

Revenue (1897) Department.

MISCELLANEOUS SERIES.

G.O., No. 3012

DATED 14th June

[Despatch Abstract.]

Communicating to the P^o of Rev. Pro: of the
L & M Dept. Communicating to the L.P^o
Concerned for early attention the Sanitary
Commissioner's Inspection notes on certain
rural areas in the S. West &c etc.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Government {1897} of Madras.

LOCAL AND MUNICIPAL. Current no. 4766



Recd. 5-6-97 } 1897. Enclosures
 Regd. 7-6-97 } Spare copies

G.O., No. 952 L., 17th May 1897.

L.S.O. (Mm) No. 3012 of 16th June 97
 Communicated to the
 Board of Revenue with reference
 to para 2 of the L.S.O.
 MAY. *W. C. C.*

Inspection Notes. *27-11 June 97*

Communicating to the local boards concerned, for early attention, the Sanitary Commissioner's — on certain rural areas in the South Arcot district, drawing the attention of the Collector to certain paragraphs of the inspection notes, and remitting for consideration by the Public department the suggestion of the Sanitary Commissioner in paragraph 13 of his notes on Vriddhachalam.

2-9-97

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following paper:—

From Surgeon-Lieutenant-Colonel W. G. KING, M.B., C.M., D.P.H., Sanitary Commissioner for Madras, to the Secretary to Government, Local and Municipal Department, dated Fort St. George, 2nd April 1897, No. 803-S.

I have the honour to forward herewith inspection notes on certain rural areas in the South Arcot district. Their submission has been delayed by the fact that it was found requisite to send the notes to the President, South Arcot District Board, in the first place, to enable him to decide as to selection of a certain site at an early date.

2. I would respectfully invite the attention of Government to the suggestion made by me in paragraph 13* of the notes.

* Under Vriddhachalam.

ENCLOSURES.

INSPECTION NOTES of the Sanitary Commissioner for Madras.

RURAL TRACTS, SOUTH ARCOT DISTRICT.

VRIDDHACHALAM.

Inspected from 7th to 9th October 1896.

	Males.	Females.	Total.
Population	3,979	3,915	7,893

The chief source of water-supply of this town is the river Manimukta. No attempt has been made in any way to preserve its purity; persons wash, bathe and drink side by side. Permanent marks should be put up showing where drinking water is to be conserved, and where bathing, &c., is to be allowed.

2. The Ammakolam is also a favorite source of supply. Entry for withdrawal of water is permitted, so that much risk of contamination is undergone. It would be advisable for the union to arrange platforms—*vide* diagram—or for the use of pumps, or “Sultan’s lift” and prohibit direct withdrawal. The depositing pit or catchpit is much silted up and should be carefully cleaned out. Considering the method of supply, it would not be possible to attempt anything in the way of filtration before allowing the water to pass into the tank; but it would be possible and be of utility to prevent the finer suspended matter passing in by arranging a series of wire screens at the catchpit so as to strain the water.

3. As might be expected, therefore, cholera is a frequent visitant. Indeed, were it possible to place any trust upon the vital statistics gathered by the village karnam, it would be necessary to believe that 27 per cent. of the total mortality was so caused. But presumably the fact that a death results from cholera has had more influence in

inducing the karnam to resort to his register than deaths by other causes. I append the statistics secured, from which it will be seen that throughout they are grossly defective, no birth being shown. A separate note on this subject will be communicated to the Collector:—

Years.	Percentage of deaths from					Death-rate per mille of population.
	Cholera.	Small-pox.	Fevers.	Dysentery and Diarrhœa.	All other causes.	
1894	22	1	11	..	66	19.8
1895	1	1	26	..	72	18.6
1896 up to 31st October 1896 ..	27	..	10	1	62	21.7

4. Nor can it be considered that vaccination is conducted with any attempt at thoroughness, as exhibited by the following statement:—

Name of Union.	Years.	Total number vaccinated.	Total vaccinated successfully.	Number vaccinated successfully under one year of age.	Date of vaccinator's visit to the union.	Number vaccinated by the vaccinator each time.
Vriddhachalam ..	1894	21	20	4	5th April 1894 ..	21
	1895	167	163	58	2nd Jan. 1895 ..	13.
					5th June „ ..	10
					6th July „ ..	37
					7th „ „ ..	29
					20th Oct. „ ..	23
					21st „ „ ..	55
					4th Jan. 1896 ..	22
					25th July „ ..	15
	1896 up to September.	42	39	8	11th Aug. „ ..	5

5. On a population of 8,369 at the intercensal rate of increase for the whole Presidency (12.49), there should have been between January 1894 and January 1896 933 infants available for vaccination, being the survivors of six months after birth; yet, the total exhibited in the above table does not amount to more than 24.7 per cent. of the number. It is evident that here also, there has been a want of attention by the village heads. It would be advisable for the panchayat to recognise the fact that, on account of the large size of the town, the ordinary village system for controlling registration and vaccination is liable to break down, and that, in the interests of the people under their charge, it is advisable they give all aid feasible in the matter of gathering statistics and aiding the acceptance of vaccination.

The following is the staff and plant employed:—

- One maistry on Rs. 8 per mensem.
- Ten sweepers at Rs. 4 each per mensem.
- Three toties at Rs. 6 each per mensem.
- Four rubbish carts drawn by men.
- One hand-drawn night-soil mounted bucket.

6. It need hardly be said that the arrangements for excreta removal are very inadequate, it being impossible to remove the excreta of 7,893 people in a conservancy bucket of 2½ cubic feet capacity. The methods advised at page 83 of this office proceedings for the second quarter of 1896 should be followed, in default of sufficient funds being available. I see that funds are allotted for purchase of dustbins. I think these might be usefully devoted for erection of latrines as per simple designs herewith.

7. The “Chief sanitary inspector” is a maistry on Rs. 8 per mensem. It cannot be supposed that the task of keeping the union accounts and correspondence tell severely on the clerk attached to the union. It seems to me that it would be advisable

to secure a man who has at least passed the "Elementary Hygiene Test" (Technical Examination) who should undertake both the duties of sanitary inspector and clerk to the union. There would thus be secured a better class of sanitary supervision.

8. Efforts should be made to prevent the practice of digging pits whence to obtain material for house building.

9. Vacant village sites are those chiefly used in this manner, and it should therefore be within the power of the Revenue authorities to put a stop to it. Certain of these pits are practically tanks that receive the sullage and surface drainage from the neighbourhood. This condition of affairs cannot be otherwise than sanitariously undesirable. It would cost a very heavy amount to fill these in. The best course is for the union to hold the matter in mind, and to make these pits the place for dumping *clean material* from walls of abandoned houses and the like. No rubbish should be employed.

10. *Pudupett.*—This is a hamlet of Vriddhachalam, situated on the banks of the river Manimukta. It is within a semi-circular depression bounded by table land extending to the north-east and south-east, whilst to the west the open ground faces the river. From this table land pass springs towards the river; springs appear at the surface freely in the land on which the hamlet is situated. It was formerly a spot held in great respect with regard to healthiness, and was therefore deemed a desirable abode for pensioners on leaving the service of Government. Of late years, however, malarial fever has affected the inhabitants so severely that they have rapidly diminished from mortality from this cause and from wholesale removal from so unenviable a site. Various theories have been advanced as to this sudden change of sanitary conditions, and equally various modes of remedying these have been suggested to the district board. Under these circumstances, before finally taking action on local recommendations, the Collector of the district invited me to inspect the spot. Too much shade by the growth of trees, obstruction of the sub-soil water—which is near the surface—by means of roads, silting up the surface drains, and growing foulness of springs owing to increase of cultivation, &c., had been suggested as the cause of the change. The remedy proposed has been improved drainage of the surface and of the sub-soil. The local recommendations are sound; but as I believe the cause of change of condition is due to less easily remediable causes than the obstruction produced by roads and silting of channels, I consider that the course advocated by Mr. Holmes, and latterly by Mr. McIver, of finally abandoning the site, is that which can with best economy be followed.

11. It is not possible from either official records—for as noted above the registration system in this town has been very defective—nor from the "oldest inhabitant" to ascertain precisely when the change commenced; but, as far as I could discover, degeneration of health of the inhabitants first was noticed about 1878, but did not become aggravated till after 1880. Now these periods correspond with the appearance of two factors, that must have been of influence in the formation of the river bed. In the former, the bridge over the Manimukta was completed. About the latter, there occurred a flood in the river, which many witnesses allowed radically changed the formation of the river bed. Looking from the bridge up the river, the fact that a great silting process has been going on above the bridge out of all proportion to the state of the river below is at once apparent. Judging by the eye, there is certainly over two feet accumulation above what was probably the original bed of the river at this place. The "oldest inhabitant" witnesses declare that opposite Pudupett in former days before construction of the bridge—which by the way has very narrow arches—the flow was swift, and that no pools such as now are found existed. What I believe, then, has occurred is that, as a result of the obstruction offered by the narrow arches of the bridge and some great change in the shape of the river bed during the flood alluded to, silting has occurred to such an extent as to obstruct the exit of the enormous amount of sub-soil water in the form of springs, that must find exit *through the banks of the river*. Judging by the condition of wells and the appearance of springs at the surface in various parts of the hamlet, and coupling their present state with the information given by witnesses, I should think that so long as Pudupett remained healthy, the springs flowed underground in well-defined courses,

but that the effect of the obstruction has been to make them spread over a greater area and thus *moisten* much more ground than formerly. If, therefore, my surmise as to cause be correct, to relieve the sub-soil it would be necessary to run a trench between the river and the town at a depth that would tap the sub-soil water throughout, and continue this down the river to a point below the bridge that would enable a good point of discharge to be obtained. This would, I believe, be more expensive than the hamlet is worth; hence my opinion in favour of the proposal to give the villagers another site and use this for the only purpose it is fit for, namely, cultivation.

12. In ascertaining the comparative merits of sites that had been selected, curious evidence was obtained as to the markedly limited character of the malarious area. This I established by using the spleen test—that is, examining the groups of the inhabitants as to existence of enlargement of the spleen and its degree. In the lower parts of the hamlet, of 48 persons examined haphazard only 5 had no enlargement, in 25 the spleen extended so as to more than half fill one side of the abdomen or touch the mesial line, in 3 it extended beyond the mesial line, and in 15, it was sufficient to fill one quarter of the abdomen or less. One of the sites selected was near the Sheikh Madar's well. The water was, at time of my examination, four feet below the surface, but during the north-east monsoon the water overflows on the surface. It was proposed to raise this site, but irrespective of the cost, this hiding of facts will not prevent the proximity of the sub-soil water to the surface keeping the soil constantly damp and thus aiding generation of the malarial micro-organism. It would therefore not be desirable to select this site. As, however, it was contended that the position was healthy, I examined the inhabitants of the neighbouring houses but found that although, as might be expected from its position, the locality was not so unhealthy as the lower and more saturated grounds, still it was not out of the influence of malaria; 22 per cent. of the cases examined had enlargement extending to one half the abdomen, and 11 per cent. to a less extent. The area permeated by springs would seem to have a limit on a line with the missionary's bungalow, and *all below this ridge to the river should therefore be avoided as a site*. In my opinion, the best of the suggested new localities would be the so-called "bungalow site" provided care be taken not to extend it towards the missionary's bungalow nearer than 150 yards. That this line will secure safety is well shown by the condition of the par-yards. *cherry which is in the neighbourhood*. I examined 26 of the inhabitants haphazard, and found only three cases of slight spleen enlargement. These instances were in the cases of boys who were in the habit of grazing cattle in the land of Pudupett, and drinking the water from the wells and rivulets there. The remaining inhabitants of this parcherry were in absolutely good health. Taking into consideration the fact that, although fever in Vriddhachalam is far from unknown, it is by no means common or severe—that is, it cannot be classed as an unusually malarious locality—it follows that on one bank of the river Manimukta there is no unusual amount of malarial fever prevalence, and that on the other it is so intense as to be uninhabitable, and that the area so affected is probably not more than half a mile square, and sharply limited by conditions noted above affecting the proximity of the sub-soil water to the surface.

13. Our present knowledge of malaria is limited to the fact that in man a parasite—the *Plasmodium malariae*—is found in the blood of those affected with malarial fever. The supposition is—and this is founded upon long records of experience—that this parasite has a stage of its existence in special, not all, soils; that a certain amount of heat—not excessive—the presence of moisture and, especially, of organic matter in a state of change are the conditions which place this parasite, or its representative in some other changing form, capable of quick propagation and increase. Further, that, when water that has been in contact with such soil is used unboiled and unfiltered for drinking purposes, infection occurs; it is held also that in a manner (difficult to account for in the state of present day knowledge) currents of wind are liable to waft this poison beyond positions in which it was propagated. But neither from the soil nor from water has the malarial parasite been segregated. Much interest in the medical profession has lately therefore been elicited by Dr. Patrick Manson showing that the malarial parasite is demonstrable in mosquitoes that have sucked the blood of patients suffering from malarial fever. Reasoning on

facts already ascertained by him in connection with mosquitoes that have imbibed the embryos causing elephantiasis from patients suffering from filariasis dying upon water and so infecting it, Dr. Manson has pointed to the possibility (by certain analogies in connection with the life history of the mosquito) of this insect having some yet incompletely determined sphere in the life-cycle of the malarial parasite. To this subject Surgeon-Major Ross, now Acting Residency Surgeon, Bangalore, has by independent observation contributed several important details, but the complete problem remains unsolved. It is of course possible to connect increase of moisture, which sanitary observations show is so great a factor in encouraging the propagation of malaria, with increased propagation of mosquitoes. Whilst, therefore, the manner in which this increased diffusion of moisture in the soil has occurred seems sufficiently clear, it would be of much importance if this possible connection between the mosquito and malaria could be ascertained by special observations. I would therefore advise that Surgeon-Major Ross, who thus far has ably contributed to this enquiry and has made the subject a speciality, should be deputed to pursue the mosquito theory at Pudupett. I know of no locality in this Presidency where the study could be conducted under so favourable circumstances. As shown above, the area affected is extremely limited, and in consequence all factors concerned are as thoroughly within touch as if the whole matter were being conducted as a laboratory experiment. At the same time, as a result of the area being so limited, the observer can himself live within a few hundred yards of the spot and enjoy a comfortable bungalow without risk to his own health. If, therefore, the missing links in the mosquito theory can be gathered, *this is certainly the spot to select for their discovery.*

14. In using the "bungalow site" for the new village, care should be taken to abolish the tank. Wells should be sunk, and these should in each case be covered and be served by pumps. The area should be carefully laid out in accordance with plans available with the Sanitary Board, and correct arrangements should be made for drainage and conservancy. Money spent on these matters would be of advantage, and would imply a far better policy than occupying a site, making it insanitary, and then endeavouring to rectify it.

Should the village ever increase in size, it ought to be possible to bring the Kundyan-kuppam springs by pipe into it. One of the local fever explanation theories has been that these springs have been contaminated by high cultivation on the table land; but this opinion is, I think, without foundation. The scum is due simply to passage of the water through ferruginous soil and subsequent aeration on the surface.

KUNDYAN-KUPPAM.

Inspected 7th October 1896.

In this village, I found that 31 cases of cholera had occurred and that many of the people had fled from the place. There was but one drinking-water tank formed from surface water, and this doubtless had become contaminated by washing infected matter, hands, clothes, &c. I arranged for its disinfection by the alum and lime process, and had shallow wells dug at the side of the tank so as to prevent direct ingress to the water for withdrawal. Permanent pot-wells arranged as per diagram might be sunk here with advantage.

2. All the cases of cholera had been entered by the karnam under the column for "dysentery and diarrhoea." This he had not done for the purpose of concealing the nature of the disease as he had duly reported the existence of it to the Tahsildar, but simply as a result of careless arrangement of the heading in his manuscript copy. In my letter, No. 3643-S., dated 30th August 1890, I pointed out this factor in evil registration to Government, and in Proceedings, No. 315, dated 21st October 1890, of the Board of Revenue, it was ordered that all karnams should be provided with printed copies. In this district, I found that the system of merely supplying a heading and using manuscript columns was pursued. This I advise be remedied.

3. The condition of cholera infection and hopeless condition of scare amongst these people brings forcibly to mind the unprepared condition of the rural parts of this Presidency to meet epidemics. In this instance, there was available for a circle extending over many miles in area that was affected with cholera but one solitary

medical subordinate, who had done his best by going hither and thither to attend cholera outbreaks; still, it had not been possible up to date of my visit to render these people aid of any description. In my opinion, it is essential that each district board should have at disposal a staff of certificated sanitary inspectors.

4. During the hot season, the villagers have to journey to Vriddhachalam—say, two miles off—to obtain water. An attempt at sinking a well had been made, but no sub-soil water had been struck at 40 feet, showing that, as found in Pudupett and its immediate surrounding, the springs proceed in definite directions and that the true sub-soil water of the locality is not held up close to the surface. Indeed, it would appear probable that the springs in the neighbourhood of this village and Pudupett are derived from the hills to the south—some 20 miles distant—and here are brought to the surface.

With these springs at hand, the people of Kundyan-kuppam ought not to require to pass them to go to Vriddhachalam for water. I advise, therefore, that wells be sunk on the bank of the nullah close to the spot where in ordinary season the springs are found oozing at the surface. The people would then have not more than half a mile instead of two miles distance to walk to procure water in the hot season.

BHUVANAGIRI.

Inspected 4th October 1896.

The following are statistics in respect to the birth and death rate and results of vaccination. The record of births is most unsatisfactory; that of deaths alarming:—

Years.	Birth-rate per mille of population.	Death rate per mille of population.	Percentage of deaths from					Death-rate among infants under one year of age per mille of births in the preceding year.
			Cholera.	Small-pox.	Fevers.	Dysentery and Diarrhoea.	All other causes.	
1894	19.3	35.7	34.1	..	22.6	0.2	43.1	152.8
1895	22.9	36.4	29.4	3.8	15.6	..	51.2	117.2
1896	27.5	28.1	38.0	..	12.5	1.1	48.4	..

Years.	Total number vaccinated.	Number vaccinated successfully.	Number vaccinated successfully under one year of age.	Date of vaccinator's visit to the union.	Number vaccinated by the vaccinator each time.
1894	230	227	29	28th Oct. 1894 13th Nov. " 8th " "	51, 42, 30, 37, 22, 48 = 230.
1895	181	121	19	6th Jan. 1895 27th July " 31st Oct. " 31st July " 26th Aug. "	24, 42, 36, 31, 15, 23, 10 = 181.
1896	242	230	60	19th Sept. 1896 4th July " 23rd Jan. " 10th June " 28th Sept. "	14, 26, 16, 22, 28, 31, 31, 16, 21, 37, = 242.

2. From the table of mortality, it will be seen that no less than 38.0 per cent. of registered deaths are due to cholera, and that, having regard to the few births registered, the deaths of infants under one year of age are absurdly small, being only 117.2 per mille of births, which is far too good to be true.

3. The town is situated within six miles of Chidambaram on the river Vellar, and has the apparently well-earned reproach of being one of the sources of infection of

that town with cholera. This may well be the case, seeing the considerable traffic there is carried on between the two towns and the fact that this place is much used for halting by pilgrims going to Chidambaram.

4. There is no mystery possible as to the manner in which cholera spreads in this town. On my approach by the river in the early morning, I found the bank of the Vellar from which the people chiefly derive their water-supply lined with persons in the act of defecating and performing their ablutions in the water. Examination of the bank showed that faecal matter was on its slope up to the chief ghât. But, lest it should have been possible for the people to escape infection by medium of this river supply, the union has long stored such faecal matter as is collected by the conservancy staff also on the river bank and well above the major portion of the stream. It, therefore, required but a slight shower of rain to bring specifically contaminated matter in the stream from this source, irrespective of the numerous deposits on the banks and the actual performance of ablutions after defecation. I found that some time back the District Medical and Sanitary Officer (Surgeon-Major Marsden) had advised against the use of the position above stream; but this was neglected till the day of my arrival, when the maistry in charge did his best to deceive me—even to taking me to a supposed site lower down! This ought to be seen to by the Chairman personally without delay. To these obvious favouring causes of cholera-spread may be added the fact that the remaining supply of the town is by open tanks, which are subject to pollution during withdrawal of water and contamination with surface drainage direct of the supplying channels. Thus, in the case of Appaswamy's tank, a channel 1,303 feet long passes houses and is at the side of the public road. This should certainly be piped by using stoneware pipes cement-jointed (probable cost Rs. 750 for pipes only).

5. Of ten tanks other than that named, only one at Mullipalaiyam is reserved for drinking purposes. In the remainder, persons defile the water as they like, and drink and let others drink the resulting mixture. Sufficient tanks for the supply of the whole town should be reserved, and, for the rest, direct washing of clothing or bathing should not be permitted. Persons should be required to draw the water in vessels and wash on the banks. If fear of water failure is entertained, the water may be allowed to enter into the tank after filtration, as shown in the accompanying diagram.

6. For drinking-water purposes the tanks, having been reserved and, if funds will allow it, properly fenced, should have sunk at their sides a sufficient number of Norton's tube wells. In this manner, practically nothing but the filtered tank water will be obtained and a great security against water-borne disease will result. I have advised the Chidambaram Municipality to use these wells also. The union might pay hire or combine in purchasing a driving apparatus, which is the only expensive item and is not recurring. This costs about Rs. 225, but each well sunk with pump complete would not cost more than Rs. 80.

7. Certain parts of the town are in a very unsatisfactory condition as regards drainage—a state of affairs chiefly due to the bad habit of making pits here, there and everywhere for walls of houses. The same statement applies here as in the case of Vriddhachalam as to remedy. In one portion of the union, however (Kala Bhuvanagiri Kotta Mottu street), there is a space of about 100 yards that is liable to be flooded and causes much inconvenience to the inhabitants. If any money is forthcoming, after putting the water-supply of the town on a better footing, I would advise that this matter be attended to. So far as I could judge, a very small amount of raising and placing of a suitable drain would secure what is desired.

8. In the "unprotected" list of the Kilbhuvanagiri karnam, I found that he had omitted to place the dates of births of infants and had with equal laziness omitted the consecutive numbers. This list showed that 119 cases remain unvaccinated dating back as far as 1893.

9. Latrines as advised for Vriddhachalam might be introduced here. After latrines are introduced, the Towns Nuisances Act should be strictly enforced.

OSSUPUR.

Inspected 4th October 1896.

This is a hamlet of only 311 inhabitants. It is, however, of importance to the health of the neighbouring town of Chidambaram on account of its being built on the banks of the Khan Sahib's canal. I found the village rubbish used so as to fill in depressions on the bank itself. I need not say this procedure is highly dangerous. The favourite easement ground is also above the village site on the canal bank. Both these matters are remediable.

2. It would cost little to make an excavation at the side of the canal, fill it with gravel, and fix at one end a pot-well. There would thus result a very good form of filtering bed that would secure a decided improvement in the water-supply of this village.

3. Of twenty children examined here, five were unprotected and three had small-pox, the remainder being protected.

4. In the neighbouring hamlet of Valakamari, the bank of the tank used for drinking purposes is also much defiled by defecation. Efforts should be made by the village head to check this filthy habit.

FORT ST. GEORGE,
16th December 1896.

(Signed) W. G. KING, Surgn.-Lieut.-Col.,
Sanitary Commissioner for Madras.

ORDER—No. 952 L., dated 17th May 1897.

Communicated to the local boards concerned for early and careful attention.

2. The attention of the Collector of South Arcot will be drawn in the Revenue Department to paragraph 9 of the Sanitary Commissioner's inspection notes on Vriddhachalam, paragraph 2 of his notes on Kundyan-kuppam, and paragraph 7 of his notes on Bhuvanagiri.

3. The suggestion of the Sanitary Commissioner in paragraph 13 of his notes on Vriddhachalam will be considered in the Public Department.

(True Extract.)

For Secretary to Government.

To the President, District Board, South Arcot.
" Revenue Department.
" Public Department.
" Sanitary Commissioner.
Editors' Table.

E.L. C. M. Thambaswamy.