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[Despatch Abstract.]

Unroofing of infected houses.

Stating that the Govt. concurs in the views expressed by the Sanitary Commissioner as to the necessity of exposing infected houses to sunlight & air & as to the mode in which this should be carried out.

BACK PAPERS.

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Government {1899} of Madras.

LOCAL AND MUNICIPAL.

Recd. } 1899. *Enclosures*

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G.O., No. 1005 P., 29th June 1899.

JUNE.

Unroofing of plague infected houses.

Stating that the Government concurs in the views expressed by the Sanitary Commissioner as to the necessity of exposing infected houses to sunlight and air and as to the mode in which this should be carried out.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—the following papers :—

From R. H. CAMPBELL, Esq., Acting Collector and District Magistrate, North Arcot, to the Plague Commissioner, Madras, dated Camp, Baireddipalle, 26th April 1899, R. C. No. 1594-P.

I have the honour to draw your attention to the enormous expenditure which is being incurred in the town of Vellore on account of compensation paid to owners of disinfected houses. In my letter of yesterday, I enclosed a statement of plague charges for the month of March in Vellore; and you will find on referring to that statement that the figure for compensation alone appearing under unpaid bills comes to over Rs. 5,000.

2. So far we have had anything but a severe epidemic of plague in Vellore; and if the disease were really to assume a virulently epidemic form, I leave you to imagine what the expenditure on compensation would rise to.

3. Considering the above facts and bearing in mind the possibility that the plague may return with perhaps greater severity after the hot weather, I feel it my duty to submit to you certain proposals the object of which is to lessen the expenses incident to our measures for coping with plague and at the same time to render those measures more popular.

4. By far the largest item in the compensation bills referred to is the sums paid in compensation for the partial unroofing of tiled houses; and if this practice were to be pursued in a place where plague was really severe, the charges on that head alone would be simply enormous. I have been driven by the following considerations to seriously question whether this measure is a necessary and desirable part of an efficient plague policy. In the first place, the practice of destroying property and giving compensation at all is a great evil even if it is a necessary one and should be restricted as far as possible. Even if the compensation is considerably in excess of the actual value of the property destroyed, the vexation and worry caused to the owners is not at all made up for by the money profit, and leads to great discontent. The evils are exaggerated in the case of Vellore. Here owing to the practice of home segregation the inhabitants are put to the discomfort of living in an unroofed house for ten days or more. The tiles are not replaced, but are left stacked (often broken and spoilt) on the unremoved portion of the roof which also suffers in the process. The owners are left to replace these tiles themselves and if, as is often the case, the houses are left unroofed for many weeks, it is unfair to lay the whole blame on the inmates. All the satisfaction they receive is a promise of compensation which is often long unpaid and which in proportion as it becomes a really adequate recompense for the extreme discomfort they have been subjected to, becomes a more and more intolerable drain on the municipal exchequer.

5. So far I have shown that the practice of unroofing houses for disinfection is highly objectionable and can be only justified by the most stringent necessity since it causes either by its injustice, great disaffection and opposition to plague measures or else, if adequate compensation is given, great expenditure of public money.

6. But is the unroofing of houses either a necessary or an efficacious means of disinfecting? I cannot say that I think it is either.

7. To begin with, as at present carried out, it does not ensure that the sun shall reach every portion of the house. The roof is taken off in longitudinal slips which leave many corners untouched by the sun throughout the day where the microbes can rest undisturbed. Indeed, the total removal of the roof itself would not ensure the letting of the sun into every portion of a house, for large portions of the northern wall at least must be left untouched; and surely it cannot be maintained that any partial destruction of the microbes in a house, however large the proportion destroyed, will adequately disinfect the house.

8. Disinfection by the sun could only be rendered thorough by practically demolishing the building. Unroofing alone cannot be efficacious. Curiously enough the parts least exposed to the sun by removing the roof are those very parts of the house which, according to a very generally-accepted theory, are the most favourite, if not the only resort, of the microbe, viz., the floor and the lower portions of the walls. There are surely strong reasons to believe that the microbe rarely moves many feet above the ground.

9. For those important parts and for all parts not touched by the sun we are compelled to depend solely on saturation by means of perchloride of mercury or other disinfectants. It seems to me that we cannot regard unroofing as either efficacious or necessary and that it would be more logical to depend entirely on the disinfectant washing.

10. It would be different if the unroofing could be regarded as a small additional precaution requiring little trouble or expense and entailing little opposition, but in fact it occupies the foremost position in all our disinfectant operations; it costs much and causes great discontent; and if persisted in during the rainy season, it might easily lead to a riot. In fact, the trouble, danger and expense it involves would only be justified by the assumption that it was absolutely efficacious and absolutely essential to a satisfactory disinfection. When the rains come, I do not see how we can possibly carry out unroofing and home segregation combined, and it would be just as well to abandon the former now, if it has to be given up eventually.

11. I may remark in conclusion that should unroofing be discontinued there would, in my opinion, be but little opposition to plague preventive measures, even in the event of a virulent epidemic of plague. The people dimly understand the point of our other measures and submit to them with a tolerable grace, but they see no possible good in the unroofing and resent most keenly the hardship of having their houses so roughly handled and rendered temporarily uninhabitable.

12. Feeling as I do the necessity of curtailing our expenditure and at the same time carrying the people with us in our efforts to combat the plague, I recommend most strongly that the practice of partially unroofing tiled or terraced houses in large towns like Vellore be entirely discontinued and that the disinfection of such houses be restricted in future to saturating the floors and the whole interiors with perchloride solution and (when the floors are made of mud) afterwards digging up and burning the floors.

Ref. on C. No. 4599, dated 1st May 1899.

Referred to the Collectors of Kurnool, Bellary, Anantapur and Salem, and the Sanitary Commissioner for favour of remarks. It is understood that no compensation for damage done during disinfection has been given anywhere outside North Arcot, except where houses have been burnt down.

(Signed) L. E. BUCKLEY,
Plague Commissioner.

From Lieutenant-Colonel W. G. KING, M.B., C.M., D.P.H., I.M.S., Sanitary Commissioner for Madras, to the Secretary to Government, Local and Municipal Department, dated Madras, 19th May 1899, No. 1500-S.

With reference to Plague Commissioner's Proceedings, Ref. on. C. No. 4599, dated 1st May 1899, I have the honour to remark as follows.

In paragraph 6 Mr. Campbell states that he does not think the unroofing of houses is "either a necessary or efficacious means of disinfecting". His grounds for the former conclusion seem to me more a plea of expediency than to touch the question of "necessity", whilst in regard to the latter it seems to me he adduces no proof whatsoever. His paragraphs 7, 8 and 9 exhibit the popular belief that, unless the direct rays of the sun act upon infected matter, no disinfection can result. He regards, further, the openings made in the roof as having reference solely to the admission of these direct rays of the sun. In both premises he is incorrect. The action of direct as against diffused daylight upon micro-organisms may be roughly said to be five times greater; but in diffused daylight inimical action nevertheless proceeds. Whilst, therefore, the direct rays of the sun are to be preferred wherever their application is possible, diffused daylight is not to be despised. But the holes in the roof have other important functions beyond the mere admission of sunlight, namely, of securing free ventilation, which could frequently not otherwise be attained. This free ventilation is especially necessary during "home segregation" on behalf of the attendants upon the sick; and, during the process of disinfection, the same applies to the men employed for the purpose. It has been clearly proved that the detrimental action of sunshine upon microbes is of a chemical nature, that is, it is the actinic rays which influence the result. This action, however, cannot be effected without the presence of free ventilation, because it is due to the production of the peroxide of hydrogen; hence whilst the direct rays of the sun are desirable, diffused daylight is of value, provided free ventilation is afforded and, with it, moisture. The latter is usually fully supplied by the use of liquid disinfectants upon the floor and, if not, by the damp condition of houses of the class where this disturbance of the roof would be necessary.

2. I regret I cannot understand Mr. Campbell's remark in his paragraph 8 where he affirms: "curiously enough the parts least exposed to the sun by removing the roof are those very parts of the house which, according to a very generally accepted theory, are the most favourite, if not the only resort of the microbe, viz., the floor and the lower portions of the walls." It seems to me if there be any place which is likely to be reached by the direct rays of the sun after unroofing of the house, it would be those indicated by him.

3. Mr. Campbell then expresses the opinion that "there are surely strong reasons to believe that the microbe rarely moves many feet above the ground." It must, however, be apparent to him that if the microbe "rarely" moves above the level stated by him, it is quite possible that it may be moved. For instance, according to Simonds, the fæces of plague-infected rats and of their parasites (fleas) contain the plague microbe. Rats dwell in native houses largely in the interior of "mud roofs" and between the tiles in the tiled roofs. With reference, therefore, to the roof as an infected place and as a convenient position for aiding in ventilating a dwelling, it cannot be safely put out of reckoning, irrespective of claims as to aiding disinfection by other means. Bacteriological evidence is in direct discord with Mr. Campbell's suggestion that the mode is not an "efficacious means of disinfection."

4. As to its necessity, I think there can be no possible doubt when dealing with certain, as it happens, very frequent, class of cases, namely, where the houses are dark and ill-ventilated. Frequently the rooms in native houses are so dark that nothing can be seen without a light, and how often they are absolutely devoid of any mode of ventilation except the door is notorious. In such instances I consider it would be unjustifiable before undertaking disinfection to do more than to send into them the officer in charge of plague operations and his immediate assistants until these defects had been completely remedied, that is to say, the ordinary cooly staff employed on disinfection work should not be called upon to face such risks, especially under such arrangements, as exist in North Arcot, where the Plague Commissioner has justified the complete absence of the most ordinary care in pneumonic plague cases undergoing "home segregation," on the ground that it is impossible to carry out all precautions in "home segregation."

5. But, in using this method, no "rule of thumb" should be employed. It does not follow that because a dwelling has been attacked with plague, it must be unroofed; especially during rains, when, indeed, the sides of the walls of the house may be advantageously pierced, instead of the roofs. Further, it does not follow that all native dwellings do require an access of light and ventilation—though certainly they usually do. In such instances, the use of the acid perchloride of mercury solution would doubtless suffice. Moreover, if the highly objectionable method of "home segregation" must be employed, I do not see that during illness of the patient, it is requisite to do more than provide for efficient ventilation. This, as already stated, could frequently be secured by making temporary windows in the sides of the house. When the question of disinfection arises, after convalescence of the patient, *each case should be considered on its own merits, in reference to possibility of infection by rats, and the nature of dwelling rooms as to ventilation and light.*

6. As to whether compensation should or should not be given, I think where damage to property is done of a nature that the tenant has to lay out funds to secure repair, it should certainly be given, and be given with a promptitude that should prevent its being imagined by his neighbours that he has been harshly treated. Whilst compensation to the manifestly poor should be invariable and full, there are conditions of life where, if a man insisted in using "home segregation" to the risk of his neighbours, he should be called upon to suffer the full consequences, whilst there may be other instances when a grant-in-aid, but not complete compensation, would meet requirements. These are matters for local discretion. Whilst then believing in the necessity of maintaining the principle of compensation, unless the people are to be provided with a good excuse for discontent, I think here also there should be no "rule of thumb" as to methods. Estimates are frequently not satisfactory either to the local authority nor the house-owner. In the case of Vellore, the Plague Officer represented to me the man engaged for this work had manifestly over-estimated charges, as proved on his having resorted to another authority for the necessary figures. So far as removal of tiles is concerned, if the gangs are made to understand it must be conducted with care, and if by them replacement is also insisted upon, compensation for broken tiles need never run up to much. Wherever other repairs can be done, they should, where feasible, be effected without money passing to the owner under the Plague Officer.

From E. A. ELWIN, Esq., Acting Collector of Bellary, to the Secretary to Government, Local and Municipal Department, dated 27th May 1899, D.D. No. 938-P.

Adverting to the Plague Commissioner's R. C. No. 4599, dated 1st May 1899, I have the honour to remark that the question of unroofing tiled or terraced houses in large towns has not arisen in this district. It is no doubt highly desirable to allow a free current of air to pass for some days through all plague-infected rooms, and as there are windows in most substantially built houses, this can generally be effected by keeping them as well as all doors open for the period decided upon: where there are no windows or the windows are too small, the difficulty can, in my opinion, be met by making a hole or holes in the outer walls just as well as by partially removing the roof.

2. I enclose a copy of the note sent to me on the subject by the District Medical and Sanitary Officer.

ENCLOSURE.

COPY of the note, dated 19th May 1899, from the District Medical and Sanitary Officer, to the Collector of Bellary.

The Collector of North Arcot evidently considers that it is unnecessary to partially unroof houses as a means of disinfection and his conclusions are drawn from the fact that the sun's rays do not reach every portion of the house, consequently several microbes lurking in corners are not destroyed.

2. The conditions favourable to the development of plague, as far as the houses themselves are concerned, are overcrowding and defective ventilation and it is principally as regards the latter that openings are absolutely necessary in ill-ventilated houses, and with admission of the sun and disinfection of floors, roof and walls there is very little chance of the microbe not being destroyed.

3. In pucka built houses, whether terraced or tiled, where there are sufficient doors and windows, there is no necessity to make any holes either in walls or roof. There is nearly always a necessity to unroof a portion in houses of Muhammadans, as the gosha system prevents free ventilation, all crevices, windows, if any, are closed with rags, &c.

4. Another reason for making openings in the roof is for the admission of light, which also assists in the destruction of the microbe.

5. As regards the careless manner in which the tiles are removed and broken, efficient supervision would prevent this, and further at the end of the 10 days the tiles could be replaced without difficulty by those employed on disinfection duty.

6. Compensation should be given only to the indigent.

From B. MACLEOD, Esq., M.A., Barrister-at-Law, Collector of Anantapur, to the Secretary to Government (Local and Municipal Department), dated 1st June 1899.

With reference to Plague Commissioner's Reference on C. No. 4599, dated 1st May 1899, regarding the unroofing of tiled or terraced houses for disinfection purposes, I have the honour to state that in this district the houses are generally of flat mud roof and the making of small holes in the roof did not cause much damage and it was repaired with little cost. In the case of tiled houses the damage was no doubt greater and the cost of repair was likewise so. The amount of compensation paid in this district on account of unroofing comes up to only some 440 rupees.

2. Though it is true that through these small openings the sun's rays will not spread to every corner of a house and kill the microbes, yet more sunshine and fresh air will be let in as the houses of ryots in the villages in these parts are more close and shut up, having no windows of any kind.

3. I submit herewith copies of reports received from the Medical Officers (Doctor Hunter and Doctor Robertson) who think that the unroofing is not without any good effect.

ENCLOSURES.

From JOHN HUNTER, Esq., M.B., C.M., Additional Medical Officer, Hindupur, to the Collector of Anantapur, dated 14th May 1899, No. 1769.

With reference to your R. C. No. 1292, dated 8th instant, on the Proceedings No. 4599, dated 1st May 1899, of the Plague Commissioner, Madras, I have the honour to inform you that I am of opinion it is not necessary to open up the roofs of infected houses although a free admission of sunshine and air tends to further minimise the chance of a recrudescence.

From Major R. ROBERTSON, I.M.S., to the Collector of Anantapur district, dated Madras, 16th May 1899.

With reference to your R.C. No. 1292, dated 8th May 1899, I have the honour to submit my views thereon.

1. The Collector of North Arcot assumes that the object of opening up roofs is solely to allow the sun's rays to enter the house, so that plague germs may be killed thereby. I may also assume that the object of perchloride of mercury and kiln burning the floors aim exactly at the same point. I think we are all agreed that the latter exactly fulfils our wishes, so that apparently the sunlight is superfluous; I do not think that is our sole object in opening up roofs. In addition to what little amount of sunshine which will enter a house through a 4-feet opening in the roof at all angles of the sun's tour we have ventilation of the house and that means oxidation or combustion of organic matter adhering to the walls and to a much greater depth in the floor than the upper two inches which have been removed by the kiln process. It is this organic matter which supplies food for the plague and other bacilli. The floors and lower part of the walls of native houses are usually amply saturated with this organic matter and in small compartments or one-roomed houses. The requisite moisture for the growth of the bacillus is always available. If then we simply saturate the floor with 1·2000 or stronger solution we lose a very important agent for other work, viz., pure air.

2. The next point is the opening of the roof. This opening is I take it always a partial opening and not the unroofing of a house. In a tiled or thatched roof I always advocated one foot of material to be removed from each side of the ridge pole. In tiled houses a considerable number, nearly 25 per cent., of these will be broken in removal and great delay occurs afterwards in procuring new tiles or in granting compensation. This is the only roof I have found that gave me any trouble and I dare say if my coolies had had any training in removing tiles my breakages would have been less. Leaving the village reddi and a few coolies to make the necessary openings always leads to wholesale destruction of tiles. Regarding the thatched roof I see no difficulty in removing the necessary foot on each side of the ridge pole; a few bundles of the particular variety of grass is all that is necessary to fill up the gap. Regarding flat-roofed houses (mud roofs) there is no expense here either. A few pieces of jungle wood, cholam stalks and mud is all that is necessary. I do not think repairs would cost more than one rupee to a roof of this type.

All roofs do not require to be opened out and in many houses ventilation is free excepting the cook-house which rarely possesses a window.

In conclusion I strongly advocate ventilation in those houses—if that is done away with, then the result will be that perchloride of mercury solution has such a rapid germicidal action that it will only be necessary for the villagers to vacate their houses for a few hours. This last policy was tried in December 1898 at Guntakal with unexpected results.

From M.R.Ry. Diwan Bahadur R. V. SRINIVASA AIYAR Avargal, B.A., Acting Collector of Kurnool, to the Secretary to Government, Local and Municipal Department, dated 10th June 1899, Dis. No. 552-P.

Adverting to Plague Commissioner's Reference on C. No. 4599, dated 1st May 1899, I have the honour to state that as I joined this district only very recently and as I have had no personal experience of the methods of disinfection adopted in the infected parts here, I am unable to offer any remarks of value. I submit herewith for the information of Government copies of the reports received on the subject from the District Medical and Sanitary Officer, the Tahsildar of Pattikonda and the Deputy Collector of Pyapali division. It will be observed that the District Medical and Sanitary Officer regards the partial unroofing of dark houses "as a very important part of the disinfection", while the Tahsildar of Pattikonda states that "disinfection by partial unroofing" is thoroughly ineffectual. Whatever may be the efficacy of the process in question it seems to me inexpedient to resort to it during the rainy season which is just setting in, as rain water by entering the houses through the openings made in the roofs will damp the floor, and this moisture may tend to develop plague germs more rapidly than can be counteracted by the influence of the light and heat of the sun on clear days.

ENCLOSURES.

From the District Medical and Sanitary Officer, Kurnool, to the Collector of Kurnool, dated 19th May 1899, Dis. No. 365-P.

In reply to your letter, No. 669-P. of 16th instant, I have the honour to state that the roofs in this district were opened up by making large circular holes of such number as seemed to be required for the free letting in of the sun and I think that in most cases the whole interior was exposed at some time of day to the direct rays of the sun. In the case of all suspected houses the system of partial unroofing was adopted in this district.

In the dark and dirty houses in the villages of this district I would not care to trust entirely to disinfection, especially as the disinfecting staff would have to work by lamp-light or in the dark unless the whole of the house were lit by sunlight from the roof, thus causing the work to be less efficiently done. The opening up of the roofs in the cases of the dark houses referred to above, I regard as a very important part of the disinfection.

From M.R.Ry. S. RAMU AIYAR Avargal, Deputy Collector, Pyápali, to the Collector of Kurnool, dated 16th May 1899, R. C. No 222-P.

With reference to your R. C. No. 669-P. of 1899, dated 5th instant, I have the honour to state that as I was absent on leave when the plague broke out in my division, as for some time even after my return, I had little to do with the plague operations owing to there being a Special Deputy Collector in charge of them, and as, since his employment was discontinued, the plague has fortunately all but ceased, I do not possess the requisite experience to enable me to give any valuable opinion on the question of the efficacy of the measure of unroofing houses infected with plague, as one of the methods of disinfection.

2. I submit, however the report of the Pattikonda Tahsildar on this subject. It will be seen therefrom that the unroofing of houses for the purpose of disinfection was not systematically resorted to, but only in some cases here and there, and that whenever unroofing was had recourse to, the roofs were not wholly removed, but only partially. I have personally seen the system of unroofing as adopted by the Plague Inspector at Pattikonda. He opens here and there sky-lights of irregular shapes. They are not so wide as to admit of the sun-light reaching every portion of the inside. They merely serve to let in more light than the precious little which people in these parts manage to secure by their mode of building houses.

3. I have reason to believe that the unroofing of houses, as also the digging up of the floors, is distasteful to the people, especially as no compensation is given and as the house-owners are obliged to reroof and refloor their houses at their own expense. Of course, it is not to be expected that they would or could be made to reconcile themselves, except perhaps in rare cases, to the inconveniences and losses arising from such measures, from any conviction of the advantages derived therefrom by themselves or their neighbours.

4. I believe that disinfection is carried out only after the inmates evacuate or are made to evacuate the houses concerned.

5. The generality of houses in these parts being mud-roofed and the timber which serves as joints being cheap jungle wood, the amount of loss occasioned by unroofing must necessarily be less than what it may be in places like Vellore, &c., where the houses are tiled or have concrete terrace. At the same time, as the people at large in these parts are as I think, poorer than those in the southern districts, the damage caused by unroofing, though small as regards its intrinsic money value, is nevertheless likely to be felt. If, therefore the unroofing of infected houses were to be resorted to as an essential part of the system of disinfection, and if such unroofing were to be carried on on a large scale, in the event of the plague spreading, and without payment of any compensation, it may probably lead to discontent and active opposition on the part of the people. On the whole, it seems to me that no hard and fast rule need be laid down, and that the measures to be adopted be regulated and modified when it need be, by actual experience, and with due regard to the degree of the intensity and extensiveness of the outbreak.

From the Tahsildar of Pattikonda, to the Deputy Collector of Pyapali, dated Ratana, 10th May 1899, Dis. No. 484-Rev.

In returning herewith your C. No. 222 of 1899, dated 8th instant, I beg to report as follows.

2. So far as I know, disinfection has been carried on in this taluk mostly by saturating the floor, walls and ceiling with *solution* and then white-washing. Digging up the floor and burning it over was also resorted to but only in a few cases. Unroofing houses was also had recourse to, but only partly, and I am not aware of even a single house which has been wholly unroofed. As far as I am aware no compensation has been either claimed or paid for damages done to houses either by unroofing or by digging up the floor. There was no active opposition to such a step, but I am sure the people concerned did not relish the act but rather resented it.

3. Personally I know only a few cases of disinfection in minute detail. The villages of Alardinne, Togalakallu and Dudekonda were disinfected thoroughly by Supervisor Mr. Berlie under the Plague Commissioner's personal orders and may be consulted with advantage, as I know nothing as to how it was done, though I can safely presume that saturation with perchloride of mercury and hydrochloric acid was one of the ways in which it was done. At Pattikonda I know the sanitary inspector dug up the floor of some houses and unroofed houses partly. At Maddikera too the houses were unroofed partly and the floor was dug up in some cases. Everywhere the most common method was saturation with the solution and white washing.

4. As stated by the Collector of North Arcot I am entirely of opinion that disinfection by partial unroofing is thoroughly ineffectual. Saturation with the solution seems to me to be the best method known now and the unroofing of houses so thoroughly as to let in the sun in every nook and corner may also probably equally be advantageous. The digging up of the floor and burning it over thoroughly well seems also to be rather efficacious.

5. As far as I know, no compensation has been paid except for burnt houses and for burnt valuable moveable property.

From R. B. CLEGG, Esq., I.C.S., Collector and District Magistrate, Salem, to the Secretary to Government, Local and Municipal Department, dated 14th June 1899, No. 1099 P.

With reference to the Proceedings of the Plague Commissioner, No. 4599, dated 1st May 1899, I have the honour to report as follows.

2. The Collector of North Arcot states that the partial unroofing of tiled houses which is done as a necessary item of the process of disinfection is not very efficacious as it does not ensure that the sunlight shall reach every part of the house, that it is productive of worry and discomfort to the inmates who have to live in an unroofed house for ten days or more, that the discomfort will be greater if the measure were insisted on during the rainy weather, that it may even lead to a riot and that it is very costly on account of compensation which has to be paid to the owners in consequence. At Mattigiri, where indigenous plague first broke out in the district, the whole of the roofs were removed in the beginning, but later on in the village and elsewhere at the instance of the Plague Commissioner, the roofs were only partially removed. The untiling was done by special coolies engaged by us and by the sappers except in some cases at Mattigiri where the people themselves undertook to do it. On the whole there was no opposition to the measure either in the Hosur taluk or in the Municipal towns of Salem, Vániyambádi and Tiruppattúr though in the last three places owing to a few imported cases it was carried out only to a limited extent. The people experienced no discomfort in consequence as whole villages were evacuated in the Hosur taluk and the villagers camped out in fields. The re-tiling in the villages in the Hosur taluk was done by the sappers and to some extent by the owners themselves of their own accord. At Salem and Vániyambádi the untiling and the re-roofing were carried out by the Municipality concerned at a cost of As. 10 and Rs. 20, respectively, but no compensation has been paid anywhere to the owners for untiling and re-tiling.

3. Regarding the efficacy or otherwise of the measure, the District Medical and Sanitary Officer, Salem, states that "as light and ventilation are very important aids in the removal of infection from houses and that as native houses or many parts of them are very deficient in both these respects the removal of the roof in whole or in part is often the only feasible means of admitting light and air to infected rooms." He adds that this method should not be abolished entirely though it may be modified according to circumstances, for instance in the case of a single roomed house where evacuation cannot be effected, this measure should not be enforced as the occupants would be exposed to the weather. I agree with this opinion that removing the roofs to let in light and air is as necessary as any other process of disinfection. We have not had many instances in this district of house segregation, but where such has been allowed (in the municipal towns) we have never removed the roof of a room while the inmates were still in it. In houses of more than one room there is not much opposition to untiling one room at a time while the inmates remove to another. A great deal depends upon the nature of each building and the state of the weather as to what can be done, but I am strongly opposed to abolishing this measure altogether. To remove the roof of the apartment where a family is residing will no doubt create as much opposition as forcible segregation and is not desirable. No compensation will be necessary if the untiling and re-roofing is done by a staff of servants or by troops engaged by the Municipality or the Local Board and the cost of labour cannot be much even in large towns.

Order—No. 1005 P., dated 29th June 1899.

The papers read above will be communicated to all Collectors with the remark that the Government concurs in the views expressed by the Sanitary Commissioner as to the necessity of exposing infected houses to sunlight and air and as to the mode in which this should be carried out.

(True Extract.)

for *Ag. Secretary to Government.*

To all Collectors (A—K).
,, the Sanitary Commissioner.
,, the Surgeon-General.
,, the President, Municipal Commission, Madras.

Exd. P. Seetharam.

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G.O., No. 1005 P., 29th June 1899.

JUNE.

Unroofing of plague infected houses.

Stating that the Government concurs in the views expressed by the Sanitary Commissioner as to the necessity of exposing infected houses to sunlight and air and as to the mode in which this should be carried out.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—the following paper :—

From R. H. CAMPBELL, Esq., Acting Collector and District Magistrate, North Arcot, to the Plague Commissioner, Madras, dated Camp Baireddipalle, 26th April 1899, R. C. No. 1594-P.

I have the honour to draw your attention to the enormous expenditure which is being incurred in the town of Vellore on account of compensation paid to owners of disinfected houses. In my letter of yesterday, I enclosed a statement of plague charges for the month of March in Vellore; and you will find on referring to that statement that the figure for compensation alone appearing under unpaid bills comes to over Rs. 5,000.

2. So far we have had anything but a severe epidemic of plague in Vellore; and if the disease were really to assume a virulently epidemic form, I leave you to imagine what the expenditure on compensation would rise to.

3. Considering the above facts and bearing in mind the possibility that the plague may return with perhaps greater severity after the hot weather, I feel it my duty to submit to you certain proposals the object of which is to lessen the expenses incident to our measures for coping with plague and at the same time to render those measures more popular.

4. By far the largest item in the compensation bills referred to is the sums paid in compensation for the partial unroofing of tiled houses; and if this practice were to be pursued in a place where plague was really severe, the charges on that head alone would be simply enormous. I have been driven by the following considerations to seriously question whether this measure is a necessary and desirable part of an efficient plague policy. In the first place, the practice of destroying property and giving compensation at all is a great evil even if it is a necessary one and should be restricted as far as possible. Even if the compensation is considerably in excess of the actual value of the property destroyed, the vexation and worry caused to the owners is not at all made up for by the money profit, and leads to great discontent. The evils are exaggerated in the case of Vellore. Here owing to the practice of home segregation the inhabitants are put to the discomfort of living in an unroofed house for ten days or more. The tiles are not replaced, but are left stacked (often broken and spoilt) on the unremoved portion of the roof which also suffers in the process. The owners are left to replace these tiles themselves and if, as is often the case, the houses are left unroofed for many weeks, it is unfair to lay the whole blame on the inmates. All the satisfaction they receive is a promise of compensation which is often long unpaid and which in proportion as it becomes a really adequate recompense for the extreme discomfort they have been subjected to, becomes a more and more intolerable drain on the municipal exchequer.

5. So far I have shown that the practice of unroofing houses for disinfection is highly objectionable and can be only justified by the most stringent necessity since it causes either by its injustice, great disaffection and opposition to plague measures or else, if adequate compensation is given, great expenditure of public money.

6. But is the unroofing of houses either a necessary or an efficacious means of disinfecting? I cannot say that I think it is either.

7. To begin with, as at present carried out, it does not ensure that the sun shall reach every portion of the house. The roof is taken off in longitudinal slips which leave many corners untouched by the sun throughout the day where the microbes can rest undisturbed. Indeed, the total removal of the roof itself would not ensure the letting of the sun into every portion of a house, for large portions of the northern wall at least must be left untouched; and surely it cannot be maintained that any partial destruction of the microbes in a house, however large the proportion destroyed, will adequately disinfect the house.

8. Disinfection by the sun could only be rendered thorough by practically demolishing the building. Unroofing alone cannot be efficacious. Curiously enough the parts least exposed to the sun by removing the roof are those very parts of the house which, according to a very generally-accepted theory, are the most favourite, if not the only resort, of the microbe, viz., the floor and the lower portions of the walls. There are surely strong reasons to believe that the microbe rarely moves many feet above the ground.

9. For those important parts and for all parts not touched by the sun we are compelled to depend solely on saturation by means of perchloride of mercury or other disinfectants. It seems to me that we cannot regard unroofing as either efficacious or necessary and that it would be more logical to depend entirely on the disinfectant washing.

10. It would be different if the unroofing could be regarded as a small additional precaution, requiring little trouble or expense, and entailing little opposition, but in fact it occupies the foremost position in all ~~over~~ disinfectant operations; it costs much and causes great discontent; and if persisted in during the rainy season, it might easily lead to a riot. In fact, the trouble, danger and expense it involves would only be justified by the assumption that it was absolutely efficacious and absolutely essential to a satisfactory disinfection. When the rains come, I do not see how we can possibly carry out unroofing and home segregation combined, and it would be just as well to abandon the former now, if it has to be given up eventually. /our.

11. I may remark in conclusion that should unroofing be discontinued there would, in my opinion, be but little opposition to plague preventive measures, even in the event of a virulent epidemic of plague. The people dimly understand the point of our other measures and submit to them with a tolerable grace, but they see no possible good in the unroofing and resent most keenly the hardship of having their houses so roughly handled and rendered temporarily uninhabitable.

12. Feeling as I do the necessity of curtailing our expenditure and at the same time carrying the people with us in our efforts to combat the plague, I recommend most strongly that the practice of partially unroofing tiled or terraced houses in large towns like Vellore be entirely discontinued and that the disinfection of such houses be restricted in future to saturating the floors and the whole interiors with perchloride solution and (when the floors are made of mud) afterwards digging up and burning the floors.

Ref. on C. No. 1599, dated 1st May 1899.

Referred to the Collectors of Kurnool, Bellary, Anantapur and Salem, and the Sanitary Commissioner for favour of remarks. It is understood that no compensation for damage done during disinfection has been given anywhere outside North Arcot, except where houses have been burnt down.

(Signed) L. F. BUCKLEY,
Plague Commissioner.

From Lieutenant-Colonel W. G. KING, M.B., C.M., D.P.H., I.M.S., Sanitary Commissioner for Madras, to the Secretary to Government, Local and Municipal Department, dated Madras, 19th May 1899, No. 1500-S.

With reference to Plague Commissioner's Proceedings, Ref. on. C. No. 4599, dated 1st May 1899, I have the honour to remark as follows.

In paragraph 6 Mr. Campbell states that he does not think the unroofing of houses is "either a necessary or efficacious means of disinfecting". His grounds for the former conclusion seem to me more a plea of expediency than to touch the question of "necessity", whilst in regard to the latter it seems to me he adduces no proof whatsoever. His paragraphs 7, 8 and 9 exhibit the popular belief that, unless the direct rays of the sun act upon infected matter, no disinfection can result. He regards, further, the openings made in the roof as having reference solely to the admission of these direct rays of the sun. In both premises he is incorrect. The action of direct as against diffused daylight upon micro-organisms may be roughly said to be five times greater; but in diffused daylight inimical action nevertheless proceeds. Whilst, therefore, the direct rays of the sun are to be preferred wherever their application is possible, diffused daylight is not to be despised. But the holes in the roof have other important functions beyond the mere admission of sunlight, namely, of securing free ventilation, which could frequently not otherwise be attained. This free ventilation is especially necessary during "home segregation" on behalf of the attendants upon the sick; and, during the process of disinfection, the same applies to the men employed for the purpose. It has been clearly proved that the detrimental action of sunshine upon microbes is of a chemical nature, that is, it is the actinic rays which influence the result. This action, however, cannot be effected without the presence of free ventilation, because it is due to the production of the peroxide of hydrogen; hence whilst the direct rays of the sun are desirable, diffused daylight is of value, provided free ventilation is afforded and, with it, moisture. The latter is usually fully supplied by the use of liquid disinfectants upon the floor and, if not, by the damp condition of houses of the class where this disturbance of the roof would be necessary.

2. I regret I cannot understand Mr. Campbell's remark in his paragraph 8 where he affirms: "curiously enough the parts least exposed to the sun by removing the roof are those very parts of the house which, according to a very generally accepted theory, are the most favourite, if not the only resort of the microbe, viz., the floor and the lower portions of the walls." It seems to me if there be any place which is likely to be reached by the direct rays of the sun after unroofing of the house, it would be those indicated by him.

3. Mr. Campbell then expresses the opinion that "there are surely strong reasons to believe that the microbe rarely moves many feet above the ground." It must, however, be apparent to him that if the microbe "rarely" moves above the level stated by him, it is quite possible that it may be moved. For instance, according to Simonds, the fœces of plague-infected rats and of their parasites (fleas) contain the plague microbe. Rats dwell in native houses largely in the interior of "mud roofs" and between the tiles in the tiled roofs. With reference, therefore, to the roof as an infected place and as a convenient position for aiding in ventilating a dwelling, it cannot be safely put out of reckoning, irrespective of claims as to aiding disinfection by other means. Bacteriological evidence is in direct discord with Mr. Campbell's suggestion that the mode is not an "efficacious means of disinfection."

4. As to its necessity, I think there can be no possible doubt when dealing with certain, as it happens, very frequent class of case, namely, where the houses are dark and ill-ventilated. Frequently the rooms in native houses are so dark that nothing can be seen without a light, and how often they are absolutely devoid of any mode of ventilation except the door is notorious. In such instances I consider it would be unjustifiable before undertaking disinfection to do more than to send into them the officer in charge of plague operations and his immediate assistants until these defects had been completely remedied, that is to say, the ordinary cooly staff employed on

disinfection work should not be called upon to face such risks, especially under such arrangements, as exist in North Arcot, where the Plague Commissioner has justified the complete absence of the most ordinary care in pneumonic plague cases undergoing "home segregation," on the ground that it is impossible to carry out all precautions in "home segregation."

5. But, in using this method, no "rule of thumb" should be employed. It does not follow that because a dwelling has been attacked with plague, it must be unroofed; especially during rains, when, indeed, the sides of the walls of the house may be advantageously pierced, instead of the roofs. Further, it does not follow that all native dwellings do require an access of light and ventilation—though certainly they usually do. In such instances, the use of the acid perchloride of mercury solution would doubtless suffice. Moreover, if the highly objectionable method of "home segregation" must be employed, I do not see that during illness of the patient, it is requisite to do more than provide for efficient ventilation. This, as already stated, could frequently be secured by making temporary windows in the sides of the house. When the question of disinfection arises, after convalescence of the patient, *each case should be considered on its own merits, in reference to possibility of infection by rats, and the nature of dwelling rooms as to ventilation and light.*

6. As to whether compensation should or should not be given, I think where damage to property is done of a nature that the tenant has to lay out funds to secure repair, it should certainly be given, and be given with a promptitude that should prevent its being imagined by his neighbours that he has been harshly treated. Whilst compensation to the manifestly poor should be invariable and full, there are conditions of life where, if a man insisted in using "home segregation" to the risk of his neighbours, he should be called upon to suffer the full consequences, whilst there may be other instances when a grant-in-aid, but not complete compensation, would meet requirements. These are matters for local discretion. Whilst then believing in the necessity of maintaining the principle of compensation, unless the people are to be provided with a good excuse for discontent, I think here also there should be no "rule of thumb" as to methods. Estimates are frequently not satisfactory either to the local authority nor the house-owner. In the case of Vellore, the Plague Officer represented to me the man engaged for this work had manifestly over-estimated charges, as proved on his having resorted to another authority for the necessary figures. So far as removal of tiles is concerned, if the gangs are made to understand it must be conducted with care, and if by them replacement is also insisted upon, compensation for broken tiles need never run up to much. Wherever other repairs can be done, they should, where feasible, be effected without money passing to the owner under the Plague Officer.

From E. A. ELWIN, Esq., Acting Collector of Bellary, to the Secretary to Government, Local and Municipal Department, dated 27th May 1899, D.D. No. 938-P.

Adverting to the Plague Commissioner's R. C. No. 4599, dated 1st May 1899, I have the honour to remark that the question of unroofing tiled or terraced houses in large towns has not arisen in this district. It is no doubt highly desirable to allow a free current of air to pass for some days through all plague-infected rooms, and as there are windows in most substantially built houses, this can generally be effected by keeping them as well as all doors open for the period decided upon: where there are no windows or the windows are too small, the difficulty can, in my opinion, be met by making a hole or holes in the outer walls just as well as by partially removing the roof.

2. I enclose a copy of the note sent to me on the subject by the District Medical and Sanitary Officer.

ENCLOSURE.

COPY of the note, dated 19th May 1899, from the District Medical and Sanitary Officer, to the Collector of Bellary.

The Collector of North Arcot evidently considers that it is unnecessary to partially unroof houses as a means of disinfection and his conclusions are drawn from the fact that the sun's rays do not reach every portion of the house, consequently several microbes lurking in corners are not destroyed.

2. The conditions favourable to the development of plague, as far as the houses themselves are concerned, are overcrowding and defective ventilation and it is principally as regards the latter that openings are absolutely necessary in ill-ventilated houses, and with admission of the sun and disinfection of floors, roof and walls there is very little chance of the microbe not being destroyed.

3. In pucka built houses, whether terraced or tiled, where there are sufficient doors and windows, there is no necessity to make any holes either in walls or roof. There is nearly always a necessity to unroof a portion in houses of Muhammadans, as the gosha system prevents free ventilation, all crevices, windows, if any, are closed with rags, &c.

4. Another reason for making openings in the roof is for the admission of light, which also assists in the destruction of the microbe.

5. As regards the careless manner in which the tiles are removed and broken, efficient supervision would prevent this, and further at the end of the 10 days the tiles could be replaced without difficulty by those employed on disinfection duty.

6. Compensation should be given only to the indigent.

From B. MACLEOD, Esq., M.A., Barrister-at-Law, Collector of Anantapur, to the Secretary to Government (Local and Municipal Department), dated 1st June 1899.

With reference to Plague Commissioner's Refrence on C. No. 4599, dated 1st May 1899, regarding the unroofing of tiled or terraced houses for disinfection purposes, I have the honour to state that in this district the houses are generally of flat mud roof and the making of small holes in the roof did not cause much damage and it was repaired with little cost. In the case of tiled houses the damage was no doubt greater and the cost of repair was likewise so. The amount of compensation paid in this district on account of unroofing comes up to only some 440 rupees.

2. Though it is true that through these small openings the sun's rays will not spread to every corner of a house and kill the microbes, yet more sunshine and fresh air will be let in as the houses of ryots in the villages in these parts are more close and shut up, having no windows of any kind.

3. I submit herewith copies of reports received from the Medical Officers (Doctor Hunter and Doctor Robertson) who think that the unroofing is not without any good effect.

ENCLOSURES.

From JOHN HUNTER, Esq., M.B., C.M., Additional Medical Officer, Hindupur, to the Collector of Anantapur, dated 14th May 1899, No. 1769.

With reference to your R. C. No. 1292, dated 8th instant, on the Proceedings No. 4599, dated 1st May 1899, of the Plague Commissioner, Madras, I have the honour to inform you that I am of opinion it is not necessary to open up the roofs of infected houses although a free admission of sunshine and air tends to further minimise the chance of a recrudescence.

From Major R. ROBERTSON, I.M.S., to the Collector of Anantapur district, dated Madras, 16th May 1899.

With reference to your R.C. No. 1292, dated 8th May 1899, I have the honour to submit my views thereon.

1. The Collector of North Arcot assumes that the object of opening up roofs is solely to allow the sun's rays to enter the house, so that plague germs may be killed thereby. I may also assume that the object of perchloride of mercury and kiln burning the floors aim exactly at the

same point. I think we are all agreed that the latter exactly fulfils our wishes, so that appar-
ently the sunlight is superfluous; I do not think that is our sole object in opening up roofs.
In addition to what little amount of sunshine which will enter a house through a 4-feet opening
in the roof at all angles of the sun's tour we have ventilation of the house and that means oxida-
tion or combustion of organic matter adhering to the walls and to a much greater depth in the
floor than the upper two inches which have been removed by the kiln process. It is this organic
matter which supplies food for the plague and other bacilli. The floors and lower part of the walls
of native houses usually amply saturated with this organic matter and in small compartments or
one-roomed houses. The requisite moisture for the growth of the bacillus is always available. If
then we simply saturate the floor with 1·2000 or stronger solution we lose a very important agent
for other work, viz., pure air.

2. The next point is the opening of the roof. This opening is I take it always a partial
opening and not the unroofing of a house. In a tiled or thatched roof I always advocated one
foot of material to be removed from each side of the ridge pole. In tiled houses a considerable
number, nearly 25 per cent., of these will be broken in removal and great delay occurs afterwards
in procuring new tiles or in granting compensation. This is the only roof I have found that gave
me any trouble and I dare say if my coolies had had any training in removing tiles my break-
ages would have been less. Leaving the village reddi and a few coolies to make the necessary
openings always leads to wholesale destruction of tiles. Regarding the thatched roof I see no
difficulty in removing the necessary foot on each side of the ridge pole, a few bundles of the parti-
cular variety of grass is all that is necessary to fill up the gap. Regarding flat roofed houses
(mud roofs, there is no expense here either. A few pieces of jungle wood, cholam stalks and mud
is all that is necessary. I do not think repairs would cost more than one rupee to a roof of this
type.

All roofs do not require to be opened out and in many houses ventilation is free excepting the cook-house which rarely possesses a window.

In conclusion I strongly advocate ventilation in those houses—if that is done away with, then the result will be that perchloride of mercury solution has such a rapid germicidal action that it will only be necessary for the villagers to vacate their houses for a few hours. This last policy was tried in December 1898 at Guntakal with unexpected results.

From M.R.Ry. Diwan Bahadur R. V. SRINIVASA ~~IYER~~ Avargal, B.A., Acting Collector of Kurnool, to the Secretary to Government, Local and Municipal Department, dated 10th June 1899, Dis. No. 552-P.

Adverting to Plague Commissioner's Reference on C. No. 4599, dated 1st May 1899, I have the honour to state that as I joined this district only very recently and as I have had no personal experience of the methods of disinfection adopted in the infected parts here, I am unable to offer any remarks of value. I submit herewith for the information of Government copies of the reports received on the subject from the District Medical and Sanitary Officer, the Tahsildar of Pattikonda and the Deputy Collector of Peapalli division. It will be observed that the District Medical and Sanitary Officer regards the partial unroofing of dark houses "as a very important part of the disinfection", while the Tahsildar of Pattikonda states that "disinfection by partial unroofing" is thoroughly ineffectual. Whatever may be the efficacy of the process in question it seems to me inexpedient to resort to it during the rainy season which is just setting in, as rain water by entering the houses through the openings made in the roofs will damp the floor, and this moisture may tend to develop plague germs more rapidly than can be counteracted by the influence of the light and heat of the sun on clear days.

ENCLOSURES.

From the District Medical and Sanitary Officer, Kurnool, to the Collector of Kurnool, dated 19th May 1899, Dis. No. 365-P.

In reply to your letter, No. 669-P. of 16th instant, I have the honour to state that the roofs in this district were opened up by making large circular holes of such number as seemed to be required for the free letting in of the sun and I think that in most cases the whole interior was exposed at some time of day to the direct rays of the sun. In the case of all suspected houses the system of partial unroofing was adopted in this district.

In the dark and dirty houses in the villages of this district I would not care to trust entirely to disinfection, especially as the disinfecting staff would have to work by lamp-light or in the dark unless the whole of the house were lit by sunlight from the roof, thus causing the work to be less efficiently done. The opening up of the roofs in the cases of the dark houses referred to above, I regard as a very important part of the disinfection.

From M.R.Ry. S. RAMU ~~IYER~~ Avargal, Deputy Collector, Pyápali, to the Collector of Kurnool, dated 16th May 1899, R. C. No 222-P.

With reference to your R. C. No. 669-P. of 1899, dated 5th instant, I have the honour to state that as I was absent on leave when the plague broke out in my division, as for some time even after my return, I had little to do with the plague operations owing to there being a Special Deputy Collector in charge of them, and as, since his employment was discontinued, the plague has fortunately all but ceased. I do not possess the requisite experience to enable me to give any valuable opinion on the question of the efficacy of the measure of unroofing houses infected with plague, as one of the methods of disinfection.

2. I submit, however, the report of the Pattikonda Tahsildar on this subject. It will be seen therefrom that the unroofing of houses for the purpose of disinfection was not systematically resorted to, but only in some cases here and there, and that whenever unroofing was had recourse to, the roofs were not wholly removed, but only partially. I have personally seen the system of unroofing as adopted by the Plague Inspector at Pattikonda. He opens here and there sky-lights of irregular shapes. They are not so wide as to admit of the sun-light reaching every portion of the inside. They merely serve to let in more light than the precious little which people in these parts manage to secure by their mode of building houses.

3. I have reason to believe that the unroofing of houses, as also the digging up of the floors, is distasteful to the people, especially as no compensation is given and as the house-owners are obliged to reroof and refloor their houses at their own expense. Of course, it is not to be expected that they would or could be made to reconcile themselves, except perhaps in rare cases, to the inconveniences and losses arising from such measures, from any conviction of the advantages derived therefrom by themselves or their neighbours.

4. I believe that disinfection is carried out only after the inmates evacuate or are made to evacuate the houses concerned.

5. The generality of houses in these parts being mud-roofed and the timber which serves as joints being cheap jungle wood, the amount of loss occasioned by unroofing must necessarily be less than what it may be in places like Vellore, &c., where the houses are tiled or have concrete terrace. At the same time, as the people at large in these parts are as I think, poorer than those in the southern districts, the damage caused by unroofing, though small as regards its intrinsic money value, is nevertheless likely to be felt. If, therefore, the unroofing of infected houses were to be resorted to as an essential part of the system of disinfection, and if such unroofing were to be carried on on a large scale, in the event of the plague spreading, and without payment of any compensation, it may probably lead to discontent and active opposition on the part of the people. On the whole, it seems to me that no hard and fast rule need be laid down, and that the measures to be adopted be regulated and modified when it need be, by actual experience, and with due regard to the degree of the intensity and extensiveness of the outbreak.

From the Tahsildar of Pattikonda, to the Deputy Collector of Pyapalli, dated Ratana, 10th May 1899, Dis. No. 487-Rev.

In returning herewith your C. No. 222 of 1899, dated 8th instant, I beg to report as follows.

2. So far as I know, disinfection has been carried on in this taluk mostly by saturating the floor, walls and ceiling with *solution* and then white-washing. Digging up the floor and burning it over was also resorted to but only in a few cases. Unroofing houses was also had recourse to, but only partly, and I am not aware of even a single house which has been wholly unroofed. As far as I am aware no compensation has been either claimed or paid for damages done to houses either by unroofing or by digging up the floor. There was no active opposition to such a step, but I am sure the people concerned did not relish the act but rather resented it.

3. Personally I know only a few cases of disinfection in minute detail. The villages of Alardinne, Thogalakallu and Dudekonda were disinfected thoroughly by Supervisor Mr. Berliet under the Plague Commissioner's personal orders and may be consulted with advantage, as I know nothing as to how it was done, though I can safely presume that saturation with perchloride of mercury and hydrochloric acid was one of the ways in which it was done. At Pattikonda I know the sanitary inspector dug up the floor of some houses and unroofed houses partly. At Maddikera too the houses were unroofed partly and the floor was dug up in some cases. Everywhere the most common method was saturation with the solution and white-washing.

4. As stated by the Collector of North Arcot I am entirely of opinion that disinfection by partial unroofing is thoroughly ineffectual. Saturation with the solution seems to me to be the best method known now and the unroofing of houses so thoroughly as to let in the sun in every nook and corner may also probably equally be advantageous. The digging up of the floor and burning it over thoroughly well seems also to be rather efficacious.

5. As far as I know, no compensation has been paid except for burnt houses and for burn valuable moveable property.

From R. B. CLEGG, Esq., I.C.S., Collector and District Magistrate, Salem, to the Secretary to Government, Local and Municipal Department, dated 14th June 1899, No. 1099 P.

With reference to the Proceedings of the Plague Commissioner, No. 4599, dated 1st May 1899, I have the honour to report as follows.

2. The Collector of North Arcot states that the partial unroofing of tiled houses which is done as a necessary item of the process of disinfection is not very efficacious as it does not ensure that the sunlight shall reach every part of the house, that it is productive of worry and discomfort to the inmates who have to live in an unroofed house for ten days or more, that the discomfort will be greater if the measure were insisted on during the rainy weather, that it may even lead to a riot and that it is very costly on account of compensation which has to be paid to the owners in consequence. At Mathigiri, where indigenous plague first broke out in the district the whole of the roofs were removed in the beginning, but later on in the village and elsewhere at the instance of the Plague Commissioner, the roofs were only partially removed. The untiling was done by special coolies engaged by us and by the sappers except in some cases at Mathigiri where the people themselves undertook to do it. On the whole there was no opposition to the measure either in the Hosur taluk or in the Municipal towns of Salem, Vániyambádi and Tiruppattúr though in the last three places owing to a few imported cases it was carried out only to a limited extent. The people experienced no discomfort in consequence as whole villages were evacuated in the Hosur taluk and the villagers camped out in fields. The re-tiling in the villages in the Hosur taluk was done by the sappers and to some extent by the owners themselves of their own accord. At Salem and Vániyambádi the untiling and the re-roofing were carried out by the Municipality concerned at a cost of As. 10 and Rs. 20, respectively, but no compensation has been paid anywhere to the owners for untiling and re-tiling.

3. Regarding the efficacy or otherwise of the measure, the District Medical and Sanitary Officer, Salem, states that "as light and ventilation are very important aids in the removal of infection from houses and that as native houses or many parts of them are very deficient in both these respects the removal of the roof in whole or in part is often the only feasible means of admitting light and air to infected rooms." He adds that this method should not be abolished entirely though it may be modified according to circumstances, for instance in the case of a single roomed house where evacuation cannot be effected, this measure should not be enforced as the occupants would be exposed to the weather. I agree with this opinion that removing the roofs to let in light and air is as necessary as any other process of disinfection. We have not had many instances in this district of house segregation, but where such has been allowed (in the municipal towns) we have never removed the roof of a room while the inmates were still in it. In houses of more than one room there is not much opposition to untiling one room at a time while the inmates remove to another. A great deal depends upon the nature of each building and the state of the weather as to what can be done, but I am strongly opposed to abolishing this measure altogether. To remove the roof of the apartment where a family is residing will no doubt create as much opposition as forcible segregation and is not desirable. No compensation will be necessary if the untiling and re-roofing is done by a staff of servants or by troops engaged by the Municipality or the Local Board and the cost of labour cannot be much even in large towns.

ORDER—No. 1005 P., dated 29th June 1899.

The papers read above will be communicated to all Collectors with the remark that the Government concurs in the views expressed by the Sanitary Commissioner as to the necessity of exposing infected houses to sunlight and air and as to the mode in which this should be carried out.

(True Extract.)

for *Ag. Secretary to Government.*

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To all Collectors (A—K).
" the Sanitary Commissioner.
" the Surgeon-General.
" the President, Municipal Coommission, Madras.

Exd. F. Seetharam.

[L. & M.]
500—4-3-99.

LOCAL AND MUNICIPAL DEPARTMENT.

Papers to be read in Proceedings:—

Current ~~Again G.O.~~, No. 4599 P. dated 26. 4. 99 ~~189~~ from the Collr. of N. Arcot
Current ~~Again G.O.~~, No. 1063 P dated 19. 5 99 —— from the Sanitary Commr.
Current No. 1238 P of 1899, dated 27 5 99, from the Collector of Bellary
" " 1350 P. " 1899, " 1.6.99 —, " do Anantapur
" " 1477 P " 1899, " 10 6 99, " do Kurnool
" " 1497 P " 99 " 14. 6 99 " " " Salem

ORDER. No 1005 P d/ 29-6-99

The papers read above will be communicated to all Collectors with the remark that the Government concurs in the views expressed by the Sanitary Commissioner as to the necessity of exposing infected houses to sun-light and air and as to the mode in which this should be carried out.

(From orders)

C.W.
27-6 99

To
All Collectors (A – K)
The Sanitary Commr.
" Surgeon-General
" President, M.C., Madras

Sign copies
H.L.
8.7.99

27.6.99.

[L. & M. 1,000—16-5-99.]

PLAGUE.

LOCAL AND MUNICIPAL DEPARTMENT.

Again G.O., No. , dated 189 .

Current No. 4599 (P.C) of 1899, dated 26-4-99 from the Collector of N. Arcot

Current No. 1063 P of 1899, dated 10-5-99 from the Sanitary Commr.

" 1238 P of 1899 .. 27-5-99 .. Collr. of Bellary

1350 P 1-6-99 — .. Anantapur

1477 P — — — 10-6-99 — .. Kurnool

1497 P — — — 14-6-99 — — — .. Salem

Dept Comnt

SUBJECT.

Unroofing of infected houses.

FOR ORDERS.

Unroofing is prescribed by Addl. Infectious Regulation 35 as a mode of disinfecting an infected house. The Collector of North Arcot now very strongly recommends its discontinuance for the following reasons:-

(1) It causes considerable damage in the case of tiled and terraced houses and the Compensation given in consequence is very heavy and is a burden on the local or Municipal revenues. In Vellore for instance in a single month Compensation to the extent of Rs 7620 was given and this was something like

48·8 per cent of the total expenditure during the month on account of plague

(ii) It causes much annoyance and hardship to the people who may be segregated in such houses; and if unroofing is insisted on during the rainy season it may possibly lead to a riot.

(iii) The measure is not absolutely necessary nor is it complete in itself. A small opening is made on the roof to let in sunlight. Only a limited portion of the floor will be exposed to the direct rays of the sun leaving untouched a large portion of the floor and the walls to disinfect which the mercury solution has to be depended upon.

2. The Collector's letter was referred, for remarks, to the Sanitary Commissioner and the Collectors of Bellary, Anantapur, Kurnool and Salem. Unroofing was not systematically

~~NOTE FOR THE~~

resorted to in the Deccan districts. Compensation was not generally claimed and in the few cases where it was awarded the sum appears to have been small. But in Salem unroofing of an infected house was recognized from the outset as an important disinfection measure. It was done by Coolies and Sepoys under proper supervision. The retiling also was done by the same agency. There was no opposition to the measure and no discomfort was felt by the people and no compensation was awarded to the owners. All the officers consulted are generally agreed that unroofing is an essential disinfection measure. Col. King explains its theoretical and practical value. First, though direct rays are most important, yet diffused light has also its value and it plays an important function in the presence of moisture in the destruction of the microbes. Secondly, it promotes free ventilation which is necessary in the interests of the Coolies who do the disinfection work in the house and the people who are segregated in it ~~the house~~.

3. Col. King does not consider that unroofing will be necessary in all cases. In the case of Native dwellings having access to a fair amount of light and ventilation the use of perchloride of mercury solution alone would doubtless suffice. During the rains, openings may be made in the walls and the roofs may be let alone. And when home

~~NOTE FOR THE~~

segregation is allowed nothing more could be done during the illness of the patient than provision for free ventilation by opening temporary windows on the walls of the house. After the Convalescence of the patient the disinfection in each case should be considered on its own merits in reference to the possibility of infection ~~of~~ by rats and the nature of dwelling rooms as to ventilation and light. Worked in this manner, unroofing should not cause inconvenience or hardship to the people.

4. The question whether owners of houses are entitled to Compensation for damages done during disinfection is already before Government and is awaiting reply to a reference to

Vide papers in linked file.

- 6 -

the Government of Bombay

H.S.
20/6/99

Meanwhile the papers may be printed & circulated to the Dt. officers with the remark that the Government concurs in the views expressed by the Sanitary Commr. as to the necessity of exposing infected houses to sunlight & air & as to the mode in which this should be carried out.

[illegible]
20/6/99

[illegible]
23.6.99

H. M.

Yes. Communicate also the ~~opinion~~ experience of other Collectors as to the cost.
M.A. 26.6.99

PLAGUE COMMISSIONER'S OFFICE.

(189)

R/26/5/99

CURRENT No. 4599

~~**Progs.**~~
~~**Letter**~~
Ref. M.C. No 4599 d/1-5-99 6 P
Collrs of K. B. A. Bellary & Salem & c.

8/1/5/99

Referred to the Sanitary Commissioner for favour of remarks. It is understood that [illegible] permission for damage [illegible] during disinfection has been given [illegible] 1/5 [illegible]

[illegible]
1/5/99

Plague Commissioner

Fort St George }
May 1899 }

From The Collector of North Arcot

N.A.

R.C. No. 1594 of 99

Dated 26 - 4 - 99

Received 29 - 4 - 99

Registered 1 - 5 - 99 3/4 [illegible]

Enclosures nil

Spare copies

Despd 2/5/99

SUBJECT.

Recommending that the practice of partially unroofing tiled or terraced houses in large towns be entirely discontinued & that the disinfection of such houses be restricted to saturating the floors & the whole interior with perchloride solution.

Note

As regards the award of compensation for damage done during disinfection, please see P.C.'s note to Govt. ref. on C. No 3598 of 99 and Progs 354/8-2-99.

The S.C.'s views may be ascertained whether unroofing is absolutely necessary.

To
Collrs. of Kurnool
" Bellary
" Anantapur
" Salem
Sanitary Commissioner

H.S. 1.6.99

BACK PAPERS.

No.	Date.
C.N^o. 4478 of 99	
R.O.C. 3598 of 99	
Procs 354	d/ 8-2-99

FURTHER PAPERS.

No.	Date.

Plague

C.N^o. 4599

NORTH ARCOT, COLLECTOR'S OFFICE,
Camp Bairedipalle, 26th April 1899
Rc No. 1594. OF 1899.

18

FROM

R. A. Campbell, Esqr.
ag. COLLECTOR AND DISTRICT MAGISTRATE,
North Arcot,

TO

THE Plague Commissioner,
Madras.

In 1005 P 8 29/6

SIR,

I have the honor to draw your attention to the enormous expenditure which is being incurred in the town of Vellore on account of Compensation paid to owners of disinfected houses. In my letter of yesterday, I enclosed a Statement of plague Charges for the month of March in Vellore, and you will find on referring to that Statement that the figure for Compensation alone appearing under unpaid bills Comes to over Rs 5,000.

C.N^o. 4478 placed below

("Compensation" for March Rs 7620 i.e. about 48.8% of the total cost)

2. So far we have had anything but a severe epidemic of plague in Vellore; and if the

disease were really to assume a virulently epidemic form, I leave you to imagine what the expenditure on Compensation would rise to.

3. Considering the above facts and bearing in mind the possibility that the plague may return with perhaps greater severity after the hot weather, I feel it my duty to submit to you certain proposals the object of which is to lessen the expenses incident to our measures for coping with plague and at the same time to render those measures more popular.

4. By far the largest item in the Compensation bills referred to is the sums paid in Compensation for the partial unroofing of tiled houses; and if this practice were to be pursued in a place where plague was really severe, the charges on that head alone would be simply enormous. I have been driven by the following Considerations to seriously question whether this measure is a necessary and desirable part of an efficient plague policy. In the first place the practice of destroying property and giving Compensation at all is a great evil even if it is a necessary one and should be restricted as far as possible. Even if the Compensation is considerably in excess of the actual value of the property destroyed, the vexation and worry caused to the owners is not at all made up for by the money profit, and leads to great dis-content. The evils are exaggerated in the case of Vellore. Here owing to the practice of home segregation the inhabitants are put to the dis-comfort of living in an unroofed house for 10 days or more. The tiles are not replaced, but are left stacked (often broken and spoilt) on the unremoved portion of the roof which also suffers in the process. The owne

are left to replace these tiles themselves and if as is often the case the houses are left unroofed for many weeks, it is unfair to lay the whole blame on the inmates. All the satisfaction they receive is a promise of compensation which is often long unpaid and which in proportion as it becomes a really adequate recompense for the extreme dis-comfort they have been subjected to, becomes a more and more intolerable drain on the municipal ex-chequer.

5. So far I have shown that the practice of unroofing houses for disinfection is highly objectionable and can ~~only~~ be only justified by the most stringent necessity since it causes either by its injustice, great dis-affection and opposition to plague measures or else, if adequate compensation is given, great expenditure of public money.

6. But is the unroofing of houses

either a necessary or an efficacious means of disinfecting? I cannot say that I think it is either.

7. To begin with, as at present carried out it does not ensure that the sun shall reach every portion of the house. The roof is taken off in longitudinal slips which leave many corners untouched by the sun throughout the day where the microbes can rest undisturbed. Indeed the total removal of the roof itself would not ensure the letting of the sun into every portion of ~~the~~ a house, for large portions of the northern wall at least must be left untouched and surely it cannot be maintained that any partial destruction of the microbes in a house, however large the proportion destroyed, will adequately disinfect the house.

8. Disinfection by the sun could only be rendered thorough by practically demolishing the build

unroofing alone cannot be efficacious. Curiously enough the parts least exposed to the sun by removing the roof are those very parts of the house, which according to a very generally accepted theory, are the most favourite if not the only resort of the microbe viz. the floor and the lower portions of the walls. There are surely strong reasons to believe that the microbe rarely moves many feet above the ground.

9. For these important parts and for all parts not touched by the sun we are compelled to depend solely on saturation by means of perchloride of mercury or other disinfectants. It seems to me that we cannot regard unroofing as either efficacious or necessary and that it would be more logical to depend entirely on the disinfectant washing.

10. It would be different if the unroofing could be regarded

4

5 as a small additional precaution, requiring little ~~tr~~ trouble or expense and entailing little opposition, but in fact it occupies the foremost position in all our disinfectant operations; it costs much and causes great dis-content; and if persisted in during the rainy season, it might easily lead to a riot. In fact the trouble, danger and expense it involves would only be justified by the ~~a~~ assumption that it was absolutely efficacious and absolutely essential to a satisfactory disinfection. When the rains come I do not see how we can ~~carry~~ possibly carry out ~~of~~ unroofing and home segregation combined and it would be just as well to abandon the former now, if it has to be given up eventually.

11. I may remark in conclusion that should unroofing be discontinued there would, in my opinion, be but little opposition to plague

preventive measures, even in the event of a virulent epidemic of plague. The people dimly understand the point of our other measures and submit to them with a tolerable grace, but they see no possible good in the unroofing and resent most keenly the hardship of having their houses so roughly handled and rendered temporarily uninhabitable.

12. Feeling as I do the necessity of curtailing our expenditure and at the same time carrying the people with us in our efforts to combat the plague, I recommend most strongly that the practice of partially unroofing tiled or terraced houses in large towns like Vebne be entirely dis-continued and that the dis-infection of such houses be restricted in future to saturating the floors and the whole interiors with perchloride solution and (when

the

5

the floors are made of mud) afterwards digging up and turning the floors.

I have the honour to be,
Sir,
Your most obdt. servant,

for Ag. Collector

27-4-99

DESPATCHED
28 APR. 1899

Plague

Local & Munl. (1899) Department.

CURRENT No. 1063 P.

From The Sanitary Commissioner for Madras.

Order

No. 1500/S.

Dated 19th May 1899.

Received

Registered

P. C.
20 MAY 1899
20.5.99

Enclosures

Spare copies.

SUBJECT.

Submitting remarks with reference to G.O. No. 4599 dated 1st May 1899 regarding expenditure incurred on account of Compensation paid to owners during disinfection in the North Arcot Dt.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

[500—20-1 98.] Plague

CNo 1063P.

No. 1500/S

Office of Sanitary Commissioner,
~~Fort St. George~~ Madras, 19th May 1899

From

~~Surgeon~~-Lieut.-Col. W G. King, M.B., C.M., D.P.H., Ims.
Sanitary Commissioner for Madras,

To

The Secretary to Government,
Local and Municipal Department.

Sir,

With reference to Plague Commissioner's Proceedings No: Ref: on. C. No. 4599 dated 1st May 1899, I have the honour to remark as follows :-

In para 6, Mr: Campbell states that he does not think the unroofing of houses is " either a necessary or efficacious means of disinfecting ". His grounds for the former conclusion seem to me more a plea of expediency than to touch the question of " necessity ", whilst, in regard to the latter, it seems to me he adduces no proof whatsoever. His paras 7, 8, and 9 exhibit the popular belief that, unless the direct rays of the sun act upon infected matter, no disinfection can result. He regards, further, the openings made in the roof as having reference solely to the admission of these direct rays of the sun. In both premises, he is incorrect. The action of direct as against diffused daylight upon micro-organisms may be roughly said to be five times greater; but, in diffused daylight inimical action nevertheless proceeds. Whilst, therefore, the direct rays of the sun are to be preferred wherever their application is possible, diffused daylight is not to be despised. But the holes in the roof have other important functions beyond the mere admission of sunlight, namely, of securing free ventilation, which could frequently not otherwise be attained. This free ventilation is especially necessary during " home segregation " on behalf of the attendants upon the sick; and, during the process of disinfection the same applies to the men employed for the purpose. It has been clearly proved that the detrimental action of sunshine upon microbes is of a chemical nature, that is, it is the actinic rays which influence the result. This action, however, cannot be effected without the presence of free ventilation, because it is due to the production of the peroxide of hydrogen; hence, whilst, the direct rays of the sun are desirable, diffused daylight is of value, provided free ventilation is afforded and, with it, moisture. The latter is usually fully supplied by the use of liquid disinfectants upon the floor, and, if not, by the damp condition of houses of the class where this disturbance of the roof would be necessary.

2. I regret I cannot understand Mr: Campbell's remark in his para 8 where he affirms, " Curiously enough the parts least exposed to the sun by removing the roof are those very parts of the house which according to a very generally accepted theory, are the most favourite if not the only resort of the microbe viz, the floor and the lower portions of the walls ". It seems to me if there be any place which is likely to be reached by the direct rays of the sun after unroofing of the house, it would be those indicated by him.

3. Mr: Campbell then expresses the opinion that, " There are surely strong reasons to believe that the microbe rarely moves many feet above the ground ". It must, however, be apparent to him that if the microbe " rarely " moves above the level stated by him, it is quite possible that it may be moved. For instance, according to Simonds, the foeces of plague infected rats and of their parasites (fleas) contain the plague microbe. Rats dwell in native houses largely in the interior of " mud roofs ", and between the tiles, in the tiled roofs. With reference, therefore, to the roof as an infected place, and as a convenient position for aiding in ventilating a dwelling, it cannot be safely put out of reckoning; irrespective of claims as to aiding disinfection by other means. Bacteriological evidence is in direct discord with Mr: Campbell's suggestion that the mode is not an " efficacious means of disinfection ".

4. As to its necessity, I think, there can be no possible doubt when dealing with certain, as it happens, very frequent class of case, namely, where the houses are dark and ill-ventilated. Frequently, the rooms in native houses are

so dark that nothing can be seen without a light, and how often they are absolutely devoid of any mode of ventilation except the door, is notorious. In such instances, I consider it would be unjustifiable before undertaking disinfection to do more than to send into them the officer in charge of plague operations and his immediate Assistants, until these defects had been completely remedied; that is to say, the ordinary coolie staff employed on disinfection work should not be called upon to face such risks; especially under such arrangements as exist in North Arcot, where the Plague Commissioner has justified the complete absence of the most ordinary care in pneumonic plague cases undergoing " home segregation," on the ground that " it is impossible to carry out all precautions in " home segregation ".

5. But, in using this method, no " rule of thumb " should be employed. It does not follow that because a dwelling has been attacked with plague, it must be unroofed; especially during rains, when indeed, the sides of the walls of the house may be advantageously pierced, instead of the roofs. Further, it does not follow that all native dwellings do require an access of light and ventilation—though certainly they usually do. In such instances, the use of the acid perchloride of mercury solution would doubtless suffice. Moreover, if the highly objectionable method of " home segregation " must be employed, I do not see that during illness of the patient, it is

requisite

Order

Copy of the note dated 19.5.99 from

requisi

This, as already sta

temporary windows in the sides of the house. When the question of disinfection arises, after convalescence of the patient, each case should be considered on its own merits, in reference to possibility of infection by rats, and the nature of dwelling rooms as to ventilation and light.

6. As to whether [redacted]on should or should not be
given, [redacted]e to property is done of a nature
that the tenant has to lay out funds to secure repair, it
should certainly be given, and be given with a promptitude
that should prevent its being imagined by his neighbours tha
he has been harshly treated. Whilst compensation to the ma
festly poor should be invariable and full, there are con-
ditions of life where, if a man insisted in usuing " home
regation " to the risk of his neighbours, he should be ca
upon to suffer the full consequences, whilst there may
other instances when a grant-in-aid, but not complete
pensation, would meet requirements. These are matter
local discretion. Whilst then believing in the nec
maintaining the principle of compensation, unless
are to be provided with a good excuse for disco
here also there should be no " rule of thumb "
Estimates are frequently not satisfactory eit
cal authority nor the house-owner. In the c

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PA 21/5

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so dark that nothing

resorted to another authority for the necessary figures.

So far as removal of tiles is concerned, if the gangs are made to understand it must be conducted with care, and if by them replacement is also insisted upon, compensation for broken tiles need never run up to much. Wherever other repairs can be done, they should, where [redacted] feasible, be effected without money passing to the owner, [redacted] under the Plague officer.

I have the honour to be,
Sir,
Your Most Obedient Servant,
W G King
Lieut-Colonel, I.M.S.
Sanitary Commissioner for Madras.

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Copy of the note dated 19.5.99 from

Local & Munl. (1899) Department.

CURRENT No. 1238 P

ASSIST. SECY TO GOVT.
31 MAY 1899
LOCAL MUNL & LEG DEPT.

From The Collector of Bellary

Order

nH @ C **No.** 938 P.

Dated 27th May 1899
Received } 31. 5. 99
Registered }
Enclosures 1
Spare copies

SUBJECT.

Offering remarks on letter from the Collector of North Arcot regarding the advisability of unroofing tiled or terraced roofs in large towns for disinfection

PA 31/5

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Copy of the note dated 19.5.99 from the District Medical and Sanitary Officer to the Collector of Bellary.

The Collector of North Arcot evidently considers that it is unnecessary to partially unroof houses as a means of disinfection and his conclusions are drawn from the fact that the sun's rays do not reach every portion of the house, consequently several microbes lurking in corners are not destroyed.

2. The conditions favourable to the developement of plague as far as the houses themselves are concerned are overcrowding and defective ventilation and it is principally as regards the latter that openings are absolutely

necessary in ill ventila[illegible]ouses, and with admission of the sun and disinfection of floors, roof, and walls there is very little chance of the microbe not being destroyed.

3. In pucka built houses whether terraced or tiled where there are sufficient doors and windows there is no necessity to make any holes, either in walls or roof. There is nearly always a necessity to unroof a portion in houses of Mahomedans as the gosha system prevents free ventilation, all crevices, windows, if any, are closed with rags. Etc

4. Another reason for making openings in the roof is for the admission of light, which also assists in the destruction of the microbe.

5. As regards the careless

many ~~to~~ on which the tiles are removed and broken, efficient supervision would prevent this and further at the end of the 10 days the tiles could be replaced without difficulty by those employed on disinfection duty.

6. Compensation should be given only to the indigent.

acting Collector

27.5.99

1/Cno 1288P

PLAGUE

1

C No 1238P

C.D. 938 P.

BELLARY COLLECTOR'S OFFICE.

Dated 27th May 1899.

16P

FROM

E. A. Elwin Esquire

Ag. COLLECTOR OF
BELLARY.

To

THE Secretary to Government
Local & Municipal Department

SIR,

Adverting to the Plague Commissioner's R.C $\frac{4599}{1.5.99}$ I have the honour to remark that the question of unroofing tiled or terraced houses in large towns has not arisen in this district. It is no doubt highly desirable to allow a free current of air to pass for some days through all plague-infected rooms, and as there are windows in most substantially built houses. This can generally be effected by keeping them as well as all doors open for the period decided upon: where there are no windows or the windows are too small, the difficulty can, in my opinion, be met by making a hole or holes in the outer-walls just as well as by partially removing the roof.

2 I enclose a copy of the note sent to me on the subject by the District Medical and Sanitary Officer.

I have the honour to be

Sir,

Your most obedient Servant,

as Collector

5-99

REVENUE DEPARTMENT.

FROM

THE COLLECTOR OF
BELLARY.

To

THE

No.

Dated
Despatched
Received

Enclosures.
Abstract.

480—13.11.98.

Local & Municipal **(1899) Department.**

CURRENT No. 13509

SECRETARY TO GOVERNMENT
5 JUN 1899
LOCAL & MUNICIPAL DEPARTMENT

Order

From The Collector of
Anantapur

Dis **No.** 991 Encls 2
2.6.99.

nH

Dated 1st June 1899
Received at Ooty 5-6-99
at Madras 7-6-99
Registered 7-6-99
Enclosures 2
Spare copies

SUBJECT.

Reporting re: the
unroofing of the
tiled or terraced houses
for disinfection.

BACK PAPERS.

No.	Date.

FURTHER PAPERS.

No.	Date.

No 1769

Office of the Additional Medical
Officer Hindupur
Dated 14. 5.99

1581

From
John Hunter Esq M.B; C.M.
Additional Medical Officer
Hindupur

To
The Collector of
Anantapur

Sir,

With reference to your R.C. No. 1292 dated 8th instant on the Proceedings No 4599 dated 1st May 99 of the Plague Commissioner Madras, I have the honour to inform you that I am of opinion it is not necessary to open up the roofs of infected houses although a free admission of sunshine and air tends to further minimise the Chance of a recrudescence.

I have the honour to be,
Sir,
Your most obedt Servt
(Sd) J. Stuiter
Additional Medical Officer.

(True Copy)

D Venkatasaiz

For Collector

148

1b
2/5

1358
8 of 1899

Madras
16th May 1899

From
Major R. Robertson
I.M.S.

To The Collector
Anantapur Dt.

Sir,

With reference to your R.C. 1292/8.5.99 I have the honour to submit my views thereon.

1 The Collector of N. Arcot assumes that the object of opening up roofs is solely to allow the Sun's rays to enter the house so that Plague germs may be killed thereby. I may also assume that the object of Perchloride of Mercury and kiln burning the floors aims exactly at the same point. I think we are all agreed that the latter exactly

fulfils our wishes, So that apparently
the Sunlight is Superfluous; I
do not think that is our Sole object
in opening up roofs. In addition
to what little amount of Sunshine
which will enter a house through
a 4 feet opening in the roof
at all angles of the Sun's tour
we have ventilation of the house
and that means oxidation or
Combustion of organic matter
adhering to the walls and to a
much greater depth in the floor
than the upper two inches which
have been removed by the Kiln
It is this organic
process. matter which supplies food for
the plague and other bacilli. The
floors and lower part of the walls

of native houses usually amply
saturated with this organic matter
and in small Compartments or one
roomed houses. The requisite moisture
for the growth of the bacillus is always
available. If then we simply
saturate the floor with 1-2000 or
Stronger Solution we lose a very
important agent for other work
viz pure Air.

2. The next point is the opening
of the roof. This opening is I take it
always a partial opening and not
the unroofing of a house. In a
tiled or thatched roof I always
advocate one foot of material to
be removed from each side of
the ridge pole. In tiled houses
a considerable number nearly 25%
of

of these will be broken in removal and great delay occurs afterwards in procuring new tiles or in granting Compensation. This is the only roof I have found that gave me any trouble and I dare say if my Coolies had had any training in removing tiles my breakages would have been less. Leaving the Village Reddy and a few Coolies to make the necessary openings always leads to wholesale destruction of tiles. Regarding the Thatched roof I see no difficulty in removing the necessary foot on each side of the ridge pole a few bundles of the particular variety of grass is all that is necessary to fill up the gaps.

Regarding flat roofed houses (mud roofs) there is no expense here either a few pieces of jungle wood Cholum stalks and mud is all that is necessary. I do not think repairs would cost more than one rupee to a roof of this type.

All roofs do not require to be opened out & in many houses ventilation is free excepting the Cook house which rarely possesses a window.

In Conclusion I strongly advocate ventilation in these houses - if that is done away with then the result will be that perchloride of Mercury solution has such a rapid germicidal action it will only be necessary for the

Villages

villagers to vacate their houses for a few hours. This last policy was tried in December 1898 at Guntakal with unexpected results.

I have the honor to be,
Sir,
Your most obedt. Servt.
(Sd) R. Robertson
Major I.M.S.

(True Copy)

Brunnyam
for Collector

18
2/10

1/
185 of Oct 1899

No.

Anantapur Collector's Office,
Dated 1st June 1899.
Camp Anantapur

Enclosure.

C No 183 [illegible]

From
Bannatyne Macleod Esq., M.A., Bar-at-Law
Collector of
Anantapur

To
The Secretary to Government
Local & Municipal Department
Madras

Sir,

With reference to Plague Commissioner's Ref. on No. 4599 dated 1.5.99 regarding the unroofing of tiled or terraced houses for disinfection purposes I have the honor to state that in this District the houses are generally of flat mud roof and the making of small holes in the roof did not cause much damage and it was repaired with little cost. In the case of tiled houses the damage was no doubt greater and the cost of repair was likewise so. The amount of

Compensation paid in this District on account of unroofing comes up to only some 440 rupees.

2. Though it is true that through these small openings the Sun's rays will not spread to every corner of a house and kill the microbes yet more sunshine and fresh air will be let in as the houses of ryots in the villages in these parts are more close and shut up having no windows of any kind.

3. I submit herewith copies of reports received from the Medical Officers (Doctor Hunter and Doctor Robertson) who think

that

that the unroofing is not without any good effect.

I have the honour to be,

Sir,

Your most obedt servant

for Collector

18
2/6

REVENUE DEPARTMENT.

FROM

THE COLLECTOR OF

Anantapur.

TO

THE

Dated
Despatched } 189 .
Received

No.

ENCLOSURES.

SUBJECT.

Local & Munl. (1899) Department.

CURRENT No. 1477 P.

SECRETARY TO GOVERNMENT
13-JUN-1899
LOCAL & MUNICIPAL DEPARTMENT

Order

From

The Collector of
Kurnool

Dis. No. 552/P of 99

Dated 10th June 1899.

Received at Ooty 13-6-99
at Anantapur 15-6-99

Registered 15-6-99

Enclosures 3.

Spare copies

SUBJECT.

Submitting information regarding the "unroofing of houses as a plague measure."

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

D. No. 365/P

Office of the District Medical
and Sanitary Officer,
Kurnool. dated 19th May 99.

From
The District Medical
and Sanitary Officer
Kurnool

To
The Collector of
Kurnool

Sir,

In reply to your letter No. 669/P of 16th Instant, I have the honour to state that the roofs in this District were opened up by making large circular holes of such number as seemed to be required for the free letting in of the sun and I think that in most cases the whole interior was exposed at some time of day to the direct rays of the sun. In the case of all suspected houses the system of partial unroofing was adopted in this District.

In the dark and dirty houses in the Villages of this District I would not care to trust entirely to disinfection, especially as the disinfecting staff would have to work by lamp light or in the dark unless the whole of the house were lit by sun light from the roof, thus causing the work to be less efficiently done. The opening up of the roofs in the cases of the dark houses referred to above, I regard as a very important part of the disinfection.

I have the honour to be
Sir
Your Most Obedient Servant
(Signed) Herbert R. Power,
for District Medical and
Sanitary Officer.

(True copy)

Kurnool }
For Acting Collector

JB
10/5

AB
10/5

Pattikonda Tahsildar's office.

Dis: No. 484/Rev of 99

Camp Ratana, 10th May 1899.

218

From
The Tahsildar of
Pattikonda

To
The Deputy Collector of
Penapalli.

Sir,

In returning herewith your letter No. 222 of 1899 dated 8th Instant, I beg to report as follows:—

2. So far as I know, disinfection has been carried on in this ~~sick~~ Taluq mostly by as saturating the floor, walls and ceiling with solution and then whitewashing. Digging up the floor and burning it over was also resorted to but only in a few cases. Unroofing houses was also had recourse to, but only partly and I am not aware of even a single house ~~which~~ whole it has been wholly unroofed. As far as I am aware no compensation has been either claimed or paid for damages done to houses either by unroofing or by digging up the floor. There was no active opposition to such a step but I am sure the people concerned did not

relish the act but rather resented it.

3. Personally I know only a few cases of disinfection in minute detail. The villages of Alardinne, Thogalahallu and Dudekonda were disinfected thoroughly by Supervisor Mr. Berlie under the Plague Commissioner's personal orders and may be consulted with advantage, as I know nothing as to how it was done, though I can safely presume that saturation with Perchloride of Mercury and Hydrochloric Acid was one of the ways in which it was done. At Pattikonda I know the Sanitary Inspector dug up the floor of some houses and unroofed houses partly. At Maddikera too the houses were unroofed partly and the floor was dug up in some cases. Everywhere the most common method was saturation with the solution and white-washing.

4. As stated by the Collector of North Arcot, I am entirely of opinion that disinfection by partial unroofing is thoroughly ineffectual. Saturation with the solution, seems to be me to be the best method known now and the unroofing of houses so thoroughly as to let in the sun on every nook and corner may also probably equally be advantageous. The digging up of the floor and ~~bu~~ burning it over thoroughly well seems also to be ~~rather~~ rather efficacious.

5. As far as I know, no compensation has been paid except for burnt houses and for burnt valuable moveable property.

I beg to remain
Sir
Your most Obedient Servant
(Sd) B. Krishna [illegible]
for Tahsildar.

(True copy)

Kurnool }
10-6-99 }

For Acting Collector

aa
W.B.R.S

Peapalli Division, Deputy
Collector's office
R.C. No $\frac{222}{p}$ of 99.
Dated 16th May 1899.

238/p

From
M.R.Ry
S. Ramu Iyer Avergal
Deputy Collector
Peapalli.

To
The Collector of
Kurnool.

Sir,

With reference to your R.C. No $\frac{669}{p}$ of 99 dated 5th Instant, I have the honour to state that as I was absent on leave when the plague broke out in ~~this~~ my Division, as for some time even after my return, I had little to do with the plague operations owing to there being a Special Deputy Collector in charge of them, and as, since his employment was discontinued, the plague has fortunately all but ceased, I do not possess the requisite experience to enable me to give any valuable opinion on the question of the efficacy of the measure of unroofing houses infected with plague, as one of the methods of disinfection.

2. I submit, however, the report of the Pattikonda Tahsildar on this subject.

It will be seen therefrom that the unroofing of houses for the purpose of disinfection was not systematically resorted to, but only in some cases here and there, and that whenever unroofing was had recourse to, the roofs were not wholly removed, but only partially. I have personally seen the system of unroofing as adopted by the Plague Inspector at Pattikonda. He opens here and there sky lights of irregular shapes. They are not so wide as to admit of the sun light reaching every portion of the inside. They merely serve to let in more light than the precious little which people in these parts manage to secure by their mode of building houses.

3. I have reason to believe that the unroofing of houses, as also the digging up of the floors, is distasteful to the people, especially as no compensation is given and as the house owners are obliged to reroof and refloor their houses at their own expense. Of course, it is not to be expected that they would

or

or could be made to reconcile themselves, except perhaps in rare cases, to the inconveniences and losses arising from such measures, from any conviction of the advantages derived therefrom by themselves or their neighbours.

4. I believe that disinfection is carried out only after the inmates evacuate or are made to evacuate, the houses concerned.

5. The generality of houses in these parts being mud roofed and the timber which serves as joints being cheap jungle wood, the amount of loss occasioned by unroofing must necessarily be less than what it may be in places like Vellore &c, where the houses are tiled or have concrete terrace. At the same time, as the people at large in these parts are, as I think, poorer than those in the Southern districts, the damage caused by unroofing, though small as regards its intrinsic money value, is nevertheless likely to be felt. If therefore, the

unroofing of infected houses were to be resorted to as an essential part of the System of disinfection, and if such unroofing were to be carried on on a large scale, in the event of the Plague spreading, and without payment of any compensation, it may probably lead to discontent and active opposition on the part of the people.

On the whole, it seems to me that no hard and fast rule need be laid down, and that the measures to be adopted be regulated and modified when it need be, by actual experience, and with due regard to the degree of the intensity and extensiveness of the outbreak.

I have the honor to be,
Sir,
Your most Obedient Servant,
(Sd) S. Rama Iyer
Deputy Collector.

(True Copy)

Kurnool
10.6.99

For Acting Collector.

3 / 4477

10.6.99

C No 14770

Dis No. 552/P of 99

DISTRICT COLLECTOR'S OFFICE,
Dated 10th June 1899.

FROM
M. R. Ry
Rao Bahadur R. V. Sreenivasa Iyer Avergal ~~Esq.,~~ B.A.
Ag. COLLECTOR OF THE
Kurnool District,

TO
THE SECRETARY TO GOVERNMENT,
Local & Municipal DEPARTMENT,
Madras.

SIR,

Adverting to Plague Commissioner's Reference on C. No 4599, dated 1st May/99 I have the honour to state that as I joined this district only very recently and as I have had no personal experience of the methods of disinfection adopted in the infected parts here, I am unable to offer any remarks of value. I submit herewith for the information of Government copies of the reports received on the subject from the District Medical and Sanitary officer, the Tahsildar of Pattikonda and the Deputy Collector of Peapalli Division.

It will be observed that the District Medical and Sanitary officer regards the partial unroofing of dark houses "as a very important part of the disinfection"

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while the Tahsildar of Pattikonda states that "disinfection by partial unroofing is thoroughly ineffectual. Whatever may be the efficacy of the process in question it seems to me inexpedient to resort to it during the rainy season which is just setting in, as rain water by entering the houses through the openings made in the roofs will damp the floor, and this moisture may tend to develop plague germs more rapidly than can be counteracted by the influence of the light and heat of the Sun on clear days.

I have the honour to be,
Sir,
Your most Obedient Ser

10/6/98
For Acting Collect

10.6.98

Dis

FROM

THE COLLECTOR OF THE

District,

TO

THE SECRETARY TO GOVERNMENT,

DEPARTMENT,

Madras.

Dated
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189 .

No.

ENCLOSURES.

SUBJEC .

Local & Municipal
~~Public~~ (1899) Department.

CURRENT No. 1497 /

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From The Ag Collector
Salem

No. 1099
P

Dated 14" June 1899

Received 06 JUN. 1899

Registered 16-6-99

P. C.
16 JUN. 1899

Enclosures

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SUBJECT.

Submitting report on a reference from the Collector of N. Arcot Dt. regarding the advisability of unroofing tiled or terraced houses in large towns for disinfection

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

CA 1497 P

No. 1099/P.

Salem Collector's Office,
14th June 1899.

From

Robert B. Clegg Esq., I.C.S.
Collector and District Magistrate,
Salem,

To

The Secretary to ~~the Commissioner of~~ Government Local and Municipal Department
Madras.

Sir,

With reference to the Proceedings of the Plague Commissioner No: 4599 dated 1st May 1899, I have the honor to report as follows:—

2. The Collector of North Arcot states that the partial unroofing of tiled houses which is done as a necessary item of the process of disinfection is not very efficacious as it does not ensure that the sun light shall reach every part of the house, that it is productive of worry and discomfort to the inmates who have to live in an unroofed house for 10 days or more, that the discomfort will be greater if the measure were insisted on during the rainy weather, that it may even lead to a riot and that

it is very costly on account of compensation which has to be paid to the owners in consequence. At Mattigiri, where indigenous plague first broke out in the district the whole of the roofs were removed in the beginning, but later on in the village and elsewhere at the instance of the Plague Commissioner, the roofs were only partially removed. The untiling was done by special coolies engaged by us and by the sappers except in some cases at Mattigiri where the people themselves undertook to do it. On the whole there was no opposition to the measure either in the Hosur Taluk or in the Municipal towns of Salem, Vaniambady and Tirupattur though in the last 3 places owing to a few imported cases it was carried out only to a limited extent. The people experienced no discomfort in consequence as whole villages were evacuated in the Hosur Taluk and the villagers camped out in fields. The retiling in the villages in the Hosur Taluk was done by the sappers and to some extent by the owners themselves of their own accord. At Salem and Vaniambady the untiling and the reroofing were carried out by the Municipality concerned at a cost of as. 10 and Rs. 20 respectively but no compensation has been paid anywhere to the owners for untiling and retiling

3. Regarding the efficacy or otherwise of the measure, the District Medical and Sanitary Officer, Salem states that "as light and ventilation are very important aids in the removal of infection from houses and that as native houses or many parts of them are very deficient in both these respects the removal of the roof in whole or in part is often the only feasible means of admitting light and air to infected rooms" He adds that this method should not be abolished entirely though it may be modified according to ~~some~~ circumstances, for instance in the case of a single roomed house where evacuation cannot be effected, this measure should not be enforced as the occupants

it is [illegible]
would be exposed to the weather. I agree with
this opinion that removing the roofs to let
in light and air is as necessary as any
other process of disinfection. We have not
had many instances in this district of
house segregation but where such has been
allowed (in the Municipal towns) we have
never removed the roof of a room while
the inmates were still in it. In houses
of more than one room there is not much
opposition to untiling one room at a time
while the inmates remove to another. A
great deal depends upon the nature of
each building and the state of the weather
as to what can be done, but I am strongly
opposed to abolishing this measure altogether.
To remove the roof of the apartment where
a family is residing will no doubt create
as much opposition as forcible segregation
and is not desirable. No compensation will
be necessary if the untiling and retiling
is done by a staff of servants or by troops
engaged by the Municipality or the Local
Board and the cost of labour cannot be
much even in large towns.

I have the honor to be
Sir
Your most obedient Servant

R. Mullins
for ag. Collector

C.O.
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