

GOVERNMENT NOTIFICATION.—No. 462.

The following Paper on the subject of providing a Refuse Destructor, which was laid before the Legislative Council this day, is published.

By Command,

J. H. STEWART LOCKHART,
Colonial Secretary.

Colonial Secretary's Office, Hongkong, 29th August, 1901.

DISCUSSION ON THE SUBJECT OF PROVIDING A REFUSE DESTROYER,

at a Meeting held on the 29th July, 1901.

A Special Meeting of the Public Works Committee of the Legislative Council, in conjunction with representatives of the Sanitary Board, was held on the 29th July, 1901. Honourable W. CHATHAM, Acting Director of Public Works, presided, and the other Members present were: Honourables C. P. CHATER, J. THURBURN, Dr. HO KAI and C. McI. MESSER. Dr. CLARK, Mr. E. OSBORNE and Honourable F. H. MAY were present as representing the Sanitary Board.

The Chairman said His Excellency the Governor had directed that the question of providing a refuse destructor should be considered in conjunction with representatives of the Sanitary Board, as the Board had again recommended that such provision should be made.

The minutes of previous meetings of the Public Works Committee, relating to refuse destructors, dated the 31st August, 1899, 23rd July, 1900, 23rd August, 1900, and 23rd January, 1901, were read. The Chairman pointed out that the estimates given in the minutes of the 23rd July, 1900, appeared to be at variance, as it was stated that the proposed expenditure of \$60,000 would provide 4 cells which could only deal with one-third of the refuse. It was obvious that, if 4 cells could only deal with one-third, 12 cells would be required to deal with the whole, and the cost would be somewhere about \$180,000 instead of \$110,000 as stated.

He then referred to Mr. Crook's elaborate Report on the subject, in which it was recommended that a destructor on the Horsfall system should be obtained, and read a letter, dated the 25th February, 1901, from Messrs. GARLICK & Co. of Bombay, who were themselves the patentees of a refuse destructor, stating that the original members of their firm had introduced Horsfall's Incinerator into Calcutta and, *after exhausting every possible means to make it work*, had to abandon it and it stands there to-day a perfect failure. The letter went on to state that the rubbish of Europe is vastly different from that of Eastern Cities, and the English type of destructor is not in the least adapted for Eastern refuse, adding that they (Messrs. GARLICK & Co.) had devoted several years to the subject and their furnaces were *the only ones*, so far as they were aware, *that successfully destroyed the rubbish.*

With regard to the latter part of Messrs. GARLICK & COMPANY'S letter, an extract was read from a report of the Municipal Commissioner of Bombay stating that a Garlick Incinerator was erected in that City by the Patentees, for which a sum of \$15,000 was paid. The consumption of coal was about a ton per day: oil, waste, water, etc. cost about Rs. 500 per annum. There was always smoke (or vapour) during combustion, which was much complained of by the residents in the locality. The Corporation, after considering the various methods of disposing of refuse, finally decided to transport it outside the City for reclamation purposes, and the use of the incinerators has been practically discontinued.

It appeared, however, from a report received from Singapore that the Garlick Destructor worked successfully there, but very inadequate information was supplied regarding the cost of working it. It was stated that 25 loads were dealt with per cell per day, or 100 loads in all, the Incinerator containing 4 cells. The actual quantity of refuse dealt with was not given, the only information being that the carts were of large size, fairly well filled. No fuel was used in the furnaces, but steam for a blower engine was raised from fire-wood. Here again no information was given as to the quantity of fire-wood consumed. The capital outlay was stated to have been from \$9,000 to \$10,000 per cell, exclusive of land. The labour required at the destructor cost ten cents per load or \$2.50 for each cell per day. The baskets and tools were found by the Municipality, but no particulars were given of the cost of these. The sum of \$108 per month was paid for the staff required to supervise operations. No details were given as to the cost of repairs or stores of any description.

Taking the figures given, however, and estimating for the items not supplied, the annual cost of working was as follows:—

Labour in dealing with rubbish @ \$10 per day,	\$3,650.00
Supervising Staff @ \$108 per month,	1,296.00
Coals say $\frac{1}{4}$ ton per day @ \$10,	912.00
Repairs, &c., say,	800.00
	Total,
	\$6,658.00

Assuming that the loads were of half a ton each, the quantity dealt with by this destructor was 50 tons per day. Comparing this with the information given by Mr. Crook with regard to the Horsfall system, it was found that the 4 cells under that system were estimated to deal with only 24 tons per day or half the quantity under the Garlick system. The cost of working a Horsfall destructor of that capacity was estimated to be \$8.65 per day, or \$3,157 per annum, and the cost per ton was therefore practically the same as under the Garlick system. That is to say that the annual outlay for dealing with the whole of the City refuse, which amounts to about 130 tons daily, would be about \$18,000. The capital outlay on plant in the case of the Garlick destructor would be \$180,000, based on the information received from Singapore, but for the Horsfall system it would be somewhere about double that amount. It must be noted that the figures given are for dealing with the rubbish from the City only. Kowloon would still remain to be dealt with under the old system, unless they were prepared to go in for further expenditure in order to provide a destructor there.

The Sanitary Board had estimated that a saving of \$1,000 would be effected on the scavenging contract by the adoption of the 4-cell destructor recommended by Mr. Crook. Personally he had grave doubts as to any saving being effected, because the cost of conveying the whole of the refuse in carts, for a long distance, to the destructor would balance any saving in removing it under the present system by junks. Mr. Crook had proposed to construct the destructor at Kennedy Town, but it transpired that this would not be a suitable site for it on account of its proximity to the Slaughter-house. Trouble would be occasioned by the fine dust from the destructor settling on the meat when it was hung up in the cooling-house which would probably render it unfit for consumption.

The Medical Officer of Health now proposed that the destructor should be erected at Happy Valley. This overcame the trouble so far as the meat was concerned, but it would not get rid of the dust.

They were met to consider the question of providing a Refuse Destructor, but he presumed that in dealing with the subject it was open to them to consider whether some equally efficient and less expensive scheme might not be devised.

Hongkong was exceptionally favourably situated for the disposal of its refuse by conveying it to sea and he would therefore suggest that steam hopper barges should be utilised in order to do away with the objections to the present system. One barge would be capable of dealing with the whole refuse from the City and Kowloon; but, to provide against accidents and admit of repairs, it would be necessary to have two barges. He estimated that these barges would cost about \$40,000 each, or \$80,000 for the two, and the cost of working them would be about \$6,000 each per annum. The latter figure was based upon the cost of running the steam tug *Praya*, including all repairs, &c., and was therefore to be relied upon.

He proposed that three piers be erected at different points along the Praya, conveniently situated for the different districts, where the refuse could be taken early in the morning and loaded directly into the barges. He estimated that the cost of these piers would be about \$40,000 each, or \$120,000 for the three which, added to the cost of the barges, would bring the total capital cost up to \$200,000. There would however be a considerable saving effected in the present scavenging contract, which amounted to \$44,000 per annum, as the contractor would be entirely relieved of the barging of the refuse in junks. The piers could be made a source of income by letting out a portion of them to ferry companies. Dozens of applications reached him for permission to erect piers for steam ferry services, and a good income could be obtained by letting out a portion of the piers to these people. There might be times when, on account of typhoons, the barges could not go to sea. To provide for this he proposed that, at the end of each pier there should be erected a shed where the rubbish could be received and stored away from public gaze and public interference, until it could be removed.

Dr. CLARK, Medical Officer of Health, referring to the Chairman's criticism of the estimate given by Mr. Crook, said that that estimate included the preparation of the site, and the approach road, the erection of a chimney 100 feet high and the erection of quarters for the attendants, and it would not be correct therefore to assume that a twelve-cell destructor would cost three times the estimate for a four-cell destructor. He understood moreover that the Garlick Destructor, now recommended, was considerably cheaper than the Horsfall Destructor recommended by Mr. Crook. The Chairman had quoted from comments of the patentees of one destructor as against the patentees of another. Well, the one would say as much as they could to deprecate the other, so he did not think that much weight attached to these quotations. One reason which actuated the Board in pressing this matter was to secure the absolute destruction of plague refuse. During a plague epidemic refuse was removed from the houses and had to be burned in any open space of Crown land which might be available in the neighbourhood. These spaces were becoming year by year more limited. Complaints were frequent from people living in their neighbourhood as to the nuisance not only from smoke but also from the street coolies picking over this stuff, and taking away what was worth their while, and it had been found that this could not be prevented unless there was a European Constable on duty at every heap. A second reason was the constant complaints as to the silting up caused by the refuse thrown or spilled from the boats that were engaged to take the rubbish away. Hundreds of tons of the rubbish found its way overboard, abolishing the deep water frontage, and if this went on year after year, they would eventually have no deep water frontage at all along the New Praya. At low water, this

refuse would be exposed and the smell emanating from it would be unquestionably a danger to the public health. Every one using the harbour knew that a large quantity of this rubbish was also unshipped as soon as the boats got away from the eyes of the Water Police at the back of Stonecutter's Island. That accounted for the quantities of rubbish that came floating back over the harbour at times, making the harbour extremely foul. Some of this was also thrown up on the sandy beaches and foreshores. The refuse of the City of Victoria was about 130 tons a day or 3,900 tons a month. Now, they had a letter from Singapore in which it was distinctly stated that a four-cell destructor consumed 2,743 large cart-loads of refuse in one month. The Hongkong cart-loads could hardly be called large, and yet he believed each of them held about a ton. So that they might assume that if their refuse only amounted to 3,900 tons a month, the probability was that a six-cell destructor would be capable of destroying all the refuse of the City. The Municipal Engineer of Singapore said that the destructor there had been in use for years "with the most satisfactory results." He also said that no fuel was used in the furnaces but that fuel was needed "to produce steam for the blower engines." The Public Works Committee had been largely influenced by the opinion of Mr. ORMSBY that the destructor would require a large quantity of fuel to consume the refuse. Comparing Hongkong with Singapore, the population was much similar, but in the latter place they had rain every day so that the refuse was bound to get wetter than here, and, if they required no fuel there other than that required to produce forced draught, surely they might reasonably assume that they would require no fuel to burn the refuse of Hongkong. He had it in his mind to suggest to the Committee to send a practical man of the Public Works Department to Singapore to see the actual working of the refuse destructor, and report. Such an Officer would be in an excellent position then to say whether the system would work in Hongkong, and they would get far more information from him than by any amount of documents or correspondence, and he might say, any amount of special pleading. With regard to the Chairman's proposal of hopper barges and piers, he thought that was perhaps equally as good an expedient, provided, of course, that it was properly controlled. He (Dr. CLARK) thought that, everything considered, the Chairman's scheme would probably be found the more expensive of the two. In speaking of the cost of running the refuse destructor, the Chairman rather pool-poohed the idea of there being any saving in the cost of the scavenging contract. In discussing the other suggestion, he stated that a very considerable saving would be effected by the abolition of the junks. Either scheme would effect practically the same saving.

Mr. THURBURN.—May I ask a question? Is it not the case that a destructor for the destruction of carcasses has been already ordered, and is to be available for the destruction of plague refuse?

Dr. CLARK.—The Sanitary Board has pointed out that a destructor designed specially for the destroying of carcasses of cattle would not be suitable for the destruction of City refuse.

Mr. CHATER.—We had it here that it could destroy plague refuse, but it came out in the Sanitary Board meeting that it could not.

The Chairman.—It could be done, but it is not an economical method.

In reply to a question by the Captain Superintendent of Police, Dr. CLARK said:—If you want to know the most economical way of getting refuse from the various parts of the City to the refuse destructor, I think that the proper way to do so is this. You fill the carts at the doors of the houses and the rubbish in these carts should not then be transferred or handled in any way. The carts should be taken to the level of Queen's Road, and put upon bogey trollies (some twelve or eighteen inches high) which would run on the tram lines, and then with ordinary coolie labour could be run along to the refuse destructor. Continuing, Dr. CLARK said that, if they were to have three wharves and only one hopper barge in use, he should be very sorry for the sanitary condition of this City, as while the barges would be loading at one pier, many cart-loads of rubbish would have to lie on the other two piers awaiting shipment.

Mr. OSBORNE said:—The reason given to the Sanitary Board by the Government when refusing the Board's application for a refuse destructor was that the matter had been referred to the Public Works Committee and they had decided not to recommend the expenditure on the grounds that the present system of disposing of Town refuse appeared to work satisfactorily.

Before entering upon a discussion of the relative merits of new schemes, he thought they should first of all come to a decision as to whether the present system was, or was not, a satisfactory one.

Speaking for himself, and he thought other members of the Sanitary Board agreed with him, he considered the existing methods most unsatisfactory and felt sure, if those present were conversant with these methods, they would also not hesitate to think the same.

The refuse was collected in carts drawn by coolies and deposited, not direct into boats, but on the Praya, where it was immediately pounced upon by men, women and children who speedily appropriated every atom of wood, rags and other morsels of the slightest value. These refuse heaps lay sometimes for days on the Praya, a nuisance to passers by and a hindrance to traffic, and he had himself seen, during a Plague epidemic, the Praya literally blocked for a distance of some 200 yards by heaps of rubbish collected from the squalid hovels of a Plague stricken district, awaiting removal by the dust boats.

The Sanitary Board in this question of refuse disposal desired that it should be removed and destroyed without the possibility of its thus being handled, and for this reason that these heaps of filth must be more or less impregnated with Plague and it was therefore reasonable to suppose that the people who carried portions back to their homes were at the same time carrying germs of disease, possibly into otherwise healthy dwellings, and thus assisting to further spread the Plague.

The Sanitary Board asked that such scenes as this should be rendered impossible, and whether it were by a destructor or by the method suggested by the Director of Public Works mattered very little. The Chairman's scheme appeared to him an excellent one, but he would suggest that three ordinary hopper barges with one tug to tow them would answer better, because it would allow the barges to be alongside the Pier continuously and thus permit rubbish to be shot into them direct from the carts without the intermediate handling which would be entailed by its having to be stored on the wharf pending the arrival of the steam hopper barge.

The Honourable F. H. MAY said that they were all agreed that the present system was bad. The reason it was bad was that there was no proper supervision over those charged with the removal of the refuse. He thought that the scheme of the Director of Public Works if modified in certain particulars would furnish the best solution of the question. But he thought that there should be sufficient points at which to discharge the refuse from the carts into the hopper barges, and that the barges should be sufficient in number, to admit of each cart-load as it reached the Praya being discharged at once into the barges. This he thought might perhaps be arranged without piers or at any rate without more piers than 3 by having wooden shoots arranged by means of which the refuse could be tipped out of the carts over the Praya direct into barges which might, as had been suggested by Mr. OSBORNE, be towed away by a tug.

He thought if refuse was deposited on the piers to await removal the existing objectionable practice of picking over the refuse would recur.

He suggested that perhaps the Director of Public Works might consider the points raised and evolve a revised scheme.

The Chairman, in replying to the remarks of the various speakers, said that, as regarded the piers, he proposed to have a concreted platform at the end, from which a shoot would convey the rubbish into the hopper barge. On this platform a brick shed would be erected, in which the refuse could remain, in cases of emergency, until removed by the barge. It would be out of sight there and protected from the effects of sun and rain. The whole place could be washed down as often as required and could be easily kept clean.

The trouble as to the refuse being thrown into the harbour, as was so largely done at present, would be overcome, because it would be a difficult matter for the men to get it out of the hoppers in order to throw it overboard.

With regard to Dr. CLARK's remarks respecting the estimated cost of the destructor, he quoted a letter from Messrs. GARLICK & Co. to Mr. ORMSBY, dated the 11th January, 1901, in which they said:—"We note you require to destroy a total of about 90 tons of street sweepings per day and that it is desired to place the destructors one at each end of the City." (Apparently such a proposal had been communicated to them.) "We presume each destructor would have to consume about an equal quantity (about 45 tons) per 24 hours. We therefore recommend you to erect a 6-cell installation "..... at each place." According to the information given by the Singapore authorities, this type of destructor cost about \$10,000 per cell and, as 18 cells would be required to deal with 130 tons per day, the total cost would be \$180,000 as he had already stated. That sum did not include quarters for an Overseer or any special expenditure on the preparation of the site.

With the destructor at Happy Valley, the greater part of the refuse would require to be trundled some miles through the town, whereas, with three piers along the harbour front, it could be run to whichever of these was within reasonable distance. He therefore maintained that there would be a saving on the scavenging contract under the system he had proposed, which would not be obtained under the destructor system on account of the distance the refuse would have to be conveyed.

The annual cost of disposing of the rubbish under his scheme would be about \$12,000 against \$18,000 for the destructor, and the former would provide for dealing with a very much greater quantity of rubbish than the latter.

Mr. OSBORNE's proposal to have ordinary hopper barges, which would be towed to sea by a steam-tug, would be more expensive than the steam hopper barges as there must be a crew of 2 men to each barge and the system of towing would be more expensive than transporting the material in a vessel which was self-propelling. Steam hopper barges could also go to sea when the weather was too rough to admit of barges being towed.

On the motion of the Honourable C. P. CHATER, seconded by the Honourable Dr. HO KAI, it was unanimously resolved that the Committee adhere to its former decision with respect to the Refuse Destructor and that the Chairman be requested to put into shape the scheme which he had proposed for the removal of the refuse to sea by means of steam hopper barges, which should then be submitted to the Sanitary Board for its consideration.