NUMBER OF PAGES 30

...icipality

REVENUE DEPT.

G.O. NO. 956

DATED. 1-4-1876.

Cumbum—Sanitary.

Read the following papers:—

No. 1. From J. HOPE, Esq., President of the Municipal Commission, Cumbum, to the Hon. D. F. CARMICHAEL, Officiating Chief Secretary to Government, Fort St. George, dated Kurnool, 8th October 1875, No. 355.

I have the honor to forward the annual report of the Cumbum Municipality for 1874-75.

2. It will be seen that the report consists chiefly of a long dissertation on the working of the Municipal Act since it was first introduced in 1866, with remarks on forms of accounts in use, and lengthy discussion regarding the unhealthiness of the climate of Cumbum. I do not think it necessary to swell the annual report by making any remarks on the points raised by Mr. Farmer, beyond stating forward. It was then stated by ... to specify in the Bill the minimum percentage of taxation to be applied to each branch of expenditure, but that on further consideration it appeared that any restriction of that sort might be found inconvenient in practice, and that it would be better to leave it to the Government to settle, from time to time, in what proportion the funds should be applied to the purposes of the Act." Varying local conditions and wants made the introduction of a clause embodying an inflexible rule inexpedient.

3. But if it is granted that the supervision and checking of the allotments, so that the more urgent may take precedence of what may be dispensed with for a time, is the province of Government, the reasons why the Commissioners have failed to furnish Government with the information necessary to secure the Municipality, the advantage of Government supervision being fully and effectually exercised, is not far to seek.

Cause of inadequacy.

The annual reports are generally based on the statements of receipts and expenditure prescribed by G.O., No. 1646, dated 28th October 1871, and the report has hitherto been framed with reference to the classification of receipts and expenditure made in these statements. Now if the purposes of these statements is to furnish data to Government for a review of the nature indicated above, it must apparently be granted that the classification of expenditure under the five grants fails to fulfil the first requisite of a good classification, *viz.*, appropriateness to the purpose in hand. The statements in fact do not show us the expenditure with reference to the purposes contemplated by the Act, for under Grant I come works of all sorts without reference to their purpose, thus making a cross division. To this it may be answered that, as Municipal reports and budgets are now reviewed in the Financial Department, the classification must be such as to suit the requirements of that department, and that with reference to his end the classification adopted is unexceptionable, and moreover that details may be learnt by reading the body of the report and detailed statements appended and then recasting the allotments for administrative as

schools. Mr. Powell visited the district, and two schools were established at Nandikotukur and Koilkuntla, the more important stations of Cumbum and Nandial being at that time provided with Grant-in-aid Schools. The schools at Nandikotukur and Koilkuntla have since been abolished, while the school at Nandial has been taken over by the Local Fund Board. I, therefore, hope that no difficulty will be found in providing funds for the Cumbum School from the Provincial grant.

5. The next subject noticed in Mr. Farmer's report which calls for remark is the supply of Medicines. In paragraph 22, Mr. Farmer, in a tone not quite becoming a subordinate officer, takes much pains to show that there was great avoidable delay on my part in forwarding his indents. The indent referred to was the usual annual indent for 1875-76, and has nothing to do with the supplies of the year under report. If any inconvenience was felt in the beginning of this year for want of medicine, it was all caused by his omission to bring the urgency of the case to my notice by a special letter.

6. With reference to paragraph 4 of G.O., No. 352, dated the 17th February 1875, an efficient Manager was, after some difficulty, procured from Madras, who took charge of the Municipal Office on the 1st of September.

7. The details of receipts and charges of the year and variations between estimates and actuals are fully explained in the Vice-President's report (paragraph 21), and call for no special remark from me.

(for 1873-74) is Rupees 2,786; this is in fact the total of Grant III in the Budget for 1873-74, so the remarks of the Secretary of State as to the "apparently inadequate expenditure on Sanitary works" is based on the Budget Statements which have led him to imagine that an allotment for "Sanitary and Medical Services" is an allotment which represents or includes proposed expenditure on Sanitary works.

Now as a matter of fact no works—in the sense of Buildings as opposed to Services—are included in Grant III; and though the Sanitary Commissioner might have seen that a sum of Rupees 1,020 had been allotted in addition to the Rupees 2,786 for New Works and Repairs (Sanitary and Miscellaneous), he could not in the absence of detailed statements say how much of this sum of Rupees 1,020 it was proposed to spend on Sanitary works, how much on Medical works, and how much on Office building, Markets, &c.

Statement IIa would, however, show the Government that the sum of Rupees 1,020 was allotted as follows:—

	Rs.
New Drains	200
,, Latrines	200
Dispensary Buildings	220
Repair to Latrines	200
,, to Drains	200
Total ...	1,020

A further reference to paragraph 2 of the Municipal Report for 1873-74 would show that only Rupees 376 out of the allotment of Rupees 1,020 was spent. Out of this sum of Rupees 376, only Rupees 53, it will be seen from column 6 of enclosure B, was spent on Sanitary works. Out of the remainder, a sum of Rupees 316 was spent on Medical works (additions to Civil Dispensary).

2/256

Proceedings of the Madras Government, Financial Department,
1*st April* 1876.

Enclosure F is a Minute by three of the Commissioners with reference to the chief points noticed in the following report.

PART I.—SCOPE AND ARRANGEMENT.

Possible inadequacy of previous Reports.

2. The Municipal Commission has now been working nearly nine years in the town, and during this time the Commissioners have had the honor to submit to Government ten Budget Estimates, and the present is the Ninth Annual Report on the working of the Acts.

Notwithstanding this, however, when the adequacy of a certain allotment was called in question by the Secretary of State in his despatch (Sanitary and Commerce, No. 3) dated the 28th of January 1875, Government had not sufficient information before them to enable them to decide whether the allotment in question was in reality or only apparently inadequate, and consequently Government in their Order, No. 873, of the 19th April 1875, had to call for a special report on the subject.

It occurs to the Commissioners that their omission hitherto to furnish Government with the information requisite before an opinion can be formed as to the adequacy or otherwise of expenditure or allotment under any particular head may have arisen from a failure to appreciate properly the object contemplated by the framers of the Act when prescribing these annual reports and budgets.

If the advice, supervision, and orders of Government are to be made the most of by a Municipality it seems clear that the circumstances and conditions of each town should be known to Government in order that Government may see whether provision is made to supply the wants of the town with due regard to the relative urgency of the several claims upon the Municipal Funds. This principle seems to be upheld in the debates of the Legislative Council when the Act was brought [illegible] stated by the introducer of the Bill that "he at one time thought it advisable [illegible] that the District Engineer has, at my request, been for many months engaged in preparing the necessary estimates for putting the Cumbum Tank Channels in proper order, and hopes to submit the estimates before the end of next month. Further, the fact that the unhealthy state of Cumbum has already been brought to the notice of Government, and that the Deputy Surgeon-General has been requested by them to visit the place and to report, renders discussion on this topic in the annual report unnecessary. I shall, therefore, confine my remarks to such part of Mr. Farmer's report as relates to the operation of the year.

3. I agree with Mr. Farmer in thinking that this small Municipality should not be burdened with the maintenance of a Middle-class School, which in the year under report cost Rupees 825, while the results grants in aid of elementary education amounted only to Rupees 32. As the Government are aware, the charge on account of the Middle-class School was sanctioned at the special request of the Commissioners. They may possibly have changed their minds lately, but the fact that no mention is made of the school, in the special minute recorded by the Native Commissioners, leads me to believe that the Vice-President's report does not fully represent their views. Still, I think it is clear that the Municipality can no longer bear this drain on its limited resources, and I trust that Government will entirely relieve it of this charge for the future.

4. I would at the same time recommend that the school be maintained out of Provincial Funds. The backward state of education in this district was recognised by Government in their Order, dated the 17th May 1869, No. 174, and the Director of Public Instruction was deputed to take steps for establishing

opposed to financial purposes. It is sufficient to remark here that this argument begs the question as to whether Administrative or Financial considerations should take precedence.

4. It will not, however, be out of place to show, in the very case which has led to the above observations, the practical result of the present classification.

Instance of effects of inadequate Reports.

The Secretary of State draws "the special attention of His Excellency the Governor in Council to the apparently inadequate expenditure on Sanitary works by the Municipality of Cumbum." This observation was no doubt based on paragraph 28 of the Memorandum by the Army Sanitary Commission forwarded with the above despatch. In this paragraph (founded on paragraphs 484 and 485 of the Madras Sanitary Commissioner's Report for 1873) it is stated that "the Municipality of Cumbum with an income of 720*l.*, expends 278*l.* for Sanitary purposes while the situation is very malarious;" and the Vice-President of the Municipality observes, "While I write this there is hardly a house in Cumbum in which some one is not suffering or has not suffered during the last month (December and January) from fever. All the public business is impeded by repeated absence from work on account of fever."

A suggestion regarding the practical direction by the Sanitary Commissioner of local Sanitary work is then made with reference apparently to the state of things above noted.

Now here the Secretary of State recognising the general principle of distribution of allotments with regard to local exigencies attempts to criticize an allotment made for Sanitary purposes in a Municipality where local wants seem to point towards more than ordinary need for expenditure on Sanitary purposes.

In the part of the Sanitary Commissioner's Report for 1873, on which the Secretary of State's observations ultimately rest, it is mentioned that the estimated expenditure for Sanitary purposes

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Report of the Proceedings of the Municipal Commissioners of Cumbum for the year ending the 31st March 1875 (*Section* 34, *Act* III *of* 1871).

The following draft report by the Vice-President was unanimously adopted at a meeting held on the 28th July 1875.

PREFATORY.—This report is divided into the following six parts :—

Part I.—Scope and arrangement.
,, II.—Health.
,, III.—Prosperity.
,, IV.—Education
,, V.—Convenience.
,, VI.—Miscellaneous.

There are six enclosures to this report.

Enclosure A is a Map of Cumbum and its environs intended *generally* to show what the Municipality has done and has still to do for the town, and *specially* to illustrate the local causes of disease.

Enclosure B is a Statement of Municipal Expenditure under the various heads since the institution of Municipality up to date. In this statement an attempt has been made to supply the want felt for a classification of expenditure suited for purposes of adminstrative review.

Enclosure C comprises the Annual Statements prescribed by G.O., No. 1646, dated 28th of October 1871.

Enclosure D is the Medical Officer's Annual Report on the working of the Civil Dispensary.

Enclosure E is the Auditor's Report.

Proceedings of the Madras Government, Financial Department,
1st *April* 1876.

From enclosure B, it will then be seen that, whereas the Secretary of State draws attention to the apparent inadequate expenditure (278*l.* out of 720*l.*) on Sanitary works, only Rupees 53 (say 5*l.*) were spent on Sanitary works; but from enclosure B (column 17) it will also be seen that Rupees 3,876, or 47 per cent. of the whole receipts and 65 per cent. of the whole expenditure of the Municipality during 1873-74, must be debited to Sanitary and Medical Works and Services. The sum referred to by the Secretary of State (Rupees 2,786 or 278*l.* as the Army Sanitary Commission put it) is the allotment for Services (exclusive of works) for the year 1873-74. The Secretary of State's remark was made under the impression perhaps that only 39 per cent. of the expenditure (278*l.*) would be made to promote health; the actual percentage of expenditure on this head to total expenditure (Rupees 5,987) was 65 per cent.

Whether 47 per cent. of receipts and 65 per cent. of expenditure is a fair quota to devote to the improvement of health in the Municipality of Cumbum is the real question to be answered. The question is one which affects all years just as much as 1873-74; and its wideness and importance demand a full and satisfactory answer. It will be one of the main objects of the present report to answer the question; and care will be taken not to introduce matter not really necessary for a clear understanding of our case.

From what has preceded, I think it will be clear that the Commission lose the benefit of the effectual check and supervision of the superior officers of Government, which they both need and value; and that this loss may be referred to a classification of Municipal expenditure which may be suited better than any other for the purposes of the Accountant-General, but which is not the most convenient for, and might possibly mislead, an Administrative Officer in reviewing allotments.

5. The Commissioners will assume, for the purposes of this report, that it is their duty to place before Government the materials necessary to enable Government to criticize the expenditure of the last year with reference to peculiar local influences and wants, as well with reference to the expenditure in past years on the various objects which the Act is intended to promote.

Extended scope of present Report.

It will also be assumed with reference to G.O., No. 824, dated 12th April 1875, that in ordinary cases, where there are no local influences to disturb the conditions usually present, the following may be considered a fair apportionment of Municipal Funds :—

	Per cent.
1. Sanitation and Conservancy	27
2. Medical	27
3. Roads	8
4. Education	11
5. Comforts, Convenience, and Extraordinary Expenditure	27
Total ...	100

This distribution implies a rateable apportionment, under the five heads, of Management expenditure, which is not an object of the Act though a necessary item of expenditure. This, it is believed, should not exceed as a rule 12 or 14 per cent. of the Municipal income.

6. The above rough apportionment for an average town has been made with reference to the generally recognised order of importance of the objects contemplated in the Act. It is true education has sometimes been mentioned first among the objects which the Act was contemplated to promote, and in Section 29 of the Act roads are mentioned first, but the preamble of the Act, and the direction which the Government Order above quoted shows that Municipal expenditure has practically taken, point pretty clearly to the order adopted above. First—subsistence—which is promoted by sanitary and medical aid and then material prosperity or improvement, which roads are calculated to advance more and

Objects of Expenditure arranged in order of importance are—1, Health; 2, Prosperity; 3, Education; 4, Convenience.

education less directly, and lastly, comforts and conveniences which are least indispensable. This classification will, it is believed, be found to have practical advantages which placing roads under the category of convenience would not have.

Though equal allotments have been made to the first three objects above named, it is intended to be understood that the order of precedence in which they have been placed must be given effect to by seeing that sufficient provision is made for each in the order in which it is placed, before the allotment for a succeeding object is considered. Thus Health (under which Sanitary and Medical Works and Services are included) must be adequately provided for before roads are taken into consideration and if necessary 80 or 90 per cent. instead of 54 should be allotted for Sanitary and Medical purposes, and under these circumstances roads, instead of receiving an allotment of 27 per cent., would be left almost altogether to take care of themselves, and comfort and convenience would be out of the question. It is no objection to the standard of average expenditure given above that it might not be applicable in practice to a single Municipality in the Presidency; it is not meant to be so applicable, but until some standard is adopted tentatively it is clear that we cannot come to a satisfactory conclusion as to the adequacy of allotments which being a relative question can only be settled with reference to a standard.

Necessity for knowing expenditure in past years, as well as local requirements before adequacy of any particular allotment can be criticized.

7. Another point must be considered before pronouncing on the adequacy of any isolated allotment. Not only the differing local accidents come in to make a departure for the standard necessary, but expenditure in past years must be considered. Suppose, for instance, 8 per cent. of receipts is considered a fair average allotment for education, and we find that for a series of years only 5 per cent. has been allotted in a certain Municipality, this may be explained by the fact that 20 per cent. (say to build a school) was spent in a former year, and that this as now has been paid back to other heads of expenditure by reducing temporarily the expenditure on education from 8 to 5 pe...

Local circumstance and past expenditure may then be taken as the circumstances which will warrant departure from a certain standard of expenditure. To enable the Government to decide whether the expenditure made during the year under report was adequate with reference to the principles above enunciated, it is now proposed to give an account (1) of the peculiar circumstances of Cumbum, and (2) of how the Municipal Funds have been apportioned hitherto to amongst the four objects (arranged as stated above) the promotion of which is contemplated by the Act.

The treatment of the subject in this way will necessarily imply an answer to the call made by Government with reference to the Secretary of State's remarks with regard to the apparent inadequacy of expenditure on Sanitary works; and though the report must necessarily be made considerably longer than usual by this method of treatment, it is hoped that it may be a form or record permanently useful to Government in revising, and to the Municipality, and in framing future budgets and reports; and though the Municipality are not so unreasonable as to expect that Government can have time to go into the various minor points of detail, yet they feel sure that if the principles enunciated meet with general approval future work will be greatly simplified and Budgets require less adjustment than if the Commission felt doubtful with reference to the cardinal principles which in different stages of a municipal existence should regulate the determination as to what quota each object can expect.

At present we see from G.O., No. 1626, of the 8th November 1873, and from Board's Proceedings No. 584, of the 11th March 1875, that Presidents may sometimes be bewildered by the Heads of Departments considering the claims of their own department paramount, without perhaps knowing what funds the due attention to other calls leaves at the disposal of the Commissioners.

By the information which it is now proposed to supply, pertinent and useful criticism by Heads of Departments will, it is hoped, be facilitated, and criticism without being aware of the various calls on the Municipality will be avoided.

4/950

Proceedings of the Madras Government, Financial Department,
1st April 1876.

Advantages of Method followed in subdividing the four objects of Expenditure.

8. So much for the end proposed. Now a word for the method it is proposed to adopt.

An indication of this method has already been given when allusion was made to a classification of expenditure better suited for purposes of administration review than the one now in use.

A reference is now solicited to enclosures A and B. These are intended to illustrate (1) What the wants of Cumbum are from a municipal point of view, and (2) What has hitherto been done by the Municipality to meet these wants.

Enclosure A is a map of Cumbum and the surrounding country on a scale of about 18 inches to the mile.

Enclosure B is a statement showing the expenditure by the Municipality on the various objects contemplated by the Acts since the Municipality was started on the 1st of November 1866.

The classification is intended to supply the want alluded to above as existing in the annual statements, and is made with reference to the method of treatment which it is now proposed to follow.

The objects contemplated by the Act are divided in enclosure B into the four main divisions of

1. Health.	3. Education.
2. Prosperity.	4. Convenience.

The first head is naturally subdivided into the preventive and remedial branches of Sanitation and Medicine, while Sanitation is again subdivided into the chief heads which the science concerns itself with, *viz.*, Works with reference to improvement (1) of the Air and (2) of the Water; and as the Conservancy establishment may be said to further the improvement of both, this has been shown separately as have also Registration and Vaccination. Registration of vital statistics as "the stepping-stone to all sanitary reform" might perhaps have been shown more appropriately as the first item.

The other subjects of which the science of Hygiene treats such as food, sleep, diet, personal ...bits, &c., are matters with regard to which the Municipality can do no more than advise.

The Medical branch is divided into Works and Services.

Under the second main division (Prosperity) Roads are shown under the subdivisions of construction and repair; Education (object No. 3) is divided into elementary and middle class; while under the last object of the Act (Convenience) the expenditure on various works—lighting, markets, cartstands, &c.—is shown separately.

A rateable share of Management expenses is debited to each of the four main objects, and it has been thought convenient to debit the appropriate share of management expenses to Sanitation and Medicine separately though these are only branches of the first main object—Health. In the last columns of the statement the percentages of the expenditure on the four objects of 1, Sanitation and Medicine (separately); 2, Prosperity; 3, Education; and 4, Convenience, are shown in appropriate columns, as also is the percentage of unexpended balance and Management expenses.

Totals and Percentages of Municipal Expenditure on the four objects above named.

9. The general result (grand total) of this statement shows that the Municipality has had, since it was started on the 1st November 1866 up to the 31st March 1875, a sum of Rupees 49,553 to expend. Of this sum 37 per cent. has been spent on Sanitation, 10 per cent. on Medicine, 9 per cent. on material prosperity (Roads), 7 per cent. on Education, 3 per cent. on Convenience, and 29 per cent. on Police, leaving 4 per cent. unexpended.

A separate total has been made up to and including 1870-71, when Act X of 1865 gave place to III of 1871, and the Hospital Registration and Vaccination took the place of the Police in Municipal Expenditure.

During these last (1871 to 1875) four years the Municipality have had Rupees 24,433 to spend. Of this sum 38 per cent. has been spent on Sanitation, 24 on Medical Services, 11 on Roads, 15 on Education, 4 on Convenience, and 8 per cent. was unexpended. In the above figures it must be remembered that Management expenses have been debited rateably to the

various objects to promote which the Act was passed. These expenses represent 18 per cent. of the total receipts, but only 16 per cent. of the receipts since Act III of 1871 has been introduced. This statement (B) thus shows what the Municipality *has* done with reference to each object for which it was started; but to see what has to be done, we must turn to the map (enclosure A). It might have seemed more natural to treat of what was wanted first, but as Statement B shows the system of arrangement, it has been thought well to give the general results of expenditure first, and then to consider the wants of the Municipality, following the order of arrangement adopted in the Statement B, and referring for illustration to the Map A.

The first and most important of the four objects is Health, and it is believed that the most practical and convenient way of treating this subject will be first to enumerate some of the recorded facts, observations, and opinions tending to show what the state of the public health is; then investigate the causes so far as traceable which have been at work in affecting health; and, lastly, to propose such remedies as may seem most suitable and likely to be given practical effect to. The other objects of Municipal expenditure will then be noticed in the order in which they are entered in enclosure B.

Part II.—HEALTH.

Facts, Observations, and Statistics indicating the state of public health at Cumbum.

13. First then as regards recorded facts tending to show the healthiness or otherwise of the place. The population of the town, both inclusive and exclusive of adjoining village of Chintalpolem included within municipal bounds and of Cumbum taluq, as shown in the Census Return for the years 1862, 1867, and 1871, is as follows:—

Taluq.						Cumbum.		Municipality.
98,473	...	...	1862	...	... (1st May)	... 8,020	...	No Municipality.
103,304	...	....	1867	...	... (1st March)	... 7,083	...	8,747
124,453	...	...	1871	...	... (15th November)	... 7,137	...	7,703

This shows a monthly decrease of 18·5 persons in the Municipality between the 1st March 1867 and the 15th November 1871. But it is believed that the quinquennial returns of 1862 and 1867 showed the population less than it really was in these years (paragraph 353 of Sanitary Commissioner's Report for 1873). During the five years which elapsed between the 1867 Census and the Census of 1871 the returns show that the population of the Presidency generally increased 16 per cent., the population of Cumbum taluq including Cumbum increased 20 per cent., the population of Cumbum Municipality decreased 12 per cent. The registered death-rate in Cumbum since the institution of Registration of Vital Statistics shows that, notwithstanding the admitted deficiency in registration, the death-rate has seldom been less than double the normal rate, and has several times been four or five times the normal rate. For the first half of the calendar year 1875, 346 deaths against 129 births have been registered; deaths are increasing fast in number and births decreasing. Assuming as we are warranted in doing that the monthly decrease in population evidenced by the Census Returns quoted above is now higher than these returns purport to show that it was between 1867 and 1871 (say 20 per cent. instead of 18½ as shown above) we get the population of Cumbum town on the 31st March 1875 as 6,893, and this would give a death-rate for the present year of 100 and a birth-rate of 37 per mille per annum, whereas the normal death-rate is 25 per mille per annum; 37 per mille per annum may be taken as the normal birth-rate in India—*vide* paragraph 375 of the Sanitary Commissioner's Report for 1873.

With reference to an annual death-rate of 33 per 1,000 in Madras, the Government in G.O., No. 777, dated 4th June 1873, after speaking of this as a "startling fact" say "that it would place the mortality of Madras only second to that of Glasgow amongst European large cities, and of Delhi amongst the large towns of India." If a death-rate of 33 per 1,000 is considered a startling fact, it would seem hardly too strong to apply the epithet of appalling to the death-rate (100 per

G/956

Proceedings of the Madras Government, Financial Department,
1st April 1876.

mille per annum) during the last six months at Cumbum. It may be objected to these six months being taken as an example of high death-rate that they were exceptionally unhealthy; to this the answer is that whenever the rainfall is heavy (and the rainfall hitherto this year is heavier than last) the death-rates may be expected to be as heavy as those quoted above.

I happened to be looking over some old correspondence the other day and found it mentioned in letter, No. 209, dated the 28th July 1868, that the death registers for the first five months in the year 1868 showed 320 deaths in Cumbum, whereas only 303 were recorded in the present year during these five months. The Taluq Accounts do not show so many deaths in the five months in 1868, but then the Taluq Accounts are admittedly deficient and incomplete; if all the deaths had been regularly registered since registration of deaths was introduced on the 1st July 1865, I feel no doubt that the real death-rate of Cumbum would be shown to be at least 75 per mille per annum, and then the great falling off in the population would be to some extent explained. I have discovered omission to register deaths (one of which occurred in my own compound), and when the subject of burial-grounds is noticed it will be shown that there are exceptional difficulties in the way of complete registration at Cumbum. Having got the facts (1) that while the population in the whole taluq of Cumbum is shown by the Census Returns to have increased at the rate of 20 per 100 between 1867 and 1871, the population of Cumbum fell off at the rate of 12 per cent., and (2) that death-rates even when registration is believed to have been deficient have reached and kept for many months together at four or five times the normal rates, we must expect to find the remainder of this rapidly-disappearing population showing very unmistakeable symptoms of decay.

Mr. Glenny, lately President, says in his letter, No. 679, dated 19th June 1875: "I myself spent two days at Cumbum in April and can testify to the plague-stricken appearance of the population."

Dr. Smith, the Deputy Surgeon-General, speaks of the atmosphere of Cumbum as pestilential, and is apparently in favor of abandoning it altogether as irremediably insalubrious (*vide* G.O., No. 499, dated 31st March 1875, Revenue Department).

Mr. Glenny in his letter embodied in G.O., No 1216, dated 4th June 1875, speaks of the extreme and rapidly-increasing unhealthiness of Cumbum and its neighborhood; and in view of this, Government were pleased to sanction the supply gratis of the medicines required at Cumbum in so far as the demand is in excess of the average for an ordinary healthy district of the same size. G.O., No. 1050, dated 18th April 1875, shows how the whole staff of the Department of Public Works and many other officials here were incapacitated for work by fever. The Municipal work was brought to a standstill as will be noticed hereafter.

It would only swell this part of the report to an inordinate length were I to show how the people are taxed for justice, protection and other objects which a Government should supply, and how the enfeebled and disheartened staff of Government servants are unable to give the people a tithe of what they might reasonably expect.

To show the sort of men whom Government are forced to employ it may be mentioned that the Municipal Clerk, who resigned under circumstances detailed in paragraph 5 of my letter, No. 84, embodied in Government Proceedings, No. 1442, dated 27th August 1874, is Acting Curnum of an important Government village.

Government will no doubt hear through the Surgeon-General of the narrow escape which Dr. Ross who was sent here had, and of the way in which the medical subordinates who came with him suffered, and made a somewhat precipitate retreat, when Dr. Ross was too ill to realize the situation and refuse them leave.

It is sufficient to state that, after two years' residence here, I am unable to point to a single man who has not suffered from fever, and that the attendance at office of the whole of my establishment, in a state fit for work, is a thing almost unheard of. For instance, when preparing the map which accompanied this report, as the Office Manager is incompetent, I tried to get the Taluq Sheristadar to draw a rough map; he began and fell sick in two or three days and though he has partially recovered he has lost his child, a girl of nine years; since then I thought the

Head Assistant Collector's Head Clerk might help ; but he has only attended office for two out of the last seventeen office days. His spleen is enlarged and he is quite unfit for work. He has lost his son and father-in-law (in the prime of life) within a year after coming here. His father was one of the three District Munsifs who died here within two-and-a-half years of each other.

The Head Clerk is now absent on account of fever and is very ill.* The Hospital Assistant who should atttend to him is also absent on sick certificate. The Head Clerk has been ordered by the Dresser to take claret, but as the subordinates here have already stated in a petition for increase of pay to the Collector they are unable to provide themselves with the necessary medical comforts. When the Head Clerk failed me I fell back on the Municipal Overseer but found him down with dysentery and symptoms just the same as those in Dr. Ross' case. He is still unable to leave his house, and has been absent now nineteen days.

I was at last obliged to get the Reddy and Curnum to go over the village and neighborhood street by street and draw the map myself ; but then even the Curnum, who is like most permanent residents a chronic invalid, was unable to accompany me, though he came part of the way on a cart.

When men who suffer in this way, and sometimes have to spend half their pay on inferior medical comforts, attempt to work their work is necessarily unreliable.

They are disheartened at seeing so many die around them ; and, knowing that extra pay is given in much less unhealthy places, the carelessness engendered by supposed neglect to bring their claims forward produces a spirit which makes successful work almost out of the question. A pertinent instance of this sort of unreliable work will be found in my letter, No. 113, dated 12th April 1875, to the Under Secretary to Government ; it is entered that 1,122 deaths and 798 births had been registered between 15th November 1871 and 1st April 1875. I had trusted the Head Clerk to fill in these figures. I since tested them and find that he should have entered 1,094 deaths and 893 births. We have to put up with such work here regularly, and be thankful for it. As Surgeon Ross remarked, "Two days' sojourn (in Cumbum) is sufficient to produce a feeling of lassitude and more or less inaptitude for work of any kind. Anyone who wishes to remain in sufficient health to perform his duties satisfactorily would never think of stopping longer than was absolutely necessary."—(Letter, dated 14th May, to Secretary, Surgeon-General.)

The Shroff of Cumbum taluq, one Gumashta (transferred previously to Markapoor), and a Police Inspector have died already this year. The second-class Revenue Inspector died at the end of last year ; and the first-class Revenue Inspector (now absent on sick certificate) is a pitiful object to behold. The Municipal Office Peon and Hospital Cook are two Municipal servants who have died this year.

I hope the Overseer may recover ; but if he does not he will be the second Overseer who has died since my arrival. And here I ought not to fail to acknowledge the valuable assistance I have received in collecting information for this report from those who are able to help.

The Tahsildar of Cumbum and the Reddy of Cumbum gave me ready and intelligent help which none but valuable servants of Government could have afforded.

The Range Officer kindly placed the services of his Draughtsman at my disposal for some days, and enclosure A is the result of his penmanship.

Passed Hospital-Apprentice Wynne, in a report on the climate of Cumbum sent to the Deputy Surgeon-General, states, "On the whole the people of Cumbum are an *anæmic*, enfeebled, ill developed, and lazy set of men ; the children are *anæmic*, undersized, and pot-bellied."

A reference to enclosure A (the map of Cumbum) will show that the most noticeable features of the place are, as might be expected, graves on all sides and uninhabited houses. Now if subordinates could only be brought to look on being sent to Cumbum as being chosen to lead a forlorn hope, possibly some of the more enthusiastic and youthful might even volunteer for the post of honor. It is, however, well known that many persons are allowed to refuse or get off being sent

* *P.S.*—He has since (24th July 1875) died, age twenty-eight. The last thing he spoke to me of was how he regretted the petition of the subordinates of this office, submitted for favorable consideration with my letter, No. 394, dated 29th September 1874, had not been submitted for orders.

here, and indeed the fact of being here at all seems invariably to suggest the inquiry, "What has he done." So the people here consider they are sent into penal servitude for having incurred the displeasure of the powers that be. If not they cannot see why the stay of servants in this deadly climate should not be shortened as it would be in the military service, where, instead of allowing an officer to get out of serving at an unpopular or dangerously unhealthy station, the term of service is rendered short, and all have to take their turn.

The District Munsif is now absent on sick leave, and the Deputy Postmaster is, I hear, about to apply for sick leave. The Head Assistant Collector has only one permanent Clerk and two learning boys in his office. I will mention one more incident indicative of mortality here.

A few days ago when leaving office thirteen little children between the ages of six and ten came to beg. It occurred to me to question them about their belongings. Only one child had a father and mother alive, and only four children had a single parent living.

To summarize the above indications of extraordinary mortality, it may be stated that if Cumbum had gone on increasing like the rest of the taluqs between 1861 and the present date, the population would now be close upon 10,000 instead of between 6,000 and 7,000, and that its attenuated population, plague-stricken and disheartened, are filling the already overcrowded graveyards in numbers three or four times greater than under normal circumstances they should do, and that the matter has, for some reason, never been brought before Government, except incidentally and partially.

The news contained in the Collector's letter, No. 761, dated 12th July, that cholera has come to the next taluq, is, under the above circumstances, rather unpleasant. We could hardly effect life insurances on very favorable terms just now, although the Head Assistant Collector has been ordered to "take all necessary precautions."

Investigation with regard to the causes which affect public health.

11. We now come to what ought to be the most interesting part of the report, *viz.*, an attempt to discover the causes of the unhappy state of things noticed above.

Theory of foreign as opposed to local causation of Fever noticed.

(*a.*) And I would beg to direct attention to paragraphs 606 to 630 of the Sanitary Commissioner's Report for 1871, as I believe the branch of Sanitary science which treats of the causation of fever (the chief cause of death here) has not been much advanced since Mr. Cornish recorded the observations and suggested the conclusions which will be found in the passages mentioned.

In tracing the probable causes of fever it will be best to give a general idea of the situation of Cumbum first.

Cumbum then is situated about 200 miles north north-west from Madras ; it is about seventy miles from the sea ; and is situated between the Nallamallay Hills (a long range here corresponding to the Western Ghauts on the West Coast) and some spurs or detached ridges which branch off and run parallel to these ghauts.

In the Nallamallay Ranges, at about twenty-six miles west of Cumbum, rises the mountain torrent known as the Gundlakamma ; this mountain stream receives a tributary called the Jampalair about four miles west of Cumbum, just as it comes into a large valley surrounded by off-shoots of the Nallamallay Hills above described. The ridge of hills, which forms the eastern boundary of the valley (shown in enclosure A), is situated about a mile and a quarter to the west of Cumbum. There was one outlet in this ridge, and through this the Gundlakamma ran in former days ; but the bund of the celebrated Cumbum Tank (308 yards in length and 27½ yards in breadth on the top) has been thrown across the gap some hundreds of years ago, and the consequence is the formation of the large inland lake which represents or rather should represent a yearly income of half a lakh of Rupees to Government and irrigates fifteen villages.

Healthiness of Cumbum before 1865 may account for a seeming slowness to realize present extreme unhealthiness.

(*b.*) Now in investigating the causes of the extraordinary prevalence of fever the first point which should arrest attention is the agreement on all sides that it was not until about the year 1865 that Cumbum was recognised as a fever-

stricken place. This is noticed in Passed Hospital-Apprentice Wynne's "Concise Report on the Climate of Cumbum." He says, "Prior to 1865-66 Cumbum may be said to have enjoyed comparatively a healthy climate." Mr. Cornish in paragraph 619 of his report for 1871 says, "I have some reason to think that the unusual prevalence of fever in the Kurnool District began in the year 1866."

When in Madras at the beginning of the year the Collector of Coimbatore, who was stationed here from 1851 to 1857, bore out entirely the substance of the above statement, and an officer, whose brother had been stationed here in former days, said that the officers of his brother's regiment considered Cumbum a favorite detachment station, and always tried to get sent there. Troops were removed from here in 1860.

It has now occurred to me that the known salubrity of Cumbum in past years may have had something to do with the difficulty which was, until the recent visit of Dr. Smith, experienced in getting the exceptionally great wants of the place in a medical and sanitary point of view recognised. Those who might be led to think, in the absence of personal experience during the unhealthy months, that Cumbum was not such a bad place after all, could in support of this idea advance the acknowledged salubrity of Cumbum in past years and cite the fact that neither the Head Assistant Collector nor Assistant Superintendent of Police had left here on sick leave for some years. To the first objection the answer is simply that Cumbum is changed since 1865; to the second that the Head Assistant Collector and Assistant Superintendent are out of Cumbum for about eight or nine months in each year; and that a medical examination would show whether they have not permanently suffered from the attacks which almost always result from coming in here even at the comparatively healthy time of the year. This is merely mentioned as a possible explanation of the difficulty of getting our position realized hitherto.

There is another point deserving notice with regard to leaving the place on sick leave. A temporary change is of little if any benefit. As Hospital-Apprentice Wynne remarks "the only thing that really benefits these sorts of cases is an entire removal from the district or at least a change of air."

The system is permanently reduced, and while one of the attacks lasts moving the patient would be certain death.

Thus Dr. Ross, whose recovery seemed to us to be almost miraculous, was obliged to remain here till he got a little better; had he remained here permanently he would no doubt have fallen into the chronic state of ill-health almost universal here. The Police Inspector and Head Assistant Collector's Head Clerk were struck down suddenly and died before they could leave the place.

Any Doctor would probably give a certificate to any of us that it is dangerous to life to remain here. Mr. Bell, lately Range Officer here, got such a certificate immediately on asking for it, and was removed accordingly. Indeed it is difficult to see how a certificate to the effect that a return to Cumbum would be dangerous to life could be withheld when it is remembered that statistics show that the chances of death are four times greater here than in an ordinarily healthy place. As Surgeon Ross said to a European resident when leaving here, "You'd better get out of this soon, or you'll be carried out feet-foremost if not." Stronger men have been carried out feet-foremost since then.

It seems then fair to assume, for the purpose of inquiry into the causes of fever at Cumbum, that up to about the year 1865 the place even if getting unhealthy was not yet generally recognised as such.

(c.) Then comes the real difficulty, *viz.*, to discover what cause for fever has since arisen?

Attempt to discover some local cause which has arisen since 1865.

Several persons have asked if wet-cultivation in the immediate vicinity of the houses has increased of late years. I have satisfied myself that instead of increasing it has decreased, but I think it is generally admitted now that the increase of wet cultivation cannot by itself be accepted as a proximate cause of fever though it may be a contributory cause.

For many months I felt disposed to adopt the wave-of-malaria theory of Dr. Cornish, and to consider that it was useless to look for local causes as opposed to foreign or adventitious causes; but on reading Dr. Cornish's Report again, it struck me that I was in a better position to collect facts and make observations upon the causes of fever than perhaps anyone else in the Presidency just now; and I observed that Dr. Cornish states that to an absence of sufficient data may be attributed the failure hitherto to discover the law of causation of fever—paragraph 627, Report 71.

I then set to work to collect facts and figures and see if some practical result could not be deduced.

One of the first things I observed was that the falling off in population was attended by a falling off of revenue under the tank. In the year 1868 (Fasli 1277) revenue derived from Cumbum Tank was Rupees 49,416, and in the year 1874 (1283) it was Rupees 42,798. It was natural at first to consider this loss of revenue (averaging more than Rupees 1,000 per annum) to have been caused by the death of so many cultivators. This hypothesis, though plausible, is negatived by other recorded facts. One of these is that the falling off in revenue in the village of Cumbum itself is only Rupees 110 or 2·3 per cent. in the years in question, while the falling off in revenue increases to 23 and 24 per cent. in proportion to the distance of the village from Cumbum Tank, although the population in those more remote villages has been increasing at a normal rate instead of falling off as it has been in Cumbum.

Now having ascertained that the revenue fell off most in the villages most distant from the tank, it was not difficult to divine the cause; in fact any ryot would explain that directly, by saying that the water did not reach the village. This subject was gone into and a report submitted to the Collector by the Head Assistant Collector in letter, No. 486, on the 10th December 1874, and No. 208, dated 17th April 1875. It will be sufficient for the purposes of this report to notice here that one of the chief causes of falling off in revenue was reported to be the leaky and silted-up state of the channels which conveyed water from the tank. By the time the channels reach the distant villages hardly any water is left.

(d.) Having thus been obliged to abandon the theory that fever and loss of revenue stand to each other in the relation of cause and effect, the thing was to see if the leaky state of the channel (the cause of the loss of revenue) and the prevalence of fever could be connected as cause and effect or as effects of one common cause. This problem did not seem very likely to be solved, so thinking that perhaps an inquiry as to the increase or decrease of revenue and population in that part of the division not irrigated by Cumbum Tank might throw some light on the subject, I looked into the statistics on this point, and find that while the revenue of Cumbum and the villages irrigated by Cumbum Tank had fallen off by Rupees 6,000, in six years the land revenue from the other part of the division had increased 47 cent. during the last thirteen years, and the population had increased in more than the natural proportion (20 per cent.).

Unusual mortality and falling off in Land Revenue commenced simultaneously and are confined to immediate vicinity of Cumbum Town.

(e.) This naturally leads one to doubt seriously whether the wave theory may be accepted as affording an explanation of fever at Cumbum, and consequently one was led to look again for local or partial influences as opposed to the more wide and universal tendency implied by the wave theory.

Special local cause must be looked for rather than foreign and general causes.

(f.) Just about this time Surgeon Ross was sent to Cumbum with reference to the prevalence of fever, and his attention was drawn by the Commissioners to the predisposing causes of the malaria (Resolution 2 of meeting held on the 1st May 1875). With reference to this subject Dr. Ross remarks upon "the stifling and pestilential vapors from the highly manured paddy-fields and stagnant pools on either side of the road" which he said were intolerable, and upon the disgraceful state of a burial-ground which he said "poisoned the river and, as it is not a quarter of a mile from the village, helps to poison the air."

The idea that bad water and other causes present in comparatively healthy places have produced the extraordinary mortality at Cumbum must apparently be negatived.

The observations which Dr. Ross made before he was himself struck down may be summarized as follows :—

1. Contamination of air from imperfectly buried bodies.
2. Contamination of water supply on account of vegetation in the channels, defœcation close to the channels, and the flow of liquid manure from paddy-fields into the channels. It may not be out of place to state here, for the information of Government, that the steps taken by the Division Magistrate to remedy, as far as possible, this state of things received the full approval of the then President in docket, No. 580, dated 26th May 1875. Dr. Ross also considered that the surrounding country, which he described as a large swamp, might be drained.

Now there can be no question whatever that Dr. Ross' suggestions deserve attention, and that the points he brings to notice are such as any Sanitary Officer would condemn ; but if the state of things described above was present here before 1866, when Cumbum was healthy and is still present in thousands of comparatively healthy villages in this and other districts, then we cannot consider that the progressing depopulation of Cumbum and a death-rate three or four times greater than in other villages, similarly circumstanced as regards the points noticed by Dr. Ross and myself, are satisfactorily explained.

(*g.*) Other causes had therefore to be sought. I could not regard the fact that the loss of revenue and prevalence of fever began about the same time to be a mere coincidence, and therefore, before abandoning the hypothesis that there was some connexion between the two (though not the connexion of cause and effect), I resolved to make further observations, and collect new facts calculated to show whether the connexion was real or not. I then adopted the hypothesis of there being an intermediate link which might be the common cause of both phenomena, or the cause of one and the effect of the other.

Attempt to discover a connexion other than that of cause and effect between the simultaneous commencement of Fever and loss of Revenue at and near Cumbum.

To discover the link I now set to work. I encamped near the channels and went along them, questioning all whom I met. To explain the results of my inquiry and observation, I would solicit a reference to enclosure A, the plan of Cumbum and its neighborhood. There the tank is shown about a mile to the west of the village. The calingula is about three-quarters of a mile to the north of the bund. Two channels—Chinna Cumbum Channel and Pedda Cumbum Channel—flow from two sluices in the tank-bund. Between the two is the old bed of the Gundlakamma. The Chinna Cumbum Channel runs to the south of this river-bed and does not come near Cumbum (proper) or Pedda Cumbum as it was originally called as opposed to Chinna Cumbum which is irrigated by the Chinna Cumbum Channel. The Pedda Cumbum Channel runs right through the town from west to north-east, and another channel called the Nakkalagandi (Jackal's gap) channel flows from a sluice in the tank calingula through the north part of the town and in the same direction as the Pedda Cumbum Channel which it joins towards the north-east of the village.

From these channels the drinking water of the town is procured. Owing perhaps to the defective construction of the sluices and channels, a vast quantity of water finds its way out of the sluices which cannot be conveyed in the channels ; this surplus water runs in great quantities into the old bed of the Gundlakamma, so that, with the swamp which borders it, it measures 300 yards in width when it reaches the bridge on the Cuddapah road (*vide* plan).

Anyone seeing the Gundlakamma here for the first time would never imagine that its course had been intercepted two miles higher up by a large tank, and that only surplus water from the sluices of this tank (for the water has only flowed over the calingula once since 1854) formed the river where the Cuddapah road crosses it.

From enclosure A it will also be seen that a large channel called the anicut channel (Katwa Kalana) which like the Gundlakamma forms the southern limit of the Municipality, branches off from the Gundlakamma, just above the bridge on the Cuddapah road. To an ordinary observer the arches and embankment over which the road passes seem nothing more than a

Proceedings of the Madras Government, Financial Department,
1st April 1876.

bridge ; and as such only I regarded it for months ; but seeing some earthwork dams thrown up in the bed of the river before it reaches the bridge, I was led to make inquiries and found that this so-called bridge is in reality the anicut constructed to turn the water into the anicut channel (Katwa Kalana). This is clear from the Board's Proceedings, No. 5915, dated the 11th of August 1869, in which some account is given of the anicut and bridge, and the Board direct that the "Inamdar must comply strictly with the conditions on which the Inam was given," *i.e.*, keep the anicut, as opposed to the road, in good repair. The repair, &c., of this anicut and of a large part of the channels should be executed by men who hold Inam on the condition (unfulfilled) of keeping the anicut and channel in repair. On inquiry I found that this anicut channel had got very much out of repair and silted up, and that the Inamdar put up these earth dams above the bridge or anicut to get a greater head of water into his silted-up channel. Notwithstanding this however the land revenue under this channel has fallen off 10 per cent. (above Rupees 1,000) in the last six years, and more than half the land is waste in the last village, which it is supposed to irrigate.

Seeing the state of, what may almost be called, ruin of the channels, I endeavoured to find some explanation of this ; and found that a former Collector of this district had, in the year 1866, reprimanded a Revenue Officer for getting the silt from these channels cleared out by the Department of Public Works.

The Collector considered that the clearing out of silt from channels which contained water for five or six villages came under the category of "Minor works of irrigation" (Kudi marammat). From paragraph 1 of G.O., No. 713, dated 5th March 1873 (Public Works Department), it appears that the repair and management of channels which supply the lands of more than one village should be carried out on behalf of Government by the Public Works Department, and that channels which supply one village only should be repaired and managed by the villagers. If this is not a misconstruction of the Government Order, then the Collector's order, No. 326, dated 10th August 1866, directing the ryots to clear the silt out of the large channels, which take the water from Cumbum Tank each to five or six villages, would appear to have been based on a misconception of the wishes of Government, which at the date of the Collector's order had not perhaps been so unequivocally expressed as they have been. Since the issue of this order, the ryots of five or six villages which each of these channels irrigates have been expected to act in concert and to repair them. This they have not done. Nor does the Collector seem to have been asked by local officers to reconsider his order. Thus we find the date of the channels falling out of repair (and the consequent loss of revenue) to coincide with the date of the recognised prevalence of fever ; and we have also the fact that the water in the Gundlakamma has been dammed up and raised, as a sort of attempt to increase the flow of water, which had been stopped and diminished by silted-up channels and breaches which the ryots and Dasabandamdars were supposed, to, but did not repair. The result of these dams and temporary makeshifts to raise the head of water is the creation of a large swamp, and the conversion of the bed of Gundlakamma on the south of the town into a stagnant morass or lagoon.

To this stream I drew the attention of Hospital-Apprentice Wynne, and he speaks of it in the following terms : "On the southern side of the town is a large stagnant stream—the Gundlakamma—thirty yards broad and forty or fifty deep. This I believe was once a running stream, and no doubt helped to drain the town ; but now for the greater part of the year its waters are covered extensively with tall grass and other noxious weeds, and the offensive odour emanating therefrom is often at times so penetrating as to be appreciable at a distance of five or six hundred yards." I have had the swamp carefully examined, and found that it increases to a breadth of over 200 yards just above the bridge on the Cuddapah road. It is studded with large floating islands, formed by rank vegetation, refuse, and so forth. Under these islands the alligator finds a congenial retreat. No wonder at the plague-stricken appearance of the inhabitants of Chintalopoliem (within municipal limits) who drink the murky fluid from this poison-swamp.

Now I think that we are able to say that we have found the connecting link between the simultaneous loss of life and revenue at Cumbum some time about 1865.

(*h.*) From the channels falling out of repair, resulted directly loss of revenue and by an attempt at increasing the head of water in these leaky channels by damming up the stream into which the drainage of the town should flow a useful drain was turned into a pestilential morass. The sub-soil became water-logged, and evil consequences acted and reacted. Thus the Cumbum Tank was turned from a blessing to a curse upon the sickly and dying inhabitants of the place.

Irrigation channels getting out of repair caused loss of Revenue directly and caused Fever indirectly by water-logging sub-soil.
(Proximate cause of outbreak of fever about 1865.)

Sub-soil drainage is now a thing unknown, the water of the wells being in many places on a level with the surface of the ground, and in most places only a few feet below the surface. The water is of course a little lower in the hot weather, and this is followed by a slightly improved sub-soil drainage and a proportionately decreasing death-rate.

I have given at length the process by which I arrived at the conclusion that the destroying of the sub-soil drainage somewhere about 1865 must be considered as the proximate cause of the fever at Cumbum, because I am anxious, as the subject seems very important, that errors or mistakes into which I have fallen may be easily detected.

(*i.*) I will now proceed to notice some circumstances which though, in my opinion, they do not account for the progressing depopulation of Cumbum since 1865, while the population of the rest of the division is increasing, yet no doubt tend to give the fever a greater hold on the people and to aggravate and intensify its symptoms as well as increase its fatality. These circumstances would, in the absence of what I submit may be considered the prime cause noted above, not result in producing any more marked effects than are produced in the other parts of the division where, though similar tendencies or predisposing causes are also at work, the population is steadily increasing. We thus pass from what may be called the proximate cause of the fever at Cumbum, viz., water-logging of the sub-soil, to the subsidiary or contributory causes, which may have been latent or but little felt. It might be perhaps more accurate to say that the fever is the result of three causes combined, but that this combination being necessary, the cause which commenced to work when the fever commenced is popularly regarded as the cause, just as pulling the trigger of a gun is considered the cause of the consequent explosion. These two subsidiary causes are—

The two contributory causes of Fever are pollution of water and stagnation of air.

1. Contamination of the drinking water.
2. The fact that the town is shut in by hills and surrounded to a great extent by trees, both of which impede ventilation, and make the atmosphere stagnant.

First with reference to the contamination of the drinking water. As before stated the drinking water of the town is derived from two irrigation channels coming from Cumbum Tank. In order to discover whether the water was contaminated before reaching the tank, I encamped in two villages (Tudamalla and Ardavid) situated on the banks of the Gundlakamma and Jampalair, the two supplying sources of the Cumbum Tank. I directed the attention of the Hospital Assistant to the subject of the contamination of the water, and he drew up a report for each village in a form prescribed by me. The general result of his report and of my own observation is that in both villages the burying and burning grounds are close to the rivers supplying Cumbum Tank; that the refuse of the village drains into the rivers; that no sufficient or proper space is allotted for purposes of defœcation; and that whereas the sum of Rupees 473 in the former, and Rupees 256 in the latter village, have been paid by the villagers for the purposes of Sanitation and Education (exclusive of double the amount for Roads) (Sections 26 and 36, Act IV of 1871), nothing has been expended on these purposes in the villages though sanitary measures of improvement are urgently required. In addition to this, I observe that the villagers are in the habit of steeping hemp, wild aloes, and other fibrous plants in the streams and also throw a mixture of the juice of the milk-hedge plant, and a stupifying powder prepared from the bark of the satin-wood tree into the water in order to stupify the fish which then come to the surface and are easily caught to sell and eat. From the enclosed minute by three of the Commissioners, it will be seen that the

Proceedings of the Madras Government, Financial Department,
1st April 1876.

cultivation of indigo in the bed of the tank is considered one of the causes of pollution of the water. The tank fills while these crops in the bed of the tank are still standing, and the young ears rot in the water. The shrub called in Telugu Vaminta Chettu (Cleone Pentaplylla) grows in the bed of the tank when the water recedes and is rotted in the water when the tank fills. This Vaminta Chettu is used as a medicine. Probably when continually present in drinking [illegible] contribute to disease. The refuse from indigo vats is also not unfrequently let off into the supplying sources of Cumbum Tank. In these various ways the water is contaminated before it reaches the tank. A reference to the map (enclosure A) will show how the water is contaminated between the tank and the town.

The whole course (about a mile-and-a-half) of both channels between the tank and town is through most richly manured sugar-cane and betel-gardens and rice-fields. There are innumerable leaks in the channels and the water keeps running continually from the channel on the north (Nakkalagandi Channel) to the channel (Pedda Cambam Kalana) more to the south, and from this latter channel into the Gundlakamma. These leaks form small streams, which, after passing for a very short distance through the highly manured land, become streams of liquid manure. Surgeon Ross has commented on this. The two places where the washermen of Cumbum wash the clothes of the place are situated above the town, and the water is subsequently used for drinking purposes—*vide* plan. Then a further reference to the map will show that a great number of the numerous graveyards in Cumbum are on the banks of these channels of drinking water. In fact many tombs or graves may be seen on the mound of excavated earth which has been taken from the channel and runs along the side of it. One of these burying-grounds may be noticed marked on the north of the plan, between the road to the calingula and the channel from the calingula. A large piece of this burial-ground was washed away in the recent floods, and the consequence of drinking the water defiled by putrifying corpses and crumbling bones may be easily imagined. As the ground of these channels is soft the jackals (from which one of the channels derives its name) are said to exhume some of the dead bodies and drag them into the channel. The plan shows twenty burial-grounds on the banks of the river, channels, and wells, the water of which is used for drinking purposes. Fifteen of these burial-grounds are in use.

There are sixty-six burying-places in Cumbum; of these fifty-one are now in use. Of these fifty-one burying-places, thirty-four are Mussalman, fourteen Hindoo, and three Christian. The Mussalmans bury near every mosque, or wherever they fancy; but they bury deep. The Hindoos have not so many burying-grounds, but it is found most difficult to get them to bury more than knee-deep. The aggregate area of the sixty-six burying-grounds is probably not more than an acre or two. They are already much overcrowded. It would be useful to know what the Sanitary Commissioner considers a fair size for burial-grounds in a town of this size. There have been 427 deaths registered out of a population of 7,000 in the last eight months. Of these 117 deaths may (at the rate of 25 per 1,000 per annum) be considered to result from irremediable or natural causes, and 310 from causes which might be counteracted.

A petition has been presented by 125 Mussalmans praying that the custom of intramural interments may not be interfered with. The petitioners have been informed that no interference with established custom will be tolerated by Government unless the strongest and most conclusive reasons for such interference are adduced. Without the strong advice of officers of Sanitary experience directing the closing of certain burial-grounds, I am not disposed to advocate steps in this direction until the other steps recommended have failed. Burying of corpses near water used for drinking purposes can never of course be tolerated. A Sanitary Officer might fix the amount of distance from water.

Another source of contamination which it is hard to stop is defœcation near the channels and bathing and washing clothes in them.

The only water available in Cumbum is that used for drinking, and if one of the two channels were set apart for drinking exclusively, very great hardship would be entailed on some people who would have to go great distances to bathe. Though every endeavour has been made to give effect to the penal provision of the law on sanitary matters, it has been found impracticable

to prevent pollution from the sources mentioned above. Some improvement has been effected in those parts of the channels where Act III of 1871 and Section 48, Act XXIV of 1859, are in force.

The only place where the drainage of the town can now run is into these channels. By endeavouring to turn the drainage in some other direction, to get persons to wash and bathe in the parts of the channels to the south and east of the town, and to reserve the parts to the north and west for drinking purposes, something has been effected, but the evil of contaminated water is very partially mitigated by these measures. In fact with the water so thoroughly foul, as it is, the people naturally regard prohibition from washing or bathing in it, as one would regard a prohibition from throwing salt in the sea in order that the water might not be made brackish.

With regard to this water, passed Hospital-Apprentice Wynne in his "Concise Report on the Climate of Cumbum" remarks :—

"The water possesses some sort of influence on the bile secretion increasing it very considerably in quantity, and I have remarked in myself and in many others when attacked with the fever, that the sufferings are very much aggravated if water be drunk, and that it produces vomitting of nothing but pure bile, increases the headache and giddiness, and in fact renders the patient worse. Another thing that occurred at the time was that for the first few days or weeks this water was used, persons passed blood with their daily motions. Other things were noticed also, derangement of the digestive functions, &c., being the main feature of the complaint." Dr. Ross sent some of this water to Madras for analysis, but the quantity was not sufficient for analytical purposes.

As above noticed it has hitherto been considered to be the duty of the villagers to clean out these channels, but they fail to do this and the channels get choked with green vegetation.

The second contributory cause of fever is I consider stagnation of the atmosphere. If the place was not sheltered by surrounding hills and trees, a fresh breeze might dissipate or mitigate the evil effects of what Surgeon Ross describes as the "sickening odour which exhales from the highly manured fields and swamp, and causes the malarial poisoning so common amongst the inhabitants." These deadly vapours are owing presumably to a great extent to the stagnation of noxious matter in a water-logged sub-soil. This state of things is aggravated by the ill-ventilated houses (regular fever-traps) and dirty habits of the people. The Medical Officer remarks, "The habits of the people of the country are very rude; they always have a liking to dirty means of living. Their houses are generally unclean, and very badly ventilated." The atmosphere is consequently as the Medical Officer remarks "impure."

Surgeon Ross also remarked on the deficiency of ventilation.

Doubt expressed as to whether the time has arrived for abandoning the theory of local causation of Fever.

(*j.*) From the above it will be seen that I have attempted to account for fever at Cumbum by suggesting local and remediable causes, as opposed to migratory or adventitious causes, for which latter, it is presumed, no remedy has been thought of. The fever, I submit, is caused by a combination of conditions most of which are transitory (or migratory if the word is preferred) and remediable.

If a place can be found where the causes above indicated are all at work together, and fever is absent, and another case where in the absence of any such local influences fever is present, then I think it will be time enough to cast about for a theory to supersede what was, I believe, hitherto considered as a *law* of local causation. Indeed, so universal seems to be the acceptance of the law of local causation, that I doubt whether Mr. Cornish even intended to imply more than fortifying it by additional observation or supplementing it in particular cases by the subsidiary law of foreign causation working in harmony with it.

Stagnation of water produces exhalation of miasmatic vapours from which a sub-soil surcharged with pollution; if to this is added a closed-in situation, and a deeply polluted water supply, waves of fever from without may come and go without making any perceptible or appreciable difference. Kurnool is I think the most northerly inland district, and accordingly we should expect if the wave of fever has been travelling south for some years back that matters would be mending here. This however is not the case. Attempting to account for the existence of fever by the mere presence of irrigation is unreasonable. Unless these irrigation works destroy sub-soil drainage (which as

a rule they do not) their influences in producing fever would be only small. The tendency is no doubt greater in double-crop wet land (like that near Cumbum) than in single-crop land. Just now (July), while cultivation and manuring are in active progress, all sorts of bowel-complaints are more than usually prevalent.

I think the theory that fever is caused or intensified by a combination of *local* causes, some of which are transitory, will account for the migratory indications noticed; at any rate I submit that before finally rejecting the local influence theory in favor of the migratory theory—before substituting the hopeless for the hopeful—we should have some well-authenticated cases where fever was prevalent in an open country, with good sub-soil drainage and pure water, although it was impossible to detect anyone of the transitory and local causes coming into existence, and I think we ought also to have a case where in the face of the combination of local causes (stagnation of air and water) noticed above, fever has receded on account of some unseen influence although the local causes continued in full force.

Until such cases well authenticated by careful local observation and reliable statistics are brought forward, it is submitted that the undulatory theory of fever causation can hardly be considered to be verified.

That fever increases in some places while it decreases in others must be frankly admitted; but the question is whether it has been clearly established that transitory local causes may not have arisen in the former and disappeared in the latter cases.

Since writing the above I observe from paragraph 399 of Mr. Cornish's Sanitary Report for 1873 that he is "forced to the conclusion that the vital statistics hitherto collected are so imperfect that any deductions from them touching the migratory character of the fever miasm may possibly be erroneous." I think every Revenue Officer, who has himself examined the vital statistics of the villages where he encamps, will most fully agree with Mr. Cornish. In fact, I would go further and do not hesitate to say that these statistics are positively misleading. If an effective system of rewards and punishments were introduced and properly worked, I venture to say that some results would follow which would be not a little surprising. From my own knowledge I can say that, in many villages of this division, not half the births and deaths are registered, and until the appointment of competent men is insisted on, and an effectual system of rewards and punishments introduced, very little improvement can be expected. It is observed that the need for Mr. Cornish's advancing a theory of migratory causation of fever arose from a failure hitherto to discover local causes which Mr. Cornish considered satisfactory.

The ground of the theory was the evidence afforded by statistics since condemned as untrustworthy by Mr. Cornish himself. I have hinted that the necessity for advancing such a theory seems hardly clear yet, and I believe careful and prolonged observation, where fever is most prevalent, would result in the vindication of what I may call the theory of local and transitory causes working in combination. Perhaps it is rash to hazard an opinion, or advance a theory on a scientific subject which is not one's speciality. The fact that I have had more practical experience of remittent and intermittent fever than men usually have during a much longer time of service has emboldened me to record the result of my experience for what it is worth. Satyamangalam in Coimbatore and Cumbum in Kurnool are perhaps as good taluqs as there are in the Presidency for observing everything connected with the intermittent and remittent types of fever respectively.

Now Satyamangalam is only about twenty miles from about the healthiest part of the Presidency (the country north of Coimbatore and Erode), and within seven miles of Cumbum we have villages where the death-rate is normal and the inhabitants are hale and hearty as any set of peasants I have seen in the country. The deaths per mille in the different divisions of the same Municipality (Madras) in 1871-72 differed from 21·1 in the 6th Division to 48·2 in the 4th Division. How are these facts to be reconciled with the theory of general or widely prevailing causes? With plenty of fresh air and good water (which implies good sub-soil drainage) I do not think fever can live.

From trees, hills (causing stagnation in the air), and a water-logged sub-soil, I do not think fever can be separated, though its effects will be most powerfully mitigated in coast districts by

sea air. With a free circulation of pure air, and a free flow of pure water, fever is incompatible; and stagnation of these elements, contaminates both and produces fever, as far as I am aware, invariably. I speak more particularly of the remittent type affecting the bile, spleen, and liver. The type of fever which these conditions lead one to expect is remittent or possibly typhoidal. Surgeon Ross in his letter embodied and printed with G.O., No. 654, dated 18th May 1875 (Public Department), speaks of the fever prevalent here as "malarious remittent and occasionally intermittent." Passed Hospital-Apprentice Wynne enumerated the sequels of the fever as "Diarrhœa, dysentery, enlargement of the spleen and liver, jaundice and general dropsy, emaciation, anæmia or leucocy-themia, irritation of the mucous membrane which when aggravated turns into inflammation or ulceration of the bowels is, I believe, one of the most commonly present conditions of the sufferers here." The conditions producing intermittent fever and ague are different no doubt in minor particulars. A certain elevation is believed to produce fever, but has this mere elevation been really found to cause fever? Where there are no trees or rank vegetation shutting out the fresh breezes and neutralizing the genial effects of the sun's rays and a damp sub-soil covered with rotting leaves, if stagnation is present fever follows. Where we get to open hill-tops and fresh breezes the fever has disappeared. This stagnation theory also harmonizes the admitted facts that fever is worse in the rainy months than in the dry months, and worse in years where the rainfall is heavy than in dry years. In fact the fever varies with the height of water in the wells; because sub-soil drainage and water at a low level are merely different ways of alluding to the same idea. The popular idea that the great fatality at Cumbum this year is owing to the fact that some buffaloes were not sacrificed when the tank calingula overflowed for the first time since 1854 has something in it. If we eliminate the part introduced by ignorance and superstition we have the rainfall and death-rate from fever connected and rightly connected by people who observe though they cannot reason.

To sum up then, it is asked has the time arrived to discard the theory of local causation of fever and look out for facts in support of a less hopeful theory? I think not. When Mr. Cornish has got under him zealous subordinates in the Health Department who will be willing to risk their own health for the sake of the general good and to make careful and prolonged observations in feverish localities; and when, instead of taking for sanitary purposes the division of the Presidency which has been found convenient for revenue purposes, we have divisions made with reference to varying local conditions, influences and peculiarities, so that places like Cumbum and Satyamangalam may be shown separately from the neighboring places which not being subject to the same deadly influences enjoy an immunity from disease, then I cherish the hope that the local causation of fever by removable causes will become an established fact, and that thousands of lives, and an unspeakable amount of misery, will be saved by the same act which will bring an increase of revenue to Government.

A fever very similar to that now raging in Cumbum broke out some years ago in the districts of Saharanpore and Muzaffanugger in the North-Western Provinces. This fever was at first referred to the irrigation canal, and then this hypothesis was abandoned as failing to explain all the phenomena observed. The Officers of the Canal Company naturally tried to show that the canal was doing no harm. The fever here was described as "not merely a purely malarious fever but often a complicated typhoidal fever accompanied with spleen enlargement and ulceration of the intestines." Medical men have now definitely pronounced this to be the result of bad drainage and bad water enhanced in canal-irrigated tracts by the influence of the canal in raising the spring level.

The Government have accepted this opinion and are executing drainage works accordingly. The belief in a law of local causation by "the defects of swampy grounds or in the drainage" is also expressed in paragraph 7 of the remarks by the Army Sanitary Commissioner on the Sanitary condition of Oudh embodied in Government Proceedings, No. 630, dated 14th May 1875.

Deputy Inspector-General Tribe even remarked that he "had known instances where the removal of very small and quickly-drying pools of water has been followed by great improvement

Proceedings of the Madras Government, Financial Department,
1st April 1876.

in the health of the inhabitants of the immediate vicinity entirely removing fevers of the remittent and greatly diminishing those of the intermittent type.

12. And this brings me to the third division of the subject of health at Cumbum, *viz.*, the remedies which there is reason to hope will bring about the desirable results noticed above. Ventilation, water supply, and last but chiefest sub-soil drainage are the points to which municipal action in sanitary matters should be directed. We will take these matters in the above order, as it is in this order that they are entered in enclosure B, the classified Statement of Municipal Expenditure, which has been framed as a basis for the report on the working of the Municipality.

Remedies proposed to remove predisposing causes of Diseases.

(*a.*) As regards ventilation, it will be seen from column 4 that, since the establishment of the Municipality, Rupees 4,182 have been spent on this object. The mode of furthering the object in view was to buy up and demolish houses which blocked up the passage of fresh air. More might no doubt be spent most advantageously in this way; and a reference to enclosure A will show this. Here the passages between the houses are shown separately from roads which are wide enough to admit a cart. These passages are tortuous, and in some places hardly broad enough to let two people pass comfortably.

Ventilation.

If Municipal funds were available money might be spent usefully in widening these suffocating alleys and making them passable for carts. These alleys measure in the aggregate more than a mile, and nothing has been spent in the year under review in widening them, nor has it been found possible to allot anything for the purpose in the current year's budget.

Another fruitful source of contamination of the atmosphere is the undue proximity of a burning-ground, marked close to the town on the south, and between the town and the swamp formed by the Gundlakamma. The people in the neighborhood bitterly complain of the way in which the burning corpses taint the atmosphere. Surgeon Ross' statements leave no doubt that the complaint of the people living near is well-founded, and the project of purchasing or procuring an eligible site for burning and burying grounds will be noticed when burying-grounds are taken into consideration.

(*b.*) Next as regards water supply, the expenditure of the Municipality on this object seems small—only Rupees 480—of which Rupees 32 were spent in the year under report. The fact is that, after giving this subject careful consideration, only one solution to the difficulty presents itself. The drinking water must be brought from the tank calingula to the north of the town by a raised masonry channel into which liquid manure cannot find its way. This channel should be brought through the middle of the town and about three masonry cisterns for drawing water be placed at convenient distances. As long as the wet cultivation and high manuring is carried on over the 500 acres of land which drain into these channels during their passage from the tank to the town, so long will the people continue to drink a dilution of liquid manure, and though the forbidding of burying bodies close to channels may in the course of years effect an improvement, it must be pretty clear that good sub-soil drainage must be at work for years before a sub-soil impregnated as it is with impurities arising from defœcation, burying, &c., can become so purified as to admit of the passage of drinking water through it without pollution. At present, I believe, the people could hardly find better manure for their fields than the earth forming the banks of the channels which convey them their drinking water. The sum of Rupees 32 spent with regard to water supply this year, was in order to provide stone steps along a part of the channel at the south end of the town from which people draw water.

Water Supply

The cost of a channel of the sort proposed would be about Rupees 20,000, according to the Range Officer's letter, No. 214, dated 13th July 1875, and any measure short of this will, I believe, fail to secure unpoisoned water for the people. The District Engineer has visited Cumbum and approves much of this plan. This explains the omission to expend hitherto much money on the water supply which is so bad.

(*c.*) The next column (column 6) of enclosure B is headed "Drainage." Upon this object Rupees 513 have been spent by the Municipality since its establishment, and Rs. 9 of this sum was spent in the year under report. This was on surface drainage; but expenditure on this head is comparatively useless until our sub-soil drainage is restored. When this is done there will be another difficulty, *viz.*, where to take the sewage of the town to. At present the drainage of a great part of the town inevitably finds its way into the channels of drinking water before they leave the town.

Drainage.

The proposed raised channel for drinking water from the calingula would dispose of this difficulty by making it unobjectionable to allow the sewage to drain into the channels now used for drinking purposes. These drains are shown in the plan along the sides of the remade roads —*vide* table of reference on plan.

A reference to the plan will show pretty clearly what is wanted to restore the sub-soil drainage. The lagoon or swamp formed by the dammed-up bed of the Gundlakamma must be removed. This swamp skirts the Municipality on the south, and is only two or three hundred yards from the town itself. The water in this swamp must be let off; and this might be done in a couple of hours by a few coolies by simply lowering the passage for the water under the arches of the bridge on the Cuddapah road which passes over the Seikrail Anicut (Dasabandum) on the Cuddapah road. But in the present silted up and leaky state of the anicut channel, if we lowered the water in the morass, we should be cutting off the supply of the anicut channel which represents a revenue of over Rupees 10,000 yearly to Government when in repair, and of over Rupees 9,000 dams; but a loss of revenue will follow their removal before the repair of the channel, [illegible] until this anicut channel is put into effective repair, the great cause of malaria at Cumbum is not likely to be removed. From a letter, dated 1st June 1872, No. 38, from the Range Officer, it appears that the question of draining the wide part of the swamp between the point where the anicut channel branches off and the anicut itself attracted the attention of a former Head Assistant Collector here. The Range Officer proposed to construct a masonry dam or weir at the spot where the anicut channel branches off from the bed of the Gundlakamma. The top of this weir should, he said, be on the same level as the high water-mark in the anicut channel. The level of the water-way under the arches of the bridge should, he said, be lowered to the level of the bed of the swamp which would thus be reclaimed and about six or seven acres of land, the assessment of which (if it were assessed like the surrounding land) would be about Rupees 12 an acre, made available for cultivation. The cost of the scheme would be about Rupees 12,000.

As the Range Officer remarks, "The Dasabandamdar should not be allowed to dam up the water in the swamp by constructing an earthen dam across the existing bridge." I may remark that the water-way under the present bridge is altogether insufficient. The road was swept away in three places in September last, and a large quantity of the crops lost. This is another argument in favor of removing the present order of things. If the height of the proposed masonry work dam were fixed with reference to the head of water required for the anicut channel *when in good repair and not silted up*, and it was clearly understood that raising the water above this height would be tolerated on no pretext as it endangers life, then I think sub-soil drainage would be permanently restored.

With reference to the removal of causes of sickness, Surgeon Ross remarks: "A proper fall for drainage can be found near the Gundlakamma river in the Kurnool road, where a bridge and dam have been built to keep the water in the paddy-fields; if this obstruction were removed, a considerable portion of the land would be drained."

(*d.*) Passing on to column 7 of enclosure B we find that Rupees 1,137 have been spent by the Municipality since its establishment to prevent contamination of drinking water; it has been sought to secure this desirable end by building latrines and dust-boxes so that the sources of pollution may be removed. Rupees 91

Water polluted by latrines, defecation, burial-grounds, washing, bathing, and sewage.

were spent on this object in the year under report, and Rupees 200 have been allotted in the current year's budget.

We have at present seven latrines (all for females only). This gives one latrine to every 1,000 of the population. The situation of these latrines is shown in the plan. With regard to one shown just north of the channel of drinking water at the south of the town, Surgeon Ross writes, "placed five yards from the edge of the stream, and immediately above the place resorted to by the inhabitants of that to part of the village for the purpose of drinking water."

Seven other latrines which it is proposed to build are shown separately in the plan. The Commissioners would be glad to know what provision in the way of latrines the Sanitary Commissioner considers adequate for a population of 7,000. We have got seventeen dust-boxes already, and the proposed site of eighteen additional ones which are badly wanted is shown in the plan.

In the plan, sixty six burying-places are marked, and some have no doubt been omitted. There are comparatively few wells in Cumbum; but many, indeed I believe most of them, are in the midst of burial-grounds, and long lines of tombs may be seen along the banks of channels. The Medical Officer remarks that "the practice of burning or burying near the town and on the banks of the channels should be forbidden." No doubt the persons thus burying dead bodies are liable under Section 269, Indian Penal Code, for doing an act calculated to spread disease and endanger life. The acts which Surgeon Ross stated should be prohibited are—

1. Defœcation on the banks of the channel.
2. Allowing drainage from houses to find its way into the channels.
3. Bathing and washing clothes above the places used for drawing water for drinking purposes.

Orders were issued at once by the Magistrate prohibiting these acts under Section 518, Criminal Procedure Code. There can be no doubt that there is a much larger number of burial-grounds in Cumbum than required; but before deciding on the action to be taken under Section 134 of the Act, the Commissioners would be very glad to have the advise of the Sanitary Commissioner which might be given after referring to the plan which shows the situation of the tombs. In the plan are also marked four proposed burial and burning grounds, one to the north and one to the south of the town for Hindoos; and one to the north and one to the west for Mussalmans. About 800 Rupees compensation would be required for three of these proposed sites. One of them is Government waste. Their distances from Cumbum vary from half to a quarter of a mile. The aggregate extent of the four burying and burning grounds would be about eighteen or twenty acres. They would not contaminate the water supply; of these the chief places proposed for sepulture and cremation are those marked on the dry ground to the north of the town. This brings us to the end of the subjects of air and water (columns 4 to 7, enclosure B), and also to the end of the remedies proposed for fever in Cumbum. We now pass on to the other items of expenditure under the Act (column 8—29, enclosure B).

In column 8 of the statement (enclosure B) is entered the money expended by the Municipality on the Conservancy Establishment. The amount hitherto spent is Rupees 7,994, the largest amount spent on any one item. Rupees 1,097 have been spent in the year under report. The cause of this sum falling short of the allotment in the *budget will* be shown in paragraph 11, where the unexpended balance and variations between actuals and estimates will be noticed in order.

Surgeon Ross remarks that "a suitable staff of officials for sanitary purposes should be supplied, the present staff being insufficient, most of them as a rule being too ill for the proper performance of their duty." We can hardly increase the establishment at present.

13. The next item (column 9) is Vaccination, under which head Rupees 443 have been spent since the passing of Act III of 1871, before which no expenditure on vaccination was incurred by the Municipality. With reference to vaccination at Cumbum, Deputy Inspector-General Smith observes, "Vaccination is very backward here, sixty-three were vaccinated during 1874; forty-two successfully, and the results in the case of five were unknown. The Municipal

Vaccination.

Vaccinator complains of the unpopularity of the practice among the Hindoos here, and of the little personal help he gets from native officials. I have called his attention to the fact that each successful case costs the Municipality nearly Rupees 3.

The following statement shows the number of people successfully vaccinated since operations were commenced :—

Year.	Number of successful Cases.	Total Cost of Vaccination.	Average Cost of each successful Case.
		Rs.	Rs. A. P.
1871-72	38	58	1 8 5
1872-73	45	128	2 11 8
1873-74	58	133	2 4 8
1874-75	41	129	3 2 4
1875-76	1 (3 months.)	30	30 0 0
Total ...	183	473	2 9 4

The Vaccinator is thus shown not to have vaccinated persons even at the rate of one per week, at an average cost of Rupees 2-9-4 to the Municipality for each case. The average cost per case throughout the Presidency for last year appears to be 4 Annas and 7 Pies.—*Vide* paragraph 3 of G.O., No. 18, dated 6th January 1875.

The Vaccinator says that his failure to vaccinate more than one case since the 1st of April is owing to the fact that the people are too sick to get vaccinated. The Commissioners therefore considered that their funds would be better disposed of, if the Taluq Vaccinator would pay Cumbum a visit in a month or six weeks, and the Commissioners would be glad to pay for his services in such a way as Government might decide.

But if there is any objection to this plan, two other expedients suggest themselves to the Commissioners to enable them to transfer some of the vaccination allotment to improve the water supply, or to effect some more urgently required work.

Government in their Order, No. 1171, dated 23rd May 1867, directed that the Hospital Assistants attached to Revenue Offices should vaccinate all cases which come to them.

The Commissioners would be glad to know what are the views of the Surgeon-General or Sanitary Commissioner with regard to employing the Hospital Assistant attached to the Municipality, to vaccinate the few cases which the people in this backward part of the country are willing to bring. If this course is objected to, the Commissioners would be glad to know how long it would be before a pupil-apprentice (G.O., No. 418, dated 23rd February 1875) would be able to learn to perform vaccine operations, and whether he might be safely entrusted with this duty.

This latter proposal was made at a meeting held on the 10th of April last, and the resolution is printed in G.O., No 1216, of the 4th June 1875. From G.O., No. 1135, dated 24th May 1875, it appears that a similar proposal had been previously made by the Oossoor Local Fund Board and has been approved.

Ten Rupees a-month to the present Vaccinator for the duties of a post which he perhaps does not care to make other than a sinecure seems to be expenditure in a wrong direction. Only one successful operation has been performed in the last three months. He may possibly be wilfully neglecting his work in hopes of getting transferred. This practice is not uncommon amongst subordinates who see that their healths are undermined and their lives endangered without the extra pay which is said to be granted in less unhealthy places.

When the Government have been so liberal as to sanction the supply gratis of the extra medicines required at Cumbum (G.O., No. 1216, of the 4th June 1875) it seems right that the Commissioners should do their utmost to see that no Municipal Funds are spent on less urgent objects, or upon objects the practical effect of which is felt so little as vaccination at Cumbum.

Proceedings of the Madras Government, Financial Department,
1st April 1876.

14. Passing on from Vaccination to Registration (column 10, enclosure B) we find that in the four years during which the Municipality have undertaken this work, a sum of Rupees 256 has been spent. That the results are now very much more complete and reliable than when there was nothing to check the returns of the village authorities, there can be no doubt; but that some cases are still omitted, and that a certain small percentage will always escape the vigilance of the Registration Peon, seems pretty certain. If burying and burning were confined to five or six places fewer cases would no doubt escape. This is supported by the following consideration. The Census of the Municipal Town of Cumbum, that is to say, Cumbum and Chintalapoliem (*vide* G.O., No. 929, dated 13th September 1866) on the 1st of March 1867 was 8,747, and on the 15th of November 1871 it was 7,703, showing a falling off of 1,044 in 56½ months or about 18·5 per month. Now since the introduction of Registration, 1st of May 1871, up to the end of June 1875, 1,061 births and 1,462 deaths have been registered. This accounts for a decrease of 401 amongst the inhabitants since May 1st, 1871; that is to say a monthly decrease of five persons; but it may fairly be presumed (1) that the Census of 1867 showed the population below what it really was, and consequently that the falling off between 1867 and 1871 was really greater than 18·5 per month as shown above, and it may also be presumed (2) that the population has been decreasing more rapidly since November 1871 than before. The increasing number of deaths registered and their increasing excess above the number of births warrants this belief.

Registration.

From the above observations, one of three hypotheses must be accepted. Either a large number of deaths are not registered, and so registration fails to show the decrease shown by the Census to be taking place amongst the people of Cumbum, or else a large number of people are emigrating to more favored places, or else both causes of decrease are operating together. Some people do no doubt leave the place to improve their health or to escape municipal taxation. The former class generally stop until it is too late to save their lives, and thus deaths properly attributable to Cumbum malaria escape registration. Thus perhaps most of the decrease shown by the Census to have taken place is to be referred to the climate of Cumbum, but some of those who leave the place may do so in time to save their lives. And now a word as to the practical good which the Municipality derives from the submission of the statistics monthly to the Sanitary Commissioner. These returns show that the death-rate at Cumbum, ever since the 1st November 1874, has been throughout considerably over double the normal rate, and sometimes over five times the normal rate. The normal rate is taken to be 25 per mille per annum, as indicated in the Sanitary Commissioner's letter, No. 724, of the 26th May 1874. Calculating that the decrease in population shown by the Census to be in progress is going on at the rate of 20 per month, the population on the 1st of April 1875 would be 6,893 amongst which number the number of deaths registered in April, *viz.*, eighty-one, would show a death-rate per annum of 141 per 1,000 of the population, or nearly six times the normal rate. Notes had been added to some of these returns before April drawing the attention of the Sanitary Commissioner to the great mortality from fever; and it was hoped that he might with reference to those remarks think it right to lay the subject of the public health at Cumbum before Government; but as nothing appeared to have been done up to April, and as matters instead of getting better, as usual before that time of the year, were getting worse, Government was addressed, and the result was the immediate supply of the requisite medicines and medical help. After Surgeon Ross had been here for about three weeks, he was attacked with the dysentery which was proving so fatal to the inhabitants, and when it was considered safe to move him, he was sent to Cuddapah in charge of a Hospital Assistant. The other Hospital Assistant left next day, though the death-rate still continued more than treble the normal rate. After they had all gone letter, No. 724, dated 26th May 1875, was received from the Sanitary Commissioner in which he requests that the working of the registration machinery may be inquired into as the death-rate is three, four, and five times in excess of the normal rate, and "there has been no prevalence of any disease to account for it."

The Sanitary Commissioner suggested that the returns should be tested to see whether outlying hamlets have been included in them. When the great mortality was shown in the returns as

the result of fever; when the prevalence of the disease had been specially noticed in foot-notes to these returns in letters, Nos. 18 and 10, dated 31st January 1874, and 31st January 1875, respectively, forwarded to the President for transmission to the Sanitary Commissioner, it is hardly clear why, with a normal birth-rate, the Sanitary Commissioner should have thought it necessary to adopt the hypothesis of our concerning ourselves with registering deaths outside our limits, in order to explain the high death-rate from fever at an unhealthy time of an unhealthy year in an unhealthy town. The Commissioners wish it to be understood that they are very far from wishing to imply that they have a right to or can reasonably expect any more from the Sanitary Commissioner. With the, in many cases, worthless and misleading vital statistics which are submitted to him, it is quite right and natural that all statistics should be looked on with suspicion. Even if there were subordinate officers of the Health Department to send over the country, it would be but right to see that they were only sent where they were really wanted, and not where inaccurate statistics seemed to show they were wanted. It is hardly necessary to give instances of cases of this sort, but to explain for instance a birth-rate 84 and 87 per mille in Madura, during December and January last, we must apparently suppose that the women there bore invariably twins or triplets. The Sanitary Commissioner thought that our statistics here might be equally worthless, and so we failed to attract his attention until medical aid had come and gone. Now on looking on the figures (7,295) entered in the Sanitary Commissioner's Report for 1873, and with reference to which he has calculated the death-rate for January, February, March, and April 1875, there appears reason to doubt their accuracy. A reference to G.O., No. 929, dated 13th September 1866 (Public Department), and to enclosure A, will show that the village of Chintalapoliem is included within municipal limits. From page 45 of the Census Returns (1871) for Kurnool District it appears that the population of Cumbum itself is 7,137, and that of Chintalapoliem 715; deducting from this 149 persons who live outside municipal limits, as defined in the Order of Government above quoted, we get the population of Chintalapoliem within municipal limits to be 566, which added to 7,137 gives us 7,703 as the population of the municipal town of Cumbum on the 15th of November 1871, and it is with reference to this population that the vital statistics were prepared.

Making a deduction of twenty per month since the last Census, it will be found that the population in April 1875 would be 6,893, so that the Sanitary Commissioner's calculation on a population of 7,295 was not so far wrong. He however entered the death-rate for April as 113·24, which is no doubt a clerical error for 133·24 (calculated on a population of 7,295). Owing to the very great number of burial-grounds probably from 5 to 7 per cent. of the deaths escape registration. The Registration Peon gets through his work as well as can be expected in Cumbum, but several instances of omission have been discovered. The registered births and deaths of each month giving names of parents, place of abode, &c., might be stuck up at the beginning of the next month in the village chávadi, and a reward of from 2 to 4 Annas given to anyone who brought to notice an unregistered or wrongly inserted event. This reward might be recovered from the Registration Peon by way of fine. This system would hardly be compatible with the entry of events which never really occurred; and this is the objection to a system of payment by results to the Registering Peon.

Percentage of Sanitary Expenditure to Total Receipts.

15. Passing from Registration (column 10) to column 11, Rateable share of Management expenses, we find that altogether Rupees 3,743 are debited under this head to Sanitation since the Municipality was established, of which sum Rupees 344 were thus debited in the year under report.

This brings us to the end of the subdivision of Sanitation, and we find from column 12 that a sum of Rupees 18,748 has been spent on this head since the Municipality was established; from column 30 we see that this sum of Rupees 18,748 represents 37 per cent. of the total Municipal receipts. The sum of Rupees 1,774, the total amount spent on Sanitation in the year under report, represents, we find from column 30, 25 per cent. of the total receipts of the year.

Proceedings of the Madras Government, Financial Department,
1st April 1876.

falls off. Even if extra medical help could be sent during the most unhealthy months (October 1st to April 30th) this would be an inestimable boon to the people.

Subordinates in the Medical as well as other Departments are tempted to neglect their duty with a view to reports being sent against them. They hope by this means to get a transfer; and if they fail to excuse themselves by pleading ill-health, they would rather be punished and sent elsewhere than remain here without punishment expressly inflicted.

There is one other point with regard to the hospital which requires notice. The funds of this institution have been to some extent misapplied by feeding incurable cases. There are two such cases in the hospital now. One has been there since the 8th of November 1872, and the other since the 14th July 1874.

With regard to one of these cases the Hospital Apprentice lately in charge wrote that it was "an incurable case of long standing, the right one for admission into an infirmary, which, to all intents and purposes, the Civil Dispensary is not."

If these people were turned out, they say they have no one who would feed them. As this is hardly a legitimate charge on the Municipality, perhaps Government might defray the charge from Provincial Funds.

Total expenditure to promote health.

17. Adding Sanitary and Medical expenditure together (column 17) we find that a sum of Rupees 24,642 has been spent to promote the health of the community; this sum represents 48 per cent. of total receipts (column 32); and the expenditure to promote health in the year under report is represented by the same percentage, 48.

Part III.—PROSPERITY.

18. We have thus got through the most important part of the report, *viz.*, what has been done, and what has yet to be done, to restore and promote the public health at Cumbum; we have still to consider what has been done and what remains to be done by the Municipality to promote the object of prosperity, education, and lastly convenience. Under the head of Prosperity (columns 18 to 21 in enclosure B) are shown the sums expended on the repairs (column 19) of Roads. The expenditure on this head amounts to Rupees 3,678 since the Municipality was established. In the year under report Rupees 372 were spent.

The houses in Cumbum have, as in all the villages about here, been built just wherever the owners pleased, so that the alleys or passages are most tortuous, and generally speaking impassable for carts. Those which are passable for carts are shown in enclosure A distinctly from alleys through which carts cannot pass, but which ought to be made broad enough for carts to pass after a due provision for the more urgent object (health) already noticed has been made.

These passages are over rocks and through cesspools; and the expense incurred in converting them into passable streets has been entered in column 19 (Repairs), though perhaps it might more appropriately have been considered as expenditure on Construction.

From enclosure A it will be seen that there are altogether about 6½ miles of roads and passages at Cumbum, for the upkeep of which (after they have all been made) a yearly allotment of about 700 or 800 Rupees (=120 Rupees a-mile) will have to be made. Out of this total length of 6½ miles of road, 2¾ miles of road have already been made.

Provision is made in the Local Fund Budget for the upkeep of the road from Cuddapah where it enters the south-east corner of Municipality up to the 104th milestone from Kurnool marked in the plan.

Deducting this length of more than 1½ mile, for the annual upkeep of which Rupees 326 are allowed from Local Funds, we have a remainder of 1¼ mile of made road to be kept up by the Municipality, for the upkeep of this a yearly allotment Rupees 190, at the rate of Rupees 150 per mile per annum, should if possible be made. Probably the Local Fund Board may before long claim part of the Tolls, or demur to keeping up the road within municipal limit; in the latter case a further annual allotment of Rupees 320 for the upkeep of the main road would be required.

Besides the 2¾ miles of made road, there remains a distance of more than 2¾ miles of road wi[illegible] enough for carts to pass which is very much in need of being made. At present, these roads are [illegible] succession of rocks and quagmires. They would cost about 1,200 Rupees per mile to make. The most urgently required is the piece of road (continuation of the Râya Vidhi) from the north side of the Pedda Cumbum Channel to where it joins the already made Kakarla road. The Basket Maker's street from the Kakarla toll-gate to the Markapooram toll-gate, skirting the north of the town, is also much used by the ryots who live in that quarter. To remake these two roads, which are already wide enough for wheel traffic, would cost about Rupees 750, and the passages, which both for the sake of ventilation and traffic should be widened, require to have about Rupees 1,800 (the length is over one mile) spent on them before the town can boast of a presentable appearance.

These passages or alleys are what a former Vice-President in his letter embodied with G.O., No. 1068, dated 2nd August 1869, described as "nothing but wretchedly narrow zig-zag lanes, worse probably than are to be found in other towns of the kind, there being in many places hardly room for one bandy to pass at a time."

The roads constructed this year were—

1. Kanacamma Street.
2. Carpenters' Street.
3. Kapa Street.
4. Pávurél Gudi Street.
5. Part of Râya Vidhi.

These roads are marked in the plan.

Perhaps exception may be taken to the amount spent on roads before due provision was made to secure an improvement in the public health; but the Commissioners would wish it to be remembered that, if the views which they entertain as to the causes of disease are correct, radical changes and works outside municipal limits, with which the Commissioners have nothing to do, are essential before the good effects of such minor improvements as their funds permit the Municipality to undertake, can be felt. Adding rateable share of management (column 20) to what has been spent on roads, we find that, since the establishment of the Municipality, Rupees 4,553 and in the year under report Rupees 462, representing respectively 9 and 7 per cent. (column 33) of the receipts, have been expended with the object of promoting the material prosperity and improvement of the town.

Part IV.—EDUCATION.

19. Passing on to the third object which the Act is intended to promote, *viz.*, Education (columns 22 to 25, enclosure B), it will be observed that expenditure on middle class as opposed to elementary education has been shown separately.

Inadequacy of expenditure on Elementary Education.
Impolicy of present large expenditure on Middle-class Education.

On elementary education Rupees 99 and on middle-class education Rupees 2,797, respectively, have been spent since education became a Municipal charge in 1871. In the year under report Rupees 32 and Rupees 830 were spent on these two kinds of education respectively. The total expenditure on education represents 11 per cent. (column 34) of the income both in the year under report and in the other three years in which education has formed a Municipal charge. From paragraph 9 of G.O., No. 824, dated 12th April 1875, it will be seen that this percentage of expenditure on education is perhaps greater than in any other Municipality in the Presidency.

The circumstances under which the word "elementary" before education was introduced by the Select Committee, and struck out at the last moment, before the Bill became Act III of 1871, are too recent to have been forgotten.

But this excision at the eleventh hour does not seem to have influenced Government so as to result in a system under which the well being of the many should be sacrificed to the luxury of the few.

Proceedings of the Madras Government, Financial Department,
1*st April* 1876.

In fact the great justifying cause for enforced contributions to what may be called a Co-operative Society for the promotion of the health, prosperity, education, and convenience of the subscribers is the fact that the subscriptions will be honestly devoted by the persons selected to represent the contributors, so as to secure the greatest amount of good to the greatest number of subscribers, and not so as to take the subscriptions which can often be but ill-spared from the ignorant and needy, and employ them to advance the interest of a small though perhaps clamorous section of the community. A People's Park is a justifiable object of expenditure when the more urgent calls upon the Municipality have been met.

But if the section of the community using the People's Park is small it would be more in consonance with fairness to reduce taxation and leave the section of the community interested in the People's Park to provide it for themselves, than to employ public funds on this object.

Suppose, however, that when the most ordinary precautions to preserve life and health are beyond the means of the Municipality, the Commissioners were to start a croquet ground, a band-stand for five or six European residents, surely this would be nothing short of robbery, and though I have taken an extreme case as an illustration, yet I propose to show that the yearly expenditure by the Cumbum Municipality of about Rupees 250 (in addition to school-fees and Government grant) on middle-class education differs from the imaginary case of the croquet ground in degree only, and in no very remote degree either.

When last I visited the school about ten days ago, I found twenty-one boys there when I arrived, and eight more came before I left, making twenty-nine altogether. I got the head-master to write down their names and the names of their parents or guardians. I then got the Municipal Manager to enter against the name of each boy's parent or guardian the amount of Municipal taxes which he paid. This amounted for the twenty-nine boys to Rupees 37-8-4. Deducting this from the sum which the Municipality has to pay towards the support of the school from general taxes, there remains a sum of over Rupees 200, which is contributed by ratepayers not benefited by the school.

Now suppose one of the many ryots living in the alleys or passages which abound in Cumbum, and which I have already described as consisting of a succession of rocks and quagmires, were to come to the Commissioners and say, "Gentlemen, since the establishment of the Municipality, nine years ago, I have been paying 5 Rupees a-year for my bullocks, carts, and house; and up to the present time the neighboring cesspools make it dangerous to approach my house at night-time; and may not improbably have been partly instrumental in causing the death of my two children from fever; I cannot bring a loaded cart to my house but have to unload it 100 yards off and carry each bag or log up the narrow passage which leads to my house; if I and some of the other ryots living in this passage had even a small portion of the money which we have paid the Municipality since it was established, we could fill up the cesspools, and make the roads passable for carts.

"Please consider our cas[illegible]s compared to the case of Pleaders or Government servants stationed here for a time. As an instance, take the Taluq Sheristadar, a Tamil man. He came here in 1873. He pays 1 Rupee a-year for a cart to the Municipality. That's all. He has a fine road, the Main Bazaar street, up to *his door; but besides this* he sends his sons and relations to get an education in English to be paid for out of the money which the ryots find it so hard to earn, and still harder to spare."

This is no imaginary case, and I am glad no ryot has troubled himself to put the question, for I scarcely see how to answer him.

The parents of three of the twenty-nine boys who attended the school when I visited it last, pay nothing at all to the Municipality. Surely such boys ought to be made to pay extra. The class which supports the Municipality is the cultivating class, and only five of the twenty-nine boys represent this class. Sixteen of the twenty-nine boys are sent by Government servants, Pleaders, and Contractors. Some persons who pay the Municipality Annas 3 and Pies 8 for their hut are giving their sons an English education. The fact that the ryot is quiet and

yielding, and the Pleader and Government servant clamorous and exacting, may explain, if it does not justify, the state of things noticed.

But the history of the Middle-class School at Cumbum will be found in G.O., No. 196, dated 15th February 1872 (Public Department), and G.O., No. 1606, dated 2nd December 1872, (Financial Department).

The Proceedings of Government upon which these orders were passed will show the nature of the representations made in order to induce Government to sanction and permit, in the case of the Anglo-Vernacular School at Cumbum, a departure from the general rule that public funds must be spent on public purposes.

"As a special case" Government were pleased to yield the point apparently even under protest and as an experiment "in consideration of repeated and earnest solicitations," but "on the express understanding that in the Budget Estimate for the ensuing year suitable provision is made for purposes of elementary education." This Order of Government directly raises the question whether the Rupees 99 spent on elementary education during the last two years (for nothing was spent before) represents a suitable provision for elementary education.

If we remember that the population of the place is 7,000, and that there are or ought to be about 1,000 boys of school-going age in this number, it appears hardly necessary to say more on the question of the adequacy of expenditure hitherto made on elementary education.

The real question is are we justified in devoting anything to education of any kind until we have done all in our power to make existence other than burdensome, as it is now to the sickly and wretched invalids who may be found in the house of almost every ratepayer. I am quite aware that if I were to give notice of bringing under the consideration of the Commissioners the subject of withdrawing municipal aid from the school, educated Cumbum would be up in arms, just as it was when it was proposed to save the Municipality Rupees 60 per annum by removing the school from the town to a building (marked in enclosure A) about three-quarters of a mile from the town. The boys' friends wrote a long petition and pointed out amongst other things that snakes might bite the children in their passage from the town to the school. The Commissioners yielded the point to these anxious parents; but if the Commissioners had really represented the interests of the general body of the ratepayers, instead of the small but educated and influential portion who give their sons an English education, I fail to see how they could have brought themselves to let Rupees 60 go yearly to save the boys a healthy walk of a mile or two daily.

The Cumbum Anglo-Vernacular School supplies no want that I can see. No one is likely to qualify there for passing the examinations required before admission into the public service can be gained; and, as has been well remarked, "many must fail in the struggle for place, and those who are too proud to fall back upon agricultural or industrial employments, remain to swell the ranks of the idle, the discontented, and the unproductive."—Census Report, 1871.

From this class comes the abuse and lies which forms the substance of low native journals in more advanced parts of the country, and of anonymous or pseudonymous petitions, where printing has not been introduced. Whether the contribution of Municipal Funds to swell the ranks of legal touts, malcontents, and intriguers is politic or just, while the children of the ryots (who form the mainstay, both of Government and the Municipality,) are not taught to read, or check the family puttah or receipt, is a question which appears to admit of but one answer. Cumbum is already a sort of city of refuge, whither fly dismissed Government servants, unsuccessful contractors, and others whose principles have made existence in better places uncomfortable. With these men the youths who have just learned enough English to read and copy are thrown in contact. The moral atmosphere of the place thus becomes as tainted as the material air.

It would be premature to say much about what the Commissioners could do for elementary education if the Government are pleased to state their views and wishes as to the percentage of funds to be devoted to this object. The first thing would be to rent or build one or two school-houses. The Deputy Inspector of Schools justly takes exception to the present aided school being held in the Master's house. Then the Commissioners should endeavour to give vitality to the effort towards promoting elementary education by advice to parents and the exhibition of

interest in the school. The Deputy Inspector in his last report states that fever has d the endeavours of the schoolmaster to earn any results grant.

Government Proceedings, No. 741, dated 30th April 1874 (Financial Department), are e views of the Commissioners as to the practical steps which should be taken to promote ary education.

get the boys to come to school is the great thing. Capitation fees might produce good this direction. If there are any grounds upon which the Director of Public Instruction to part payment of schoolmasters by Capitation fees, the Commissioners would be glad vored with the Director's views on the subject. The sum of Rupees 99 already spent on education during the last two years has shown no appreciable results yet. The unsatisfactory state of the Anglo-Vernacular School and remissness of the master have been noticed in eports. This part of the report has been read to the Deputy Inspector of Schools, and he the views recorded. The state of the Anglo-Vernacular School is, he says, unsatisfactory.

Part V.—CONVENIENCE.

We now come to the fourth and last object of Municipal expenditure, *viz.*, "Convenience," upon which from column 38 we see 3 per cent. of Municipal Funds has been spent since the ality was started, and 8 per cent. (Rupees 216) in the present year. The amount spent since ing of the Municipality is Rs. 1,484; Rs. 1,122 for the nineteen lamps marked in enclosure and lighting them, Rupees 57 on a cart-stand in 1867, which was found to be unsuccessful ot in use—*vide* paragraph 11 of Vice-President's letter printed with Government Proceed-. 1027, of the 20th August 1868—and Rupees 17 on the Municipal market. The remaining Rupees 288 represents the rateable share of Management expenses to be debited to this s 174.

Lighting Cart-stand and Market place.

the gen al principle be recognised that expenditure on Convenience (head 4) ought to be aring until Sanitary and Medical requirements have been fairly provided; for, perhaps speaking, the lighting of the town at this stage of Municipal history at Cumbum may be xception to. As, however, lighting the town tends to prevent accidents, and a really e sanitary reform must be on a scale which the Municipality unaided cannot hope to carry s hoped that the apportionment of 3 per cent. of Municipal Funds to lighting may be ed defensible.

wever as the incidence of Municipal taxes at Cumbum as compared to other Municipal ppears to be heavy, and as the people have as a rule but very slender means, some might t deprecate the enforced contribution to a public convenience by persons who may have to ir families in the necessaries of life in an unfavorable year for agriculture.

Part VI.—MISCELLANEOUS.

We have now got to column 36 (the last column except the Remark column) of enclosure B. This column shows the percentage which the unexpended balance bears to the This is shown to be 27 per cent. (Rupees 1,960) of the Municipal income, and with e to G.O., No. 1874, dated 5th November 1874 (Financial Department), and paragraph 3 No. 1442, dated 27th August 1874, on the subject of "the annually-recurring failure e funds," it is proposed to explain how this sum of Rupees 1,960 remained as unexpended in the year under report.

Variations between Actuals and Estimates.

unexpended balance consists of two parts (1) allotted (1,167) and (2) unallotted (698). udget originally sanctioned by Government, it was estimated that there would be no alance in the year under report; but this was based on the belief that the opening ould be Rupees 2,038, whereas it is 2,218, or Rupees 180 more than expected, and that ,233 would be spent on a Municipal Office. This work, it was subsequently determined ent Proceedings, No. 1874, dated 5th November 1874) should lie over for the present,

RECEIPTS.

(1.) The opening balance exceeds the estimate by Rupees 180. This is explained in paragraph 4 (1) of my letter submitting the current year's Budget (G.O., No. 352, dated 17th February 1875).

(2.) A sum of Rupees 31-8-0, the portion of the Government grant due for March 1875, was not credited to Municipal Funds until April.

(3), (4), and (5.) The falling off in rates on (3) House, (4) Vehicles and Animals, (5) Registration of Carts, is accounted for (*a*) because in framing the Budget allowance was not made for the declining state of the town; (*b*) because the services* of an efficient Manager have not yet been secured; (*c*) because fever made the Municipal servants less able than usual to do their work, and the people less able to pay. The Budget Estimates for 1874-75 were believed to be too high when framing the estimates for this year (1875-76). The actuals for the year under report are very little less than for last year, and if the arrears collected since the close of the year be added, the receipts from the three heads will be found to be very little if at all less than they were last year. A sum of Rupees 196 has been entered as irrecoverable balance of assessed rates on houses against a sum of Rupees 182 last year. If a revised list of houses (Section 47 of the Act) had been prepared, ruined houses would have been struck out, and the demand assessed would then have been less.

(6.) The receipts from Tolls were over-estimated—*vide* paragraph 4 (6) of letter submitting Budget for current year, and paragraph 2 of letter submitting Administration Report for 1873-74.

(7.) Fines are necessarily fluctuating.

(8.) The increase of the Local Fund Grant by Rupees 354 is explained in paragraphs 4 and 6 of the letter submitting the Budget for the current year.

EXPENDITURE.

(9.) The changes in the allotment of Rupees 1,333, Grant I. (New Works) are given in paragraph 4 (8) of letter submitting Budget. Besides Rupees 154 spent for bath-rooms to the Civil Dispensary, Rupees 60 were spent before the end of the year towards the erection of a latrine. The remaining cost of the latrine (Rupees 54-8-0) and Rupees 251 for a Municipal office building bought at auction were disbursed from Grant I (New Works) after the close of the year for expenses incurred within the year under report.

(10.) Besides the sum of Rupees 400, originally allotted for repairs to roads, another sum of Rupees 400—making altogether Rupees 800—was added in accordance with the G.O., No. 1874, dated the 5th November 1874. In addition to the sum of Rupees 372 entered as spent during the year under report, a sum of Rupees 194 has been since disbursed for work which on account of the prevailing fever could not be completed and paid for within the year. The savings under this head have, as before stated, been transferred to the Civil Dispensary to meet additional expense unavoidably incurred.

(11.) A sum of Rupees 150 was allotted—

Rupees 50 for repair of latrines.
Rupees 50 do. drains.
Rupees 50 do. toll-gates and sheds, but only a little more than half this allotment has been spent. A sum of Rupees 31-10-0 was disbursed within the year for the repair of latrines; Rupees 31-12-0 for repair of drains, or rather to make a revetment for a channel used for drinking and as a drain too.

It was not found necessary to spend more than Rupees 8-10-0 out of the Rupees 50 allotted for toll-gates and sheds. The saving of Rupees 74 has been utilized for the hospital.

(12.) A saving of Rupees 39 in the allotment for the Anglo-Vernacular school is accounted for by the fact that contingent expenses have been cut down.

* New Manager took over charge on 1st September 1875.—H. R. F.

(13.) The saving under Salary Results Grant of Rupees 118 is accounted for by the fact that the Deputy Inspector of Schools reports that school operations were stopped by fever, and that he did not therefore examine the boys (vide Resolution 4 of Meeting of the 19th April 1875). The sum of Rupees 32 was paid in the form of a salary grant (eight months at 4 Rupees) to the pial schoolmaster.

(14.) The decrease from Rupees 50 to Rupees 5 on account of School Inspection contingencies is explained above.

(15.) The apparent decrease in the expenses of the Civil Dispensary, while in reality there was a considerable increase, is accounted for (a) because the bill for the salary of servants, &c., for February was not sent in till April on account of the illness of the Medical Officer in charge; and (b) because the Commissioners were only informed of the amount of salary of the Medical Officer from March 1874 to March 1875 after the end of the year under report. The sum of Rupees 738 has been since disbursed in payment of salaries earned in the year under report.

(16.) A sum of Rupees 173 is shown as saving out of the allotment for conservancy. It was intended to get some new carts made, and Rupees 100 were allotted for this purpose; the carpenters have been dying, and the overseer has been often too ill to look after the work; so only Rupees 16 out of Rupees 100 allotted were spent.

Rupees 50 were allotted for cleansing wells, drains, and channels. Work was expended partly on account of sickness, and partly because on consideration it appeared that these minor works are of little, if any, appreciable value, until we can get pure water and sub-soil drainage brought within reach of us. There was a saving of Rupees 31 out of the sum of Rupees 100 allotted for conservancy contingencies. The same establishment as usual was kept up and paid.

(17.) The short expenditure under Lighting (Contingencies) is Rupees 35; the saving by reducing expenditure under this head, so as to be available to promote health, will, it is hoped, be considered justifiable for the reasons already adduced.

(18.) Management contingencies have for the same reason been cut down to Rupees 50.

22. In paragraphs 4 and 5 of the Administration Report for 1873-74 (reviewed in G.O., No. 1442, dated the 27th August 1874) allusion

Difficulties in the way of a successful working of the Act.

was made to two of the causes which made a successful working of the Act in Cuddalore somewhat difficult. These two difficulties referred to the insalubrity of the place, and the little help the Commissioners got from the European Officers in the Commission who cannot remain much in Cuddalore, and the great difficulty of getting any one to serve here except those who have been tried and found wanting elsewhere.

In the year under report twenty meetings were held; the Assistant Superintendent of Police attended one meeting, and the Range Officer four meetings.

The same Manager whose inefficiency is mentioned in paragraph 8 of the President's letter embodied in G.O., No. 1874, dated 5th November 1874, and whose early removal was ordered by Government in paragraph 4 of G.O., No. 352, of the 17th February 1875, continues* in his post. In answer to a notice published in the Gazette inviting persons to apply to the Vice-President for the post, only three applications were received and were sent to the President with letter, No. 95, dated 9th July 1875.

It is observed that Government in paragraph 4 of their Order of the 17th February speak of the "Manager" as a Head Clerk for the management of the Municipal Office. Perhaps in larger Municipalities the outside executive work is satisfactorily provided for by separate agency, but here with only an Overseer on 15 Rupees, who is not unfrequently absent from sickness, and in view of the frequent absence of the Vice-President, it is very necessary that the Manager should be, if possible, a man who can keep his eyes open, go round in the morning and see that the conser-

* Relieved 1st September 1875.—H. R. F.

vancy people are at work, that contracts are being faithfully carried out, nuisances not allowed to prevail, &c.

This is the great want here. The present Manager is a fair, if a very slow clerk, but for any other work, he is about as ill-fitted as he could be.

About five days of his time in each month have been taken up in writing out the long Financial Statements (a fair and office copy) called for by the Accountant-General in his Circular, No. 2608, dated 24th June 1874.

From the President's docket, No. 767, of the 13th July 1875, it appears that the Municipality must either get the required number printed, or continue to have them written, as the printed copies received were for the use of the Collectorate. The work which now takes five or six days ought not then to take more than as many hours. This extra work partly accounts for the fact that the proceedings of the meeting of the 5th of June were not copied and translated till 10th July.

We have been trying to economize by keeping our bills for printing as low as possible. The printing of such a large form as this would be very expensive. From the last bill, prepared it is stated in accordance with the scale of printing charges given in Board's Proceedings, No. 463, dated 26th March 1871, it would appear that the cost of printing 250 copies (a ten-years' supply) would be about Rupees 70, and that a less number would cost nearly as much. When a number of copies are printed, we might get a supply for two or three years for a small fraction of the cost mentioned above, and, with a view to economy of Municipal Funds, it appears doubtful whether the Government would not think it better to have a moderate number of forms supplied for a few rupees, than to have the Manager's time taken from the routine work of the office to copy these long statements.*

There can be no doubt that the appointment by Government of the Range Officer and Medical Officer to be ex-officio members of the Municipality will prove a real advantage.

The appointment of a popular member of the Commission was a real want, and it was hoped that this want might be supplied when the Reddy of Cumbum was appointed; but he has been told not to take any part in municipal business until October. He took a share in the Municipal Toll Contract between the date of his nomination and appointment; but it would hardly seem that this act on his part makes his appointment void. The Municipality in this out-of-the-way place may be allowed to have exceptional difficulties to contend with, which make periodical visits and advice all the more necessary; on account, however, of climate we get less inspection than perhaps any other Municipality. During the last two years, we have had the advantage of one short visit from the President; we have had one from the Deputy Surgeon-General, the good results of which have become apparent already. No Inspector of Schools has come since 1872, nor have we had the advantage of the Sanitary Commissioner's advice. It is hoped, however, that if Government are pleased to send enclosure A to this Report to the Sanitary Commissioner, he may find the plan of the place serve to some extent instead of a visit to the Municipality; and if such a plan as this had been in his hands, it seems more than probable that some of the local causes of disease would not have remained in existence so long.

Then the Hospital, which I may call the mainstay of the Municipality, in popular favor suffered a good deal this year on account of their being no suitable medicines at the most unhealthy time of the year.

The original indent was sent to the President on the 20th February last.† There was only one printed copy of the form, and as the Hospital Apprentice was sick he sent the original by itself to prevent the delay which would occur if he waited until he could copy it. This original indent was received back from the President on the 16th of March with orders to have a duplicate copy

* Printed copies of new forms since received.—H. R. F.

† Received on 5th March in an incomplete state, and therefore returned on the 10th for the total value of the medicines being entered, as well as for a duplicate copy.—J. H.

prepared. It was a very long indent, but with the help of the Vaccinator the Medical Officer managed to get a copy made, and it was retransmitted to the President on the 1st of April.*

Then it appears from the Zillah Surgeon's letter, No. 37, dated 19th April 1875, that the President wrote to him on the 16th of that month, asking him to check this indent.

It does not appear that his knowledge of local requirements would enable him to say what was really requisite, but he said he "fancied" that the indent could be cut down to Rupees 350 without interfering with the working of the hospital, and so both copies of the original indent became useless, and the President's order to prepare a fresh indent arrived here on the 25th of April, but before this, we had received a supply of medicines, as, in view of the numbers of people dying here for want of medicines,† the Head Assistant Collector had ventured to take upon himself to address Government direct in letters, Nos. 113 and 117, dated 12th and 14th April, respectively, copies of which were sent to the President with his letter, No. 58, dated 7th May 1875. The peon left here on the 12th April, and brought the medicines here on the 24th of April. In the mean time, however, while indents were being recopied, and again rejected, some of the people lived in hope of the arrival of medicines, but many died in despair for want of them.

The indent, cut down as suggested by the Zillah Surgeon, took some time to prepare as the Hospital Assistant's work in dispensing to patients was more than he could well get through.

It reached here on the 12th of May and was sent on to the President the same day. From G.O., No. 1185, dated the 2nd June 1875, it seems that it was forwarded by the President to Government on the 26th of May, and was passed on for supply to the Surgeon-General on the 2nd June 1875; but in the mean time it appears that the Surgeon-General, being alive to the loss of life implied by delay, had, while indents were being rewritten and examined, and while the Sanitary Commissioner was beginning to doubt statistics, procured a copy of the original indent (disallowed by the President)‡ direct from the Medical Officer, and had supplied medicines in accordance with that. The medicines reached here on the 25th of May. These facts and the fact that the Commissioners received no reply from the President in answer to their application of the 8th of June 1874, nor to the application contained in Resolution 8, printed with G.O., No. 1634, of the 28th September, as to the delay in supply of medicines, leads them to think that, if Government sees no objection, it might be advantageous for the Commissioners to be allowed to address the medical authorities direct.

Since the arrival of the first batch of medicines on the 22nd of April (quinine ordered by Surgeon-General from Kurnool by telegram), people flock as usual to the Civil Dispensary. There can, however, be no fear now with reference to G.O. No. 1216, dated 4th June 1875, that the wants of the place will not be fully recognised and liberally met if we make them known.

General Result.

23. Now it will be seen, as the general result of what is stated above, that, if the views expressed as to the local causation of fever are accepted, the first thing must be to remove the local causes, first by reconverting the large morass on the south of the town into a running stream as it was formerly. The Government will observe from the map (enclosure A) that this is a Government irrigation work outside municipal limits; and from what has already been said it will be seen that Government are losing more than Rupees 6,500 yearly on account of the channels [illegible] fall out of repair. [illegible] ry makshift, rendered nec[illegible] [illegible]ls co[illegible] are the [illegible].

The cots are two in number, of the common low wooden native roped kind. Both are viceable. Patients frequently bring their own cots.

Hospital Servants.

One ward cooly, one cook, one toty common to Police and Civil Dispensary, who is paid Rupees 5 per mensem by Government, and Rupee 1 from the Municipal Funds. There is no nurse, no compounder, and no peon.

Medicines.

Second-class indent medicines were not sufficient in 1874. Frequent purchases had to be made in the local market; the indent of 1874 was responded to in October 1874; but the supplies sanctioned were less than those indented for. ***.

in this river, and thus turn the health-promoting running stream into a noisome swamp, which is believed to be the great cause of all the fever here.

The Commissioners feel perfectly confident that this state of things only requires to be brought to the notice of Government to ensure speedy measures of relief being adopted. A great annual increase of revenue to Government and of health to the people may be confidently looked for as the result.

But while this measure will remove the cause which, it is believed, originated the fever, it is more than can be expected that the shattered constitution of from 50 to 70 per cent. of the people of Cumbum will be restored by this single measure of relief.

The orders of the Collector, No. 326, dated 10th August 1866, by which the repair of these large channels was said to be the duty of ryots, was given by an officer who had not seen the place, and does not seem to have elicited remonstrance from local officers; nor in fact could it be expected that the result could be foreseen; and, although the tide had begun to set in the wrong direction for Cumbum before this order was passed, the order must apparently be considered to have given the *coup de grace;* and if the Government are pleased to consider that from this order has resulted in a very great measure the present unhealthness of Cumbum, and moreover that the order was passed under a mistaken view of the wishes of Government, then the Commissioners feel emboldened from the past liberality of Government to hope that, besides having the channels repaired and thus removing pestilential swamp at the south of the town, Government will be pleased, in consideration of what the place has suffered during the last ten years, to give the Commissioners that help which is requested before comparatively pure water can be substituted for the foul dilution of liquid manure, bones, and the remains of dead bodies which the people are now obliged to drink.

The scheme for bringing water from the tank calingula by a masonry work raised channel into the town is the least expensive scheme which the Commissioners can hope to be really effectual.

The District Engineer aproves of the scheme.—H. R. F.

Its cost has been roughly estimated at Rupees 20,000.

If Government, advised by officers of sanitary experience, consider the scheme essential to enable the people of Cumbum to live in health once more, the Commissioners feel the question of where the funds are now, and eventually to be provided from, is one which the Government with the facts now submitted before them will be able to decide without a formal request from the Commissioners, whose partial or local leanings might [illegible] seem to ask too much. An unwillingness to appear too rapacious may, the Commissioners hope, be considered by the Government as an excuse for not asking for anything definite, either as a loan or a gift.

If, however, the Commissioners can claim the credit, or part of the credit, of bringing to the notice of Government that a loss of Rupees 6,500 yearly would be saved to Government by the same work which would remove one great cause of fever, the Commissioners do not despair of getting placed at their disposal the saving which will be realized by Government in three years (6,617 × 3 =) Rupees 19,851; with a view to remove the other great cause of disease by procuring a supply of good water for drinking.

	Rs.
Besides this outlay of	20,000

for drinking water, the drainage of the swamp which will result from

unhealthy season began last year in October. The only extraordinary cause for the dinarily high death-rate is believed to be the excessive rainfall. At the present time the s much fuller than it was this time last year, and the na[illegible]es anticipate a heavy rainfall this ye[illegible]. Under these circumstances I think the services of at least one extra medical man seem really necesary.

Surgeon Ross will be able to state whether it is fair to expect one man—and the Municipal Hospital Assistant is by no means a strong man—to get through the work unaided. On this subject Surgeon Ross remarked: "The Medical staff is weak. There ought to be one to attend to patients in the village, and another in charge of the dispensary, besides the medical subordinate who accompanies the Head Assistant Collector. A compounder is also necessary." The inevitable result is that many patients cannot be attended to, and so attendance at the hospital

The new dispensary recommended by Dr. Smith and Surgeon Ross is a matter upon which the Medical authorities will, if necessary, address Government.

The answer then to the call made by Government in G.O., No. 873, dated 10th April 1875, for a report as to the adequacy of expenditure on Sanitary works is briefly as follows. The expenditure on Sanitary *works* has been quite inadequate—

(1.) Because unless works with [illegible] Commissioners cannot interfere are executed it seems to the Commissioners that other works will to a great extent be futile.

(2.) Because the water works required must be on such a scale that the Commissioners unaided cannot undertake them. The expenditure on minor works, such as latrines, dust-boxes, &c., seems to have been fairly adequate. The expenditure on Sanitary and Medical Services, which is the allotment really criticised by the Secretary of State, is very large (71 per cent.—*vide* enclosure (B) in the current year's Budget), and from Government Proceedings printed with G.O., No. 1216, dated 4th June 1875, it will be seen that the Commissioners are ready to raise the allotment by every means in their power.

Incompleteness of Report.

24. This Report has already reached an inordinate length, and therefore the Commissioners do not propose to make it exhaustive by considering how the three great desiderata in taxation might be better secured than they are at present. One point only the Commissioners think it right to notice. In Section 41 of the Act, it is provided that the Commissioners shall exempt from assessment any house, building or land, the annual value of which is less than 6 Rupees, if the same be the sole rateable property of the owner.

Now the annual rate on houses in Cumbum is imposed by assessing a percentage of 7½ per cent. on the annual rent (*vide* Vice-President's Memorandum embodied in G.O., No. 929, of [illegible] September 1866). The annual rent must be taken to be a little more than the annual value. The assessment according to the fixed percentage on a house, the annual value of which is Rupees 6, would be about 7 Annas and 2 Pies. If the assessment is less, the annual value of the house must be less than 6 Rupees, and consequently Section 41 of the Act requires its exemption from taxation. There are 603 houses in Cumbum taxed at less than 7 Annas, and 582 houses are taxed at Annas 3-8. The owners of these houses have no other rateable property.

The Commissioners feel doubtful [illegible] the taxes to be realized from the owners of these houses should be included in next year's estimates of receipts.

Conclusion.

25. The burden of all that has been written is that if Cumbum is to be arrested in the downhill course which it is now running so rapidly—if the palmy days are to be restored when Europeans vied with each other to get stationed here, and the native sepoys selected it as the favored spot where to end his days in peace—then two things are necessary, the poison vapors from the swampy river must be removed, and the foul waters of the irrigation channels must be replaced for drinking purposes by the waters of a stream of pure water. The emaciated forms of the grown-up people, the sickly, helpless look of the children, the ruined houses, and the losses in almost every early death from the prevailing pestilence, point clearly to a repetition, at no very distant period, of the scene pictured surviving as the Deserted Village, unless we recognise the causes while in progress, and combat the evil by striking at its root before it becomes ineradicable. It is mentioned in a report already quoted that the swamp, already so often alluded to, "was once a running stream, and no doubt helped to drain the town."

If we do not recognise the position in time, the subject may be supplied to some future local Goldsmith for an idyl on the desolation now but too swiftly progressing at Cumbum. Whether that possible bard of the future may choose, in view of the land-absorbing Komati, to ring the changes once more on the *latifandia perdidere* fallacy, or whether he may ascribe the downfall of the place to the barbaric demolition of the old village system under which the now famous Reddy of the Ceded Districts grew and flourished, it would be premature to surmise. But if the

local poet be as true to nature as his English prototype, he will not allow his admiration for a proud peasantry departed to efface from the picture the Gundlakamma which

> "No more a glassy brook reflects the day,
> But choked with sedges works its way."

Perhaps if a Sanitary Commissioner could have been invoked to visit "Auburn" before the desolation was complete, the scene which suggested one of the gems of English [illegible] might never have been presented, the "glassy brook" might have been made once more "to reflect the day." We hope it may at Cumbum.

(Signed) H. R. FARMER,
Vice-President.

CUMBUM,
20th September 1875.

No. 2. From Dr. H. KING, A.M., M.B., Acting Sanitary Commissioner for Madras, to the Hon. D. F. CARMICHAEL, Officiating Chief Secretary to Government, Fort St. George, dated Madras, 13th November 1875, No. 1993.

I have the honor to report that, in obedience to G.O. of the 2nd October 1875, No. 1453, paragraph 2, I have visited the station of Cumbum and certain other sites in the Division suggested by the Acting Head Assistant Collector as eligible for division or taluq headquarters or both, and to request that you will submit to Government the following conclusions at which I have arrived.

Although the order appears to imply a determination to abandon Cumbum as [illegible] exception of sites recommended for a new station, I trust I may be excused for having so far exceeded my instructions as to have inquired into, and reported on, the possibility of retaining Cumbum as headquarters.

2. The site of Cumbum Town is not essentially unhealthy; its facilities for drainage and water supply were originally good, and there is evidence that until a comparatively recent period it was considered a healthy and pleasant station. Unfortunately there can be no doubt of its present and progressive unhealthiness. This I believe to be remediable by removal of its causes.

3. The chief predisposing causes of the abnormal sickness and mortality of the town were, in my opinion, the crowding of every available spot within its limits with corpses, and the pollution of its water-supply. The exciting cause is malaria arising from a swamp which, owing to partial silting up of an important irrigation channel, has replaced for about two miles the running streams which originally drained efficiently the irrigated lands around the town.

4. More tombs than living persons are visible in the t[illegible] is almost literally true that one corpse at least has been laid under every [illegible] house or street. The borders of wells and water-channels, so far from being avoided, seem chosen especially for sepulture. I attach a copy of a letter on this subject addressed to the President of the Municipality on the 25th ultimo. The Mussulmans are the principal offenders in this respect. I had an opportunity of ascertaining the views of the Mahomedan community on this point, and I found that they preferred the abandonment of Cumbum as a station, the withdrawal of hospital and dispensary, even death by what they call fate, and we call posion, to interference with the *manul* of burying the present generation in the remains of the past.

5. The water supply is derived almost altogether from the great lake two miles east of the town, a few wells, reputed good, being rarely used, except when the channel water is muddy in time of fresh, though the latter being then most diluted is at its best. The main stream which supplies Cumbum proper, receives its first instalment of contamination immediately after its issue from the calingulah sluice. One of the two parties of dhobies who do all the public washing of a town of 7,000 inhabitants works here (the other having chosen a spot which interests only the Municipal village of Chintapolliem). The channel then runs for about two miles through or along cultivated and highly-manured rice-fields, its edge being the favorite site for extramural interment. Graves are dug close to the stream, and some have evidently been broken into by flood waters. Within the town the open channels not only receive the ordinary pollutions of Indian water-courses, but also drainage and soakage from innumerable corpses, graves having for centuries been and still being dug in immediate proximity to the stream. The main channel runs through the middle of the principal Mahomedan cemetery, interference with which is earnestly deprecated by the Mussulmans. It is obvious, without entering into further detail, that the present water supply of Cumbum is incurably bad.

6. The remedy is easy if expensive. The enormous tank affords a perennial supply of wholesome water, which a special channel constructed along the unirrigated land to the north-west would convey and distribute to the town. As the tank often runs low and occasionally dry, the propriety of checking the outflow, at present unfruitful, and of prohibiting cultivation in its bed, will be deserving of consideration.

7. It is possible that the effects of unwholesome air and water simply accumulated, unnoticed by an unobservant population, until they reach the point of explosion and spread disease and death to the extent which has prevailed for the past ten years. When, however, we find the diseases to belong almost invariably to the type due to malarial poisoning—when we know from abundant experience that irrigated land in itself does not necessarily generate paludal fevers—when we observe a noisome swamp of such a character as we know to be capable of producing malaria in virulent abundance, stretching for two miles along the southern edge of the town—when we learn that malarial diseases began to prevail and increase from the time at which the irrigation channel, communicating with what is now a swamp, ceased to be kept clear and became unable to fulfil its purpose without the aid of obstructions in the river-bed, which aided in extending and perpetuating the morass—it appears to me impossible to resist the conclusion that the unhealthiness of Cumbum is the result of known and removable causes, and is therefore remediable. I have reason to believe that the original condition of the river-bed and channel can be restored, and the swamp drained and reclaimed without diminishing the area of irrigated land below.

8. I have indicated the three principal conditions necessary to be fulfilled in order to restore an average health-state to the population of Cumbum. If the opposition of the Mahomedan population be regarded as an insuperable obstacle to the prohibition of burial within the town, and if considerations of expense preclude the introduction of an abundant supply of pure water and the draining

of the southern swamp, I believe that attention to minor sanitary improvements will have no appreciable effect; and, under such circumstances, I should recommend the abandonment of Cumbum as headquarters either of division or of taluq. On the other hand, I am anxious to guard against the inference that a normal rate of sickness and mortality will be an immediate result of the completion of the sanitary improvements suggested. It is even not unlikely that the effects of malaria will be at first intensified by the measures taken for its extinction. A period of three years at least should intervene between the beginning of the needful sanitary works and the reoccupation of the station. During this time temporary offices could be provided in a neighboring part of the taluq, the hospital (or a better one if possible) remaining at Cumbum in charge of a Medical officer or subordinate competent to observe closely and carefully the effects of the measures which have been adopted for the improvement of the public health. Should the retention of Cumbum as a division station be decided on, I would suggest that the new offices and other buildings which are, I understand, contemplated, should be erected on the high ground north-west of the town, near the eslingulah. Should this suggestion be adopted, it will be desirable to extend the limits of the Municipality in this direction, so that the hamlet which may be expected to grow up around the public offices, and the entire length of the new water supply channel, may be under municipal control.

9. In the foregoing paragraphs I have, for the sake of brevity and to avoid delay, confined myself to a general statement of my conclusions with respect to Cumbum. In my detailed Inspection Report I shall enter more fully into the evidence by which I have been guided, and I shall forward to Government extracts bearing upon this point if desired. Most, however, of the facts on which my opinions have been based are, I am informed, already before Government in the Head Assistant-Collector's reports.

ARAVIDU.

10. *Aravidu*, in the Markapur Taluq, about seven miles north-west of the present cusbah of Markapur, has been suggested as the most eligible position for the new headquarters of the division in the event of Cumbum being abandoned. After careful examination of the site and neighborhood, I believe them to be unexceptionable from a sanitary point of view. A considerable tank lying north and south has been formed by connecting a line of rocky hills by short bunds, the line of embankment forming the eastern boundary of the artificial lake and the waste weir being to the north. The south-western angle of one of these hills juts into the tank, and on the spur there is a well-raised, well-drained, level surface, supplying an excellent site for the Head Assistant-Collector's offices. Higher up on the same hill are two or three spots well-suited for a residence. Southward of this hill, at the other end of the nearest bund, there is abundance of high level ground on which taluq offices could be erected, should the transfer of these from Markapur be ordered.

11. The water of Aravidu is considered the best in the taluq. The favorite well is close to the Tamarind tope below the hill. It is excellent to the taste, and springing in clay slate and being almost out of reach of organic contamination, it will afford an abundant and pure supply. It should be emptied and thoroughly cleaned,

protected by parapet and platform from surface drainage, and provided with wheel and iron buckets to obviate the necessity of dipping vessels of doubtful cleanliness. Its present occasional use for the irrigation of some dry cultivation need not be interdicted. A small portion of the land in its immediate neighborhood might well be [illegible] and planted.

12. The drainage of the fields under the bund north of the hill will require a little attention. At the time of my visit the sluice was leaking freely, and the water not being then distributed for irrigation had a tendency to lodge and form a swamp. There is sufficient fall, and the remedy is easy.

13. It is scarcely necessary to say that the present village will bear a good deal of cleaning. Its domestic dung-heaps must be moved out, its street-holes filled up, and its wells protected from pollution. New houses which will be required, if any of the public offices should be transferred to Aravidu, must not be allowed to spring up anywhere or anyhow. An opportunity may be afforded of building a model Government village on sound sanitary principles.

14. With reference to the choice of temporary or permanent headquarters for the taluq of Cumbum, I visited four places, which may be named with sufficient accuracy,—Cheticherla, Turimilla, Taticherla, and Daddavadu.

15. It had been suggested that a convenient spot might be found at no great distance from Cumbum, beyond the southern limit of land irrigated by the great tank on the main road to Cuddapah. Accordingly, CHETICHERLA was chosen as a type of such a site. The village is a small one near the 10th mile-stone from Kurnool, and where the Ongole road branches off north-eastward. The ground is well-raised and dry; but the position is clearly directly in the course which malaria blown from its Cumbum source by almost any wind, except a southerly, would take. During the north-east monsoon, especially when the malarious influence at Cumbum attains one of its maxima, no spot in the valley or funnel, extending from Cumbum to Taticherla, could be pronounced secure from wind borne malaria. The experiment has already been tried. A most promising site for a temporary encampment was selected by Mr. Farmer at Pandinapullay, about four miles lower down the valley. After a week's trial (August 6th to 14th) the position was found to be untenable owing to fever.

TURLILLA.

16. *Turimilla* is a town of 2,884 inhabitants, on the right bank of the Gundlakamma river, which is one of the two main feeders of the Cumbum Tank, reappearing below it under the same name. The town is about four miles from the tank. As the crow flies it is nearly nine miles from Cumbum; though, as the man walks, it is a good deal further, and as cart and bullocks travel—unless my experience is exceptional—the distance, measured by time and personal suffering, is great indeed. The complete absence of anything, which even flattery could call a road to the place, is the only objection, and this not insuperable to the selection of Turimilla as taluq headquarters.

17. The town is reputed healthy, and inquiries made on the spot confirmed its good report.

18. Two excellent sites for offices, &c., were examined. One (which I prefer) is on high ground, a short distance from the south bank of the river a little above the upper ford. The soil is dry and porous and drainage excellent. A belt of trees on the north bank shelter the position from the possible noxious influence of a tank of which I shall speak further on. The other site is good [illegible] to the east of the town, below the lower ford, near some disused indigo-vats.

19. A third site I mention only to exclude. It is on the north side of the unbridged stream, and on this account alone is ineligible, the river being always difficult to cross and occasionally impassable. On sanitary grounds, however, the position is, in spite of appearances, objectionable. It is high and so well-drained that Turmeric grows luxuriantly; but it is close to the south-west side of a neglected tank, acres of which are shallowed by silting and overgrown with rank vegetation.

20. The town is cleaner than most towns of its class, but is still capable of improvement. Many dung-heaps have been moved out of streets and yards, but many remain. The banks of the river, which supplies drinking water to the inhabitants, are very foul, being used freely both as a latrine and a graveyard.

21. The remaining two sites are equally eligible as regards communications and position in the taluq, both being near the junction of the Kurnool with the Cuddapah road. *Taticherla* is a miserable village of 901 inhabitants, east of the combined road to Cumbum, a little distance to the north of the 89th milestone from Kurnool. No spot in the immediate vicinity of the village can be recommended as a site, but south of it, on the same side of the road, close to the junction of the Kurnool road, a rocky knoll affords, on its southern side, a good position for buildings. For two reasons, however, I think the site objectionable. Though 15 miles from Cumbum it is at the mouth of the valley down which the current of malaria may be expected to come; and the possible, if improbable, danger may as well be avoided. Secondly, a tank belonging to the village of considerable extent has been converted into an ill-drained or undrained rice-swamp by cutting the bund through.

22. North of the Kurnool road, at the 88th milestone, a well raised site with gravelly soil outside the valley in which Taticherla lies was found. The nearest important village is *Daddivadu*, with 2,355 inhabitants, reputed healthy. Should any considerations preclude the choice of Turimilla as taluq headquarters, I recommend that this site be adopted.

23. As during my inquiries I enjoyed the advantage of the presence and assistance of the Acting Head Assistant Collector, Mr. Farmer, and the District Engineer, Mr. Goodchap, I hope I may be pardoned if, in summing up the conclusions at which I have arrived, I do not restrict myself to sanitary considerations exclusively:—

(1.) Cumbum Town may, I believe, be restored to a satisfactory condition as regards health, but the work will be costly and will need at least three years for its accomplishment.

(2.) Aravidu is well suited for division headquarters. It is rather more central than Cumbum, may be made quite as accessible at little expense, is healthy, and affords excellent sites for offices and residences of European and Native officials. Fair building stone, moreover, is obtainable in abundance on the spot.

Proceedings of the Madras Government, Financial Department,
1*st April* 1876.

(3.) The transfer of taluq headquarters from Markapur, situated at the eastern edge of the taluq and cut off by a considerable river, though ordered in 1869, appears to be still practically an open question. Should the removal be judged expedient, Aravidu will probably, in any case, certainly, if chosen as divisional station, be the best position to select for the new taluq station.

(4.) Should Cumbum be abandoned as cusbah of its taluq, the best site for the new offices will be Turimilla, provided it be made accessible by roads—a condition which will, I understand, be expensive of fulfilment, though, I may suggest, improvement of communications in this direction is highly desirable, independently of the question immediately under consideration. Building materials of good quality are obtainable at hand.

(5.) Next to Turimilla, the position on the Kurnool road near its junction with that from Cuddapah, a little east of the village of Daddivadu, appears to me best. It is fairly central for the taluq and near to the only roads which I observed in the division.

(6.) If it should be determined to remove taluq headquarters from Cumbum, as a temporary measure only, and not to incur the serious expense of making Turimilla freely accessible to traffic, the last-mentioned site is to be preferred.

From Dr. H. KING, A.M., M.D., Acting Sanitary Commissioner for Madras, to the President, Cumbum Municipality, Kurnool, dated Cumbum, 25th October 1875, No. 29.

I have the honor to state that the pollution of the air and water supply by [illegible] in the midst of crowded dwellings and on the borders of channels is the most obvious predisposing cause of the present unhealthy state of Cumbum. The burial-grounds within the town proper are "in such a state and position as to be dangerous to the health of persons living in the neighborhood thereof," and "suitable places for interment" exist and either are, or can readily be, made "available within reasonable distances;" I request, therefore, that the Municipal Commissioners of Cumbum will immediately take the necessary steps for the absolute prohibition of burials within any part of the town.

2. The prohibition of interment or cremation within municipal limits generally is not at present necessary. My notes on this and other subjects connected with the sanitary improvement of Cumbum will be communicated to you as soon as possible. I address you thus early on the subject of burial within the town, because the evil is great and growing; and Act III of 1871, Section 134, requires two months' notice at least before a burial-ground can be closed.

3. In addition to closing all cemeteries within the town of Cumbum proper, the objectionable and dangerous practice of burial on, or close to, the banks of the channels which supply the Municipal Town or any part of it with water, should be at once and peremptorily forbidden.

4. In order to save time, I shall supply a copy of this letter to the Vice-President of the Cumbum Municipality.

No. 3. From Surgeon-General E. G. BALFOUR, Surgeon-General, Indian Medical Department, to the Hon. W. HUDLESTON, Chief Secretary to Government, Fort St. George, dated Fort St. George, 7th December 1875, No. 630.

In accordance with the orders of Government, No. 499, of the 31st March 1875, I have the honor to submit a report on the town of Cumbum by the Deputy Surgeon-General, Mysore and Ceded Districts.

2. Two subjects were originally submitted in my letter, No. 135, of the 17th March 1875, *viz.*, (*a*) as to the advisability of retaining Cumbum as the taluq and division headquarters; or (*b*) of abandoning Cumbum altogether as irremediably insalubrious. In my letter, I mentioned that the Vice-President of the Municipality had reported that natives dread the villages in the Cumbum taluq more than Cumbum itself, though he had doubts whether the dread was well-founded, and he advised that Aravidu in the Markapur taluq be made the headquarters, being more salubrious and more central, and Government then (G.O., No. 499, of the 31st March 1875) authorized me to depute an officer to have the country examined and a favorable site reported on, and added that the largest question might be considered at the same time.

Subsequently, in July last (G.O., No. 970), Government observed that after the rains the Deputy Surgeon-General would examine the neighborhood of Cumbum in order to report on the subject of a new site for the Head Assistant and Taluq headquarters.

On the 2nd October (No. 1453), Government remarked on the imperative necessity for the early selection of a new and healthy site for the Head Assistant and Taluq headquarters, and the Deputy Surgeon General's report was ordered to be expedited, but the Sanitary Commissioner was ordered not to await it; and in the G.O., No. 1804, of the 28th October, I was required to submit detailed proposals with estimate of additional cost for creating a Civil Surgeoncy at Cumbum.

3. The information, which the Deputy Surgeon-General has now received from the Head Assistant to the Collector, is that the population of the taluq is steadily increasing at the rate of 20 per cent. per annum, but the population of the town has been annually decreasing at the rate of 12 per cent., and he furnishes in illustration the following tabular statement showing the population in the past thirteen years :—

Years	Population of the Taluq.	Population of the Town.
1862	98,437	8,020
1867	103,304	7,983
1871	121,453	7,137
1875	31st March	6,893

He adds that the death-rate amongst children is high; that the death-rate is in excess of the birth-rate; that the casualties from fever are so common, and often so sudden, the people have become apathetic and are even prepared to reject attempts made by the Municipality to improve the sanitation of the town, and that [illegible] to feel also the pressure of taxation. The Deputy Surgeon-General refers to the map of Cumbum which accompanied the 1874-75 report of its Municipality, as showing that the principal sanitary defects are obstructed drainage with its colligated evils and polluted water supply. He mentions that the 1874-75 report traces the obstructed drainage to a silting up of the water-channels, which began in the year 1866, in consequence of their conservancy having been transferred from the Civil authorities to the Inamdars, and he states that the medical history of the town seems to indicate that the evils of the obstructed drainage and polluted water supply have been in existence for some years, and that no thoroughly efficient steps have been taken to restore the town to the healthy state it enjoyed

Proceedings of the Madras Government, Financial Department,
1st April 1876.

previous to the year 1866. He describes the town of Cumbum as built on a slightly elevated tongue of rock in the centre of 500 acres of irrigated land with natural facilities for drainage. A small stream, however, the Gundlakamma, formed from the surplus water from the sluice, passes along the southern border of the irrigated land, receiving in its course much of the irrigation and town drainage, and then turning to the south-east is arrested at the Seekrail Anicut; but, during the latter half of its course, it widens into an unconserved morass, thirty to 200 yards wide and five to forty feet deep, choked with rank vegetation, pregnant with mephitic gases, and tenanted it is said by crocodiles. The channel had become silted up, and instead of clearing out the silt, dams of earth have been erected above the anicut in order to obtain head pressure sufficient to carry the water over the silt. The ponding back of this mass of water has led to the water-logging of the irrigated fields and the associated evils of leakage into the channels and of percolation of impure water into the wells. And he says that with efficient drainage and a reclaimed morass one important cause of disease and death in Cumbum would be got rid of. The Deputy Surgeon-General when noticing the other sanitary evil, the impure water supply, mentions that the water comes principally from the tank sluice, but also in part from a channel which leaves the Gundlakamma streamlet close to its exit from the tank, and running northward joins the channel already referred to as issuing from the tank sluice. From these sources two water-channels supply the northern part of the irrigated land and of the town, while branches passing south supply the central and southern parts. It is from these channels that the fields are irrigated and the population supplied with potable water, for the town wells are insufficient and yield water more or less brackish. But the water of the channel, fouled by human voidances, by irrigation water from heavily-manured fields, by washermen's wash, and by percolation from fifty uncovered town burial-grounds, is not fit for the use of man, and the remedy he recommends is that the people be provided with pure water by pipes or a closed channel, directly from the great tank, and have all the brackish town wells closed, thereby putting an effectual stop to the sewage poisoning of the people.

The Deputy Surgeon-General urges that, alike in major as in minor matters, the town of Cumbum be now placed in a state of thorough conservancy, and he concludes his observations by pointing out the following as the principal requirements :—

(*a.*) The restoration of efficient drainage, including the cleansing of the river, the reclamation of its marshes, the rectification of its bed, and the relief of the water-logged soil.

(*b.*) The protected supply of pure potable water to the town with closure of existing brackish wells.

(*c.*) The thorough repair of the irrigation channels.

(*d.*) The closure of all intramural burial-grounds, and the provision of extramural places of interment and cremation.

(*e.*) The ventilation and thorough conservancy of the town, the closure of house and street cesspits, and the erection of public latrines of an improved type.

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Proceedings of the Madras Government, Financial Department,
1st April 1876.

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(*a.*) The restoration of efficient drainage, including the cleansing of the river, the reclamation of its marshes, the rectification of its bed, and the relief of the water-logged soil.

(*b.*) The protected supply of pure potable water to the town with closure of existing brackish wells.

(*c.*) The thorough repair of the irrigation channels.

(*d.*) The closure of all intramural burial-grounds, and the provision of extramural places of interment and cremation.

(*e.*) The ventilation and thorough conservancy of the town, the closure of house and street cesspits, and the erection of public latrines of an improved type.

(*f.*) The removal from the town of the headquarters of the Head Assistant and of the taluq to the sites selected by the Sanitary Commissioner, *viz.*, Aravidu and Turimilla.

(*g.*) The construction of good practical roads, so as to remove the difficulties of approaching and quitting Cumbum, and to facilitate the journey to Aravidu and Turimilla more especially.

(*h.*) The conservancy of the tank. It is said that the water is fouled by crops of indigo grown within water-mark, by the cultivation of irritant medicinal herbs (Gynandropsis Pentaphylla?) and by silting up of the tank-bed consequent upon the slipping into the water of the soil loosened by cultivation.

The Deputy Surgeon-General anticipates the questions, whether, when all has been done in the way of improvements that can be, will Cumbum town become healthy, with a normal death-rate; or will it regain the state of comparative health it enjoyed prior to the year 1866? and he replies to the two questions by observing that, surrounded as Cumbum is by wet cultivation and in a country where malerial fever is endemic, the death-rate of its people cannot be expected to become so low as that of non-malarial, well preserved native towns; but he hopes that it would eventually reach the standard of health indicated by Mr. Wedderburn though the process of recovery may be slow because the health of the people has been damaged, and the community must be awakened to an increasing desire for life, and to increase their efforts to preserve it, by a consciousness that their chance of life has increased.

4. With this report, I have the honor to submit to the Most Noble the Governor in Council my opinion that it is very undesirable longer to retain the headquarter station at Cumbum Town, and recommend that new public buildings be erected either at Aravidu or at Turimilla, as suggested by the Officiating Sanitary Commissioner.

5. I consider it also desirable that effect be given to the recommendations of the Deputy Surgeon-General to improve the drainage, clean and repair the water-channels, reclaim the marsh, provide potable water for the people, close the existing brackish wells, provide ground for interments and burning outside the town and close all intramural burial-grounds and places for cremation, erect public latrines and close all house and street cesspits; and prevent the growth of indigo and irritant medicinal plants in the bed of the tank.

Cumbum a Second-Class Civil Surgeoncy.

Surgeon-Major of Service. YEARS.	Pay of Rank. RS.	A.	P.
25	1,093	2	0
20	1,056	9	7
15	825	11	5
12	789	3	0

Surgeon of Service. YEARS.	Pay of Rank. RS.	A.	P.
10	550	0	0
6	550	0	0
5	550	0	0
Under 5	400	0	0

6. I have already in my letter, No. 512, dated 6th October 1875, submitted as my view that Cumbum be temporarily erected into a second-class station with a Medical Officer stationed there; and I now place in the margin the charges that would be incurred.

7. It will have been observed that the report by the Deputy Surgeon-General of the Circle is confined to what he noticed in the town of Cumbum. This limitation of his inquiries was caused by the

Proceedings of the Madras Government, Financial Department,
1*st April* 1876.

circumstance that he arrived there on the 15th November, but fell ill; and, acting on the advice of the Hospital Assistant and on that of the Head Assistant to the Collector, he again left Cumbum on the 17th. This is to be regretted, but it is of less consequence seeing that Government is now in possession of a very able report by the Sanitary Commissioner, who has given his opinions on all the questions mooted. He sent a copy of it to me for information, and I observe that he reviews at length the state of the town of Cumbum, discusses the questions of its retention or abandonment as a Division headquarters and removal to Aravidu, as also of its temporary abandonment; he likewise takes up the question of removing the taluq headquarters from Markapur; and, if this suggestion be acted on as he recommends, that Aravidu be the place adopted for the new taluq station. If Cumbum be abandoned as the cusbah of its taluq, he considers that Turimilla, if made accessible by roads (which will be expensive), will afford the best site; and after Turimilla he recommends a site a little east of the village of Daddavada, and particularly if the abandonment of Cumbum be only temporary. The Sanitary Commissioner describes the site of Cumbum town as not essentially unhealthy; its facilities for drainage and water supply being originally good, and until a comparatively recent period it was considered a healthy and pleasant station; but he says there can be no doubt of its present and progressive unhealthiness. He, however, believes this to be remediable by removal of its causes. He remarks that the diseases which have been occurring belong to the type caused by malarial poisoning; that irrigated land of itself does not necessarily generate paludal fevers; and he points out that malarial fevers began to prevail and increase from the time at which the irrigation channel, as was allowing with what is now a swamp, ceased to be kept clean. He attributes the chief predisposing causes of the continuous unhealthiness of the town of Cumbum to the crowding of every available spot within its limits with corpses and the pollution of its water supply, and that the exciting cause is malaria arising from a swamp about two miles long, which has formed since the silting up of an important irrigation channel. He has had reason to believe that the original condition of the river-bed and channel can be restored, and the swamp drained and reclaimed without diminishing the area of irrigated land below.

The water supply of Cumbum is derived almost wholly from the great lake, about two miles east of the town. A spot, immediately after the main stream which supplies the town leaves the sluice, has been selected by a party of washermen, who there contaminate the stream. The channel then runs for about two miles through, or along, cultivated and highly-manured rice-fields, its edge being the favorite site for extramoral interment.

In the town itself more tombs than living persons are visible; it is almost literally true that one corpse at least lies buried under every spot not occupied by house or street. Within the town itself the open channels not only receive the ordinary pollution of Indian water-courses but also drainage and leakage from innumerable corpses, graves having for centuries been, and still being, dug in immediate proximity to the stream. The main channel runs through the middle of the principal Mahomedan cemetery, interference with which is earnestly deprecated by the Mahomedans, and he concludes by remarking that it is obvious,

without entering into further detail, that the present water supply of Cumbum is incurably bad.

Of the three remedial measures which he proposes, the draining of this two mile of swamp is one; a second is to supply the town of Cumbum with pure water by means of a special channel constructed along the unirrigated land to the north-west; the third being the prohibition of intramural interments; and he is of opinion that the introduction of minor sanitary improvements will have no appreciable effect, and if the larger measures cannot be undertaken he recommends the abandonment of Cumbum as headquarters either of division or taluq. But even if the suggested important improvements be adopted, he does not hold out a hope that the sickness and mortality will immediately assume a normal rate, for it is, he thinks, even not unlikely that the effects of malaria will be intensified by the measures taken for its extinction.

At another place (paragraph 23) he mentions his belief that Cumbum town may be restored to a satisfactory condition as regards health, but the work will be costly, and will need at least three years for its accomplishment.

If Cumbum be retained as a division station he suggests that the proposed new offices and subsidiary buildings be erected on the high ground north-west of the town near the sluice. If Cumbum be temporarily abandoned, and temporary offices provided at a neighboring part of the taluq, he considers that, between the beginning of the needful sanitary works and the reoccupation of the station, a period of three years at least should be allowed to intervene, and during the interval the Medical Officer at Cumbum should be carefully watching the effects of the measures which have been adopted for the improvement of the public health.

8. The observations of both officers on the bad health-state of Cumbum and their recommendations as to the remedial measures for the existing insanitary conditions may now be summed up. Both officers recognise the site of the town of Cumbum as one not essentially unhealthy; built as it is on a slightly elevated tongue of rock, and a great lake near, it possesses good facilities for drainage and water supply. But, ever since the year 1866, the town has been decidedly and increasingly unhealthy. The ailment afflicting the people has been fever. This disease began to prevail from the time that the state of the water-channel came to be neglected. The channel began to silt up and drains had to be thrown across it in order to raise the water to a higher level, and thus the drainage became obstructed, and impure water percolated into the wells. The channel also fell out of repair and the waters escaping into the lower lands have formed into an unconserved marsh about two miles long, five to forty feet deep, and thirty to 200 yards broad, studded with reed vegetation, from which malarial exhalations emanate in virulent abundance; also, indigo and irritant medicinal herbs are said to be grown in the bed of the tank; the water-supply channel leading from the lake to the town of Cumbum is upwards of a mile long, but a body of the town washermen have made it their washing-station at a part near its origin at the sluice; its banks, close up to the water's edge, are the favorite places for extramural interments; the channel runs through highly-manured rice-fields and through the principal graveyard of the town, though indeed every available spot in the town in which a body can be laid has been used for interments; its waters are fouled by human voidances, by irrigation

Proceedings of the Madras Government, Financial Department,
1st April 1876.

water from heavily-manured fields, all these sources of defilement adding a polluted water supply to the evils of an obstructed drainage and malarial exhalations; the water is described as dirty and discolored to the sight, and it emits an objectionable odour. These are pointed to as the predisposing and exciting causes of the fevers that have been occurring, and both the reporting officers consider that with restoration of efficient drainage and reintroduction of a pure water supply, by enforcing extramural interments, by clearing and repairing the river-bed and irrigation channel and restoring it to its original condition, by reclaiming the marsh and rectifying its bed, with a thorough ventilation and conservancy of the town, the provision of latrines, and prohibition of street and house cesspits, at the same time closing all existing town wells, there would be a riddance of many of the causes of the diseases and deaths that have been occurring.

9. Both of the reporting officers, however, guard against an impression being conveyed that, when all these changes and improvements have been effected, Cumbum town will necessarily become healthy with a normal death-rate, or regain the state of comparative health it enjoyed prior to the year 1866. The Deputy Surgeon-General of the Circle says the health of the people has been damaged; the process of recovery may be slow; he hopes it may eventually reach the former standard of health; but that the death-rate of its people can never be expected to become so low as that of non-malarial, well-preserved, native towns. And, if the suggested improvements be adopted, the Sanitary Commissioner does not hold out a hope that the sickness and mortality will immediately assume a normal rate, for it is, he thinks, even probable that the effects of the malaria will be intensified by the measures taken for its extinction. At another place he mentions his belief that Cumbum town may be restored to a satisfactory condition as regards health, but the work will be costly and will need at least three years for its accomplishment; for, he adds, a period of three years at least should intervene between the beginning of the needful sanitary works and the reoccupation of the station.

10. Both reporting officers are of opinion that Cumbum should be abandoned—I understand the Deputy Surgeon-General of the Circle to recommend that it be permanently abandoned—and a site at Aravidu or at Turimilla occupied; and the Sanitary Commissioner says if Cumbum be permanently abandoned as the Divisional headquarters, Turimilla will be the best site to occupy, and the next best site will be on ground a little east of Dâddavada, particularly if it be only a temporary abandonment; and he suggests that the Taluq headquarters be removed from Markapur to Aravidu.

11. The Sanitary Commissioner distinctly states as his belief that, if considerations of expense preclude the introduction of an abundant supply of pure water and the draining of the southern swamp, attention to minor sanitary improvements will have no appreciable effect, and, under such circumstances, he would recommend the abandonment of Cumbum as the headquarters either of the division or taluq.

12. I had before, and again at paragraph 6 of this letter, recommended that Cumbum be erected temporarily into a second-class Civil Station, and the Sanitary Commissioner suggests that the hospital, or a better one if possible, remain at

Cumbum in charge of a Medical Officer or subordinate competent to observe clearly and carefully the effects of the measures which have been adopted for the improvement of the public health. On this point I would recommend that the hospital be a little outside the town, on a healthy site, to which the in-door sick could be taken to give them a chance of recovery when removed from malarial influences; but that the present hospital inside the town be retained as a dispensary, to which out-door patients, not requiring detention in hospital, could resort between the hours of 6-30 to 8 A.M. daily. One hospital establishment can easily superintend the two institutions. If the new hospital now proposed be constructed on the pavilion plan suggested in my letter, No. 181, dated 2nd June 1871, such as have been erected in the Lying-in Hospital here, the new structure would not cost 500 Rupees.

From Deputy Surgeon-General G. SMITH, M.D., Deputy Surgeon-General, Indian Medical Department, Mysore Division and Ceded Districts, to Surgeon W. S. FOX, Acting Secretary to the Surgeon-General, Indian Medical Department, dated Bangalore, 27th November 1875, No. 460.

Under date the 4th February 1875, I solicited the attention of the Surgeon-General to the insanitary condition of the town of Cumbum, and I have now the honor to submit, for his consideration, the observations made and information collected during a second, and, owing to severe illness, very brief inspection of that town made on the 15th instant.

Vide Annual Inspection Report of Civil Dispensary and Police Hospital, Cumbum, dated 4th February 1875.

2. A glance at the map of Cumbum, which accompanies the report of the Municipality of that town for 1874-75, shows that the principal sanitary defects are obstructed drainage with its colligated evils and polluted water supply. The medical history of the town seems to indicate that these evils have been in existence for some years, and that no thoroughly efficient steps have been taken to remedy them and to restore the town to the health-state it enjoyed previous to 1866. The report referred to traces the first of the two sanitary defects to the silting up of the water channels, which began in that year in consequence of their conservancy having been transferred from the Civil authorities to the Inamdar.

3. The town of Cumbum is situated 1¼ mile to the east of the tank, in the centre of 500 acres of irrigated (rice, sugar, and betel) land, and is built upon a slightly elevated tongue of rock which projects into the irrigated ground from the uncultivated higher ground which lies to the north. The line of drainage of the irrigated ground and of the town is represented by the depression through which runs the small stream Gundlakamma, which, issuing from the tank in the form of surplus water from the sluice, passes along the southern border of the irrigated land, and receives in its course much of the irrigation and town drainage. The river then passes S.E. and is arrested at the Seekrail Anicut. During the latter half of its course from the tank to the anicut it widens into an unconserved morass choked with rank vegetation, pregnant with mephitic gases, and tenanted, it is said, by crocodiles. The morass varies in width from thirty to 200 yards, [illegible] feet.

4. One object of this anicut was to arrest the stream and so secure head pressure for an irrigation channel which runs due east from a point some fifty yards higher up. This channel, however, is now silted up, and the Dasabandamdar, instead of clearing it out, has thrown up dams of earth above the anicut in order that head pressure, sufficient to carry the water over the silt, may be obtained.

5. The ponding back of this mass of water by what appears to me to be an unskilfully worked anicut has led to water-logging of the irrigated fields, and to the associated evils of leakage into the channels, and of percolation of impure water into the wells. This state of matters, so prejudicial to health, demands the prompt action of authority. The natural facilities of drainage of

Proceedings of the Madras Government, Financial Department,
1st April 1876.

the locality are apparent even to an unprofessional eye. With efficient drainage and a reclaimed morass one important factor in the production of disease and death in Cumbum would be got rid of.

6. Turning to the other sanitary evil, *viz.*, the impure water supply, it may be noted that this supply comes principally from the calingulah of the tank, in part also from a channel which leaves the Gundlakamma close to its exit from the tank and running north joins the channel already referred to as issuing from the calingulah. From these sources two water-channels supply the northern part of the irrigated land and of the town, while branches passing south supply the central and southern parts. Much of this water finds its way ultimately into the Gundlakamma. These water-channels are nearly all out of repair, leakage from the fields takes place freely into them, and all are more or less foul and silted up. In some cases this latter process is carried the length of throwing considerable blocks of land out of irrigation altogether.

7. These channels supply the wet lands with irrigation, and the population with potable water, for the wells of the town are insufficient and yield more or less brackish water. The water of the channels has not been conserved so as to render it fit for the use of man; it is fouled by human voidances, by irrigation water from heavily-manured fields, by dhobie's wash, and by percolation from unconserved burial-grounds, of which there are about fifty within the limits of the town. The water is, as a rule, dirty and discolored to the sight, and it emits moreover an objectionable odour.

8. The remedy for this unsatisfactory condition of the water supply lies upon the surface. The town should no longer be dependent for its supply of potable water upon open irrigation channels, but upon a supply derived directly from the tank itself. This supply distributed in pipes or closed channels and protected from pollution would meet all the wants of the people so far as potable water is concerned, and would enable the Municipality, by closing up the brackish wells, to put an effectual stop to the sewage poisoning of the people.

9. Mr. Farmer, C.S., to whom I am indebted for much valuable help, and who is himself a living illustration of the unhealthiness of Cumbum, shows that whilst the population of the taluq is steadily increasing, that of the town is steadily diminishing, the increment of the former being at the rate of 20 per cent. per annum, and the decrement of the latter at that of 12 per cent.:—

Years.	Population of Taluq.	Population of Town.
1862	98,437	8,020
1867	103,304	7,983
1871	121,153	7,137
1875	31st (March)	6,893

10. The Head Assistant to the Collector further states that the death-rate is higher than the average death-rate of native towns (25 per mille per annum), being sometimes double, treble or even quadruple that ratio. He calculates the death-rate at present—the unhealthy season—at 75 per mille per annum, and believes that it may rise even higher before the close of February 1876. In estimating the salubrity of a town it must be borne in mind that the mortality rate constitutes but one of the factors—and not in all cases the most important one—by which to judge of the health state of a community, for it takes no cognizance of the residuary aggregate of impaired health in those who have not succumbed from disease. This caution is specially necessary when the principal cause of mortality arises, as in Cumbum, from malarial poisoning. The mortality rate among children is high. The death-rate is in excess of the birth-rate. Casualties from fever are so common and often so sudden that the people have become apathetic, and are even prepared to resist attempts made by the Municipality to improve the sanitation of the town. They seem to feel also the pressure of taxation.

11. Every fact of importance bearing upon the question of the health-state of Cumbum is now or will soon be before Government, and I respectfully suggest that the time for reporting is passed, and that that of action is fully come. I would strongly advocate the direct interference of Government in this grave matter to the extent of placing Cumbum in a state of thorough

conservancy in minor as well as in major matters before the town and its interests are again placed in the charge of its present impoverished Municipal Commissioners.

12. It may be asked will Cumbum, when these improvements are carried out, become a healthy town with a normal death-rate, or will it, at all events, regain the state of comparative health it enjoyed previous to 1866? To these questions I would reply that Cumbum, situated in a locality surrounded by wet cultivation and in a country where malarial fever is endemic, cannot be expected, however thorough its sanitary arrangements, to show so low a death-rate as that to be expected from non-malarial and fairly conserved native towns; and to the second query I would reply that it is my hope that the town will eventually reach the health-standard indicated by Mr. Wedderburn, though I recognise the fact that it is one thing to preserve a town in health, and quite another to restore it to health after nine years of more or less sanitary neglect. The process of recovery will probably be slow, for there is much of damaged health in the existing community, but with increasing chances of life will come increasing desire of life and increasing efforts to preserve life, and thus a community, which at one time may be obstructive from ignorance, may at another co-operate cordially with the authorities towards securing the removal of the principal and preventable causes of disease.

13. The principal requirements may be formulated as follows:—

(*a.*) The restoration of efficient drainage, including the cleansing of the river, the reclamation of its marshes, the rectification of its bed, and the relief of the water logged soil.

(*b.*) The protected supply of pure potable water to the town with closure of existing brackish wells.

(*c.*) The thorough repair of the irrigation channels.

(*d.*) The closure of all intramural burial-grounds, and the provision of extramural places of interment and of cremation.

(*e.*) The ventilation and thorough conservancy of the town, the closure of house and street cesspits, and the erection of public latrines of an improved type.

(*f.*) The removal from the town of the Headquarters of the Head Assistant and of the taluq to the sites selected by the Sanitary Commissioner, *viz.*, Aravidu and Turimilla.

(*g.*) The construction of good practicable roads, so as to remove the difficulties of approaching and quitting Cumbum, and to facilitate the journey to Aravidu and Turimilla more especially.

(*h.*) The conservancy of the tank. It is said that the water is fouled by crops of indigo grown within water-mark, by the cultivation of irritant medicinal herbs (*Gynandropsis Pentaphylla?*), and by silting up of the tank-bed consequent upon the slipping into the water of the soil loosened by cultivation.

Cumbum Tank Repair "Estimate."

No. 4. MEMORANDUM.

The District Engineer, Kurnool, forwards two estimates for the repair of twenty miles of irrigation channels under the Cumbum Tank aggregating Rupees 41,540. One estimate, amounting to Rupees 32,700, is for channels irrigating Government land; the other, amounting to Rupees 8,840, is for channels for the upkeep of which Inams have been granted called Dasabandam Channels. The District Engineer further reports that complete plans and estimates are under preparation for the larger project which includes the provision of anicuts and head and supply sluices to the channels.

29/956

Proceedings of the Madras Government, Financial Department,
1st April 1876.

2. [illegible] the estimate for the Dasabandam Channels amounting, as before stated, to Rupees 8,840 provision is made to the extent of Rupees 1,950 for the Dasabandam portion of the Kutva Kalva Channel. The channel is to be cleared of silt and jungle, revetted where necessary, and the banks repaired so as to prevent the spread of water by leakage and overflow. This estimate together with the remainder of the Dasabandam work estimates has been forwarded to the Collector, who has been requested to take action thereon and enforce the service of the Inamdars. This matter is therefore not at present in the hands of this department. It should be added that the estimate does not provide for a masonry dam at the bridge on the Cuddapah road, and that when the channel is cleared as proposed the water will doubtless be carried off much more freely and the evil complained of much lessened. The question of a weir will be considered in connexion with the estimate under preparation, but proper regulation above will very probably obviate any necessity for it.

3. As regards the estimates for the Government Channels including the remainder of the Kutva Kalva Channel there are no funds whatever at the disposal of the Public Works Department at present, but there will be no difficulty in placing the District Engineer in funds at the commencement of the next financial year when the Repair Grant is made available. It will be necessary however, unless the grant is larger than usual, to apply for a special assignment of funds from the Government of India in the course of the year.

4. The District Engineer will be directed to make all necessary preparations for commencing the work at the opening of the year.

5. The question of enfranchising the Nirkatti Inams, and providing a fixed establishment of paid servants, appears from the Collector's letter forwarded by the District Engineer to be before the Board of Revenue.

FORT ST. GEORGE, (Signed) A. DEC. SCOTT, Major, R.E.,
10*th March* 1876. *Asst. Chief Engineer for Irrigation.*

To the Chief Secretary to Government, Fort St. George.

No. 5. ORDER THEREON, 1st April 1876, No. 610.

The Governor in Council has perused these papers with painful interest, but sees no reason to doubt that the real cause of the extreme, but comparatively recent unhealthiness of the station of Cumbum has been certainly ascertained, and that the remedial course to be adopted is plainly indicated.

2. It appears to Government to be clearly established that the origin of the crying evil is the water-logged [illegible]wn and surrounding irrigated from the Cumbum Tank, caused mainly by the silted and ch[illegible] condition of the Katwa Kalva Channels and consequent construction of earthen bunds to raise the head of water above the level originally commanded by the masonry anicut, the result being to convert the upper portion of the channel or river-bed from the tank-bund into a stagnant pool or swamp of some two miles in length, varying from 50 to 300 yards in width, and many feet in depth, to waterlog the surrounding country so that in the wells the water-level corresponds

with that of the outside soil, to effectually preclude all possibility of drainage, thus fouling the water supply and to develope a constant supply of noxious malaria. Under these miserable conditions the death-rate has attained the enormous proportion of 75 if not 100 per mille per annum; in the first six months of 1875, 346 deaths were registered against 129 births; while the population of the taluq is shown by the Census returns to be increasing at the annual rate of 20 per cent. in the four years' interval, that of the town decreased at the rate of 12 per cent.; and it is not improbable that the death-rate ought to be estimated at 141 per mille per annum. Notwithstanding the defects of the earlier registration, the latest Census showed a decrease of 1,044 inhabitants in fifty-six and a-half months.

3. The first step to be taken at once in view to remedying this disastrous state of things is unquestionably to sweep away, with the least possible delay, all obstruction to the drainage of the town site and surrounding country, to bring back the irrigation works at least to the condition in which they stood when the health of the locality was apparently unaffected by them, and if it should prove ultimately necessary to do so, to breach the masonry anicut (*Seekrail*) on which the "Katwa Kalva" depends.

4. Estimates aggregating Rupees 41,450 have been prepared for the repair of twenty miles of irrigation channels under the Cumbum tank, including Rupees 8,340 for channels dependent for repairs on the holders of Dusbundam Inams, of which Rupees 1,[illegible] is for the upper portion of the Katwa Kálva, and these last have been forwarded to the Collector with instructions to take action [illegible] them and enforce the service of the Inamdars.

5. The Governor in Council considers that these repairs should not, under the exigency of the case, be left subject to the contingency of this extraneous service being promptly rendered or adequate for the speedy completion of the work. Any questions of the liability of the several Inamdars and its extent can be dealt with as they arise, but meanwhile it is imperatively necessary that the work should be carried out with the least possible delay.

6. There can be no question that the clearing of the channels leading from the anicut, as well as directly from the tank itself, is a primary necessity, and the Governor in Council accordingly directs the Collector, in communication with the District Engineer, and guided by the levels supplied by him, to take the earliest possible and most effectual steps to have this work and the removal of all obstruction tending to keep the water-level higher than the original level of the masonry [illegible] carried out with all possible speed. Funds will be available from the [illegible] ant of the official year f[illegible] Government Channels and Dusbundam Chan[illegible] once taken in hand and vigorously prosecuted to completion, the necessary steps being taken for the recovery whatever may be due from the Inamdars.

7. The Governor in Council does not doubt that the Collector will duly appreciate the urgency of the case and the importance which the Government attach to the earliest possible completion of the work, for which the season is now favorable. If it should prove ultimately necessary, application will be made to the Government of India for a special grant of funds for the *repair* of these irriga-

Proceedings of the Madras Government, Financial Department,
1st April 1876.

tion works, but meanwhile the necessity for striving to check this loss of life and health is imperative and cannot be postponed.

8. Earnest attention must at the same time be given to restoring to the town the supply of good drinking water of which it has been deprived by the neglect of the irrigation works which has resulted in destroying the outfall for the town drainage and saturating the soil with impurities. The expense of correcting these evils and replacing the former condition which was not specially unhealthy must be borne by the Imperial Agricultural head of account, but the work must be taken in hand at once by the Collector.

As President of the Municipal Commission he will also give immediate attention to the provision of extramural burial and burning grounds in view to those in the town being speedily closed, and he will also take action to provide for widening the narrow streets, for draining all the streets of the town, and for protecting the supply of drinking water from future pollution. If necessary, application should be made for a loan from Imperial funds for the early execution of these vitally necessary improvements, but the natural advantages and former prosperity of the town warrant the belief that, if healthy conditions can be re-established, the burden on Municipal income will not long be felt.

9. The need of reform is, however, urgently pressing, and the application of a remedy cannot be deferred. The Government therefore authorize the Collector, as President of the Municipality, to proceed at once with what is immediately necessary for the purpose, relying on funds being provided by loan so far as proves necessary.

10. The remaining measure which the Governor in Council deems it advisable to adopt at once is the removal for a time of the public offices from Cumbum town to some more healthy neighboring locality, for which purpose—

(*a.*) Turimilla situated about nine miles from Cumbum town on the river which forms the tank four miles lower down its course, and

(*b.*) The vicinity of Daddivadu at the junction of the Kurnool and Cuddapah roads, are advocated by the Sanitary Commissioner, the latter for choice as a merely temporary settlement, being apparently more accessible than the former, though it would seem to be some fourteen miles from Cumbum.

11. Aravidu, about seven miles north-west of Markapur, is advocated as the best permanent site for the Head Assistant's headquarters in the event of Cumbum being abandoned.

12. The Governor in Council is however averse to deciding that Cumbum shall be permanently abandoned, just when efforts for restoring its former condi[illegible] are about to be [illegible] healthy locality as an experimental step both as regards the advantages of the site selected and the benefit to be derived from the action at Cumbum.

13. To give effect to the resolutions embodied in this Proceeding, the Governor in Council resolves to direct the Collector, the Sanitary Commissioner, and an Engineer Officer, to be specially nominated for the work in the Public Works Department, to form themselves into a Committee for the purpose of deciding as speedily as possible whether Turimilla or the Daddivadu site is preferable for a temporary settlement, and to frame plans and estimates for the necessary temporary

accommodation at the selected site, for the Head Assistant's Office and the offices of the other Government officials now stationed at Cumbum. Also for such improvements to the communications as may be needed to make the site readily accessible.

14. They will further consider how best and most speedily to give effect to the Government resolution for clearing the irrigation channels and draining the swamp, for the improvement of the town water supply and for removal of the causes of pollution, and they will report the conclusions at which they may arrive, taking, however, immediate steps to give effect to their decisions so far as they are calculated to carry out the resolutions expressed in these Proceedings.

15. The Government trust to receive early intimation that actual work has commenced. The Collector will convey to Mr. Farmer the thanks of Government for his exhaustive report.

(True Extract.)

for Chief Secretary.

To the Collector of Kurnool.
,, Board of Revenue.
,, Revenue Department.
,, Public Works Department.
,, Surgeon-General, Indian Medical Department.
,, Sanitary Commissioner.
,, Inspector-General of Police.
,, Accountant-General.

Exd. J. Wright.

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