on the Town of Cuddapah.

CUDDAPAH DISTRICT.

CUDDAPAH MUNICIPALITY.

*Inspected 21st to 23rd August* 1894.

Population as per census of { 1881 .. .. .. .. .. 18,982
1891 .. .. .. .. .. 17,379

Chairman's Remarks.

Inspection Notes.

The town site is surrounded by hills distant from four to seven miles from it. These are arranged in a circle—in almost the centre of which Cuddapah lies. In this basin-like shape, one is reminded of the surroundings of the highly malarious town of Cumbum, in the Kurnool district. The site possesses a slope from west to east towards the Pennár valley.

2. The soil is chiefly of red gravel, having below in some parts a blackish alluvial deposit, followed by clay, and subsequently the imperfect clay known by natives as "sowd" and lime kunkur. The average sub-soil water fluctuation is from thirteen to six feet. Above the town is a tract of land which is rich in springs-evidently having their source in the distant hills, as they burst forth on the surface after a period of subterranean flow, without the occurrence of local rain. The volume of water thus discharged is sufficiently large to form a very considerable stream, known as the Bugga. This is

dammed near the town, and its water is diverted from its natural course towards the Pennár river to supply the Patha-Cuddapah tank. This tank, which has an area of about 640 acres, is situated on the north-east of the town. To the south-east is also another large tank, known as the Dongacheruvu.

3. The town has been long notorious for being highly malarious. Following the depression which probably occurred in the sub-soil water-level of the town, owing to the small amount received during the south-west and north-east monsoons in 1891 and 1892, there ensued during 1893, as might be expected, on the access of a normal amount of rain securing a rise of the sub-soil water (or, at least, a greater depth of soil moistened) a marked increase of malarial fever; so that in this year the mortality was the highest registered in the Presidency in any town. As the birth-rate in Cuddapah during 1893 was only 16·0, in the absence of immigration, with the present population the town would be a deserted ruin in a century. Despite the fact that it is the head-quarter of the district and is an important railway station, the decrease during the decade 1881–91 was 8·76 against an average increase for the Presidency of 14·55 per mille per annum.

4. So far as registration can be trusted, the following table illustrates the conditions mentioned:—

| Years. | Birth ratio per mille of the census population of 1891. | Death ratio per mille of the census population of 1891. | Percentage of deaths from | | | | | | Ratio of deaths of infants under one year of age per mille of those born in the preceding year. | Ratio of deaths of children above one and under five years of age per mille of the population of that age. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cholera. | Small-pox. | Fevers. | Dysentery and diarrhœa. | Injuries. | Other causes. | | |
| 1891 .. .. .. | 21·1 | 29·6 | 7·8 | 1·6 | 49·4 | 6·2 | 0·8 | 34·2 | 219·0 | 20·3 |
| 1892 .. .. .. | 32·7 | 38·4 | 10·7 | 0·3 | 43·8 | 3·4 | 1·6 | 40·2 | 209·8 | 33·7 |
| 1893 .. .. .. | 16·1 | 46·9 | .. | 1·5 | 67·9 | 2·1 | 0·9 | 27·6 | 146·1 | 27·7 |
| 1894 .. .. .. | 12·9 | 38·0 | .. | 3·3 | 56·1 | 3·1 | 2·1 | 35·4 | 143 4 | 28·7 |

But, heavy as the death-rate is, showing that in 1893 one person out of every 21 died in that year, it by no means exhibits the full influence upon the population of the unhealthy conditions to which they are subject. For example, it may be said that although people die at about the same rate in Madras as



in Cuddapah no one objects to residing in the former, and although, occasionally, an apathetic protest is raised as to the sanitary state of that city, it has never been so bad as to induce real alarm in the minds of the inhabitants. The difference between the two conditions is this: in Madras after an illness of, it may be, weeks or days a person may die of some fatal disease, and his next door neighbour has the fatuity to think that he will escape; a large number too of the Madras population can never know under existing conditions what vigorous health is; but they are not subjected to the frequent interruptions of labour and the power of securing a livelihood which attacks of malarial fever imply, and, consequently, the insanitary state of their surroundings, leading nevertheless to fatal issues, is not so well forced upon their observation. In a town afflicted with malaria, the people become apathetic as to their ever recurring sickness, die rapidly, and rarely leave issue to mourn their departure. Before this barrenness of the race can be secured by Nature, much sapping of vitality must have occurred. It is not, therefore, so much in the actual death-roll—although that is sufficiently appalling—that the evil effects of malaria can be estimated; the daily misery and suffering to which those subjected to it must pass through must be taken into account. In Cuddapah not only is the effect of malaria shown in the registration rates affording an enormous death-rate and but a nominal birth-rate, but, probably, one-half the inhabitants exhibit the influence of marked malarial cachexia. Thus of 90 persons examined in the streets no less than 52 per cent. were found to possess enlarged spleens—in most cases the enlargement being sufficient to fill one-half of the abdomen; and, in the Collector's cutcherry, of 93 employés examined 21 per cent. were found affected—a difference due in part to many being but short residents in the locality, and to the better protection from malaria, which the superior hygienic circumstance of the higher classes affords. This is a diseased condition, in which the victim can possess but little pleasure in mere living.

5. As to the cause of the highly malarious condition of Cuddapah, there exists nothing mysterious in the matter. Certain soils contain the malarial parasite:

others do not. If a soil contain this parasite—generally now recognized as the plasmodium malaria—a protozoon—whether or not it shall increase and multiply, or shall decrease and die out, is but a question of how the soil is treated. The favouring agents being present, namely, heat, organic matter and moisture, the malarial agent will certainly increase. To ensure the most perfect exhibition of vitality, these conditions must be present in exactly the required proportions. For example, if water be present to such an extent as to choke the pores of the earth, and prevent the throwing off of the germ, malaria over that special part will not be evolved; if heat be so intense as to deprive the soil of the requisite moisture again, its vitality is threatened. Whilst it is not in the hand of man to modify the conditions of temperature of the soil to any practical degree, it is certainly to regulate to a very great extent the amount and duration of moisture; and, at least, the organic matter already existing in the soil need not be added to. Probably, the most typical pabulum for the growth of the malarial germ is the condition in which an irrigated and well manured rice-field is at intervals in consequence of various grades of soil and sub-soil moisture. This is the experience of the whole civilized world; but, in this Presidency, we have often set before us the example of the huge tracts of Tanjore and Trichinopoly, which are irrigated without the production of excessive malaria. Of course, it is so; we do not produce rice in a field by simply irrigating it; there is something more required — the seed; and so it is with malaria — irrigation will not produce a malarial germ, but if the malarial germ exist in the soil, it most indubitably will excite its vitality and frightful increase. But the extent of mischief that can be effected by irrigation will, of course, greatly depend upon the physical nature of the soil as affecting the retention of moisture or the reverse, and the natural and artificial richness of the soil itself in organic matter. The determination of Cuddapah to follow the lead of the Municipality of Kurnool — another specially malarious tract — in demanding that no irrigation should take place within its limits is, I consider, founded on strong practical and commonsense sanitary grounds. But to deduce from this



fact that in the locality of all towns irrigation is harmful would of course be as faulty in reasoning as to point to statistics gathered from non-malarious tracts to support the argument that "irrigation generally has not been proved to be deleterious or to cause a fever death-rate high as compared with towns around which there is comparatively little irrigation" (G.O., No. 689, Revenue, dated 12th September 1891).

6. To attempt to curb favouring conditions for the propagation of malaria is the recognized method of combating it. The chief factor is undoubtedly the presence of moisture in the impregnated soil; hence, drainage is the remedy which is universally acknowledged should be the first aim of sanitary effort. In considering how best this can be applied, it is of little utility to estimate possible results of pressure on one direction causing a rise of a few inches on another. If the sub-soil water be within a short distance of the surface and the soil above it be permeable, the great factor of capillary attraction, the ascensional force of evaporation, and effects of fluctuation of the ground air circulation must all be regarded as important factors. Granted then that the soil of Cuddapah is of that description — unhappily for those who choose to live upon it — which contains the malarial germ, in what matter should we proceed to mitigate its growth? In the first place is their excessive moisture in the town site and its surroundings. Looking first of all to possible disturbance of the natural sub-soil water level, we find to the south-east the Dongacheruvu tank. Notwithstanding the opinion that this tank has something to do with the matter by the exercise of pressure, I much doubt it. The slope of the sub-soil is generally that of the soil surface, and in this case, unless it can be proved that there is an exception, the slope from the Dongacheruvu tank is very rapid to the east, and away from the town. The suggestion therefore to make a channel running between this tank and the town, so as to arrest the overflow from the Patha-Cuddapah tank made by the Sanitary Engineering department, seems to me not likely to be of practical utility.

7. The influence upon sub-soil flow seems to me to be caused by obstruction at its natural outlet by the presence of the water-logged soil within the area of the Patha-Cuddapah tank. I must be

remembered that the natural outlet of the Bugga springs which disappear within the soil must be most probably in this direction, and that their surface flow also in the form of the Bugga stream is backed up by the anicut. It was, I believe, Mr. Wolfe-Murray's suggestion that the Bugga anicut should be breached. This I think a most desirable recommendation, and it is now a possible event in view of the construction of the new channel from the Kurnool-Cuddapah canal. If this be done, care should be taken to regulate *the whole surface of the stream bed*, so as to permit of no obstruction to ready flow. But it is in the Kotha-Cuddapah tank that the greatest resistance to outflow must occur. To recommend the abolition of this tank on sanitary grounds seemed to me out of the question for financial reasons; but, in discussing the subject with one of the councillors, M.R.Ry. Thimma Reddi, he brought to my notice the fact that it need not be regarded as an impossibility. The existence of the new channel for supply no longer renders it imperative that water should be stored in the tank, seeing that the quantity at disposal in the canal need know no stint. His suggestion, therefore, was that the tank should be breached, and that the supply to the fields should be from the canal only. This suggestion seems to me to meet the conditions required, and I advise that its feasibility be considered. Government would gain by the enormous area of the tank-bed at disposal for cultivation. But to justify my assertion as to the influence of this tank, it would be necessary to prove, first of all, that the sub-soil water is impeded by it, and again that the fluctuation in the sub-soil so brought about is sufficient to ensure disturbance of a considerable bulk of sub-soil air or varying grades of moisture of the layers of sub-soil. Apparently the total rise of the sub-soil water is from 13 feet to about 6 feet of the surface by no means an extensive fluctuation—when compared with many Indian towns. But, in estimating the influence of this factor, it must be held in mind that the soil is such as to favour capillary attraction, and thus the sub-soil water is held up by a clayey substratum. Proof of the broad fact that obstruction to outflow is produced is, I think, fairly well exhibited in the level of wells shown in the accompanying diagram—the *datum* being the surface level of the Patha-Cuddapah tank.



8. Whilst, then, I would credit the Patha-Cuddapah tank with retaining the sub-soil water level of the town at a higher level than would be natural, in view of certain geological peculiarities of the substratum, were no such obstruction to free outflow present, the influence is not such as to produce water-logging of the soil, nor violent fluctuations of sub-soil water level. Again, if the marshy state of the Bugga bed brought about by the existing anicut be taken into account, and it be remembered that during a considerable portion of the year a large part of Patha-Cuddapah tank is not covered by water but is a water-logged or marshy area, and that this bed covers no less than 640 square acres, it is conceivable that whilst no one condition can be pointed to as the sole cause of the favoured growth of the malarial germ in Cuddapah, this combination does afford the conditions required. Nor can the simple circumstance that the people live chiefly in houses having mud walls be ignored. In the close confined huts whose floors are, by way of cleaning them, damped with cowdung, and which cover a soil readily acted upon by capillary attraction from the sub-soil water below, the existence of a ring of damp wall near the foundation and where the sleeper lies, all go to afford opportunities for malarial germ growth and infection of the human being. Of course, this may seem mere theoretical nonsense to some; but, if it be true that the poison of malaria be found in the earth, even those who may question the existence of a living parasite, and would claim it to be an unknown chemical product the result of the combined action of heat, organic matter and moisture in the soil, will at least see that the existence within a foot of a sleeper's head of the poison-containing soil in a state of moisture must be favourable to the action of the poison. It has been actually demonstrated by medical men experimentally that, by taking earth from a malarious locality and placing it within suitable distance of a person formerly free of malaria and living in a non-malarious country, infection can be induced.

9. To render Cuddapah habitable, I would therefore advise that the Patha-Cuddapah tank be breached so completely as to offer no obstruction to surface drainage *in all* directions, and the supply of the fields below be effected by irrigation from the canal direct—that the bed of

Inspection Notes.

the Patha-Cuddapah tank be effectually cultivated, and, if necessary, sub-soil drained; the Bugga anicut should be breached, and the Bugga bed be correctly trained—the old Bugga channel being left open, or, if filled, being supplied with sub-soil drains throughout its length before being so.

10. The people should be taught to use houses on well elevated basements; the use of earth for making houses should be discouraged, and where poverty forbids the use of stone and mortar throughout, it should at least be employed for two or three courses of the foundation, and this should be surmounted before building up of mud by an impervious "dry course."

11. The stoppage of irrigation within municipal limits should be adhered to.

12. But it must be conceded that whilst each of the causes enumerated will go to aid the total result, one of the most important factors in maintaining the soil of the site in a condition that at once provides moisture and organic matter, is the non-removal of sewage. The typical South Indian town has its side channels which serve to remove storm water, and to, at least, distribute over the surface of the town site the sewage water of the inhabitants. But, in Cuddapah, arrangements are specially made for practically the whole of the sewage water going directly *into* the sub-soil through pervious cesspools. It need not be said that so long as this state of affairs lasts, even were the other suggestions effected, Cuddapah, in view of the fact of the soil being malarious, *cannot* be rendered healthy.

13. In this connection it would be of importance to be able to ascertain whether the late introduction of more water than has probably been used by the nhabitants formerly has influenced the

Chairman's Remarks.

The suggestions will be given effect to in all practicable cases.

The prohibition of wet cultivation refers to lands under Dongacheruvu and Patha-Cuddapah tanks within the municipal limits. Adverting to the remarks of the Sanitary Commissioner contained in paragraph 6 of the notes, if, as he says, "the slope of Dongacheruvu tank is very rapid to the east, away from the town," and if the suggestion of the Sanitary Engineer to make a channel running between the tank and the town is of no practical utility, the council doubts if the order as to the prohibition of wet cultivation, in so far as it relates to lands sloping to the east ought to continue.



Chairman's Remarks.

The present financial condition of the municipality is such that the council does not consider it desirable to go in for further loans or to undertake an expensive system of drainage.

The council has already taken on hand to give effect to the suggestions of the Sanitary Commissioner as to the bye-lanes.

Inspection Notes.

extent of moisture of the sub-soil injuriously. The water-supply was introduced in 1890, but a correct estimate of results cannot be made. Certainly, there has since that date been an increase of fever prevalence and general mortality in the town (*vide* table preceding), but the result is obscured by the fluctuations of the sub-soil water that must have been caused following the scanty rainfall of 1891 and subsequent fairly normal rainfall of 1892. Whilst, therefore, with the data available, it is impossible to state that the introduction of extra water in the town has brought about an exaggeration of malarial conditions, there can remain no doubt as to the absolute necessity for all sullage water being scrupulously removed from the site.

14. Cuddapah has been lucky in obtaining a very cheap and efficient water scheme, and it is therefore possible that there may be room in the financial conditionof the town for borrowing sufficient to secure the necessary corollary—a good drainage system. In carrying out a drainage scheme, there ought to be no two opinions as to the form it should take, namely, an underground separate system *supplemented by free sub-soil drainage throughoutthe town.* In this instance I would strongly deprecate the use of the "open drain" system unless it also were supplemented by sub-soil drainage, resulting in a very incongruous and expensive combination. On this being completed, in addition to the above suggestions, the death-rate of Cuddapah ought to show a decline, and the fever rate sh ould rapidly fall.

15. *Roads.*—The main roads are in fairly good order, but the result of steady increment to their surface whilst the bye-lanes have been neglected has resulted in these being below the surface level of the main thoroughfares. The result is blockage of surface drainage, a most undesirable effect in this malarious town. The Chairman is, however, alive to this condition of affairs, and has already directed the raising of five of the smaller roadways. This process should be carried out systematically, and should be regarded as a matter not only of public convenience but of hygienic import.

16. *The water-supply* is derived from a body of water above the town, which, according to season, exhibits itself above

Inspection Notes.

Chairman's Remarks.

the ground in the form of springs, or disappears and forms an extensive sub-soil flow. It is unfortunate that at the site this water is tapped there exists a well filled graveyard which, up to January 1893, was still in use. One body had, on the visit of the Deputy Sanitary Commissioner in December 1893, also been surreptitiously buried. I believe this condition of affairs is now finally put a stop to.

17. The water-works site is held in veneration by certain castes of Hindus. There is a small temple on the spot, and a chattram in which pilgrims are accommodated. Two large wells exist, or, rather, enclosures of springs, which are used by pilgrims to bathe in; one of these has been breached, so as to enable a full flow to proceed to the water-works gathering ground. Further, yearly some thousands from Cuddapah and adjoining villages assemble here for the celebration of a festival, in which the sacrifice of animals forms a prominent part. Again, a pious Hindu is collecting material for enlarging the chattram for the accommodation of pilgrims. Caution is necessary in these matters. The whole area should be carefully conserved, so that the bare possibility of contamination by a human being should be out of the question. I understand that the land belongs to a Muhammadan. It would be advisable for the municipality to buy up the whole and to attempt to arrive at some understanding with the trustees of the temple as to bathing in the springs and celebration of the festival. It seems to me whilst worship in the temple need not be interfered with, that there are probably no religious grounds why the festival should take place on the present site, that is, within the immediate surroundings of the temple. In any case, purchase of the land would give the municipality the right to completely control the acts of those they might permit to enter their land during the festival season irrespective of the protection that could be claimed by them under sections 155 and 150.

18. Including the families, there are thirteen persons on the water-works staff at this spot. No latrine has, however, been provided by the municipality. It requires but an attack of typhoid or cholera in their households to scatter death broadcast among the inhabitants of the town. Not only should a faultless form of

The council will give effect to the suggestion making provision in the next budget.



Chairman's Remarks.

Inspection Notes.

Care will be taken that, in future, no applications for private service will be granted when the waste water is likely to lead to contamination of the water-supply or to the premises becoming insanitary. Extra rates cannot be levied if water is used for domestic purposes only. Water is not allowed for other than such purposes at present.

In case of poor people, considerable difficulty will be felt in inducing them to construct cesspools of the approved pattern suggested by the Sanitary Commissioner, but steps will be taken by the council to introduce the system recommended gradually when funds are available.

covered latrine be provided, but care should be taken by frequent inspections that the conservancy of latrines and surroundings is perfect. A *daily* report that an inspection of conservancy arrangements has been made should be demanded by the Chairman from the Engineer in charge of the water-works.

19. Several of the inhabitants have introduced the pipes into their houses. The extension of this system should not be favoured by the municipality. In such cases extra rates should be demanded and the supply be gauged by metre. A condition that should be insisted upon is that the tap is placed in such a position that it can be seen at all times by persons of any caste (section 148).

20. Neglect of this precaution is liable to lead to much waste and to contamination of the water-supply by careless habits, owing to aspiration of air and fluids under special conditions. Some arrangements should be made to enable the municipality to cut off the supply at intervals of a week as at present whilst cleansing the reservoir. Direct pumping to the town has apparently been followed by the bursting of certain of the mains; but presumably, on the municipality consulting the Sanitary Engineer, either an air vessel, stand-pipe, or other mode could be arranged for. Every effort should be made to render the supply as absolutely *constant* as the amount of water available will permit, and this apparently would be possible for nearly all the year round.

21. *Drainage.*—Practically no drains exist beyond side channels for storm water. Sewage water is in nearly all cases received into pervious cesspools. I have already remarked upon the serious influence for evil so caused, and as to the advisability of the early adoption of a complete sewerage *plus* a careful sub-soil drainage scheme as essential for the remedy of this undesirable state of affairs. In the meantime the municipality should insist that cess-pools are built of approved patterns, and are rendered with Portland cement and have a backing of concrete or puddled clay so as to be impervious. This should be insisted upon at once, in the case of the chattram owned by Soobya Chetty, from which the discharge of sullage water is evidently of very great amount.

Inspection Notes.

22. I was glad to find that the present Chairman has, since taking over office, exerted himself to get rid of the unsightly pools caused by the waste water from taps by diverting the water to petty ornamental plots of vegetation and trees. This method should be systematically pursued.

23. *Conservancy.*—There are forty-two latrines in the town; all are of the common open-space pattern with the exception of two. The latter are suitably divided into compartments by Cuddapah slabs, but the back of each is plastered with common mortar. This should be removed, and cement plaster be substituted. The drains are square and are also mortar-plastered; here, also, Portland cement should be used and the drains should be altered to the egg-shape. The walls, unfortunately, also are formed of very rough laterite. This should either be cement-plastered, or be painted freely with boiling pitch and tar. In certain of the latrines Cuddapah slabs are used for the walls. Provided these can be so sunk as to be in no danger of becoming irregular, as I found had been effected in one instance, no better material could be used. Indeed, in Cuddapah, there ought to be no difficulty about making fairly efficient latrines with this admirable stone at disposal. I enclose a plan (will follow) of a cheap form of latrine made from this material for information. The masonry walls therein shown might well be substituted by Cuddapah slabs, and for the pathway Cuddapah slabs above the concrete might also be substituted. There would thus be presented for the whole latrine a completely smooth surface of Cuddapah slabs, which could be kept absolutely clean by flushing with little trouble. I need hardly add that each joint must be carefully pointed with good Portland cement, and the slabs should be smooth and regular in section.

24. Earthen tubs are used for receiving the urine; these should be substituted by iron tubs, or, at least, the earthen tubs should not be employed till rendered fairly impervious by the use of tar and pitch.

25. Burnt paddy husk is used for deodorization. The amount of carbon available in this must be very small, and hence deodorization cannot be complete, although doubtless the value of the night-soil may be added to as manure. Dry-earth should be used.

Chairman's Remarks.

The suggestions will be carried out when funds are available.

Ditto

Ditto

Will be attended to.



Chairman's Remarks.

The council fully concurs with the views expressed, but is unable at present to carry out the suggestions.

Since abolished.

The council will do its best to increase the number of houses served with private scavenging system and will reduce the rate to be levied per head when it is expedient to do so without prejudice to the revenue.

The council is not in a position to adopt the suggestion as to rubbish carts for want of funds.

Provision will be made in the next budget.

Will be attended to.

Ditto

Inspection Notes.

26. Each latrine should have a toty on the spot, at all times during the day. In no other way can latrines worked on the dry-earth or separate removal system be kept in a condition in which it is possible for a human being to enter into them without disgust. Near each latrine quarters for the toties (man and wife by preference) and a store for dry-earth should be erected. Of course, this may be an expensive measure, but if latrines are to be used by the people they must be kept in a state which shall not call forth repugnance; without complicated mechanical arrangements this is the only mode that will secure cleanliness.

27. At Ammapett is a most unsuitable form of latrine. It is, in any case, far too close to habitations and should, on this ground, be abolished. It seems to have been built upon a most crude plan, as it permits, notwithstanding apparently the inception of measures to prevent this, contamination of the soil, and exposure of fœcal matter to the public view.

28. *Private Scavengering.*—There being no less than 7,574 Muhammadans of the entire population of 17,379, it stands to reason that a large field for private scavengering exists. Only 613 houses are, however, attended to under this system. The charge made is eight pies per head per mensem, excluding children. An effort should be made to reduce this charge. With careful management, it is probable that six pies per head should cover the cost of collection, and this seems quite as much as most of the poorer classes are willing to give under a voluntary system.

29. *Rubbish* is removed in vehicles of the country-cart type. These should gradually be replaced by the municipality supplying wooden skeleton-carts lined with sheet iron and provided with covers.

30. *Night-soil* is removed in four carts. These are wooden. They should be replaced by iron carts directly those in use show signs of wear.

31. *Rubbish and Night-soil Depot.*—More care is required in the arrangements carried out here, although trenching has been effected more systematically than in most towns. The trenches should be laid in regular order and should be constantly of one size. Neat paths should be made between each series of trenches.

32. Each day's collection of rubbish should be covered with four inches of earth.

Inspection Notes.

33. Rubbish and night-soil obtain a good sale. The following sums were realized during the last three years:—

| | Rs. |
|---|---|
| 1891–92 .. .. .. | 430 |
| 1892–93 .. .. .. | 404 |
| 1893–94 .. .. .. | 610 |

The making of poudrette on the system successfully pursued in Poona is recommended to the attention of the municipality. A communication on this subject from the Secretary to the Poona Municipality will be found printed in the "Proceedings of the Sanitary Commissioner" for the second quarter of 1894.

34. *General Conservancy.*—In the more scattered parts of the town there was evidently much neglect as to rank vegetation on private lands. Ruined houses forming resorts for easement were also frequent. A particularly bad instance of the latter was found in the house of Silar Bee, who has long been absent from the municipality and has retained the house shut. Every house that is roofless should after due notice be demolished by the municipality; the debris being but of mud can have but a nominal value, and, if not claimed within a definite period, might be usefully employed as the filling for the depressed road above referred to.

35. *Markets—Butchers' Stalls.*—The old boxes on which the butchers expose their meat for sale should be abolished. Iron rails with steel hooks should be provided, on which the meat should be hung. The blocks used for cutting meat should be retained in a cleanly condition, and it should be seen that each butcher planes his block before commencing his day's work. The flooring of the pyals, which is formed of Cuddapah slabs, should be relaid; all irregular slabs should be removed; the joints should be cement pointed. The pillars should be painted with white silicate paint, so that dirt can be at once detected and be removed by washing. Small egg-shaped drains with plastered Portland cement should be provided in front of the pyals. The water-pipes should be taken on to the pyals, so that a tap can be at the disposal of each holder of a stall for instant washing and cleansing, as may be desired.

36. *Slaughter-houses.* — The cattle slaughter-house is well constructed, and is maintained in a cleanly condition. The available space is, however, insufficient,

Chairman's Remarks.

Will be attended to.

The instructions will be attended to.



Chairman's Remarks.

Provision will be made in the next budget.

Provision will be made in the next budget.

Ditto ditto.

Will be attended to.

Inspection Notes.

so that, at present, slaughtering is carried on in the rooms meant for cooling of carcases. There is a prepared space between the slaughter-house and the wall, which could be made available by covering it with corrugated iron roofing. The interior of the slaughter-house would be improved by raking out the mortar joints and substituting cement pointing. The water available is from an open well. As the public water-supply is immediately outside, this should be introduced, and the well be closed, or its water be only used for flushing purposes; this could be arranged by giving the slaughter-house superintendent charge of the key. On the outside the cistern for receiving washings is not in the best state for retention of cleanliness. It should be lined with cement throughout instead of being in part mortar plastered as at present. It should then be well tarred at intervals. The provision of a small iron hand-cart having a frame work around it and steps for approach, so as to permit of the gut contents being opened immediately over it, would be of advantage. The gut contents should not be allowed to be scattered over the flooring.

37. *Sheep Slaughter-house.*—This is neatly and efficiently floored with Cuddapah slabs; but no provision is made for affording shelter during rainy weather except in the cooling room, which is unsuitable for the purpose. Arrangements should be made to secure shelter by the use of corrugated iron and old rails.

38. The remarks as to water-supply made in regard to the cattle slaughter-house apply here also, in their entirety.

39. *Graveyards.*—No burials are permitted within town limits. The Muhammadans have a burial-ground in a suitable spot well away from habitations—made over to them by the municipality. Care should be taken to see that the ground is not wasted. The graves should be made in regular order, with suitable paths between each series. It should also be seen that the graves are correctly protected from the ravages of dogs and jackals. Certain of them were seen to have been emptied of their contents.

40. The Muhammadan burial-ground is, however, in very neat order compared to that used by Hindus, near the head of the new channel to Patha-Cuddapah tank. No system as to laying out the graves is here ordered. The

Inspection Notes.

contractor making the bank for the new channel seems not to have had much respect for the dead, as the bund for a long distance and the graveyard itself have scattered over them skulls and bones. This graveyard should be reduced to order. The vettyans should be licensed under section 242, and a peon should be stationed both here and at the Muhammadan burial place. Burial should be carried out in regular lines, so as to economise space. All rank vegetation, which at present especially gives the place the air of absolute neglect, should be cleared away.

Chairman's Remarks.

Will be attended to.

41. *Vaccination.* — The vaccine depôt consists of a very small room of about twelve square feet, opposite the market. The calf is kept on the plain ground in front, under the shelter of the verandah. This arrangement is unsuitable. A special building providing accommodation for the calf and for the persons to be operated upon should be erected. On the municipality intimating to me that it is willing to make this provision, details as to its character will be supplied.

The vaccination depôt has been removed to the premises of the hospital and a separate shed is provided for the same.

42. Compulsion is ineffectually carried out. The Chairman should issue notices and compel the attendance of the people at a suitable depôt, both for the operation and subsequent inspection. On inspecting the register, on 23rd August, I found that no action had been taken by the municipality to enforce vaccination in cases that had refused the operation, although this refusal had been brought to notice by formal letters of the vaccinator, viz., 20 cases reported on the 2nd August, 21 on the 21st July, and 13 on the 15th March. Fifteen cases reported in January were not prosecuted till April 1894. The vaccinator's instruments were cleanly, also his person; the register was neatly kept.

Steps are being taken for prosecuting the cases of neglect and nearly cases are pending before the Magistrate.

43. The following is the result of the vaccination of children who had attained six months of age and over during the preceding twelve months :—

| Total births registered during preceding six months. | Number vaccinated. | | Number vaccinated a second time, because first operation proved unsuccessful. | | Postponed under Medical certificate at the end of six months. | Died. | Left the town. | Unaccounted for. | Ratio of successful vaccinations to total births per cent. |
|---|---|---|---|---|---|---|---|---|---|
| | Successful. | Unsuccessful for the first time. | Successful. | Unsuccessful. | | | | | |
| 117 | 98 | 18 | 24 | 9 | 33 | 1 | .. | .. | 104·2 |



Chairman's Remarks.

Inspection Notes.

44. The following table exhibits the total results of vaccination up todate :—

| — | 1890. | 1891. | 1892. | 1893. | 1894 up to June. |
|---|---|---|---|---|---|
| Number vaccinated .. .. .. .. .. .. .. | 624 | 746 | 593 | 406 | 310 |
| ,, ,, successful .. .. .. .. .. | 571 | 738 | 575 | 346 | 288 |
| ,, ,, under one year of age .. .. .. | 164 | 356 | 239 | 98 | 99 |
| ,, of births registered .. .. .. .. .. | 315 | 367 | 568 | 279 | 112 |

Will be attended to.

45. In a result-grant school where the boys were of from 5 to 12 years of age and chiefly Muhammadans, it was found that of 33 examined only 11 were protected by vaccination, 12 had had small-pox and 10 remained unprotected—a result that must be characterized as very bad.

46. *Registration.*—One registrar on Rs. 10 is maintained. Only three prosecutions for failure to register have been undertaken since April 1894. It is probable that this represents unnecessarily lenient treatment on the part of the municipality. Sign-boards directing attendance at the office of the municipality of informants should be placed in several public resorts, so that the requirement may be kept constantly before the public. At intervals also it might be arranged with advantage to bring the matter to the notice of the uneducated by the use of the "tom-tom."

(Signed) C. CHELLAYA PILLAY,
*Chairman.*

FORT ST. GEORGE,
*21st September* 1894.

(Signed) W. G. KING, Surgn.-Lt.-Col.,
*Ag. Sanitary Commissioner.*

—

Forwarded.

(Signed) J. HEWETSON,
*Acting Collector.*

*18th November* 1894.

Exd. J. Mosee.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following paper:—

From M.R.Ry. C. CHELLAYA PILLAY, Avergal, B.A., B.L., Chairman, Municipal Council, Cuddapah, to the Chief Secretary to Government (through the Collector of Cuddapah), dated Cuddapah, 17th November 1894, No. 855.

I have the honour to submit herewith the inspection notes of the Sanitary Commissioner for Madras on the town of Cuddapah with the remarks of the Council duly entered as per G.O., dated the 23rd December 1893, No. 1765, Local and Municipal.

ENCLOSURE.

INSPECTION Notes of the Sanitary Commissioner for Madras on the Town of Cuddapah.

CUDDAPAH DISTRICT.

CUDDAPAH MUNICIPALITY.

*Inspected* 21*st to* 23*rd August* 1894.

Population as per census of { 1881 .. .. .. .. .. 18,982
1891 .. .. .. .. .. 17,379

Chairman's Remarks.

Inspection Notes.

The town site is surrounded by hills distant from four to seven miles from it. These are arranged in a circle—in almost the centre of which Cuddapah lies. In this basin-like shape, one is reminded of the surroundings of the highly malarious town of Cumbum, in the Kurnool district. The site possesses a slope from west to east towards the Pennár valley.

2. The soil is chiefly of red gravel, having below in some parts a blackish alluvial deposit, followed by clay, and subsequently the imperfect clay known by natives as "sowd" and lime kunkur. The average sub-soil water fluctuation is from thirteen to six feet. Above the town is a tract of land which is rich in springs-evidently having their source in the distant hills, as they burst forth on the surface after a period of subterranean flow, without the occurrence of local rain. The volume of water thus discharged is sufficiently large to form a very considerable stream, known as the Bugga. This is

dammed near the town, and its water is diverted from its natural course towards the Pennár river to supply the Patha-Cuddapah tank. This tank, which has an area of about 640 acres, is situated on the north-east of the town. To the south-east is also another large tank, known as the Dongacheruvu.

3. The town has been long notorious for being highly malarious. Following the depression which probably occurred in the sub-soil water-level of the town, owing to the small amount received during the south-west and north-east monsoons in 1891 and 1892, there ensued during 1893, as might be expected, on the access of a normal amount of rain securing a rise of the sub-soil water (or, at least, a greater depth of soil moistened) a marked increase of malarial fever; so that in this year the mortality was the highest registered in the Presidency in any town. As the birth-rate in Cuddapah during 1893 was only 16·0, in the absence of immigration, with the present population the town would be a deserted ruin in a century. Despite the fact that it is the head-quarter of the district and is an important railway station, the decrease during the decade 1881–91 was 8·76 against an average increase for the Presidency of 14·55 per mille per annum.

4. So far as registration can be trusted, the following table illustrates the conditions mentioned:—

| Years. | Birth ratio per mille of the census population of 1891. | Death ratio per mille of the census population of 1891. | Percentage of deaths from | | | | | | Ratio of deaths of infants under one year of age per mille of those born in the preceding year. | Ratio of deaths of children above one and under five years of age per mille of the population of that age. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cholera. | Small-pox. | Fevers. | Dysentery and diarrhœa. | Injuries. | Other causes. | | |
| 1891 .. .. .. | 21·1 | 29·6 | 7·8 | 1·6 | 49·4 | 6·2 | 0·8 | 34·2 | 219·0 | 20·3 |
| 1892 .. .. .. | 32·7 | 38·4 | 10·7 | 0·3 | 43·8 | 3·4 | 1·6 | 40·2 | 209·8 | 33·7 |
| 1893 .. .. .. | 16·1 | 46·9 | .. | 1·5 | 67·9 | 2·1 | 0·9 | 27·6 | 146·1 | 27·7 |
| 1894 .. .. .. | 12·9 | 38·0 | .. | 3·3 | 56·1 | 3·1 | 2·1 | 35·4 | 143 4 | 28·7 |

But, heavy as the death-rate is, showing that in 1893 one person out of every 21 died in that year, it by no means exhibits the full influence upon the population of the unhealthy conditions to which they are subject. For example, it may be said that although people die at about the same rate in Madras as



in Cuddapah no one objects to residing in the former, and although, occasionally, an apathetic protest is raised as to the sanitary state of that city, it has never been so bad as to induce real alarm in the minds of the inhabitants. The difference between the two conditions is this: in Madras after an illness of, it may be, weeks or days a person may die of some fatal disease, and his next door neighbour has the fatuity to think that he will escape; a large number too of the Madras population can never know under existing conditions what vigorous health is; but they are not subjected to the frequent interruptions of labour and the power of securing a livelihood which attacks of malarial fever imply, and, consequently, the insanitary state of their surroundings, leading nevertheless to fatal issues, is not so well forced upon their observation. In a town afflicted with malaria, the people become apathetic as to their ever recurring sickness, die rapidly, and rarely leave issue to mourn their departure. Before this barrenness of the race can be secured by Nature, much sapping of vitality must have occurred. It is not, therefore, so much in the actual death-roll—although that is sufficiently appalling—that the evil effects of malaria can be estimated; the daily misery and suffering to which those subjected to it must pass through must be taken into account. In Cuddapah not only is the effect of malaria shown in the registration rates affording an enormous death-rate and but a nominal birth-rate, but, probably, one-half the inhabitants exhibit the influence of marked malarial cachexia. Thus of 90 persons examined in the streets no less than 52 per cent. were found to possess enlarged spleens—in most cases the enlargement being sufficient to fill one-half of the abdomen; and, in the Collector's cutcherry, of 93 employés examined 21 per cent. were found affected—a difference due in part to many being but short residents in the locality, and to the better protection from malaria, which the superior hygienic circumstance of the higher classes affords. This is a diseased condition, in which the victim can possess but little pleasure in mere living.

5. As to the cause of the highly malarious condition of Cuddapah, there exists nothing mysterious in the matter. Certain soils contain the malarial parasite:

others do not. If a soil contain this parasite—generally now recognized as the plasmodium malaria—a protozoon—whether or not it shall increase and multiply, or shall decrease and die out, is but a question of how the soil is treated. The favouring agents being present, namely, heat, organic matter and moisture, the malarial agent will certainly increase. To ensure the most perfect exhibition of vitality, these conditions must be present in exactly the required proportions. For example, if water be present to such an extent as to choke the pores of the earth, and prevent the throwing off of the germ, malaria over that special part will not be evolved; if heat be so intense as to deprive the soil of the requisite moisture again, its vitality is threatened. Whilst it is not in the hand of man to modify the conditions of temperature of the soil to any practical degree, it is certainly to regulate to a very great extent the amount and duration of moisture; and, at least, the organic matter already existing in the soil need not be added to. Probably, the most typical pabulum for the growth of the malarial germ is the condition in which an irrigated and well manured rice-field is at intervals in consequence of various grades of soil and sub-soil moisture. This is the experience of the whole civilized world; but, in this Presidency, we have often set before us the example of the huge tracts of Tanjore and Trichinopoly, which are irrigated without the production of excessive malaria. Of course, it is so; we do not produce rice in a field by simply irrigating it; there is something more required — the seed; and so it is with malaria — irrigation will not produce a malarial germ, but if the malarial germ exist in the soil, it most indubitably will excite its vitality and frightful increase. But the extent of mischief that can be effected by irrigation will, of course, greatly depend upon the physical nature of the soil as affecting the retention of moisture or the reverse, and the natural and artificial richness of the soil itself in organic matter. The determination of Cuddapah to follow the lead of the Municipality of Kurnool — another specially malarious tract — in demanding that no irrigation should take place within its limits is, I consider, founded on strong practical and commonsense sanitary grounds. But to deduce from this



fact that in the locality of all towns irrigation is harmful would of course be as faulty in reasoning as to point to statistics gathered from non-malarious tracts to support the argument that "irrigation generally has not been proved to be deleterious or to cause a fever death-rate high as compared with towns around which there is comparatively little irrigation" (G.O., No. 689, Revenue, dated 12th September 1891).

6. To attempt to curb favouring conditions for the propagation of malaria is the recognized method of combating it. The chief factor is undoubtedly the presence of moisture in the impregnated soil; hence, drainage is the remedy which is universally acknowledged should be the first aim of sanitary effort. In considering how best this can be applied, it is of little utility to estimate possible results of pressure on one direction causing a rise of a few inches on another. If the sub-soil water be within a short distance of the surface and the soil above it be permeable, the great factor of capillary attraction, the ascensional force of evaporation, and effects of fluctuation of the ground air circulation must all be regarded as important factors. Granted then that the soil of Cuddapah is of that description — unhappily for those who choose to live upon it — which contains the malarial germ, in what ~~matter~~ should we proceed to mitigate its growth? In the first place is their excessive moisture in the town site and its surroundings. Looking first of all to possible disturbance of the natural sub-soil water level, we find to the south-east the Dongacheruvu tank. Notwithstanding the opinion that this tank has something to do with the matter by the exercise of pressure, I much doubt it. The slope of the sub-soil is generally that of the soil surface, and in this case, unless it can be proved that there is an exception, the slope from the Dongacheruvu tank is very rapid to the east, and away from the town. The suggestion therefore to make a channel running between this tank and the town, so as to arrest the overflow from the Patha-Cuddapah tank made by the Sanitary Engineering department, seems to me not likely to be of practical utility.

7. The influence upon sub-soil flow seems to me to be caused by obstruction at its natural outlet by the presence of the water-logged soil within the area of the Patha-Cuddapah tank. It must be

* see map. It is not clear how the proposed channel could anyhow arrest the overflow from the Patha-Cuddapah tank. The San. Comm. seems to be under some misapprehension. —

remembered that the natural outlet of the Bugga springs which disappear within the soil must be most probably in this direction, and that their surface flow also in the form of the Bugga stream is backed up by the anicut. It was, I believe, Mr. Wolfe-Murray's suggestion that the Bugga anicut should be breached. This I think a most desirable recommendation, and it is now a possible event in view of the construction of the new channel from the Kurnool-Cuddapah canal. If this be done, care should be taken to regulate *the whole surface of the stream bed*, so as to permit of no obstruction to ready flow. But it is in the Kotha-Cuddapah tank that the greatest resistance to outflow must occur. To recommend the abolition of this tank on sanitary grounds seemed to me out of the question for financial reasons; but, in discussing the subject with one of the councillors, M.R.Ry. Thimma Reddi, he brought to my notice the fact that it need not be regarded as an impossibility. The existence of the new channel for supply no longer renders it imperative that water should be stored in the tank, seeing that the quantity at disposal in the canal need know no stint. His suggestion, therefore, was that the tank should be breached, and that the supply to the fields should be from the canal only. This suggestion seems to me to meet the conditions required, and I advise that its feasibility be considered. Government would gain by the enormous area of the tank-bed at disposal for cultivation. But to justify my assertion as to the influence of this tank, it would be necessary to prove, first of all, that the sub-soil water is impeded by it, and again that the fluctuation in the sub-soil so brought about is sufficient to ensure disturbance of a considerable bulk of sub-soil air or varying grades of moisture of the layers of sub-soil. Apparently the total rise of the sub-soil water is from 13 feet to about 6 feet of the surface, by no means an extensive fluctuation when compared with many Indian towns. But, in estimating the influence of this factor, it must be held in mind that the soil is such as to favour capillary attraction, and thus the sub-soil water is held up by a clayey substratum. Proof of the broad fact that obstruction to outflow is produced is, I think, fairly well exhibited in the level of wells shown in the accompanying diagram—the *datum* being the surface level of the Patha-Cuddapah tank.



8. Whilst, then, I would credit the Patha-Cuddapah tank with retaining the sub-soil water level of the town at a higher level than would be natural, in view of certain geological peculiarities of the substratum, were no such obstruction to free outflow present, the influence is not such as to produce water-logging of the soil, nor violent fluctuations of sub-soil water level. Again, if the marshy state of the Bugga bed brought about by the existing anicut be taken into account, and it be remembered that during a considerable portion of the year a large part of Patha-Cuddapah tank is not covered by water but is a water-logged or marshy area, and that this bed covers no less than 640 square acres, it is conceivable that whilst no one condition can be pointed to as the sole cause of the favoured growth of the malarial germ in Cuddapah, this combination does afford the conditions required. Nor can the simple circumstance that the people live chiefly in houses having mud walls be ignored. In the close confined huts whose floors are, by way of cleaning them, damped with cowdung, and which cover a soil readily acted upon by capillary attraction from the sub-soil water below, the existence of a ring of damp wall near the foundation and where the sleeper lies, all go to afford opportunities for malarial germ growth and infection of the human being. Of course, this may seem mere theoretical nonsense to some; but, if it be true that the poison of malaria be found in the earth, even those who may question the existence of a living parasite, and would claim it to be an unknown chemical product the result of the combined action of heat, organic matter and moisture in the soil, will at least see that the existence within a foot of a sleeper's head of the poison-containing soil in a state of moisture must be favourable to the action of the poison. It has been actually demonstrated by medical men experimentally that, by taking earth from a malarious locality and placing it within suitable distance of a person formerly free of malaria and living in a non-malarious country, infection can be induced.

9. To render Cuddapah habitable, I would therefore advise that the Patha-Cuddapah tank be breached so completely as to offer no obstruction to surface drainage *in all* directions, and the supply of the fields below be effected by irrigation from the canal direct—that the bed of

Inspection Notes.

the Patha-Cuddapah tank be effectually cultivated, and, if necessary, sub-soil drained; the Bugga anicut should be breached, and the Bugga bed be correctly trained—the old Bugga channel being left open, or, if filled, being supplied with sub-soil drains throughout its length before being so.

10. The people should be taught to use houses on well elevated basements; the use of earth for making houses should be discouraged, and where poverty forbids the use of stone and mortar throughout, it should at least be employed for two or three courses of the foundation, and this should be surmounted before building up of mud by an impervious "dry course."

11. The stoppage of irrigation within municipal limits should be adhered to.

12. But it must be conceded that whilst each of the causes enumerated will go to aid the total result, one of the most important factors in maintaining the soil of the site in a condition that at once provides moisture and organic matter, is the non-removal of sewage. The typical South Indian town has its side channels which serve to remove storm water, and to, at least, distribute over the surface of the town site the sewage water of the inhabitants. But, in Cuddapah, arrangements are specially made for practically the whole of the sewage water going directly *into* the sub-soil through pervious cesspools. It need not be said that so long as this state of affairs lasts, even were the other suggestions effected, Cuddapah, in view of the fact of the soil being malarious, *cannot* be rendered healthy.

13. In this connection it would be of importance to be able to ascertain whether the late introduction of more water than has probably been used by the inhabitants formerly has influenced the

Chairman's Remarks.

The suggestions will be given effect to in all practicable cases.

The prohibition of wet cultivation refers to lands under Dongacheruvu and Patha-Cuddapah tanks within the municipal limits. Adverting to the remarks of the Sanitary Commissioner contained in paragraph 6 of the notes, if, as he says, "the slope of Dongacheruvu tank is very rapid to the east, away from the town," and if the suggestion of the Sanitary Engineer to make a channel running between the tank and the town is of no practical utility, the council doubts if the order as to the prohibition of wet cultivation, in so far as it relates to lands sloping to the east ought to continue.



Chairman's Remarks.

The present financial condition of the municipality is such that the council does not consider it desirable to go in for further loans or to undertake an expensive system of drainage.

The council has already taken on hand to give effect to the suggestions of the Sanitary Commissioner as to the bye-lanes.

Inspection Notes.

extent of moisture of the sub-soil injuriously. The water-supply was introduced in 1890, but a correct estimate of results cannot be made. Certainly, there has since that date been an increase of fever prevalence and general mortality in the town (*vide* table preceding), but the result is obscured by the fluctuations of the sub-soil water that must have been caused following the scanty rainfall of 1891 and subsequent fairly normal rainfall of 1892. Whilst, therefore, with the data available, it is impossible to state that the introduction of extra water in the town has brought about an exaggeration of malarial conditions, there can remain no doubt as to the absolute necessity for all sullage water being scrupulously removed from the site.

14. Cuddapah has been lucky in obtaining a very cheap and efficient water scheme, and it is therefore possible that there may be room in the financial conditionof the town for borrowing sufficient to secure the necessary corollary—a good drainage system. In carrying out a drainage scheme, there ought to be no two opinions as to the form it should take, namely, an underground separate system *supplemented by free sub-soil drainage throughout the town.* In this instance I would strongly deprecate the use of the "open drain" system unless it also were supplemented by sub-soil drainage, resulting in a very incongruous and expensive combination. On this being completed, in addition to the above suggestions, the death-rate of Cuddapah ought to show a decline, and the fever rate should rapidly fall.

15. *Roads.*—The main roads are in fairly good order, but the result of steady increment to their surface whilst the bye-lanes have been neglected has resulted in these being below the surface level of the main thoroughfares. The result is blockage of surface drainage, a most undesirable effect in this malarious town. The Chairman is, however, alive to this condition of affairs, and has already directed the raising of five of the smaller roadways. This process should be carried out systematically, and should be regarded as a matter not only of public convenience but of hygienic import.

16. *The water-supply* is derived from a body of water above the town, which, according to season, exhibits itself above

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the ground in the form of springs, or disappears and forms an extensive sub-soil flow. It is unfortunate that at the site this water is tapped there exists a well filled graveyard which, up to January 1893, was still in use. One body had, on the visit of the Deputy Sanitary Commissioner in December 1893, also been surreptitiously buried. I believe this condition of affairs is now finally put a stop to.

17. The water-works site is held in veneration by certain castes of Hindus. There is a small temple on the spot, and a chattram in which pilgrims are accommodated. Two large wells exist, or, rather, enclosures of springs, which are used by pilgrims to bathe in; one of these has been breached, so as to enable a full flow to proceed to the water-works gathering ground. Further, yearly some thousands from Cuddapah and adjoining villages assemble here for the celebration of a festival, in which the sacrifice of animals forms a prominent part. Again, a pious Hindu is collecting material for enlarging the chattram for the accommodation of pilgrims. Caution is necessary in these matters. The whole area should be carefully conserved, so that the bare possibility of contamination by a human being should be out of the question. I understand that the land belongs to a Muhammadan. It would be advisable for the municipality to buy up the whole and to attempt to arrive at some understanding with the trustees of the temple as to bathing in the springs and celebration of the festival. It seems to me whilst worship in the temple need not be interfered with, that there are probably no religious grounds why the festival should take place on the present site, that is, within the immediate surroundings of the temple. In any case, purchase of the land would give the municipality the right to completely control the acts of those they might permit to enter their land during the festival season irrespective of the protection that could be claimed by them under sections 155 and 150.

18. Including the families, there are thirteen persons on the water-works staff at this spot. No latrine has, however, been provided by the municipality. It requires but an attack of typhoid or cholera in their households to scatter death broadcast among the inhabitants of the town. Not only should a faultless form of

Chairman's Remarks.

The council will give effect to the suggestion making provision in the next budget.



Chairman's Remarks.

Care will be taken that, in future, no applications for private service will be granted when the waste water is likely to lead to contamination of the water-supply or to the premises becoming insanitary. Extra rates cannot be levied if water is used for domestic purposes only. Water is not allowed for other than such purposes at present.

In case of poor people, considerable difficulty will be felt in inducing them to construct cesspools of the approved pattern suggested by the Sanitary Commissioner, but steps will be taken by the council to introduce the system recommended gradually when funds are available.

Inspection Notes.

covered latrine be provided, but care should be taken by frequent inspections that the conservancy of latrines and surroundings is perfect. A *daily* report that an inspection of conservancy arrangements has been made should be demanded by the Chairman from the Engineer in charge of the water-works.

19. Several of the inhabitants have introduced the pipes into their houses. The extension of this system should not be favoured by the municipality. In such cases extra rates should be demanded and the supply be gauged by metre. A condition that should be insisted upon is that the tap is placed in such a position that it can be seen at all times by persons of any caste (section 148).

20. Neglect of this precaution is liable to lead to much waste and to contamination of the water-supply by careless habits, owing to aspiration of air and fluids under special conditions. Some arrangements should be made to enable the municipality to cut off the supply at intervals of a week as at present whilst cleansing the reservoir. Direct pumping to the town has apparently been followed by the bursting of certain of the mains; but presumably, on the municipality consulting the Sanitary Engineer, either an air vessel, stand-pipe, or other mode could be arranged for. Every effort should be made to render the supply as absolutely *constant* as the amount of water available will permit, and this apparently would be possible for nearly all the year round.

21. *Drainage.*—Practically no drains exist beyond side channels for storm water. Sewage water is in nearly all cases received into pervious cesspools. I have already remarked upon the serious influence for evil so caused, and as to the advisability of the early adoption of a complete sewerage *plus* a careful sub-soil drainage scheme as essential for the remedy of this undesirable state of affairs. In the meantime the municipality should insist that cess-pools are built of approved patterns, and are rendered with Portland cement and have a backing of concrete or puddled clay so as to be impervious. This should be insisted upon at once, in the case of the chattram owned by Soobya Chetty, from which the discharge of sullage water is evidently of very great amount.

Inspection Notes. | Chairman's Remarks.

22. I was glad to find that the present Chairman has, since taking over office, exerted himself to get rid of the unsightly pools caused by the waste water from taps by diverting the water to petty ornamental plots of vegetation and trees. This method should be systematically pursued.

Nice ; pretty. Look it up in the original

Is this pretty in the original –

23. *Conservancy.*—There are forty-two latrines in the town; all are of the common open-space pattern with the exception of two. The latter are suitably divided into compartments by Cuddapah slabs, but the back of each is plastered with common mortar. This should be removed, and cement plaster be substituted. The drains are square and are also mortar-plastered; here, also, Portland cement should be used and the drains should be altered to the egg-shape. The walls, unfortunately, also are formed of very rough laterite. This should either be cement-plastered, or be painted freely with boiling pitch and tar. In certain of the latrines Cuddapah slabs are used for the walls. Provided these can be so sunk as to be in no danger of becoming irregular, as I found had been effected in one instance, no better material could be used. Indeed, in Cuddapah, there ought to be no difficulty about making fairly efficient latrines with this admirable stone at disposal. I enclose a plan (will follow) of a cheap form of latrine made from this material for information. The masonry walls therein shown might well be substituted by Cuddapah slabs, and for the pathway Cuddapah slabs above the concrete might also be substituted. There would thus be presented for the whole latrine a completely smooth surface of Cuddapah slabs, which could be kept absolutely clean by flushing with little trouble. I need hardly add that each joint must be carefully pointed with good Portland cement, and the slabs should be smooth and regular in section.

The suggestions will be carried out when funds are available.

24. Earthen tubs are used for receiving the urine; these should be substituted by iron tubs, or, at least, the earthen tubs should not be employed till rendered fairly impervious by the use of tar and pitch.

Ditto      Ditto

25. Burnt paddy husk is used for deodorization. The amount of carbon available in this must be very small, and hence deodorization cannot be complete, although doubtless the value of the night-soil may be added to as manure. Dry-earth should be used.

Will be attended to.



Chairman's Remarks. | Inspection Notes.

26. Each latrine should have a toty on the spot, at all times during the day. In no other way can latrines worked on the dry-earth or separate removal system be kept in a condition in which it is possible for a human being to enter into them without disgust. Near each latrine quarters for the toties (man and wife by preference) and a store for dry-earth should be erected. Of course, this may be an expensive measure, but if latrines are to be used by the people they must be kept in a state which shall not call forth repugnance; without complicated mechanical arrangements this is the only mode that will secure cleanliness.

The council fully concurs with the views expressed, but is unable at present to carry out the suggestions.

27. At Ammapett is a most unsuitable form of latrine. It is, in any case, far too close to habitations and should, on this ground, be abolished. It seems to have been built upon a most crude plan, as it permits, notwithstanding apparently the inception of measures to prevent this, contamination of the soil, and exposure of fœcal matter to the public view.

Since abolished.

28. *Private Scavengering.*—There being no less than 7,574 Muhammadans of the entire population of 17,379, it stands to reason that a large field for private scavengering exists. Only 613 houses are, however, attended to under this system. The charge made is eight pies per head per mensem, excluding children. An effort should be made to reduce this charge. With careful management, it is probable that six pies per head should cover the cost of collection, and this seems quite as much as most of the poorer classes are willing to give under a voluntary system.

The council will do its best to increase the number of houses served with private scavenging system and will reduce the rate to be levied per head when it is expedient to do so without prejudice to the revenue.

29. *Rubbish* is removed in vehicles of the country-cart type. These should gradually be replaced by the municipality supplying wooden skeleton-carts lined with sheet iron and provided with covers.

The council is not in a position to adopt the suggestion as to rubbish carts for want of funds.

30. *Night-soil* is removed in four carts. These are wooden. They should be replaced by iron carts directly those in use show signs of wear.

Provision will be made in the next budget.

31. *Rubbish and Night-soil Depot.*—More care is required in the arrangements carried out here, although trenching has been effected more systematically than in most towns. The trenches should be laid in regular order and should be constantly of one size. Neat paths should be made between each series of trenches.

Will be attended to.

32. Each day's collection of rubbish should be covered with four inches of earth.

Ditto.

Inspection Notes.

33. Rubbish and night-soil obtain a good sale. The following sums were realized during the last three years:—

| | Rs. |
|---|---|
| 1891–92 .. .. .. | 430 |
| 1892–93 .. .. .. | 404 |
| 1893–94 .. .. .. | 610 |

The making of poudrette on the system successfully pursued in Poona is recommended to the attention of the municipality. A communication on this subject from the Secretary to the Poona Municipality will be found printed in the "Proceedings of the Sanitary Commissioner" for the second quarter of 1894.

34. *General Conservancy.*—In the more scattered parts of the town there was evidently much neglect as to rank vegetation on private lands. Ruined houses forming resorts for easement were also frequent. A particularly bad instance of the latter was found in the house of Silar Bee, who has long been absent from the municipality and has retained the house shut. Every house that is roofless should after due notice be demolished by the municipality; the debris being but of mud can have but a nominal value, and, if not claimed within a definite period, might be usefully employed as the filling for the depressed road above referred to.

35. *Markets—Butchers' Stalls.*—The old boxes on which the butchers expose their meat for sale should be abolished. Iron rails with steel hooks should be provided, on which the meat should be hung. The blocks used for cutting meat should be retained in a cleanly condition, and it should be seen that each butcher planes his block before commencing his day's work. The flooring of the pyals, which is formed of Cuddapah slabs, should be relaid; all irregular slabs should be removed; the joints should be cement pointed. The pillars should be painted with white silicate paint, so that dirt can be at once detected and be removed by washing. Small egg-shaped drains with plastered Portland cement should be provided in front of the pyals. The water-pipes should be taken on to the pyals, so that a tap can be at the disposal of each holder of a stall for instant washing and cleansing, as may be desired.

36. *Slaughter-houses.* — The cattle slaughter-house is well constructed, and is maintained in a cleanly condition. The available space is, however, insufficient,

Chairman's Remarks.

Will be attended to.

The instructions will be attended to.



Chairman's Remarks.

Provision will be made in the next budget.

Provision will be made in the next budget.

Ditto ditto.

Will be attended to.

Inspection Notes.

so that, at present, slaughtering is carried on in the rooms meant for cooling of carcases. There is a prepared space between the slaughter-house and the wall, which could be made available by covering it with corrugated iron roofing. The interior of the slaughter-house would be improved by raking out the mortar joints and substituting cement pointing. The water available is from an open well. As the public water-supply is immediately outside, this should be introduced, and the well be closed, or its water be only used for flushing purposes; this could be arranged by giving the slaughter-house superintendent charge of the key. On the outside the cistern for receiving washings is not in the best state for retention of cleanliness. It should be lined with cement throughout instead of being in part mortar plastered as at present. It should then be well tarred at intervals. The provision of a small iron hand-cart having a frame work around it and steps for approach, so as to permit of the gut contents being opened immediately over it, would be of advantage. The gut contents should not be allowed to be scattered over the flooring.

37. *Sheep Slaughter-house.*—This is neatly and efficiently floored with Cuddapah slabs; but no provision is made for affording shelter during rainy weather except in the cooling room, which is unsuitable for the purpose. Arrangements should be made to secure shelter by the use of corrugated iron and old rails.

38. The remarks as to water-supply made in regard to the cattle slaughter-house apply here also, in their entirety.

39. *Graveyards.*—No burials are permitted within town limits. The Muhammadans have a burial-ground in a suitable spot well away from habitations—made over to them by the municipality. Care should be taken to see that the ground is not wasted. The graves should be made in regular order, with suitable paths between each series. It should also be seen that the graves are correctly protected from the ravages of dogs and jackals. Certain of them were seen to have been emptied of their contents.

40. The Muhammadan burial-ground is, however, in very neat order compared to that used by Hindus, near the head of the new channel to Patha-Cuddapah tank. No system as to laying out the graves is here ordered. The

Inspection Notes.

Chairman's Remarks.

contractor making the bank for the new channel seems not to have had much respect for the dead, as the bund for a long distance and the graveyard itself have scattered over them skulls and bones. This graveyard should be reduced to order. The vettyans should be licensed under section 242, and a peon should be stationed both here and at the Muhammadan burial place. Burial should be carried out in regular lines, so as to economise space. All rank vegetation, which at present especially gives the place the air of absolute neglect, should be cleared away.

Will be attended to.

41. *Vaccination.* — The vaccine depôt consists of a very small room of about twelve square feet, opposite the market. The calf is kept on the plain ground in front, under the shelter of the verandah. This arrangement is unsuitable. A special building providing accommodation for the calf and for the persons to be operated upon should be erected. On the municipality intimating to me that it is willing to make this provision, details as to its character will be supplied.

The vaccination depôt has been removed to the premises of the hospital and a separate shed is provided for the same.

42. Compulsion is ineffectually carried out. The Chairman should issue notices and compel the attendance of the people at a suitable depôt, both for the operation and subsequent inspection. On inspecting the register, on 23rd August, I found that no action had been taken by the municipality to enforce vaccination in cases that had refused the operation, although this refusal had been brought to notice by formal letters of the vaccinator, viz., 20 cases reported on the 2nd August, 21 on the 21st July, and 13 on the 15th March. Fifteen cases reported in January were not prosecuted till April 1894. The vaccinator's instruments were cleanly, also his person; the register was neatly kept.

Steps are being taken for prosecuting the cases of neglect and nearly cases are pending before the Magistrate.

43. The following is the result of the vaccination of children who had attained six months of age and over during the preceding twelve months :—

| Total births registered during preceding six months. | Number vaccinated. | | Number vaccinated a second time, because first operation proved unsuccessful. | | Postponed under Medical certificate at the end of six months. | Died. | Left the town. | Unaccounted for. | Ratio of successful vaccinations to total births per cent. |
|---|---|---|---|---|---|---|---|---|---|
| | Successful. | Unsuccessful for the first time. | Successful. | Unsuccessful. | | | | | |
| 117 | 98 | 18 | 24 | 9 | 33 | 1 | .. | .. | 104·2 |



Chairman's Remarks.

Inspection Notes.

44. The following table exhibits the total results of vaccination up to date :—

| — | 1890. | 1891. | 1892. | 1893. | 1894 up to June. |
|---|---|---|---|---|---|
| Number vaccinated .. .. .. .. .. .. .. | 624 | 746 | 593 | 406 | 310 |
| ,, ,, successful .. .. .. .. .. | 571 | 738 | 575 | 346 | 288 |
| ,, ,, under one year of age .. .. .. | 164 | 356 | 239 | 98 | 99 |
| ,, of births registered .. .. .. .. .. | 315 | 367 | 568 | 279 | 112 |

Will be attended to.

45. In a result-grant school where the boys were of from 5 to 12 years of age and chiefly Muhammadans, it was found that of 33 examined only 11 were protected by vaccination, 12 had had small-pox and 10 remained unprotected—a result that must be characterized as very bad.

46. *Registration.*—One registrar on Rs. 10 is maintained. Only three prosecutions for failure to register have been undertaken since April 1894. It is probable that this represents unnecessarily lenient treatment on the part of the municipality. Sign-boards directing attendance at the office of the municipality of informants should be placed in several public resorts, so that the requirement may be kept constantly before the public. At intervals also it might be arranged with advantage to bring the matter to the notice of the uneducated by the use of the "tom-tom."

(Signed) C. CHELLAYA PILLAY,
*Chairman.*

(Sd.) W. G. KING, Surgn.-Lt.-Col.,
*Ag. Sanitary Commissioner.*

FORT ST. GEORGE,
21*st September* 1894.

Forwarded.

(Signed) J. HEWETSON,
*Acting Collector.*

18*th November* 1894.

Exd. J. Moses.

1646 M. M. of 94
1216 M. M. of 94
1085 M. M. of 94
1337 M. of 94
1283 M. M. of 94
161 M. of 94
1765 M. of 93
86 R. 12th Sep. 91. Revenue

Cuddapah insp. notes

Rd 6/12

L & M. DEPARTMENT.

Curr. No. 2906 M.

From

Dated 189 .

FOR ORDERS.

The important part of the Notes is that which deals with the Cuddapah Drainage, & its effect upon malarial fever in the town.

Dr. King comes to the conclusion that the Drainage Channel proposed by the Sanitary Engineer, & just sanctioned for execution by Govt. at a cost of Rs. 19,210 "seems ... not likely to be of practical utility". (Page 5 of the Inspection Notes).

The estimate for which was sanctioned in G.O. 127.M. 30.1.93

I don't think Dr K. is speaking of the Chl already sanctioned, but of another Mr Ellis has been thinking of, but report regarding which hasn't yet come in.
B.S.

The history of the various suggestions for improving the subsoil drainage of Cuddapah is as follows.

In his Inspection Notes recorded in G.O. dated 5.3.91. No. 313.M. the then San. Commr. Dr. Laing, recommended that the Durga cheruvu should be abolished as it had raised the subsoil water-level in the town; that the supply channel of the Patha Cuddapah tank should be done away with as it ran near the Brahman quarter, & water stood in it, & it was used as a latrine; (the Patha Cuddapah tank might, it was suggested, be filled from the Kurnool-Cuddapah canal); & that at the same time the anicut across the Booga, which banks up the water for this channel, should be blown up.

The Council in its resolution in G.O. dated 21st April 91. No. 595.M. approved of the closing of the Patha Cuddapah tank channel, but that G.O. said that the expense rendered the proposal out of the question at ...

asked the D.P.W. to report on the question of breaching the ancient & supplying the tank from the Canal. The San. Engr. was asked also to send up a detailed drainage scheme for the town.

In G.O. 2723. (Revenue) 4.5.91. printed in G.O. 1870.M. 29.10.91. Govt. asked the San. Engr. to report upon the proposal to abolish the Dunga channa (Dongal channa it is now called), & see whether the waterlogging of the subsoil could not be effected by draining the town as well as by closing the tank & sacrificing the Revenue derived from it. Meanwhile the D.P.W. were asked not to spend any more money on the tank.

Mr. Jones reported (vide the same G.O.) that the Dongal channa did not affect the health of the town, and did not raise the subsoil water level. He thought the high level of the subsoil water was due to the geological position of the town which being in a basin, collected water rapidly & was situated on strata which did not allow it readily to escape, the more so as the pointed out that the only two natural outlets were the Penner which was too far away to do much good, & the Booga, which was uneven in its bed & moreover dammed by the ancient. He recommended therefore that a channel 8 feet deep to the supply channel of the Patta Caddapah tank be dug to the East of the town to carry off subsoil water there, & that on the other (West) side of the town the Booga ancient be removed & the bed of the river lowered as far as possible, so that water could no longer pass along the Patta Caddapah tank channel, & subsoil water could escape by the river.

[G/25.]

C. No. DEPARTMENT.

## FOR ORDERS.

He offered certain suggestions for an alternative method of supplying the Patta Caddapah tank.

In the order upon this report (No 869 Revenue, dated 12.9.91. in G.O. 1870.M. 29.10.91 Govt. accepted the view that the Dongal channa did no harm to the town, withdrew the former restriction as to repairs to it, & asked the D.P.W. to report upon the removal of the Bugga ancient, & Mr. Jones' proposal for supplying the Patta Caddapah tank by other means, & upon the cost of lowering the bed of the Bugga river.

The exact steps that followed in the D.P.W. are not to be traced from the papers supplied by it & the Rev. Dept., & the note has not been delayed for fuller information, for it appears from G.Os Nos 927.W. Cy. 3.92 and 484.I. 13.5.92 that estimates for Rs.15.000 for breaching the ancient & filling up the supply channel, & for Rs.49000 for making a new supply channel to the Patta Caddapah tank from the Kurnool-Caddapah Canal under the Booga river were drawn up. The former was ordered to be over until the latter be carried out. This latter estimate has now (G.O. 1033. 12.11.93) been raised to Rs.54.000, & the Govt. of India have sanctioned this. The work is apparently still in progress.

Dr. King in his present Inspection notes, while agreeing that the Dongal channa is

not a source of danger to the town, considers that the big drainage channel proposed by Mr. Jones will be of no use because it is in the wrong place, in a situation where there is already a rapid fall away from the town.

He considers it advisable to breach the Bogga anicut and to properly train the bed of that river, but considers that the main reason that the Cuddapah subsoil water is at such a high level is that the Patta Cuddapah tank, to which the costly supply channel is now being taken, is situated where it is. He recommends therefore that this tank be entirely breached, that its bed be cultivated, & that the land in its agacut be irrigated direct from the new channel.

In the Budget for this year, Rs. 19.210 have been provided for carrying out Mr. Jones' drainage channel. It also appears from H.M's note in G.O. 1646 M. dated 7.11.94 that Mr. Ellis has been sent to Cuddapah to report further upon a complete drainage scheme for the town.

This being the position it is suggested that Mr. Ellis may be informed of Dr. King's views on the matter, & that they be left to decide between them what is the best thing now to be done, & report as the Sanitary Board with Col. Pennycuick's additional help.

A Draft order is submitted for approval

WC. 8.1.95

Para 3. of the draft order is inserted as it is not known whether irrigation from the channel direct would be feasible.

WC. 8.1.95

I don't think he means this chl at all
WS

Better ask Dr. King first whether the Channel mentioned at the end of this para is that for which the Estt of Rs 19000 odd is already sanctioned and - Then we shall know what we are about. You can get a reply from him in a day or two
WS
10/1/95

I. & M. DEPARTMENT.

Current No.s

From 2906 M. of 94.
and 246 M. of 95.

Dated

189 .

FOR ORDERS.

The amended order is passed.

The difficulty now will be that Mr. Jones will not know exactly what has taken place - Please see that Mr. Ellis posts him & Col Pennycuick up; or let Mr. Jones come here & send to do so.
WS
2/2/95

Please see notes & orders on Current 2906 M. within.

A Reference was made to the San. Comm^r. as directed by H.M. to discover whether the channel referred to in his notes was that proposed by Mr. Jones, & in current 246 M. he answers this question in the affirmative.

Mr. Ellis informed me personally this morning that H.M. has now directed that both this question, & the larger question of the measures that should be taken to do what is possible to render the Cuddapah less malarious, should be referred to the Sanitary Board for report. Col. Pennycuick being now on the Board will be able to advise the steps that can be taken to introduce cultivation in the Patta Cuddapah tank bed direct from the new Channel from the Kurnool Cuddapah canal.

Mr. Ellis has lent me a map of the town & the localities in question for H.M's perusal, & it is attached to the file.

Paras 2 and 3. of the draft order originally proposed have been amended in accordance with the above, & it is resubmitted for approval.

WC 28-1-95
1.2.95

San. Commr's Inspection Notes

on Cuddapah.

2906 M + 246 M

Wm/

(for orders)

Office/ When this file comes back from circulation return the map now attached to it to the San. Engr's office: don't record it in this office.

W. 25.1.95

Returned accordingly

4.2.95

182 M

7-2-95

[illegible]



Papers to be read in Proceedings :—

30

Again G.O., dated 189 , No.

Current No. 2906 M of 1894, dated 17th Nov: from the Chairman M.C. Cuddapah.

Order. 7-2-95 No. 182 M.

Recorded.

2. ~~The Sanitary Engineer's attention will be drawn to~~ The Sanitary Commissioner's remark at the close of para. 6 of his notes regarding the proposed excavation of a drainage channel to the east of the town.

3. ~~The Sanitary Commissioner's~~ His suggestions in para. 9 of his notes will be referred to the Public Works Department for remarks.

~~Will be referred to the Sanitary Board for full report.~~

JP 2/2/95

(2). Paras 5-14 of the San. Commr's notes will be referred to the Sanitary Board which will be requested to go fully into the causes of the malarial fever in Cuddapah, & to suggest comprehensive measures for ~~dealing with~~ removing them as thoroughly and completely as may be possible.

W. 25.1.95

(3) ~~4.~~ The Chairman has not reported the action which the Council proposes to take on the Sanitary Commissioner's suggestions in paras. 17. 20. + 33. of his notes. This omission should be supplied.

(4) ~~5.~~ With reference to the Chairman's remarks on para. 19 of the notes, his attention will be drawn to section 147 of the District Municipalities Act.

To.

The Chairman M.C. Cuddapah. ✓

" Collector of Cuddapah. ✓

" Sanitary ~~Commissioner~~ Board ✓

" ~~Sanitary Engineer.~~

" ~~Public Works Department~~

Editors' Table

Desp. 19/2/95

V.R. 10/12/94 W. 5.1.95 [illegible] 9/1.

replied in CNo 246M of 95

2906m.

N/mis.

Refce .29 / 16/1/95

The San. Commr. will be requested to report ~~whether it~~ in Commn. with the San. Engr. whether the channel referred to at the conclusion of para 6 of his Inspectn. Notes is that for which a provision of Rs 19,210 has been made in the ~~San. Engrs. Budget~~ revised estimate 1894–95 of ~~Provincial Grants to~~ for the ~~past year~~ Municipalities printed in G.O. 15.12.94. No. 1107. Finl.

M. 11/1/95

Note for the A.S.

Please see CN. 246 M from the Sanitary Commissioner, which furnishes the information called for in the above reference.

M. 25/1

To,

The Sanitary Commissioner.

Despd 16/1

2906 m

Cuddapah Inspection Notes

H.M.

~~C.S~~

P.S



## GOVERNMENT OF MADRAS.

## LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers:—

From M.R.Ry. C. CHELLAYA PILLAY, Avergal, B.A., B.L., Chairman, Municipal Council, Cuddapah, to the Chief Secretary to Government (through the Collector of Cuddapah), dated Cuddapah, 17th November 1894, No. 855.

I have the honour to submit herewith the inspection notes of the Sanitary Commissioner for Madras on the town of Cuddapah with the remarks of the Council duly entered as per G.O., dated the 23rd December 1893, No. 1765, Local and Municipal.

ENCLOSURE.

INSPECTION Notes of the Sanitary Commissioner for Madras on the Town of Cuddapah.

### CUDDAPAH DISTRICT.

### CUDDAPAH MUNICIPALITY.

*Inspected 21st to 23rd August* 1894.

| Population as per census of | | |
|---|---|---|
| | 1881 | 18,982 |
| | 1891 | 17,379 |

| Chairman's Remarks. | Inspection Notes. |
|---|---|
| | The town site is surrounded by hills distant from four to seven miles from it. These are arranged in a circle—in almost the centre of which Cuddapah lies. In this basin-like shape, one is reminded of the surroundings of the highly malarious town of Cumbum, in the Kurnool district. The site possesses a slope from west to east towards the Pennár valley. |
| | 2. The soil is chiefly of red gravel, having below in some parts a blackish alluvial deposit, followed by clay, and subsequently the imperfect clay known by natives as "sowd" and lime kunkur. The average sub-soil water fluctuation is from thirteen to six feet. Above the town is a tract of land which is rich in springs-evidently having their source in the distant hills, as they burst forth on the surface after a period of subterranean flow, without the occurrence of local rain. The volume of water thus discharged is sufficiently large to form a very considerable stream, known as the Bugga. This is |

Inspection Notes.

Chairman's Remarks.

dammed near the town, and its water is diverted from its natural course towards the Pennár river to supply the Patha-Cuddapah tank. This tank, which has an area of about 640 acres, is situated on the north-east of the town. To the south-east is also another large tank, known as the Dongacheruvu.

3. The town has been long notorious for being highly malarious. Following the depression which probably occurred in the sub-soil water-level of the town, owing to the small amount received during the south-west and north-east monsoons in 1891 and 1892, there ensued during 1893, as might be expected, on the access of a normal amount of rain securing a rise of the sub-soil water (or, at least, a greater depth of soil moistened) a marked increase of malarial fever; so that in this year the mortality was the highest registered in the Presidency in any town. As the birth-rate in Cuddapah during 1893 was only 16·0, in the absence of immigration, with the present population the town would be a deserted ruin in a century. Despite the fact that it is the head-quarter of the district and is an important railway station, the decrease during the decade 1881–91 was 8·76 against an average increase for the Presidency of 14·55 per mille per annum.

4. So far as registration can be trusted, the following table illustrates the conditions mentioned:—

| Years. | Birth ratio per mille of the census population of 1891. | Death ratio per mille of the census population of 1891. | Percentage of deaths from | | | | | | Ratio of deaths of infants under one year of age per mille of those born in the preceding year. | Ratio of deaths of children above one and under five years of age per mille of the population of that age. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cholera. | Small-pox. | Fevers. | Dysentery and diarrhœa. | Injuries. | Other causes. | | |
| 1891 .. .. .. | 21·1 | 29·6 | 7·8 | 1·6 | 49·4 | 6·2 | 0·8 | 34·2 | 219·0 | 20·3 |
| 1892 .. .. .. | 32·7 | 38·4 | 10·7 | 0·3 | 43·8 | 3·4 | 1·6 | 40·2 | 209·8 | 33·7 |
| 1893 .. .. .. | 16·1 | 46·9 | .. | 1·5 | 67·9 | 2·1 | 0·9 | 27·6 | 146·1 | 27·7 |
| 1894 .. .. .. | 12·9 | 38·0 | .. | 3·3 | 56·1 | 3·1 | 2·1 | 35·4 | 143 4 | 28·7 |

But, heavy as the death-rate is, showing that in 1893 one person out of every 21 died in that year, it by no means exhibits the full influence upon the population of the unhealthy conditions to which they are subject. For example, it may be said that although people die at about the same rate in Madras as



Chairman's Remarks.

Inspection Notes.

in Cuddapah no one objects to residing in the former, and although, occasionally, an apathetic protest is raised as to the sanitary state of that city, it has never been so bad as to induce real alarm in the minds of the inhabitants. The difference between the two conditions is this: in Madras after an illness of, it may be, weeks or days a person may die of some fatal disease, and his next door neighbour has the fatuity to think that he will escape; a large number too of the Madras population can never know under existing conditions what vigorous health is; but they are not subjected to the frequent interruptions of labour and the power of securing a livelihood which attacks of malarial fever imply, and, consequently, the insanitary state of their surroundings, leading nevertheless to fatal issues, is not so well forced upon their observation. In a town afflicted with malaria, the people become apathetic as to their ever recurring sickness, die rapidly, and rarely leave issue to mourn their departure. Before this barrenness of the race can be secured by Nature, much sapping of vitality must have occurred. It is not, therefore, so much in the actual death-roll—although that is sufficiently appalling—that the evil effects of malaria can be estimated; the daily misery and suffering to which those subjected to it must pass through must be taken into account. In Cuddapah not only is the effect of malaria shown in the registration rates affording an enormous death-rate and but a nominal birth-rate, but, probably, one-half the inhabitants exhibit the influence of marked malarial cachexia. Thus of 90 persons examined in the streets no less than 52 per cent. were found to possess enlarged spleens—in most cases the enlargement being sufficient to fill one-half of the abdomen; and, in the Collector's cutcherry, of 93 employés examined 21 per cent. were found affected—a difference due in part to many being but short residents in the locality, and to the better protection from malaria, which the superior hygienic circumstance of the higher classes affords. This is a diseased condition, in which the victim can possess but little pleasure in mere living.

5. As to the cause of the highly malarious condition of Cuddapah, there exists nothing mysterious in the matter. Certain soils contain the malarial parasite;

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Chairman's Remarks.

others do not. If a soil contain this parasite—generally now recognized as the plasmodium malaria—a protozoon—whether or not it shall increase and multiply, or shall decrease and die out, is but a question of how the soil is treated. The favouring agents being present, namely, heat, organic matter and moisture, the malarial agent will certainly increase. To ensure the most perfect exhibition of vitality, these conditions must be present in exactly the required proportions. For example, if water be present to such an extent as to choke the pores of the earth, and prevent the throwing off of the germ, malaria over that special part will not be evolved; if heat be so intense as to deprive the soil of the requisite moisture again, its vitality is threatened. Whilst it is not in the hand of man to modify the conditions of temperature of the soil to any practical degree, it is certainly to regulate to a very great extent the amount and duration of moisture; and, at least, the organic matter already existing in the soil need not be added to. Probably, the most typical pabulum for the growth of the malarial germ is the condition in which an irrigated and well manured rice-field is at intervals in consequence of various grades of soil and sub-soil moisture. This is the experience of the whole civilized world; but, in this Presidency, we have often set before us the example of the huge tracts of Tanjore and Trichinopoly, which are irrigated without the production of excessive malaria. Of course, it is so; we do not produce rice in a field by simply irrigating it; there is something more required — the seed; and so it is with malaria — irrigation will not produce a malarial germ, but if the malarial germ exist in the soil, it most indubitably will excite its vitality and frightful increase. But the extent of mischief that can be effected by irrigation will, of course, greatly depend upon the physical nature of the soil as affecting the retention of moisture or the reverse, and the natural and artificial richness of the soil itself in organic matter. The determination of Cuddapah to follow the lead of the Municipality of Kurnool — another specially malarious tract — in demanding that no irrigation should take place within its limits is, I consider, founded on strong practical and commonsense sanitary grounds. But to deduce from this



Chairman's Remarks.

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fact that in the locality of all towns irrigation is harmful would of course be as faulty in reasoning as to point to statistics gathered from non-malarious tracts to support the argument that "irrigation generally has not been proved to be deleterious or to cause a fever death-rate high as compared with towns around which there is comparatively little irrigation" (G.O., No. 869, Revenue, dated 12th September 1891).

6. To attempt to curb favouring conditions for the propagation of malaria is the recognized method of combating it. The chief factor is undoubtedly the presence of moisture in the impregnated soil; hence, drainage is the remedy which is universally acknowledged should be the first aim of sanitary effort. In considering how best this can be applied, it is of little utility to estimate possible results of pressure on one direction causing a rise of a few inches on another. If the sub-soil water be within a short distance of the surface and the soil above it be permeable, the great factor of capillary attraction, the ascensional force of evaporation, and effects of fluctuation of the ground air circulation must all be regarded as important factors. Granted then that the soil of Cuddapah is of that description — unhappily for those who choose to live upon it — which contains the malarial germ, in what manner should we proceed to mitigate its growth? In the first place is the excessive moisture in the town site and its surroundings. Looking first of all to possible disturbance of the natural sub-soil water level, we find to the south-east the Dongacheruvu tank. Notwithstanding the opinion that this tank has something to do with the matter by the exercise of pressure, I much doubt it. The slope of the sub-soil is generally that of the soil surface, and in this case, unless it can be proved that there is an exception, the slope from the Dongacheruvu tank is very rapid to the east, and away from the town. The suggestion therefore to make a channel running between this tank and the town, so as to arrest the overflow from the Patha-Cuddapah tank made by the Sanitary Engineering department, seems to me not likely to be of practical utility.

7. The influence upon sub-soil flow seems to me to be caused by obstruction at its natural outlet by the presence of the water-logged soil within the area of the Patha-Cuddapah tank. It must be

D. O.

GOVERNMENT OF MADRAS

FORT ST. GEORGE,

February 1895.

My dear Jones,

In some recent inspection notes on Cuddapah town, Mr. King has raised the question of the best method of dealing with the malarial fever which always prevails there, Govt. has in its order referred the whole question to the Sanitary Board for comprehensive

D. O.

GOVERNMENT OF MADRAS

FORT ST. GEORGE,

February 1895.

My dear Ellis

Govt has now referred the whole question of the treatment of the causes of the malarial fever in Cuddapah to the Sanitary Board for comprehensive report. As you have recently been to Cuddapah, as you are aware of what has recently

further information.

Madras 6/2/95

(Commanders).

Occurred upon the subject,
am to ask that you will
kindly explain to Mr. Jones
& Col. Pennycuick any matters
in connection with the subject upon
which they may want informa-
tion other than that which is
contained in the official papers
already in your hands.

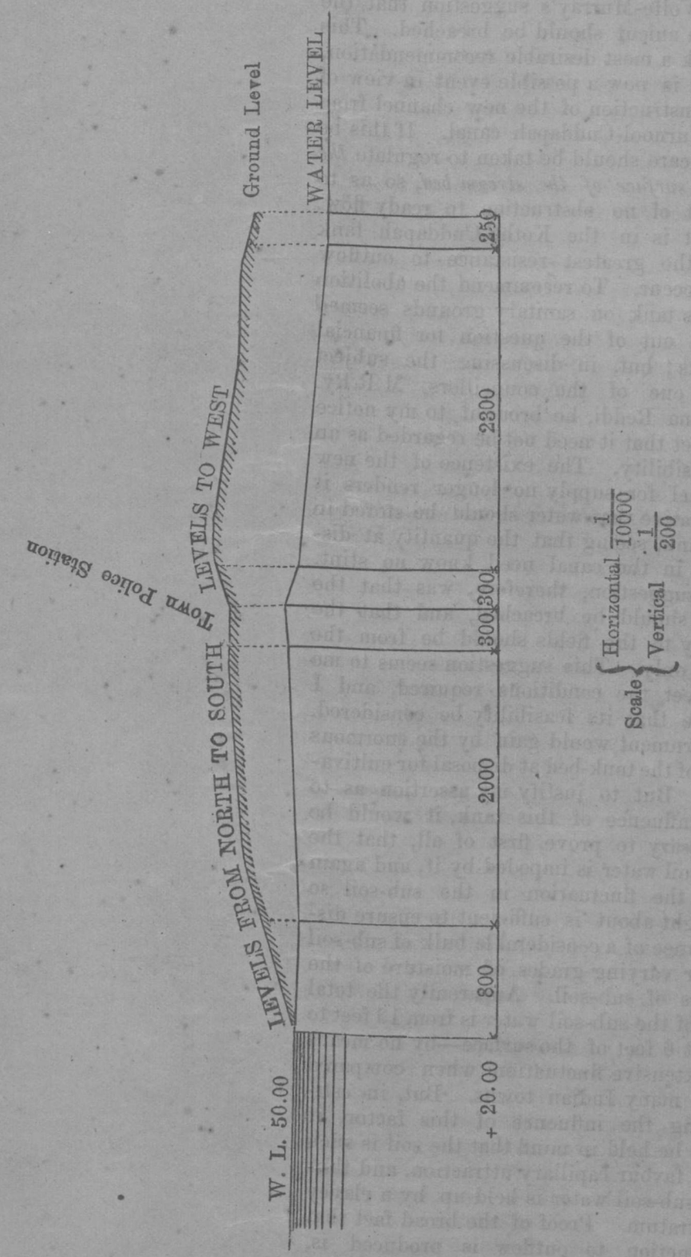
W. A. Ingalls (for myself)
6/2/55

treatment. Ellis has recently been to Caddapah to inspect the place, & has also had several interviews with the Hon. W. Bliss upon the matter, and I am to say that he will be able to explain ~~make clear~~ to you ~~yourself~~ & Col. Penny anything ~~connected with the matter~~ ~~question~~ that has taken place in connection with the subject, & the reasons which have led to the issue of the order referred to. The Hon. W. Bliss will also be glad to see you ~~upon~~ ~~the subject~~ should you require any

Inspection Notes.

remembered that the natural outlet of the Bugga springs which disappear within the soil must be most probably in this direction, and that their surface flow also in the form of the Bugga stream is backed up by the anicut. It was, I believe, Mr. Wolfe-Murray's suggestion that the Bugga anicut should be breached. This I think a most desirable recommendation, and it is now a possible event in view of the construction of the new channel from the Kurnool-Cuddapah canal. If this be done, care should be taken to regulate *the whole surface of the stream bed*, so as to permit of no obstruction to ready flow. But it is in the Kotha-Cuddapah tank that the greatest resistance to outflow must occur. To recommend the abolition of this tank on sanitary grounds seemed to me out of the question for financial reasons; but, in discussing the subject with one of the councillors, M.R.Ry. Thimma Reddi, he brought to my notice the fact that it need not be regarded as an impossibility. The existence of the new channel for supply no longer renders it imperative that water should be stored in the tank, seeing that the quantity at disposal in the canal need know no stint. His suggestion, therefore, was that the tank should be breached, and that the supply to the fields should be from the canal only. This suggestion seems to me to meet the conditions required, and I advise that its feasibility be considered. Government would gain by the enormous area of the tank-bed at disposal for cultivation. But to justify my assertion as to the influence of this tank, it would be necessary to prove, first of all, that the sub-soil water is impeded by it, and again that the fluctuation in the sub-soil so brought about is sufficient to ensure disturbance of a considerable bulk of sub-soil air or varying grades of moisture of the layers of sub-soil. Apparently the total rise of the sub-soil water is from 13 feet to about 6 feet of the surface—by no means an extensive fluctuation when compared with many Indian towns. But, in estimating the influence of this factor, it must be held in mind that the soil is such as to favour capillary attraction, and thus the sub-soil water is held up by a clayey substratum. Proof of the broad fact that obstruction to outflow is produced is, I think, fairly well exhibited in the level of wells shown in the accompanying diagram—the *datum* being the surface level of the Patha-Cuddapah tank.

Chairman's Remarks.




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Chairman's Remarks.

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8. Whilst, then, I would credit the Patha-Cuddapah tank with retaining the sub-soil water level of the town at a higher level than would be natural, in view of certain geological peculiarities of the substratum, were no such obstruction to free outflow present, the influence is not such as to produce water-logging of the soil, nor violent fluctuations of sub-soil water level. Again, if the marshy state of the Bugga bed brought about by the existing anicut be taken into account, and it be remembered that during a considerable portion of the year a large part of Patha-Cuddapah tank is not covered by water but is a water-logged or marshy area, and that this bed covers no less than 640 acres, it is conceivable that whilst no one condition can be pointed to as the sole cause of the favoured growth of the malarial germ in Cuddapah, this combination does afford the conditions required. Nor can the simple circumstance that the people live chiefly in houses having mud walls be ignored. In the close confined huts whose floors are, by way of cleaning them, damped with cowdung, and which cover a soil readily acted upon by capillary attraction from the sub-soil water below, the existence of a ring of damp wall near the foundation and where the sleeper lies, all go to afford opportunities for malarial germ growth and infection of the human being. Of course, this may seem mere theoretical nonsense to some; but, if it be true that the poison of malaria be found in the earth, even those who may question the existence of a living parasite, and would claim it to be an unknown chemical product the result of the combined action of heat, organic matter and moisture in the soil, will at least see that the existence within a foot of a sleeper's head of the poison-containing soil in a state of moisture must be favourable to the action of the poison. It has been actually demonstrated by medical men experimentally that, by taking earth from a malarious locality and placing it within suitable distance of a person formerly free of malaria and living in a non-malarious country, infection can be induced.

9. To render Cuddapah habitable, I would therefore advise that the Patha-Cuddapah tank be breached so completely as to offer no obstruction to surface drainage *in all* directions, and the supply of the fields below be effected by irrigation from the canal direct—that the bed of

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the Patha-Cuddapah tank be effectually cultivated, and, if necessary, sub-soil drained; the Bugga anicut should be breached, and the Bugga bed be correctly trained—the old Bugga channel being left open, or, if filled, being supplied with sub-soil drains throughout its length before being so.

10. The people should be taught to use houses on well elevated basements; the use of earth for making houses should be discouraged, and where poverty forbids the use of stone and mortar throughout, it should at least be employed for two or three courses of the foundation, and this should be surmounted before building up of mud by an impervious "dry course."

11. The stoppage of irrigation within municipal limits should be adhered to.

12. But it must be conceded that whilst each of the causes enumerated will go to aid the total result, one of the most important factors in maintaining the soil of the site in a condition that at once provides moisture and organic matter, is the non-removal of sewage. The typical South Indian town has its side channels which serve to remove storm water, and to, at least, distribute over the surface of the town site the sewage water of the inhabitants. But, in Cuddapah, arrangements are specially made for practically the whole of the sewage water going directly *into* the sub-soil through pervious cesspools. It need not be said that so long as this state of affairs lasts, even were the other suggestions effected, Cuddapah, in view of the fact of the soil being malarious, *cannot* be rendered healthy.

13. In this connection it would be of importance to be able to ascertain whether the late introduction of more water than has probably been used by the inhabitants formerly has influenced the

Chairman's Remarks.

The suggestions will be given effect to in all practicable cases.

The prohibition of wet cultivation refers to lands under Dongacheruvu and Patha-Cuddapah tanks within the municipal limits. Adverting to the remarks of the Sanitary Commissioner contained in paragraph 6 of the notes, if, as he says, "the slope of Dongacheruvu tank is very rapid to the east, away from the town," and if the suggestion of the Sanitary Engineer to make a channel running between the tank and the town is of no practical utility, the council doubts if the order as to the prohibition of wet cultivation, in so far as it relates to lands sloping to the east ought to continue.



Chairman's Remarks.

The present financial condition of the municipality is such that the council does not consider it desirable to go in for further loans or to undertake an expensive system of drainage.

The council has already taken on hand to give effect to the suggestions of the Sanitary Commissioner as to the bye-lanes.

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extent of moisture of the sub-soil injuriously. The water-supply was introduced in 1890, but a correct estimate of results cannot be made. Certainly, there has since that date been an increase of fever prevalence and general mortality in the town (*vide* table preceding), but the result is obscured by the fluctuations of the sub-soil water that must have been caused following the scanty rainfall of 1891 and subsequent fairly normal rainfall of 1892. Whilst, therefore, with the data available, it is impossible to state that the introduction of extra water in the town has brought about an exaggeration of malarial conditions, there can remain no doubt as to the absolute necessity for all sullage water being scrupulously removed from the site.

14. Cuddapah has been lucky in obtaining a very cheap and efficient water scheme, and it is therefore possible that there may be room in the financial conditionof the town for borrowing sufficient to secure the necessary corollary—a good drainage system. In carrying out a drainage scheme, there ought to be no two opinions as to the form it should take, namely, an underground separate system *supplemented by free sub-soil drainage throughout the town.* In this instance I would strongly deprecate the use of the "open drain" system unless it also were supplemented by sub-soil drainage, resulting in a very incongruous and expensive combination. On this being completed, in addition to the above suggestions, the death-rate of Cuddapah ought to show a decline, and the fever rate should rapidly fall.

15. *Roads.*—The main roads are in fairly good order, but the result of steady increment to their surface whilst the bye-lanes have been neglected has resulted in these being below the surface level of the main thoroughfares. The result is blockage of surface drainage, a most undesirable effect in this malarious town. The Chairman is, however, alive to this condition of affairs, and has already directed the raising of five of the smaller roadways. This process should be carried out systematically, and should be regarded as a matter not only of public convenience but of hygienic import.

16. *The water-supply* is derived from a body of water above the town, which, according to season, exhibits itself above

Inspection Notes.

the ground in the form of springs, or disappears and forms an extensive sub-soil flow. It is unfortunate that at the site this water is tapped there exists a well filled graveyard which, up to January 1893, was still in use. One body had, on the visit of the Deputy Sanitary Commissioner in December 1893, also been surreptitiously buried. I believe this condition of affairs is now finally put a stop to.

17. The water-works site is held in veneration by certain castes of Hindus. There is a small temple on the spot, and a chattram in which pilgrims are accommodated. Two large wells exist, or, rather, enclosures of springs, which are used by pilgrims to bathe in; one of these has been breached, so as to enable a full flow to proceed to the water-works gathering ground. Further, yearly some thousands from Cuddapah and adjoining villages assemble here for the celebration of a festival, in which the sacrifice of animals forms a prominent part. Again, a pious Hindu is collecting material for enlarging the chattram for the accommodation of pilgrims. Caution is necessary in these matters. The whole area should be carefully conserved, so that the bare possibility of contamination by a human being should be out of the question. I understand that the land belongs to a Muhammadan. It would be advisable for the municipality to buy up the whole and to attempt to arrive at some understanding with the trustees of the temple as to bathing in the springs and celebration of the festival. It seems to me whilst worship in the temple need not be interfered with, that there are probably no religious grounds why the festival should take place on the present site, that is, within the immediate surroundings of the temple. In any case, purchase of the land would give the municipality the right to completely control the acts of those they might permit to enter their land during the festival season irrespective of the protection that could be claimed by them under sections 155 and 150.

18. Including the families, there are thirteen persons on the water-works staff at this spot. No latrine has, however, been provided by the municipality. It requires but an attack of typhoid or cholera in their households to scatter death broadcast among the inhabitants of the town. Not only should a faultless form of

Chairman's Remarks.

The council will give effect to the suggestion making provision in the next budget.



Chairman's Remarks.

Care will be taken that, in future, no applications for private service will be granted when the waste water is likely to lead to contamination of the water-supply or to the premises becoming insanitary. Extra rates cannot be levied if water is used for domestic purposes only. Water is not allowed for other than such purposes at present.

In case of poor people, considerable difficulty will be felt in inducing them to construct cesspools of the approved pattern suggested by the Sanitary Commissioner, but steps will be taken by the council to introduce the system recommended gradually when funds are available.

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covered latrine be provided, but care should be taken by frequent inspections that the conservancy of latrines and surroundings is perfect. A *daily* report that an inspection of conservancy arrangements has been made should be demanded by the Chairman from the Engineer in charge of the water-works.

19. Several of the inhabitants have introduced the pipes into their houses. The extension of this system should not be favoured by the municipality. In such cases extra rates should be demanded and the supply be gauged by metre. A condition that should be insisted upon is that the tap is placed in such a position that it can be seen at all times by persons of any caste (section 148).

20. Neglect of this precaution is liable to lead to much waste and to contamination of the water-supply by careless habits, owing to aspiration of air and fluids under special conditions. Some arrangements should be made to enable the municipality to cut off the supply at intervals of a week as at present whilst cleansing the reservoir. Direct pumping to the town has apparently been followed by the bursting of certain of the mains; but presumably, on the municipality consulting the Sanitary Engineer, either an air vessel, stand-pipe, or other mode could be arranged for. Every effort should be made to render the supply as absolutely *constant* as the amount of water available will permit, and this apparently would be possible for nearly all the year round.

21. *Drainage.*—Practically no drains exist beyond side channels for storm water. Sewage water is in nearly all cases received into pervious cesspools. I have already remarked upon the serious influence for evil so caused, and as to the advisability of the early adoption of a complete sewerage *plus* a careful sub-soil drainage scheme as essential for the remedy of this undesirable state of affairs. In the meantime the municipality should insist that cess-pools are built of approved patterns, and are rendered with Portland cement and have a backing of concrete or puddled clay so as to be impervious. This should be insisted upon at once, in the case of the chattram owned by Soobya Chetty, from which the discharge of sullage water is evidently of very great amount.

| Inspection Notes. | Chairman's Remarks. |
|---|---|
| 22. I was glad to find that the present Chairman has, since taking over office, exerted himself to get rid of the unsightly pools caused by the waste water from taps by diverting the water to petty ornamental plots of vegetation and trees. This method should be systematically pursued. | |
| 23. *Conservancy.*—There are forty-two latrines in the town; all are of the common open-space pattern with the exception of two. The latter are suitably divided into compartments by Cuddapah slabs, but the back of each is plastered with common mortar. This should be removed, and cement plaster be substituted. The drains are square and are also mortar-plastered; here, also, Portland cement should be used and the drains should be altered to the egg-shape. The walls, unfortunately, also are formed of very rough laterite. This should either be cement-plastered, or be painted freely with boiling pitch and tar. In certain of the latrines Cuddapah slabs are used for the walls. Provided these can be so sunk as to be in no danger of becoming irregular, as I found had been effected in one instance, no better material could be used. Indeed, in Cuddapah, there ought to be no difficulty about making fairly efficient latrines with this admirable stone at disposal. I enclose a plan (will follow) of a cheap form of latrine made from this material for information. The masonry walls therein shown might well be substituted by Cuddapah slabs, and for the pathway Cuddapah slabs above the concrete might also be substituted. There would thus be presented for the whole latrine a completely smooth surface of Cuddapah slabs, which could be kept absolutely clean by flushing with little trouble. I need hardly add that each joint must be carefully pointed with good Portland cement, and the slabs should be smooth and regular in section. | The suggestions will be carried out when funds are available. |
| 24. Earthen tubs are used for receiving the urine; these should be substituted by iron tubs, or, at least, the earthen tubs should not be employed till rendered fairly impervious by the use of tar and pitch. | Ditto Ditto |
| 25. Burnt paddy husk is used for deodorization. The amount of carbon available in this must be very small, and hence deodorization cannot be complete, although doubtless the value of the night-soil may be added to as manure. Dry-earth should be used. | Will be attended to. |



| Chairman's Remarks. | Inspection Notes. |
|---|---|
| The council fully concurs with the views expressed, but is unable at present to carry out the suggestions. | 26. Each latrine should have a toty on the spot, at all times during the day. In no other way can latrines worked on the dry-earth or separate removal system be kept in a condition in which it is possible for a human being to enter into them without disgust. Near each latrine quarters for the toties (man and wife by preference) and a store for dry-earth should be erected. Of course, this may be an expensive measure, but if latrines are to be used by the people they must be kept in a state which shall not call forth repugnance; without complicated mechanical arrangements this is the only mode that will secure cleanliness. |
| Since abolished. | 27. At Ammapett is a most unsuitable form of latrine. It is, in any case, far too close to habitations and should, on this ground, be abolished. It seems to have been built upon a most crude plan, as it permits, notwithstanding apparently the inception of measures to prevent this, contamination of the soil, and exposure of fœcal matter to the public view. |
| The council will do its best to increase the number of houses served with private scavenging system and will reduce the rate to be levied per head when it is expedient to do so without prejudice to the revenue. | 28. *Private Scavengering.*—There being no less than 7,574 Muhammadans of the entire population of 17,379, it stands to reason that a large field for private scavengering exists. Only 613 houses are, however, attended to under this system. The charge made is eight pies per head per mensem, excluding children. An effort should be made to reduce this charge. With careful management, it is probable that six pies per head should cover the cost of collection, and this seems quite as much as most of the poorer classes are willing to give under a voluntary system. |
| The council is not in a position to adopt the suggestion as to rubbish carts for want of funds. | 29. *Rubbish* is removed in vehicles of the country-cart type. These should gradually be replaced by the municipality supplying wooden skeleton-carts lined with sheet iron and provided with covers. |
| Provision will be made in the next budget. | 30. *Night-soil* is removed in four carts. These are wooden. They should be replaced by iron carts directly those in use show signs of wear. |
| Will be attended to. | 31. *Rubbish and Night-soil Depôt.*—More care is required in the arrangements carried out here, although trenching has been effected more systematically than in most towns. The trenches should be laid in regular order and should be constantly of one size. Neat paths should be made between each series of trenches. |
| Ditto. | 32. Each day's collection of rubbish should be covered with four inches of earth. |

Inspection Notes.

33. Rubbish and night-soil obtain a good sale. The following sums were realized during the last three years:—

| | Rs. |
|---|---|
| 1891-92 .. .. .. | 430 |
| 1892-93 .. .. .. | 404 |
| 1893-94 .. .. .. | 610 |

The making of poudrette on the system successfully pursued in Poona is recommended to the attention of the municipality. A communication on this subject from the Secretary to the Poona Municipality will be found printed in the "Proceedings of the Sanitary Commissioner" for the second quarter of 1894.

34. *General Conservancy.*—In the more scattered parts of the town there was evidently much neglect as to rank vegetation on private lands. Ruined houses forming resorts for easement were also frequent. A particularly bad instance of the latter was found in the house of Silar Bee, who has long been absent from the municipality and has retained the house shut. Every house that is roofless should after due notice be demolished by the municipality; the debris being but of mud can have but a nominal value, and, if not claimed within a definite period, might be usefully employed as the filling for the depressed road above referred to.

35. *Markets—Butchers' Stalls.*—The old boxes on which the butchers expose their meat for sale should be abolished. Iron rails with steel hooks should be provided, on which the meat should be hung. The blocks used for cutting meat should be retained in a cleanly condition, and it should be seen that each butcher planes his block before commencing his day's work. The flooring of the pyals, which is formed of Cuddapah slabs, should be relaid; all irregular slabs should be removed; the joints should be cement pointed. The pillars should be painted with white silicate paint, so that dirt can be at once detected and be removed by washing. Small egg-shaped drains with plastered Portland cement should be provided in front of the pyals. The water-pipes should be taken on to the pyals, so that a tap can be at the disposal of each holder of a stall for instant washing and cleansing, as may be desired.

36. *Slaughter-houses.* — The cattle slaughter-house is well constructed, and is maintained in a cleanly condition. The available space is, however, insufficient,

Chairman's Remarks.

Will be attended to.

The instructions will be attended to.



Chairman's Remarks.

Provision will be made in the next budget.

Provision will be made in the next budget.

Ditto ditto.

Will be attended to.

Inspection Notes.

so that, at present, slaughtering is carried on in the rooms meant for cooling of carcases. There is a prepared space between the slaughter-house and the wall, which could be made available by covering it with corrugated iron roofing. The interior of the slaughter-house would be improved by raking out the mortar joints and substituting cement pointing. The water available is from an open well. As the public water-supply is immediately outside, this should be introduced, and the well be closed, or its water be only used for flushing purposes; this could be arranged by giving the slaughter-house superintendent charge of the key. On the outside the cistern for receiving washings is not in the best state for retention of cleanliness. It should be lined with cement throughout instead of being in part mortar plastered as at present. It should then be well tarred at intervals. The provision of a small iron hand-cart having a frame work around it and steps for approach, so as to permit of the gut contents being opened immediately over it, would be of advantage. The gut contents should not be allowed to be scattered over the flooring.

37. *Sheep Slaughter-house.*—This is neatly and efficiently floored with Cuddapah slabs; but no provision is made for affording shelter during rainy weather except in the cooling room, which is unsuitable for the purpose. Arrangements should be made to secure shelter by the use of corrugated iron and old rails.

38. The remarks as to water-supply made in regard to the cattle slaughter-house apply here also, in their entirety.

39. *Graveyards.*—No burials are permitted within town limits. The Muhammadans have a burial-ground in a suitable spot well away from habitations—made over to them by the municipality. Care should be taken to see that the ground is not wasted. The graves should be made in regular order, with suitable paths between each series. It should also be seen that the graves are correctly protected from the ravages of dogs and jackals. Certain of them were seen to have been emptied of their contents.

40. The Muhammadan burial-ground is, however, in very neat order compared to that used by Hindus, near the head of the new channel to Patha-Cuddapah tank. No system as to laying out the graves is here ordered. The

Inspection Notes.

contractor making the bank for the new channel seems not to have had much respect for the dead, as the bund for a long distance and the graveyard itself have scattered over them skulls and bones. This graveyard should be reduced to order. The vettyans should be licensed under section 242, and a peon should be stationed both here and at the Muhammadan burial place. Burial should be carried out in regular lines, so as to economise space. All rank vegetation, which at present especially gives the place the air of absolute neglect, should be cleared away.

Chairman's Remarks.

Will be attended to.

41. *Vaccination.* — The vaccine depôt consists of a very small room of about twelve square feet, opposite the market. The calf is kept on the plain ground in front, under the shelter of the verandah. This arrangement is unsuitable. A special building providing accommodation for the calf and for the persons to be operated upon should be erected. On the municipality intimating to me that it is willing to make this provision, details as to its character will be supplied.

The vaccination depôt has been removed to the premises of the hospital and a separate shed is provided for the same.

42. Compulsion is ineffectually carried out. The Chairman should issue notices and compel the attendance of the people at a suitable depôt, both for the operation and subsequent inspection. On inspecting the register, on 23rd August, I found that no action had been taken by the municipality to enforce vaccination in cases that had refused the operation, although this refusal had been brought to notice by formal letters of the vaccinator, viz., 20 cases reported on the 2nd August, 21 on the 21st July, and 13 on the 15th March. Fifteen cases reported in January were not prosecuted till April 1894. The vaccinator's instruments were cleanly, also his person; the register was neatly kept.

Steps are being taken for prosecuting the cases of neglect and nearly cases are pending before the Magistrate.

43. The following is the result of the vaccination of children who had attained six months of age and over during the preceding twelve months :—

| Total births registered during preceding six months. | Number vaccinated. | | Number vaccinated a second time, because first operation proved unsuccessful. | | Postponed under Medical certificate at the end of six months. | Died. | Left the town. | Unaccounted for. | Ratio of successful vaccinations to total births per cent. |
|---|---|---|---|---|---|---|---|---|---|
| | Successful. | Unsuccessful for the first time. | Successful. | Unsuccessful. | | | | | |
| 117 | 98 | 18 | 24 | 9 | 33 | 1 | .. | .. | 104·2 |



Chairman's Remarks.

Inspection Notes.

44. The following table exhibits the total results of vaccination up to date :—

| — | 1890. | 1891. | 1892. | 1893. | 1894 up to June. |
|---|---|---|---|---|---|
| Number vaccinated .. .. .. .. .. .. .. | 624 | 746 | 593 | 406 | 310 |
| ,, ,, successful .. .. .. .. .. | 571 | 738 | 575 | 346 | 288 |
| ,, ,, under one year of age .. .. .. | 164 | 356 | 239 | 98 | 99 |
| ,, of births registered .. .. .. .. .. | 315 | 367 | 568 | 279 | 112 |

Will be attended to.

45. In a result-grant school where the boys were of from 5 to 12 years of age and chiefly Muhammadans, it was found that of 33 examined only 11 were protected by vaccination, 12 had had small-pox and 10 remained unprotected—a result that must be characterized as very bad.

46. *Registration.*—One registrar on Rs. 10 is maintained. Only three prosecutions for failure to register have been undertaken since April 1894. It is probable that this represents unnecessarily lenient treatment on the part of the municipality. Sign-boards directing attendance at the office of the municipality of informants should be placed in several public resorts, so that the requirement may be kept constantly before the public. At intervals also it might be arranged with advantage to bring the matter to the notice of the uneducated by the use of the "tom-tom."

(Signed) C. CHELLAYA PILLAY, *Chairman.* (Sd.) W. G. KING, Surgn.-Lt.-Col., *Ag. Sanitary Commissioner.*

Fort St. George,
21*st September* 1894.

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Forwarded.

(Signed) J. HEWETSON,
*Acting Collector.*

18*th November* 1894.

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From Surgeon-Lieutenant-Colonel W. G. KING, M.B., C.M., D.P.H., Acting Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Fort St. George, 24th January 1895, No. 144-S.

With reference to memorandum, No. 29, dated 16th January 1895, Local and Municipal, I have the honour to state that, on consulting the Sanitary Engineer on the subject, I find that the channel referred to in paragraph 6 of my inspection notes is that sanctioned by Government in G.O., dated 15th December 1894, No. 1107, Financial.

ORDER—dated 7th February 1895, No. 182 M., Local and Municipal.

Recorded.

2. Paragraphs 5—14 of the Sanitary Commissioner's notes will be referred to the Sanitary Board, which will be requested to go fully into the causes of the malarial fever in Cuddapah, and to suggest comprehensive measures for removing them as thoroughly and completely as may be possible.

3. The Chairman has not reported the action which the council proposes to take on the Sanitary Commissioner's suggestions in paragraphs 17, 20 and 33 of his notes. This omission should be supplied.

4. With reference to the Chairman's remarks on paragraph 19 of the notes, his attention will be drawn to section 147 of the District Municipalities Act.

(True Extract.)

J. F. PRICE,
*Chief Secretary.*

To the Chairman, Municipal Council, Cuddapah.
" Collector of Cuddapah.
" Sanitary Board.
Editors' Table.

Exd. A. Raitt.

# Govt. of {1895} Madras.

## LOCAL AND MUNICIPAL.

*Issued*

*Recd.* *Encl.*

G.O., 7th Feb. 1895, No. 182 M.

FEBRUARY.

### Inspection Notes.

Recording, with remarks, Sanitary Commissioner's — on the Cuddapah Municipality.

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