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EAST AFRICA PROTECTORATE.

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Nairobi Sanitary Commission  
1913.

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REPORT, EVIDENCE, &c.



NAIROBI;

PRINTED AT THE UGANDA RAILWAY PRESS.

# NAIROBI SANITARY COMMISSION 1913.

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## COMMISSIONERS APPOINTED.

HON. H. B. TAYLOR, M. INST. C. E., General Manager Uganda Railway, Member of the Legislative Council,—CHAIRMAN.

DR. P. H. ROSS, M.R.C.S., ENG., L.R.C.P., LOND., D.P.H., CAMB., Fellow of the Royal Institute of Public Health, Membre Correspondant de la Societe de Pathologie Exotique, Government Bacteriologist.

A. C. TANNAHILL, ESQ., F.A.S.I., Chief Land Ranger, Member of Nairobi Municipal Committee, Secretary to Land Board.

HON. B. G. ALLEN, Solicitor and Advocate, Nairobi, Member of Legislative Council and Nairobi Municipal Committee, and of the Labour Commission.

HON. R. C. BAYLDON, Lieut. R.N., Managing Director of Nairobi Electric Power and Lighting Co., Ltd., Member of Legislative Council and Nairobi Municipal Committee.

HON. V. M. NEWLAND, Managing Director of Newland Tarlton & Co. Ltd., Nairobi and London, Member of Legislative Council and Nairobi Municipal Committee.

J. J. TOOGOOD, ESQ., Manager of the Standard Bank of South Africa, Nairobi.

T. A. WOOD, ESQ., Senior Partner of the firm of Bullows and Roy, Merchants, Nairobi, formerly Member of Legislative Council, Member of Nairobi Municipal Committee.

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J. A. WATSON, ESQ., W.S., Town Clerk, Nairobi :—*Secretary to Commission.*

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# **PART I.**

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## **REPORT**

**BY**

**Commissioners appointed by His Excellency the Governor  
of the East Africa Protectorate, to enquire into  
and report on the sanitary condition of  
Nairobi and Environs.**



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# EAST AFRICA PROTECTORATE.



## Nairobi Sanitary Commission

1913.

### REPORT

TO

HIS EXCELLENCY THE GOVERNOR.

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THE COMMISSION was appointed in the end of 1912, as the result of a resolution of the Legislative Council to which His Excellency was pleased to accede.

A number of preliminary meetings were held, in the course of which it was decided to approach His Excellency with a view to constituting the Commission under the Commissions of Enquiry Ordinance 1912.

In the end of January Mr. Bayldon left the country and resigned his place on the Commission.

Early in February His Excellency constituted the Commission under the Ordinance above mentioned. Notice thereof was published in the "Official Gazette" of 15th February 1913.

The terms of reference, which were also published, were as follows:—

"1. To enquire into and report upon:

- (a) *The Sanitation and Drainage of the Township of Nairobi and the residential area adjoining the same.*
- (b) *The localisation and housing of Asiatics and Africans and business centres for the same as affecting Nairobi.*
- (c) *The Nairobi Water Supply.*
- (d) *Sanitary and Municipal Services of Nairobi.*

2. *To submit recommendations with a comprehensive scheme for carrying out the same, and an estimate of the cost thereof.*"

The Commissioners met on 25 occasions and sat in all for 93 hours. They examined fifteen witnesses of whose evidence full notes will be found in Appendix I. hereto.

## I.—INTRODUCTORY.

The Geographical position, climate and early history of Nairobi are sufficiently dealt with in the first part of the Report prepared in 1907 by Mr. Bransby Williams, but supplementary statistics of rainfall are now given in Appendix II. The Despatch by his Excellency the Commissioner, Sir James Hayes Sadler (mentioned by Mr. Williams on page 3 of his Report as covering the substance of the whole series of previous Reports), together with several subsequent Reports hereafter dealt with are printed in Appendix III.

## II.—HISTORY OF NAIROBI SINCE THE DATE OF Mr. WILLIAMS' REPORT.

Mr. Williams' Report was published early in 1907 and was accepted from the outset as the basis of future town improvements.

Part II,  
pp. 25 and 36

The Commissioners are satisfied from the evidence given before them (notably Dr Radford's and Mr. Tanner's) as well as from their own knowledge that the scheme embodied in the Report was in its main outlines and subject always to certain reservations explained later, sound and practicable.

Williams  
Report p. 42

The estimated cost of the works recommended by Mr. Bransby Williams was £ 115,000. "This expenditure", he remarked "can be spread over three years in the following proportions :—

				£
1907	...	...	...	53,000
1908	...	...	...	50,000
1909	...	...	...	12,000
TOTAL				115,000 "

Of the total sum £ 73,900 was to be applicable to drainage alone : but on a revised estimate by the Public Works Department, this figure was reduced to £ 65,948.

Following on the publication of the Report, sanction was accorded by Government for the expenditure of £ 20,000 during the years 1907-8, 1908-9 and 1909-10 on the Williams Scheme.

The construction of the chief main sewer was then begun. The question of the order in which the various other works should be undertaken was considered and reported on by a Special Committee, whose report is printed in Appendix III.

The Committee recommended deferring removal of the Bazaar till the new site was prepared : preparation of the native location site : drainage and road making on the new Bazaar site : drainage of Government Buildings site : improvement of roads and drains behind Government Road : and installation of a 9 inch flushing main water pipe.

The work which proceeded under the various heads is shown in the schedule to Mr. Tanner's evidence and the £20,000 was spent within the three years. The largest item was the sewer on which over £9,000 was spent. The second item in magnitude was a sum of over £5,067 spent on drainage of the Native Location site. Part II, p. 38

In the year 1910-11 no provision was made for drainage expenditure, although the Public Works Department asked for provision of a second instalment of £21,000 of which £3,000 should be available at once. Funds were however sanctioned for, and £11,225 was spent during this and the following year on, the new water main from Kikuyu, one of the items included in the Williams Scheme.

Meantime no progress had been made with the scheme for the institution of separate locations for Africans and Indians.

In the case of the Africans the reason for this was that until the new water main was ready it was impossible to contemplate moving the natives to the proposed location.

For the year 1911-12, the Director of Public Works was informed by Government that a further grant against the Drainage Scheme would not be available. He however applied for £1,450, the sum necessary for connecting up certain drains already in existence, and succeeded in obtaining £700.

In May 1911 the Land Ranger (Mr. Tannahill) was appointed to prepare an assessment of the town for submission to the Secretary of State, with the view, it is understood, of enabling him to determine whether the time had come for applying to Nairobi the Municipal Corporations Ordinance 1909, under which, if supported by a Rating Ordinance, a Corporation with powers of borrowing etc. could be established.

Early in the year an outbreak of Plague occurred, and a public meeting was held at which strong resolutions were passed for the immediate removal of the Indian Bazaar. These were forwarded by His Excellency Sir Percy Girouard to the Secretary of State. As the result of enquiries following thereon, a report was obtained from Mr. Tannahill, estimating the cost of removal of the Bazaar and dealing with alternative measures. Mr. Tannahill's Report, which is printed in Appendix III, was remitted to a Special Committee (which included three of the unofficial members of the Municipal Committee) for their advice. Their report, which is also printed in Appendix III, provides *inter alia* for the removal of the Bazaar, at a cost estimated at £184,717; but only if found legally and financially practicable. It is to be noted that this figure is based on the provisions of the Land Acquisition Act, 1894, (India) and that if legislation on the lines of the Housing of the Working Classes Act, 1890, (Great Britain) were applied to the Protectorate, removal could be accomplished at a greatly reduced expenditure. For an alternative scheme estimated to cost £83,100, reference is made to the report. Part II, p. 69  
73  
(9)." 74

Towards the end of 1911, the new water main was completed and much labour was spent by the Municipal Committee in elaborating a scheme for establishment of a Native Location upon the site reserved. About this time the Police entered upon their new lines upon the site adjacent. In the early months of 1912 very heavy rains

Williams  
Report p. 28.  
Part II.  
pp. 12E,  
28C.

fell, and the result of the experiences of the Police was to convince the Municipal Committee that the Native Location site (which it will be remembered was selected by a Sites Committee before Mr. Bransby-Williams' visit, and accepted by him with the comment that "it is as water logged in the wet season as it is possible to be") was totally unsuitable. This conclusion is amply confirmed by the evidence before the Commission.

For the year 1912-13, £7,800 was allocated to the drainage scheme. Only £817 however was spent. This unfortunate result is attributed by the Public Works Department to a shortage of labour.

In September 1912, the Municipal Committee applied for the site now occupied by the Medical Department as an Infectious Diseases Camp site and generally known as the Medical Quarantine Reserve, to be transferred to them for the purposes of a Native Location. The application has not yet been finally disposed of.

For the year 1913-14, a sum of £10,548 was allocated to the Drainage Scheme. Progress was made with Government Road Main Sewer.

A serious outbreak of cerebro-spinal meningitis began in May 1913. In five months about 250 cases occurred of which slightly over 50 per cent were fatal. The epidemic was widely distributed over the highlands of the Protectorate, and it is not considered possible to connect its incidence at Nairobi with insanitary conditions there.

In May 1913, an important administrative change was made in the establishment of a Government Sanitary Department. A Government Sanitary Inspector was appointed for service in Nairobi.

This change coincided with an official visit of inspection to the Protectorate by Professor W. J. Simpson, C.M.G., who was appointed by the Colonial Office to report and advise on the sanitary condition of the Protectorate.

Part II, p. 40

Following on the evidence of Mr. Grogan, the Commissioners were asked by Government to advise as to the suggested purchase by Government of Mr. Grogan's plot No. 137, known as the Cross estate

Map. I.

After much deliberation, in the course of which the form of Mr. Grogan's proposals underwent several material alterations, the result set in the following Memorandum was arrived at:—

"MEMORANDUM OF MEETING OF THE SANITARY COMMISSION. 4TH JUNE 1913.

"PRESENT:—The Chairman, Dr. Ross, Hon. B. G. Allen, and Mr. Toogood.

"The Hon. the Chief Secretary and the Hon. the Land Officer also attended.

"The Hon. the Chief Secretary stated that he had seen Mr. Grogan, who "would consider no proposal except a lease of the Cross estate at a rent "of £3,000 per annum, which Mr. Grogan thought much less than its "value.

"The lease of the Cross estate having been produced it was agreed that "it would be inexpedient to attempt to interfere with the proposed sale on "account of any divergences from the sub-division scheme as passed.

"It was decided that the Commission could not see their way to accept  
 "Mr. Grogan's new proposal—the third which had been put before them—  
 "and to recommend such heavy expenditure, on the facts and figures  
 "submitted and within the limited period before Mr. Grogan's departure.

"It was generally considered that no sufficient probability had been  
 "established of the rents by which Government were to recoup themselves  
 "amounting to as such as £ 3,000 and that there would be a danger of  
 "rents fixed on so high a basis proving too severe for the requirements  
 "of the small trader for whom accommodation was required.

"The opinion was expressed that while it was a matter of regret that the  
 "sale should proceed on conditions under which residence on the plots,  
 "European occupation, and the holding up of plots by speculators could  
 "not be prevented, it should still be possible, if the draft Building Rules  
 "at present before the Municipal Committee were pressed forward and  
 "published soon, to control the development of the property on satisfac-  
 "tory lines."

Immediately thereafter Mr. Grogan sold 44 plots on this Estate. The average size of the plots was 3300 sq. ft. and the average price realised was Rs. 3,943.

In the years under review the development of Nairobi proceeded, at first steadily, and after 1910 with great rapidity. During the years 1911 and 1912, 235 building plans were passed by the Municipal Committee, many of which were for buildings of a superior class. The value of buildings erected since October 1911 is estimated by the Municipal Engineer at £ 224,200. No Government buildings are included in this estimate. Land values throughout the township rose to very high figures, suburban plots changing hands at £ 200 an acre, while business sites in the best quarters realised as much as £ 1 per square foot. During the same period the population also largely increased. The results of last Census (taken in 1911) which are shown in Appendix II, show a material advance on previous figures, but a much greater increase is believed to have occurred since 1911. Statistics of the African population, which is extremely fluctuating, and of the Indians, who are averse from a census, are of doubtful value ; but it may be mentioned that the present Medical Officer of Health estimates the European population at 1,600, the Asiatic at 6,000 and the African at 15,000. Part II, p. 36

No effective measures were taken to cope with the increase of population. With the exception of the sale of business plots in Sixth Avenue in 1912, practically no Government land was alienated by Government after 1910. Subdivision and sale of private plots was not encouraged in the Suburban areas, where until recently one acre continued to be the minimum subdivisional area insisted on by Government ; but took place to a considerable extent in large plots on the plain, owned in most cases by Asiatics. As however the plots in question could not be drained until the main

drains were installed, many remained unbuilt on, and the rest came to constitute an aggravation rather than an alleviation of the sanitary problem. Mr. Jeevanjee continued to hold up his Bazaar plots on the north side of the Garden.

See Part II,  
p. 73  
(beginning.)

The Bazaar continued to be confined within the same limited space, except that it overflowed to a certain extent in the River Road direction, and along the river, where a large number of shanties were erected either on temporary permits, or without any authority. The Municipal Committee refrained from exercising their powers of destroying these, in the absence of all provision for persons dislodged.

The defects in existing legislation which Mr. Bransby Williams pointed out were, along with several others, remedied and a number of additional Township Rules dealing with various matters such as eating houses, aerated water manufactories, conveyance and inspection of meat, prevention of mosquitoes, establishment of a commercial area and regulation of all trade premises by licence, etc., were passed at the instance of the Municipal Committee.

On the other hand, his recommendations for new public health regulations and for regulations regarding the milk supply have not yet been adopted.

The total expenditure on the Williams scheme up to the 1st April 1913, excluding the cost of the new water main, was £21,542, out of which the £9,386 spent on the main sewer and £497 on connections therewith, and the £5,097 spent on the Native Location site, were items from which no benefit has yet accrued to the Township. £2,176 was applicable to roads; and the balance, £4,386, represents the total sum applied to improving the Sanitation of Nairobi from which any benefit has hitherto been reaped.

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### III.—PRESENT STATE OF THE TOWNSHIP.

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Where the expert's recommendations for expenditure within 3 years of £65,984 on drainage have been followed by the expenditure thereon within 6 years of a sum of which £4,386 only has yet come into beneficial operation, and that in a rapidly developing town, it would be unreasonable to look for any striking improvements. In fact what Mr. Bransby Williams called the "normal unsanitary condition" of Nairobi still prevails.

Report, p. 5.

While the small sums expended have been laid out to advantage and the condition of the road surface of some of the main roads in the Plain is now comparatively good, on the other hand lack of drainage and lapse of time combined with increased population has resulted in conditions which are probably on the whole considerably more insanitary than those of 1906.

Part II, p. 1:

The Principal Medical Officer considers the present condition of Nairobi, "pretty bad".

Dr. Burkitt regards it is "admirably conducive to the spread of disease." He considers that Nairobi at present is "about as insanitary as it could be," and adds that "the responsibility of carrying on Nairobi was a serious one. If the necessary money was not forthcoming he did not think that any European should live in Nairobi." Part II,  
pp. 9C, 13F.

Mr. Anderson, the Government Entomologist, says that "the state of the town, as regards mosquitoes and flies and their breeding places is disgraceful": "unless stringent measures were adopted an once matters would most certainly become worse." Part II,  
p. 16 F.

Dr Bodeker, M. O. H., Nairobi, said "sanitary conditions were very bad in European as well as Asiatic quarters." Part II,  
p. 24 B

Dr. Radford, Senior Medical Officer of the province, stated that "the condition of Nairobi was absolutely insanitary and constituted a grave danger to public health." Part II,  
p. 25 A

Mr. Bailie, Sanitary Inspector, said "the sanitation of Nairobi was in a disgraceful state." Part II,  
p. 33 D.

In addition, the Indian witnesses, Messrs Hassambhai, Alibhoy, Pultanwalla and Alidina Visram were no less dissatisfied with conditions, especially in the Bazaar.

The Town is described fully by Mr. Bransby Williams in Section II of his Report, to which reference is made: but his description requires supplementing in the light of subsequent developments.

#### SANITARY CONDITIONS OF GENERAL AREA.

The Gaol has been removed to a site outside and to the South east of the township, close to which the Police have established a new Depot. A number of substantial stone buildings have replaced tin structures in Government Road and Victoria Street. A concrete drain has been made in the Sanitary lane on the south west side of Government Road.

Otherwise Mr. Williams' description, as far as it goes, holds good in the main. The other Sanitary lanes in so far as drained at all are served only by earth drains.

Despite the provision of dustbins, house and trade refuse is still thrown about and allowed to lie behind Government Road, particularly on the narrow strip between the new concrete drain above mentioned and the backs of houses, and in the narrow public side alleys. Government Road plots are thickly built over with few open spaces and those generally unpaved and ill drained. The defective drains in Government Road have not been replaced. The construction of drains in Victoria Street is now in hand: but until recently the entire north western section of Victoria Street, over a quarter of a mile in length, was served only by earth drains which, as the fall was imperceptible, were a serious danger to health. The drain on the south west side of the road received the drainage of a large number of houses and workshops, which in several cases was led into a hole in the drain, which was cleared daily by the Municipal slop water carts. At the south east end of this section a number of earth



drains converged, of which none had any appreciable fall, and all took the drainage of a number of dwelling houses. All these earth drains were constantly found swarming with mosquito larvae.

The Sanitary Lanes on either side of Government Road are, with the exception of one section which has recently been repaired, in a bad condition. They have come to be used as roads of access for delivery of goods into Government Road warehouses, with the result that any surface which they may ever have possessed has been completely destroyed by the traffic. They are also made to serve as dumping grounds for all sorts of rubbish. Owing to the absence of statutory restraint they have in several cases come to be used as frontage streets for shops and dwellings. Rules have however recently been passed to prevent the further development of this mischief.

#### SIXTH AVENUE AREA.

This area is not mentioned by Mr. Bransby Williams in his sanitary survey of the town, having been opened up since his Report.

It has been surveyed into roads and plots the greater number of which have been alienated. These cover almost the entire frontage of Sixth Avenue as far as the Railway, and substantial stone buildings have been or are being built upon at least 15 of them. There are four other stone buildings in the area to the east of Sixth Avenue. To the west, the only buildings other than those on Sixth Avenue are those fronting Sadler Street, a road running close to and parallel with the Railway. The quadrilateral area bounded by plots fronting Sadler Street and Sixth Avenue and by Hardinge Street and the Bazaar is an open space.

A concrete drain leads along the entire length of Sadler Street, running under Sixth Avenue. At the eastern end of Sadler Street the drain curves and terminates on the boundary of the Roman Catholic Church plot, close to the School, in a deep earth drain, consisting of a series of large stagnant pools.

See Part II,  
p. 14A.

Sixth Avenue itself is practically destitute of effective drainage. The earth cuts at the side lead off some of the storm water in a flood, but are quite ineffective for carrying away ordinary domestic slop water. The buildings on the south east side are now served by earth drains running south eastwards into one of the railway drains: but this system is anything but satisfactory. The soil throughout this area is deep black cotton and holds water like a sponge. There can be no doubt that but for the accident that, with one exception, the buildings concerned are not domestic buildings the position would long since have become intolerable.

A large new hotel at the junction of Hardinge Street and Sixth Avenue is now nearing completion; any interval that may elapse between its opening and the provision of effective drainage must be attended with grave dangers to public health.

#### RIVER ROAD AREA.

This area has now come to be an offshoot or extension of the Indian Bazaar, the worst features of which it reproduces with scrupulous fidelity. The road itself, except for a strip in the centre, is generally about 9 inches deep either in dust or in liquid mud according to the season. It is lined on the south side with Indian dwell-

ings and lodging houses of the worst type. The ground on the south side is absolutely level black cotton. The drainage is collected in sumps. These in wet weather are constantly flooded and spread their unclean contents over the surrounding soil, which owing to its spongy nature retains them until the slow process of evaporation is complete.

Such of the houses on the north side as do not drain directly on to the road drain by a natural fall into the irrigation canal, which is used by the inhabitants for drinking and domestic purposes.

The drainage of all this area was provided for in the Williams Scheme, under which a main sewer was to be led along River Road.

#### INDIAN BAZAAR.

The Bazaar is laid out in plots of 28 feet by 100 of which it contains 96, giving a total plot area of 268,800 square feet. Its population is probably not less than 4,000. It consists of three rows of plots divided first by a wide main road and then by a narrow sanitary lane which has come to be used as a public thoroughfare with shop and house frontages. The condition of the surface of the lane and of the stone drain at the side of it is extremely bad. On either side of each pair of plots runs a narrow unpaved public alley.

Some of the plots are bisected by a line of cement cesspools, accessible only by the alleys referred to. The cesspools connect by cement gutters with the backs of the latrines. The cesspool passage divides the plot into two portions. In most cases each portion is entirely covered with a conglomeration of dilapidated tin hovels.

One really good stone building has now been erected in the Bazaar by Messrs. Suleman Virjee & Sons : and one or two proprietors have since the date of Mr. Williams' Report restored their premises and even paved such open spaces as they possess. But on the whole the Bazaar is actually fouler by seven years of neglect and aggravated overcrowding than it was in 1906. As it stands to-day it is an epitome of reeking squalor. With the single exception of excessive height of houses it is doubtful whether there is any known insanitary condition that does not exist in the Bazaar.

See Williams  
Report, p. 10

#### RAILWAY QUARTERS.

His Excellency The Governor has decided that the Railway Subordinate Quarters area shall be vacated as opportunity occurs by the Railway for subsequent conversion into a European business area. Their removal to the site forming roughly the eastern half of the Public Parks area is proposed, and the Commissioners agree that the site is suitable. It is naturally less swampy than the old site, and could easily be converted at small expense into a well drained and sanitary area. Meantime the condition of the present Quarters as regards drainage and otherwise is quite satisfactory, although the site was originally a much more unpromising site than that now recommended.

The Railway Landies are laid on a well sloped site, on good red soil. Concrete drains of a good type carry off the drainage. The sanitary condition of the landies is carefully supervised by the Railway : but the older houses are of a bad design.

**MUNICIPAL LANDIES, SLAUGHTER HOUSE AND DHOBIES QUARTERS.**

These buildings have all been erected since the date of the Williams Report. All are in a satisfactory condition and are well supervised. The Slaughter House however will soon be inadequate in point of size for the requirements of the town.

**P. W. D. LANDIES.**

These are situated to the east of the town, on the farther side of the Railway Station. The soil is black cotton and in wet weather is water-logged. The landies consist of ranges of iron buildings, some of which are inhabited by Indians, and others by Natives.

The native landies have no roof guttering and the floors are not raised. There is practically no latrine accommodation for the natives housed, the number of whom fluctuates from 600 or less to as many as 1,500, with the result that the plain around is strewn with filth.

**NAIROBI RIVER AND IRRIGATION TRENCHES.**

The water in these is seriously polluted and is undoubtedly a source of enteric. Analyses of the river water taken at points above and below the town are printed in Appendix I. One of the irrigation trenches receives all the foul water sewage of the Indian Bazaar, River Road and surrounding district. This trench is used for irrigating the market gardens where large quantities of vegetables are grown for the use of the town. Such of the sewage as is not absorbed by the market gardens runs directly into the river which is used freely for drinking and domestic purposes by Natives and Asiatics.

**PUBLIC LATRINES.**

Public Latrines for the use of Indians and Natives have been erected and are maintained by the Municipality at the following places :—

Bazaar	...	...	...	...16 Buckets.
Duke Street	...	...	...	4 "
Native Market	...	...	...	4 "
Ainsworth Bridge	...	...	...	4 "
Slaughter house	...	...	...	4 "
Near Western Valley	...	...	...	4 "
River Road...	...	...	...	4 "
Victoria Street	...	...	...	8 "
Swamp Road	...	...	...	8 "

The latrines are disinfected daily.

The provision made is entirely insufficient.

**UNOCCUPIED SUBURBAN AREAS.**

Large tracts of land both alienated and unalienated are covered with dense bush which conceals mosquito breeding places and shelters mosquitoes. These, being constantly used by natives for defecation, are a potential source of dissemination of the germs of enteric and dysentery.

Following upon urgent representations by the Municipal Committee Government have taken in hand the clearing of unalienated land. Large areas have been cleared by convict labour ; but much still remains to be done.

### HOUSING OF NATIVES.

Besides house boys and natives in the employment of Government and Municipality there is always a large though very fluctuating native population in Nairobi. Numbers reside in the Bazaar and in River Road. Natives are also the principal inhabitants of the shanties, numbering over 200, scattered round about the River area. Several large employers of labour house their boys in temporary grass huts near the Municipal Landies.

The extensive Crown lands lying to the north of the River known as the Ngara plain are the chief native quarters. Here are 5 separate native villages composed of wattle and daub huts, with an occasional iron building erected upon a temporary permit. These villages are mainly occupied by the more civilised tribes : the raw Kikuyu when residing in Nairobi generally leads a casual existence in Bazaar lodging houses, or else procures illicit accommodation in boys' quarters attached to European bungalows. Two of the villages are mainly Swahili, and one is occupied by the employees of the Railway.

The occupants of the villages (which approach close to European residences on the west) defecate promiscuously in the open, with the result that the whole plain is fouled. The proximity of these natives with their flocks and herds is also a constant source of annoyance to the Europeans.

The total population of the villages cannot be less than 2,000. No Latrine accommodation is provided, and except in the case of the Railway village, no water supply.

### CONSERVANCY.

The single bucket system is still in force. It is found impossible to disinfect buckets, as the work of emptying buckets is done by natives by night. No alteration has been made in the night soil trench system, which works satisfactorily. The slowness of decomposition noted by Mr. Bransby Williams was undoubtedly due to the use of disinfectants, which has been almost entirely discontinued, and the trench system is not now a source of trouble.

Williams  
Report, p. 16

The gross cost of conservancy, removal of refuse, street cleaning and scavenging is about £2,400 per annum.

About 120 cesspools and 1,500 buckets are at present cleaned nightly. Conservancy is only supplied to houses within the Municipal area. The cesspool system is unsatisfactory in the extreme. Many of the cesspools are difficult of access and many are too small to hold the effluents discharged into them, with the result that overflowing takes place. There is however no alternative so long as proper drains are not provided.

## REFUSE DESTRUCTION.

No steps have been taken to procure a Destructor. The question came before the Municipal Committee in 1911 when on the advice of the Director of Public Works they decided that the expense would not be justified.

## WATER SUPPLY.

Part II, p. 80 A Report by the Chief Engineer, Uganda Railway, showing the measures which have been taken for increasing the water supply is printed in Appendix IV. The present supply is ample in quantity, but the storage tanks are quite inadequate, with the result that the volume of water distributed is not sufficient. Further, they are situated at a lower elevation than several dwelling houses in the vicinity which are consequently without any satisfactory water supply. The district is one in which development is proceeding rapidly.

The water contains a large amount of zinc, and is liable to casual contamination.

## DISTRIBUTION OF RACES.

Government Goan employees are housed together in quarters in Ngara Road. The Indian and African employees of the Railway have separate quarters provided. The Somali and Swahili populations live for the most part in isolation though under highly insanitary conditions. Otherwise few if any signs are visible throughout the town of any recognition of the principle of segregation of races. Europeans and Indians share the Government Road and Victoria Street area: while in the Bazaar, River Road and on the shambas Asiatics and Africans herd together indiscriminately.

## GENERAL.

In conclusion, the Commissioners are of opinion that the condition of Nairobi is dangerously insanitary, through insufficient drainage, over-crowding, and non-segregation of races. Mr. Bransby Williams wrote in 1906 :—

Report p. 52

“The state of things which exists in Nairobi would not be tolerated in an English town. If the drainage of a town of 14,000 inhabitants in this country were so inadequate, and the town were in such an insanitary condition as is at present the case in Nairobi, the house-holders would demand proper drains and sewers, and the Local Government Board would undoubtedly insist on the defaulting local authority providing proper drainage. Your Lordship will doubtless desire that in Nairobi, where the Government have absolute control in Municipal affairs, there should be no delay in doing works so absolutely necessary.”

Unquestionably these words are not less true of Nairobi at the present time than they were in 1906.

It is impossible to prove the exact extent to which over-crowding prevails; but in the Bazaar, in which the buildings with two or three exceptions are one storey structures, there are at the lowest estimate 300 persons to the acre. It is believed

that this rate is double that prevailing in the most congested districts of London where the inhabitants of each house are distributed over a number of storeys.

It is no doubt true that as bad or worse conditions might be found in tropical cities in India and elsewhere, but it is considered misleading to draw comparisons between such cities and Nairobi, on the following grounds.

To what extent Nairobi may be regarded as primarily a European city may be a controversial question, but that its extensive interests are in a preponderating degree European is undeniable. In support of this it may be mentioned that according to a careful estimate prepared by the Municipal Engineer, over 80 per cent in value of the buildings erected since October 1911 were built for Europeans. It is also certain that the European trade has for several years been gaining steadily and rapidly on the Indian. As a general rule the European merchant puts his profits into his business, whereas the Indian either accumulates his or remits them to India. For these reasons, Nairobi as a trade centre cannot be regarded as in any way falling under the same category as any Indian town.

Comparisons are no less misleading from a strictly hygienic point of view. Nairobi as a largely European city situated close to the Equator is almost unique among the cities of the world. If the diversity of the races inhabiting it be also taken into account, it must be pronounced wholly unique. While the altitude of its situation renders the climate suitable for the European, he cannot safely neglect any of the precautions appropriate to the tropics, and will be injuriously affected by insanitary conditions which in the temperate zone might be regarded as comparatively innocuous. In particular, he has malaria to contend with, and he is comparatively helpless before it so long as in the absence of a thoroughly efficient system of drainage he is unable to remove stagnant water from his compound and from the streets and lanes in its vicinity.

The Commissioners desire to emphasise the consideration that Nairobi is also unique in being at once the capital of a young country of immense possibilities, and therefore destined to rank as an Imperial city; and in being itself a creation of the twentieth century.

Considering the advances recently made in sanitary science, especially in the sphere of tropical medicine and hygiene, and the fact that despite past mistakes it is hardly too late to say that the authorities have a clean slate to work on, it would be deplorable if all possible advantage were not taken of modern science to render Nairobi at a comparatively insignificant expense, a model of a sanitary tropical city.

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#### IV.—CAUSES OF PRESENT CONDITIONS.

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While the witnesses examined before the Commission were unanimous in considering present conditions highly unsatisfactory, different views were expressed as to the chief cause of the trouble.

- Part II, p. 1 A. Dr. Milne found it in lack of funds.
- " p. 11 E. Dr. Burkitt mentioned lack of Municipal authority.
- " p. 19 A. Dr. Haran specified the want of adequate building regulations.
- " p. 25 A, C. Dr. Radford laid most emphasis on the lack of town planning and of sufficient Municipal supervision.

The Commissioners agree to some extent with all these views, but prefer to state what in their opinion are the principal causes in the following manner.

#### GENERAL.

Part II, p. 60 The town owing to the circumstances detailed in Sir James Hayes Sadler's Report was in the beginning placed upon a bad site. For several years after its foundation the idea that it would develop into an important city was not entertained by those in authority. Persons with expert knowledge on the subject of the laying out of towns were not available : and the result was that development proceeded in haphazard fashion. Serious mistakes were made, such as the granting to individuals of large blocks of land in the township, entailing grave difficulties in regard to town planning and almost prohibitive expense in respect of public services

There was no scheme of town planning until Mr. Bransby Williams presented his Report. Thereafter development was delayed and adequate supervision was rendered impossible by lack of funds, while the advantageous laying out of such sums as were available was prejudiced by the fact that the expenditure lay in the hands of Government Departments charged with the execution of public works schemes for the entire Protectorate and therefore not in a position to concentrate their attention upon the particular requirements of the capital.

There has also been a lack of sufficient co-operation between Government and the Municipal Committee.

The Government Departments represented on the Municipal Committee are the Police, the Land Office, the District Office, the Railway, the Treasury, the Veterinary Department and the Audit Department.

With the first two named the Committee have constant dealings. Before these departments were so represented the lack of a mutual understanding was found to be prejudicial both to the Committee and to the Departments. Now on the other hand a most satisfactory understanding exists in each case, and the expediency of the change has been proved by practical experience.

The most vital questions however which come before the Committee are those in which they require to deal with the Administration.

Till the year 1913 the Committee could only approach His Excellency through the Provincial Commissioner, an arrangement by which they were seriously prejudiced. Their correspondence now passes direct to the Secretariat, and the change has been in every way beneficial. It is however impossible that a full under-

standing can be established with the Government as long as the Committee is without the advantage of the presence on their body of a senior Officer of the Secretariat.

Representations to this effect were sent to Government in the end of 1912, and were sympathetically received. Government however were not able to accede to them at the time.

For similar reasons it is in the highest degree desirable that the Medical Department should be represented upon the Committee. It is thought that if either the Secretariat or the Medical Department had been so represented, the unfortunate dead-lock with regard to the Native Location Site would not have occurred.

#### DEFECTIVE DRAINAGE.

The defective drainage of the town is due to the fact that the Crown being in the position of the proprietor of a building estate under development, has alienated large portions of that estate, without first fulfilling the obligations in respect of drainage and road making which are imposed upon private proprietors in urban districts in all civilised countries.

The Williams scheme was a scheme for the carrying out of these obligations. Had it been executed within three years, as its author advised, any defects in the drainage of Nairobi would be capable of prompt and inexpensive remedy.

#### OVERCROWDING ETC.

The main cause of the overcrowding with all its attendant evils is in the opinion of the Commissioners the absence of a satisfactory scheme of town planning providing for separate areas for Europeans Asiatics and Africans.

The scheme propounded by Mr. Bransby Williams provided for Asiatic and African areas which in the opinion of the Commissioners based on the evidence before them, cannot now be considered suitable.

The reason why the African area was not opened up has already been explained.

The Commissioners believe that lack of funds was the main reason for the delay in removing the Bazaar and providing a new Asiatic area as suggested by Mr. Bransby Williams. The delay coincided with a constant and copious influx of population. Pending the settlement of the question, no further land was made available for Indian residence, with the result that the Indian population was for the most part cooped up in the Bazaar, where the sanitary authority was obliged to abstain from condemning insanitary dwellings, the inhabitants of which were almost entirely of the poorest artisan class, because no provision could be made for evicted persons. In the long run, however, the settlement of the Indian population in an unsuitable area might have proved even more disastrous.

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## V.—REMEDIAL MEASURES.

### DRAINAGE.

See Map II. The Commissioners recommend that immediate steps be taken to carry into execution the entire drainage scheme recommended by Mr. Bransby Williams with the exception of the unfinished portion of the Native Location drainage and with the addition of certain amplifications recommended by Mr. Tanner in his evidence.

Part II,  
p. 36 B 1 & 2.

Report p. 31.

In their opinion the time has clearly arrived for what Mr. Williams refers to as the third stage in the development of the sewage system of Nairobi; and the completion of the system by means of sewers proper, at least in so far as the plain is concerned, must be taken in hand.

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Mr. Williams remarks that "by the time the third stage has been reached it "may be necessary to purify the sewage before turning it into the river "

The latest report of the Sewage Commission lays down that it is not the duty of a local authority to convert its sewage into drinking water before turning it into a stream, but that such an authority has fulfilled all its obligations to riparian owners further down stream if it discharges its sewage so treated that it will not become a nuisance. This doctrine in its application to Nairobi River is strengthened by the fact that the River has repeatedly been proved to be infected with typhoid, and need not therefore be considered as a source of drinking water for people living on its banks below Nairobi.

Part II,  
p. 31 C.

On the other hand, under Rule 11 of Rules dated 21st December 1902, issued under the Crown Lands Ordinance 1902, the discharge of untreated sewage into a river is illegal: and considering that the total flow of the Nairobi river when measured by Mr. Williams was only  $5\frac{1}{2}$  million gallons, and that of this quantity 400,000 gallons will pass through the sewer as flushing water, also considering that it is the opinion of the Government Analyst that the Nairobi river is already carrying almost all the organic matter that it can, the result of turning the sewer contents directly into the river would be to create an open sedimentation sewer immediately below the town and immediately up-wind from the town. It would therefore appear to be imperative to treat the sewage in some way so as to prevent the formation of an extensive nuisance.

Report p. 36

The most satisfactory method of treating the sewage should be by settlement, by precipitation, or by septic tanks, followed by treatment on land. Unfortunately, as pointed out by Mr. Williams, the land at or below the sewage outfall is quite unsuitable for treating sewage. Immediately below the sewage outfall it consists of a thin layer of black soil interrupted at frequent intervals by outcrops of rock. Further east and south there is a large expanse of rather flat land above the river banks. But sewage would require to be pumped on to this land from the outfall and the land itself is not suitable for sewage farming, consisting as does of black soil with rock near the surface. Land treatment would therefore be at once expensive and ineffective.

The modern practice of treating sewage in septic tanks, followed by filtration, would appear to be that most suitable to Nairobi. It is true that this method is vigorously condemned by Mr. Bransby Williams : but it is now known to be a thoroughly practical and satisfactory method of sewage disposal.

Williams  
Report p 17.

On this point reference is made to the Report by Mr Price Williams, printed in Appendix IV.

Part II, p 81

The sewage out fall should be moved at least half a mile further from the town than the site chosen by Mr. Bransby Williams, which is much too near the town and tanks and filters of an approved type should be constructed at the outfall.

The importance of instituting as comprehensive as possible a system of water-borne sewage can hardly be over-estimated, and the Commissioners therefore recommend that the main sewers should be used as soon as possible for sewage, that the outfall sewer be extended half a mile further eastwards, that septic tanks and filters sufficient for 300,000 gallons should be installed at the new outfall, and that regulations should be passed on the lines of those in force in Great Britain, obliging proprietors to connect up to any sewer lying within 100 feet at their own expense. The main sewers are adapted for receiving connections at intervals of 75 feet, but it is considered preferable that connections should only be made at the manholes, and pipe sewers should therefore be laid along back lanes to connect with the main sewers at manholes, so as to serve at any rate the Bazaar, River Road, Government Road, Hardinge Street, Victoria Street. Duke Street and Sixth Avenue

See Part II,  
pp 9A, 20E,  
22E, 27F:  
Williams  
Report, p.31

### SEGREGATION OF RACES.

The evidence in favour of the principle of segregation is overwhelming and the Commissioners have no hesitation in accepting it.

Part II,  
pp 14F,  
20F, 26B,  
76 (8).

#### A.—NATIVE LOCATION.

They do not understand why the proposals of the Municipal Committee on this vital question have met with no response. On the evidence, including that of the chief officers of the Medical Department, the proposals appear to be open to no objection worthy of serious consideration. The Commissioners are satisfied that the only suitable area now available for the Native Location is that at present occupied as a Medical Reserve. The site is capable of satisfactory drainage at small expense, as it is everywhere well sloped. It is in the line of two native roads which are the oldest and among the most frequented in the neighbourhood of Nairobi—those leading to the populous districts of Fort Hall and Machakos. Further Crown land is available when required on the south side of the river for extension eastwards up to a total acreage of about 500 acres. If however the site is utilised for this purpose, effective steps must be taken to protect the river and to prevent it from being used as drinking water. In September 1912, when this area was applied for by the Municipal Committee, the buildings thereon were valued at Rs. 3,400. The question of compensation can therefore present no serious difficulties.

Part II,  
pp 7B,  
13A, 26D.

Map I,

Reference to the map annexed will show that the only other possible sites for a Native Location are (1) the existing reserve (2) the area lying between the Uganda Railway and the Thika Tramway and (3) the area round the existing native villages. Of these the first has already been dealt with, and the objections urged against it apply with practically equal force to the second. The Commissioners cannot too strongly deprecate any attempt to establish the natives upon sites so fundamentally unsuitable.

The third, though much inferior to the quarantine reserve site, is not in itself a bad site; but it is open to the vital objection that in so far as not actually trenching upon what must inevitably be the Asiatic area, it lies directly between it and the area recently sold for Indian settlement by the Nairobi East Township Co. The utilisation of this site for a native location is therefore incompatible with any sound and practicable scheme of town planning.

See Map III.

When the site question has been decided steps should be taken for compulsory removal of all natives other than house boys: and the villages on the plain should be dismantled. It will be necessary for the Municipality to devise a satisfactory and inexpensive latrine system.

#### B.—ASIATIC AREA.

##### *Bazaar.*

Since Mr. Bransby Williams proposed the removal of the Bazaar the question has been the subject of constant discussion, and the opinion is universal in the European community that removal is in the highest degree desirable. With this opinion all the expert medical witnesses examined were in accord and the Commissioners have no hesitation in agreeing with them. A sound scheme of town-planning for Nairobi should follow the main lines laid down by Mr. Bransby Williams and since accepted and acted upon, and it is impossible to regard as satisfactory a scheme which leaves a large block of Asiatic property in the heart of the European area.

It is however open to grave doubt whether actual expropriation in view of the attendant expense can be considered a matter of practical politics.

From such information as they have been able to procure regarding recent developments in town planning in Great Britain, the Commissioners gather that the best expert opinion is unfavourable to the wholesale expropriation of slum property even by the wealthiest corporations, on the ground of excessive cost, and in view of the facilities existing for forcing an owner of insanitary property to reconstruct it at his own expense.

These facilities exist in Nairobi in the Nairobi Township Rules of 1905 which can if necessary be amplified and strengthened, and utilised if and so soon as provision can be made for the accommodation of the surplus population. But though these Rules may be adequate for the purpose of reconstructing the Bazaar on sanitary lines, their enforcement would not effect the removal therefrom of its existing inhabitants.

In the careful and exhaustive Report of the Special Committee of 1912 the net expense of expropriation of the Bazaar under the Land Acquisition Act 1894 was estimated at about £184,000, a figure which may be regarded as prohibitive. Under an ordinance containing provisions similar to those of the Housing of the Working Classes Act 1890, expropriation could be effected at a cost which the Commissioners estimate at £76,200. Part II, p.73

The Commissioners recognise that this expense might also not unreasonably be regarded by Government as prohibitive if any other scheme could be devised whereby the overcrowding and insanitary conditions of the Bazaar could be abolished at a moderate cost.

The opinion of the various witnesses upon this subject may here be summarised. All the Medical witnesses agreed that removal of the Bazaar was the ideal, but none went so far as to state that it was imperative. All agreed in recommending that the Bazaar should be made a purely commercial area, with residence prohibited. With this view Mr. Alidina Visram, to whose evidence the Commissioners attach much weight, concurred. The other Asiatic witnesses were not averse from the prohibition of residence by all except the actual shop-keepers and their families. Part II,  
pp. 6C, 10C,  
19D, 20B, 22  
C, 26E.

The Commissioners however are of opinion that the legal and financial difficulties attendant upon the execution of any such scheme in the Bazaar would prove insuperable: and that if the expense of expropriation cannot be faced the Bazaar must be dealt with by the strict enforcement of sanitary rules following the establishment of other Asiatic areas as provided for hereinafter. Part II,  
p. 48D.

Meantime immediate steps should be taken to prohibit the development as an Asiatic quarter of the unbuilt on Bazaar plots lying to the north of the Jeevanjee Gardens. The Commissioners are satisfied that such steps are practicable, as well as in the highest degree expedient. Part II,  
pp. 42E,  
44C, 46D.

#### *Residential Area.*

Apart from the question of the existing Bazaar, the opening up of a new residential area for Asiatics is a necessity second only in importance to that for a Native Location.

In allotting an area for Asiatics, the Commissioners feel it to be of the utmost importance that the sentiments of the Asiatics themselves should be consulted. It is therefore with much satisfaction that the Commissioners find themselves in entire agreement with the Asiatic witnesses in preferring the area lying between the Protectorate Subordinate Quarters and Fort Hall Road, on the west side of Kyambu Road. At least 100 acres are available here and can be occupied as soon as the necessary roads and drains have been made, and the Native Villages have been dismantled. The land lying to the east of the road should be reserved for future requirements. Map I.

The Commissioners therefore recommend that plots and roads should be laid out in this area and a drainage scheme formulated: and that a sufficient See Williams  
Report p. 27.

number of plots should thereafter be put up to auction for sale to Asiatics only. Conditions should be inserted in the leases prohibiting alienation to non-Asiatics.

*Trading Area.*

A separate trading area for Asiatics is also considered a prime necessity. The bulk of the Asiatic trade is with natives and is on a comparatively small scale. What the small tradesman requires therefore is a small plot at a low rental, situated not too far from the heart of the township and on the route most frequented by natives.

Map I. Unfortunately no Crown land is to be found fulfilling these requirements. An exceedingly suitable area does exist : but it is the property of Mr. Grogan. It consists of the unsold balance of the Cross Estate as shown on the map annexed to this Report, in all about 16 acres capable of subdivision into about 500 plots of 800 square feet each. It is situated on well sloped ground. The land is good red soil. It lies on the principal native route leading into Nairobi,—the road from Fort Hall.

Part II, pp. 14E, 51A. The Commissioners have reason to believe that Mr. Grogan is willing to negotiate with Government for a lease of the Cross Estate. They have carefully considered the question of its value and are of opinion that if it can be secured at a rental of £2,000 it could profitably be taken over and leased out on easy terms to Asiatic traders. They therefore recommend that negotiations be entered into with this object and that if the transaction is completed the area be developed on the same lines as recommended above for the new residential area, except that the lessees should be taken bound to erect suitable shops, and to maintain them as shops only, and prohibited from using the premises for domestic purposes. In fact the area should be developed on the lines indicated in the evidence of Dr. Burkitt for a lock-up bazaar.

Map I. The adoption of the above recommendations regarding the Bazaar and the proposed residential and trading areas should be made parts of a more comprehensive scheme providing for the division of the entire township into European, Asiatic and African areas. The division recommended by the Commissioners is shown upon the map annexed to the Report

Supra, p. 17.

1. The African area shown is that recommended above.
2. The Asiatic residential area is roughly that lying to the north east of the centre line of Victoria Street. Its western boundary runs along Swamp Road and the western line of the Goan Subordinates Quarters produced up to the Fort Hall Road.

3. The Asiatic commercial area is as shown on the map.

The present Bazaar area must be treated separately.

4. It is recommended that the rest of the town should be reserved for European occupation. It is not considered desirable, even if it were practicable, to evict all Asiatics from this area forthwith : but Asiatics could gradually be eliminated without hardship by the refusal of consent by Government to transfer to non-Europeans. Similarly transfer to non-Asiatics in the Asiatic area should be prevented.

## MEASURES FOR PREVENTION OF DISEASE.

Revised Public Health Legislation is urgently required, especially for control of the milk trade.

### (a) MALARIA.

The completion of the drainage scheme is the first necessity for the prevention of Malaria.

Sufficient machinery exists in the Township Rules known as the Mosquito Rules for enforcing all necessary precautions by private householders. The execution of the Rules lies with the M. O. H. and all that is necessary is that he should have sufficient labour at his disposal. For this work convict labour is available.

The Commissioners however are not prepared to recommend the general enforcement of the mosquito rules against private householders until such time as Government has fulfilled the obligations resting upon itself in respect of its own property

Notification of malaria and other infectious diseases should be made compulsory. The working out of the details of a suitable scheme is a matter for the Medical Department.

Part II,  
pp 3B,  
12A, and D.

### (b). ENTERIC AND DYSENTERY.

It is recommended that the excellent work recently done by Government in clearing Crown lands of bush should be continued, and that so soon as all Crown lands have been dealt with, private proprietors should in turn be called upon to clear their holdings.

Ample provision should be made for public latrines where the sanitary authority considers them to be necessary. A large number are urgently required.

### (c). PLAGUE.

In addition to the recommendations above contained dealing with overcrowding and the segregation of races, and the vigilant enforcement of sanitary regulations, the Commissioners wish to emphasise the necessity for rat-proof buildings, for protection of foodstuffs against rats in all buildings, whether rat-proof or not, and for unremitting efforts on the part of the health authority and public alike for the catching of rats.

## CONSERVANCY.

Under the system of Conservancy in vogue the daily cleansing and disinfecting of buckets is practically impossible. The inauguration of the double bucket system is imperative. Owing to the steep gradients in Nairobi, the system which is found most satisfactory in more level towns, whereby buckets are sealed with air-tight lids and removed bodily with their contents, is impracticable. The system generally in use in South African towns, under which contents of buckets are emptied into a tank-cart and the buckets themselves nested on a specially constructed lorry accompanying the tank, should be adopted.

For cleansing of buckets, a building will require to be erected near the Municipal Landies where all buckets will be cleansed and disinfected daily by a special staff.

#### DESTRUCTION OF RUBBISH.

A destructor would cost at least £ 1,000 and the expenditure would yield no return. The Commissioners are not satisfied that it is as yet necessary.

#### DESTRUCTION OF CORPSES AND DEAD ANIMALS.

Several hundred dead natives are buried annually by the Municipality. The Cemetery is nearly two miles out of the town. The road of access which crosses the Ngongo River by a roughly constructed drift is extremely bad and causes constant damage to carts. African natives cannot be found to do the work of removal and burial which has been carried out in an unsatisfactory manner by Indians. The bodies require to be removed in the first instance to the mortuary attached to the Native Hospital which is of insufficient size and badly situated for the purpose.

A new public mortuary should be erected on the east side of the town.

A road should be constructed to give access to the cemetery, and the river should be bridged.

Dead animals—oxen, horses, mules, &c.,—are removed by the Municipality and buried near the night soil trenches. It is impossible to prevent the conservancy staff in all cases from exhuming and devouring the bodies, and even curing and disposing of the hides. Disease might be spread in this manner.

It is recommended that incinerators should be erected for calcining infectious corpses and dead animals.

#### TREATMENT OF ROADS.

In dry weather the main roads of the town are generally in an extremely dusty condition, and it is believed that dust carries germs of disease.

The President of the Local Government Board recently quoted figures showing that the tarring of roads in England had resulted in greatly improved vital statistics.

The expense of tar at Nairobi is heavy, but the Commissioners recommend that Government Road and River Road at any rate should be treated with some suitable preparation at an early date.

The Commissioners also recommend that the principal sanitary lanes in the plain should be resurfaced as soon as possible : and that new sanitary lanes be constructed where necessary.

#### WATER SUPPLY.

The Commissioners adopt the recommendation of Mr. Kirkham for the covering in of Kikuyu Reservoir, and addition of lime.

They also recommend (1) that the use of zinc lined piping should be discontinued ; (2) that new storage tanks of sufficient capacity should be erected at the highest point in the Hill District and that such tanks should be kept carefully protected against all casual contamination.

#### MUNICIPAL DEPOTS.

At the present time all municipal services are supplied from a depot situated on the eastern boundary of the township, and distant at least 4 miles by road from the outlying suburbs on the west. Such an arrangement is plainly not economical, and the Commissioners therefore recommend that two municipal substations should be erected, one on the Hill and one in the Parklands District. The selection of suitable sites will be a matter for the Municipal Committee and Government.

#### FUTURE TOWN PLANNING.

##### OPEN SPACES.

The Commissioners recommend that with a view to the future development of the town the following areas in particular (as shown in Map I.) should be earmarked as open spaces, in addition to the existing reserves :—

1. All unalienated crown land lying between Lamoru Road, Kikuyu Road and Selater Road.
2. Existing water works reserve.

##### WIDENING OF ROADS.

A number of the roads of the town are dangerously narrow and the Commissioners recommend that immediate steps be taken, where necessary, before any further appreciation in land values has taken place, to arrange with the proprietors of the plots abutting on such roads for acquisition of such land as may be needed for purposes of widening.

#### NAIROBI RIVER AND IRRIGATION TRENCHES.

It has frequently been suggested that Nairobi River in so far as within the Township should be covered in. The Commissioners cannot agree that the expense entailed by such a plan would be justified. They consider however that measures should be taken to prevent the irrigation trenches within the Commercial Area from being accessible to the public for purposes of drinking &c. This could be effected by erection of a suitable fence on either side, by arrangement with the lessees concerned.

#### P. W. D. LANDIS.

The sanitary defects in the P. W. D. Landis mentioned on p. 10 should be rectified.

#### ROADS IN BAZAAR.

The Commissioners have already recommended to Government that a sum of £2,500 provided in the Government estimates for year 1913-14 for improvement of the Bazaar should be spent in metalling the surfaces and providing concrete channels upon either side of the following roads in the Bazaar :—

1. Bazaar Road from Government Road to Sadler Street.
2. Stewart Street so far as within the Bazaar, up to Tenth Avenue.
3. Eighth Avenue from Government Road to Sadler Street.



## VI.—ESTIMATE OF COST.

The measures above recommended are re-enumerated below in approximate order of importance with a rough estimate of probable cost appended in each case.

		Non-recurrent	Recurrent
1. COST OF WILLIAMS DRAINAGE SCHEME, as per Mr. Tanner's evidence...	£65,948		
Less already spent including current year's expenditure ... ..	£32,008		
Less unspent balance of sum applicable to drainage of old Native Location site ...	£5,933 37,941		
	£28,007		
Add additions proposed by Mr. Tanner ...	8,000		
Extension of outfall sewer ...	1,265		
Septic tanks and filters at outfall, ...	5,000		
Subsidiary sewers for connections ...	6,000	48,272	...
Upkeep of septic tanks and filters, at 10% ...		...	500
2. NATIVE LOCATION, capital cost.			
Difference between actual value and scrap value of buildings on Medical Quarantine Reserve site, ...	£200		
Cost of laying out and draining area, making roads latrines, Superintendent's house etc., ...	5,000	5,200	...
<i>Recurrent expenses will be covered by takings.</i>			
3. ASIATIC RESIDENTIAL AND COMMERCIAL AREAS.			
The prices secured for plots sold should more than balance the necessary expenditure on roads drains &c.			
ASIATIC COMMERCIAL AREA.			
Annual rent suggested ... ..		...	2,000
4. PUBLIC LATRINES ... ..		1,000	...
5. "DOUBLE BUCKET" CONSERVANCY.			
Pails ... ..	£600		
Carts ... ..	1,000		
Cleaning Station ... ..	500	2,100	...
Upkeep ... ..		...	200
6. WATER SUPPLY.			
New Storage tanks ... ..	£15,000		
Covering in of Reservoir ... ..	10,000	25,000	...
7. ROAD TREATMENT to minimise dust nuisance ...		5,000	...
8. MAKING UP SANITARY LANES ... ..		500	...
9. ERECTION OF MUNICIPAL SUBSTATIONS...		1,000	...
10. BURIAL OF NATIVES ETC.			
Road to Native Cemetery ... ..	£300		
Bridge over Ngong River ... ..	150		
New Mortuary ... ..	600	1,050	...
11. INCINERATORS for disposal of rubbish &c. ...		200	...
12. CLOSING IRRIGATION TRENCHES ... ..		600	...
TOTAL	£	89,922	2,700

\* Remunerative.

It has to be observed that the figure given for total cost of the drainage scheme is only £14,339 in excess of the balance of the expenditure on drainage to which Government is already committed under the Williams Scheme. Of the total non-recurrent expenditure recommended the amount representing expenditure now proposed for the first time is £61,915.

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## VII.—FINANCE.

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The Commissioners do not consider it incumbent upon them to specify in detail what proportions of the cost of the above recommendations can properly be charged against Protectorate and Municipal funds respectively. It is however in their opinion clear that such of the works recommended as fall under the category of works the execution of which is incumbent upon a ground landlord—*e.g.* the entire drainage scheme and all measures connected with water supply—cannot equitably be debited against the Municipality, inasmuch as Government is the fee simple proprietor of practically the entire Municipal area.

There remains however a large amount of absolutely necessary expenditure which Government is in no way obliged to undertake and which ought to be borne by the Municipality.

The resources of the Municipality are summarised in the Report by the Town Clerk (Appendix IV.) which shows that as at present constituted it is quite incapable of bearing the burden of more than a fraction of this expenditure. Part II, p 83

It follows that if the town is to be made sanitary, either the entire expense must be found out of Protectorate funds, or the township must be put in a position to finance and control itself.

The latter alternative is in the opinion of the Commissioners desirable from every point of view, and they are confident that it will be found to be practicable.

The Town has far outgrown the stage of being unable to raise loans and to undertake public works. There is no sufficient reason why Government should continue to be burdened with immediate responsibility for the constantly increasing volume of local business. From a sanitary point of view, the witnesses examined generally expressed themselves as strongly in favour of Municipal control. The Commissioners recommend the application of the Municipal Corporations Ordinance of 1909 to Nairobi at the earliest possible date.

If and when a Corporation is granted and a basis of assessment decided upon, the Commissioners are of opinion that the Municipal area will require to be readjusted. The boundaries of the present area are purely artificial: though from a sanitary point of view too small for requirements, it is much too extensive for the financial resources of the Municipal Committee.

Map I

The Commissioners consider that if a Corporation is granted and a system of rating is established, the larger area shown on the annexed map should form the Municipal unit. This area should be divided into wards and a differential scheme of rating for the various wards should be formulated, in order that the burden falling upon each of the districts may be in some degree proportionate to the benefit derived by it from municipal services. Provision should be made for future inclusion of outlying districts.

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### VIII.—CONCLUSION.

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In formulating their recommendations the Commissioners have made it their primary aim to put forward a conservative and financially practicable scheme. While the expense advised is serious, they are convinced that making due allowance for possible omissions and errors in detail, it represents the lowest sum for which it can be hoped to render the town sanitary. They have endeavoured to resist the temptation to make utopian and impracticable proposals and have borne it in mind that measures appropriate to a town where land can be purchased cheaply, however alluring in theory, cannot be seriously entertained in respect of a town in which land values stand as high as they do in Nairobi.

Finally they desire to express their indebtedness to the gentlemen who gave evidence before them: to those who supplied the Reports in Appendix IV: and to Messrs. W. H. Tanner and H. J. Stedman of the Public Works Department, for valuable assistance in working out the probable cost of the measures recommended.

H. B. TAYLOR.  
P. H. ROSS.  
ARTHUR. C. TANNAHILL.  
B. G. ALLEN.  
V. M. NEWLAND.  
J. J. TOOGOOD.  
THOS. A. WOOD.

NAIROBI: }  
30th December 1913. }

# SUMMARY OF RECOMMENDATIONS CONTAINED IN THE FOREGOING REPORT.

	Page.
1. Drainage scheme, completion subject to modifications. Main sewers to be used for sewage: septic tanks and filters to be installed at outfall. Outfall to be moved half a mile eastwards. Compulsory house connections with sewers ...	17
2. Segregation of races, principle to be adopted ... ..	17
3. Native Location, site to be that now used as Medical Quarantine Reserve. On inauguration of location, native villages to be dismantled ... ..	17
4. Existing Bazaar, unless funds forthcoming to remove it, to be retained, but sanitary regulations to be rigidly enforced and overcrowding stopped ..	19
5. New Asiatic residential area to be laid out near Native Market. Trading therein to be prohibited ... ..	19
6. New Asiatic trading area to be leased from Mr. Grogan, laid out and leased out. Residence therein to be prohibited ... ..	20
7. Delimitation of Asiatic and European areas: Segregation to be ensured by restricting powers of transfer in each case ... ..	20
8. Open spaces to be conserved ... ..	23
9. Western Valley site for new Railway Subordinates Quarters ... ..	9
10. Water Supply: Reservoir at Kikuyu to be covered in: admixture of lime ...	22
11. New and improved storage tanks on higher site ... ..	23
12. No more zinc lined pipes to be laid down ... ..	23
13. Municipal Council: Secretariat and Medical Department to be represented ...	15
14. Municipal Corporation to be established ... ..	25
15. Municipal Area to be extended ... ..	25
16. Wards to be formed: differential rating by wards ... ..	26
17. Public Health Legislation, to regulate especially milk trade ... ..	21
18. Notification of malaria to be made compulsory ... ..	21
19. Enforcement of "Mosquito Rules" ... ..	21
20. Continued Bush clearing ... ..	21
21. Erection of sufficient Public Latrines ... ..	21
22. Extirpation of rats: protection of buildings and foodstuffs against rats ...	21
23. "Double Bucket" conservancy system to be adopted ... ..	21
24. Municipal substations, to be established on the Hill and in Parklands ...	23
25. New mortuary to be erected ... ..	22
26. Access to Native Cemetery to be provided ... ..	22
27. Incinerators for destroying carcasses and infectious corpses to be erected ...	22
28. Treatment of main roads against dust ... ..	22
29. Making up of sanitary lanes ... ..	22
30. Closing in of irrigation trenches ... ..	23
31. Sanitary overhauling of P. W. D. Landies ... ..	23
32. Widening of roads ... ..	23
33. Metalling and Draining roads in Bazaar ... ..	23

**PART II.**

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**APPENDICES.**

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**CONTENTS.**

	PAGE.
Appendix 1. Evidence ... ..	1
Appendix 2. Statistics (Rainfall, population, incidence of various diseases, etc.) ... ..	53
Appendix 3. Previous Reports, etc. dealing with Sanitation of Nairobi ... ..	59
Appendix 4. Reports presented to the Sanitary Commission ...	79

# APPENDIX I.

## EVIDENCE.

	PAGE.
1. DR. A. D. MILNE, Principal Medical Officer ...	1
2. „ R. W. BURKITT, ...	9
3. T. J. ANDERSON, Esq., Government Entomologist, ...	16
4. DR. J. A. HARAN, Deputy Principal Medical Officer ...	19
5. „ H. A. BODEKER, Medical Officer of Health, Nairobi...	22
6. „ W. J. RADFORD, Senior Medical Officer Ukamba Province, ...	25
7. V. H. KIRKHAM, Esq., Government Analyst, ...	29
8. A. B. H. BAILIE, Esq., Sanitary Inspector, ...	33
9. W. H. TANNER, Esq., Deputy Director of Public Works ...	36
10. E. S. GROGAN, Esq., ...	40
11. KHASSAM BHAI, ...	42
12. ALIBHOY, ...	44
13. R. W. PULTANWALA, ...	45
14. ALIDINA VISRAM, ...	48
15. R. M. GEATER, Esq., ...	50

# NOTES OF EVIDENCE.

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1. DR. A. D. MILNE, M.B.C.M. ABERDEEN, *Principal Medical Officer.*

EXAMINED ON 27TH FEBRUARY 1913.

(PRESENT:—Hon. Mr. H. B. TAYLOR, (CHAIRMAN), Hon. Mr. V. M. NEWLAND, Dr. ROSS, Messrs. TANNAHILL, TOOGOOD and WOOD).

THE CHAIRMAN read the terms of the Commission.

THE PRINCIPAL MEDICAL OFFICER, having been called and sworn, was then examined. (A)

THE CHAIRMAN explained that the main points which the Commission had to enquire into were why health conditions were bad in Nairobi, or, rather what the present position was, and why was it so, and what was necessary to remove the disabilities.

THE P. M. O. said that the root reason of the present unsatisfactory condition of affairs was due to lack of finances.

THE CHAIRMAN asked what was the present position of Nairobi from a health point of view.

THE P. M. O. replied that in his opinion it was pretty bad.

MR. WOOD asked whether the P. M. O. considered that sickness in Nairobi in proportion to the population was abnormal.

THE P. M. O. said he would not go so far as to say that. He believed that the sick rate of Nairobi was higher than that of the West Coast of Africa. That this should be so was abnormal. (B)

MR. NEWLAND asked whether the P. M. O. was of the opinion that sickness—malaria, typhoid, &c.,—was on the increase in Nairobi.

THE P. M. O. replied that he was certainly of that opinion.

MR. NEWLAND asked whether any reason could be given for the increase, and were things getting worse in town than they were.

THE P. M. O. said that, taking Nairobi pure and simple, he certainly thought that enteric and malaria were annually increasing. There was an increase in the number of cases yearly but whether it was a real increase or not he was not in a position to say. He had not sufficient figures from which to draw deductions. He knew from his Annual Report that the malaria increase was from 2 to 3% per annum. (C)

MR. NEWLAND asked what was the reason for this.

THE P. M. O. said that the only thing to blame was the lack of public sanitation and lack of domestic sanitation. He referred to compounds being infested with mosquitoes and people not taking the trouble to eradicate them.

MR. NEWLAND said that a good deal of public Government land was covered by bush, and referring to private lands he asked whether the private individual could not do a great deal to clear such areas.

THE P. M. O. said that the private individual could do a great deal in that direction. The clearing of certain parts of the town depended upon private enterprise. Taking his own case, and leaving out the question of the presence or absence of drains, if he had mosquitoes in his compound it was up to him to eradicate them; or, if that was not done the one man to blame was himself. (D)

MR. NEWLAND asked whether the P. M. O. blamed the lack of private enterprise.

THE P. M. O. replied that he could not under existing circumstances, adding that he blamed the general condition of things—the non-removal of storm water, &c. Even if they started with a clean slate there would still be malaria in town unless there was domestic co-operation.

MR. NEWLAND asked whether it was possible to eradicate malaria.

THE P. M. O. replied that it was a question of educating public opinion. Everybody had his own point of view. The disease could be stamped out with 6 months if everybody was animated with the same idea. (E)

- (A) It had been done elsewhere; it was compulsion that was needed especially in a place containing so many different communities: they must have rules and must see that they were enforced.
- MR. TANNAHILL asked whether bush without water bred mosquitoes.
- THE P. M. O. No, but bush could shelter mosquitoes.
- MR. TANNAHILL said that if there was a lot of Crown land covered with bush it would be difficult to prevent any accumulation of water in the neighbourhood.
- THE P. M. O. in reply, said that it ought to be reasonably easy to locate all public localities in Nairobi where mosquitoes were breeding and then it was for the Municipality to clear these areas. For the clearing of private compounds he thought that in the absence of educated public opinion they would require to have rules and to enforce them until the nuisance was removed.
- (B) MR. NEWLAND asked how long water had to lie in order to breed mosquitoes.
- THE P. M. O. replied that it took a period of about 10 to 14 days but it depended very much on the temperature.
- MR. TOOGOOD asked whether enteric was more prevalent than malaria.
- THE P. M. O. replied in the negative.
- MR. NEWLAND asked whether, if stagnant pools were done away with, there would be any necessity to clear bush. He had gone into bush a good deal at different times and had found hundreds of mosquitoes.
- (C) THE P. M. O. said that a shower of rain would give enough water in certain places under certain conditions to breed mosquitoes. As regards clearing bush, he instanced Mombasa where in what was known as the European quarter, where it had been laid out as a golf course, and where during the last 3 or 4 years very systematic bush clearing had been adopted, the diminution in the number of mosquitoes was very marked, and if it was thoroughly done he saw no reason why mosquitoes should not be eradicated. The question of mosquito reduction in a tropical country meant a continual warfare, and efforts could not be relaxed for a moment.
- MR. TANNAHILL asked whether it would do to clear the bush and plant gum trees in its place.
- THE P. M. O. said that would improve conditions.
- (D) MR. TANNAHILL referred to the gum plantation behind Mr. Couper's house and asked whether that would prevent mosquitoes.
- THE P. M. O. said that formerly the area referred to was swampy ground receiving the road drainage and he should imagine that mosquitoes bred there; now that the place had been properly cleaned out it had made a great difference in that corner.
- MR. TANNAHILL referred to the custom of natives going into the bush.
- THE P. M. O. said that was one of the worst features in the Sanitation of the town. It was a means of propagating enteric, dysentery, ankylostomiasis and intestinal worms of various sorts.
- MR. TANNAHILL asked whether milk was a source of enteric.
- (E) THE P. M. O. said that milk was always regarded with suspicion.
- MR. TANNAHILL suggested the advisability of having all milk brought into a central Depot in town.
- THE P. M. O. said that all milk sellers should be under license. Reverting to the question of mosquitos he would advocate compulsory legislation.
- MR. NEWLAND asked whether it was the P. M. O.'s belief that compulsion was the only practical way of solving the difficulty.
- THE P. M. O. said he believed that was a very good way of educating public opinion.
- MR. TOOGOOD asked whether any rules were in force at present.
- THE P. M. O. replied that there were the Township Rules.
- (F) MR. TOOGOOD asked if there was any penalty.
- THE P. M. O. Yes.
- THE SECRETARY explained that notice of the nuisance had first to be given, and if instructions were not complied with there was a penalty.
- DR. ROSS pointed out that there were some places, such as 6th Avenue, from which water could not be removed.
- THE P. M. O. agreed.
- MR. WOOD said he understood that was one of the reasons why they had not been able to prosecute.
- MR. TANNAHILL referred to defective guttering on houses and asked whether that would be a source of danger.



- THE P. M. O. replied that it was probably the case in Nairobi, in Mombasa it was one of the worst (A) sources.
- MR. TANNAHILL suggested that if guttering was a source of danger every householder ought to inspect it regularly.
- THE P. M. O. said that should be done at least twice yearly.
- MR. TANNAHILL asked whether the medical officer had to report cases of malaria which might arise anywhere.
- THE P. M. O. replied that malaria was not notifiable.
- MR. TANNAHILL asked whether the P. M. O. was of the opinion that it ought to be notified.
- THE P. M. O. replied that he was in favour of all epidemic diseases being made notifiable but that the difficulty was a financial one as a notification fee would be necessary. Notification. (B)
- DR. ROSS mentioned that as all the Doctors in town sent him blood specimens in cases of suspected enteric for examination which he reported on to the M. O. H. the disease was as good as notified.
- MR. NEWLAND asked the P. M. O. whether he considered that a notification Act would be beneficial.
- THE P. M. O. replied in the affirmative.
- MR. TOOGOOD asked whether malaria was of a severe type in East Africa.
- THE P. M. O. replied that generally it was not, speaking for Nairobi.
- MR. NEWLAND asked the P. M. O. whether in his opinion the fact of coloured and white people being more or less mixed up together had any bearing on health as regards malaria. Malaria. (C)
- THE P. M. O. said he was of that opinion, there was no doubt about it.
- MR. TOOGOOD asked the P. M. O. whether in his opinion, if Nairobi was inhabited by white people alone, the state of health would be better.
- THE P. M. O. said that would certainly be the case. They could reach white people but it was difficult to get at black people.
- MR. NEWLAND said he understood the P. M. O. to mean that the fact of white and black people living together assisted the spread of malaria.
- THE P. M. O. said that was his opinion.
- MR. TANNAHILL asked the reason for this.
- THE P. M. O. said that blacks were more potential carriers of parasites than whites. Blacks gained a certain amount of immunity, and the disease did not affect blacks in the same way. In the same way some whites had a certain amount of immunity. (D)
- He referred to a case which had come under his personal notice in some children who had not been out of Nairobi for over 18 months. He was called in and diagnosing malaria endeavoured to ascertain the source of infection. On enquiry he found that one of the native boys had been sick, suffering from malaria for a fortnight. This boy had infected the mosquitoes in the compound, up till then uninfected, which had thus transferred the infection to the white children. That was the danger of proximity of races.
- MR. TANNAHILL asked if, once cleared, Nairobi could easily be kept clear of malaria. He referred to the case of boys coming in from infected areas. (E)
- THE P. M. O. said that the Fort Hall road was a highway of infection: natives would always come in by it, always keeping open the possibility of reinfesting the Nairobi mosquitoes. The warfare against mosquitoes was unending.
- MR. NEWLAND asked whether the quality of water had any bearing on malaria.
- THE P. M. O. replied that so far as the Nairobi water supply was concerned, except in its domestic use, it had none.
- MR. TOOGOOD suggested that the P. M. O's recommendation would be a systematic campaign.
- THE P. M. O. agreed, adding that he considered that Nairobi was a place where there should be no mosquitoes.
- MR. TOOGOOD asked whether the responsibility did not lie with somebody. He thought there should be a controlling body. He asked whether the P. M. O. thought there was much difficulty in educating public opinion. (F)
- THE P. M. O. said that there was a difficulty, the country being so new, and there were so many interests that people had neither the time nor the interest.
- MR. NEWLAND suggested that practically the P. M. O's recommendation was a campaign against mosquitoes, the clearing of bush and stagnant water, and the segregation of blacks and whites.
- THE P. M. O. said that was his view. He would like something done in the way of making separate locations for Indians and Africans. He thought that the first step was to educate public opinion. Education in all these public health matters he regarded as being of the first important.

Enteric: A) MR. TANNAHILL asked what was the cause of enteric.

THE P. M. O. said that enteric was caused by a bacillus that gained entrance into the alimentary tract. It was usually a water-borne disease, and the bacillus was found in water, milk, vegetables, or food.

MR. TANNAHILL asked whether the Nairobi water supply was good.

THE P. M. O. replied that, with the information at his disposal to date the water was unimpeachable.

MR. TANNAHILL referred to disposal of faeces of patients in the Infectious Diseases hospital.

THE P. M. O. said that it was burned behind the hospital.

MR. TANNAHILL referred to the bucket system and to night soil from the other hospitals being carried through the town. Would that be a source of infection?

(B) THE P. M. O. said he thought that, though there was a risk, it was not a very great one but infectious excreta should be calcined.

MR. TOOGOOD asked whether enteric was a severe disease in East Africa.

THE P. M. O. said that usually it was not a fatal disease, and on the whole East Africa had been let off very lightly. There had been deaths but the rate of mortality was not high. He considered that enteric was going to be one of the great dangers of this country.

MR. NEWLAND asked how they were going to fight against it.

(C) THE P. M. O. said that they would have to start a system of inoculation. If private practitioners did not take it up, it would perhaps be necessary to have Government centres. All Government officials should be obliged to undergo inoculation on first arrival as a future preventive measure. They must safeguard the Nairobi pipe supply so that there could be no question of contamination. He could not see that they could prevent enteric fever so long as the Nairobi River flowed through the town. It was polluted water, and he presumed therefore that it was capable of carrying enteric. He anticipated that one day it would be converted into a covered sewer.

MR. NEWLAND asked whether the drainage system had any effect on the spread of enteric.

THE P. M. O. replied that any factor that prevented the efficient disposal of infected stools would be a danger. He would like to bring up another point: he did not see how they could keep natives from roadside pools or from streams. Natives washed in these, and they were continually seeing natives going to drink there.

(D) MR. TOOGOOD asked whether the present Nairobi drainage system was good.

THE P. M. O. replied that it was not.

Drainage. MR. NEWLAND referred to the proposed drains under the Williams scheme.

THE P. M. O. said that the Williams scheme was a compromise between a proper sewage system and turning the sewage slop and refuse water into an open drain with a flush.

MR. NEWLAND asked whether the P. M. O. considered that open drains were a sound thing.

(E) THE P. M. O. replied that taking into consideration the finances of the country it was about the best thing that could be done. Although the drains were not altogether satisfactory he did not consider them a menace. If proper cement drains were put in, they would take not only refuse water but storm water. It depended upon a good flush of water so that there could be no possibility of blocking or any stagnation. It was not impossible to make the sanitation of the town good.

MR. NEWLAND referred to the prevalence of sore throats in Nairobi at present and asked whether open drains had any effect on this.

THE P. M. O. replied that this was probably caused by dust.

DR. ROSS asked the P. M. O. whether as regards the distribution of enteric by flies he did not think there was great danger in the removal of the night soil.

THE P. M. O. said he did. He considered that the men ought to be drilled and taught how to carry out the work properly; at present the boys did pretty well what they liked.

(F) MR. WOOD asked whether the P. M. O. recommended the double-bucket system.

THE P. M. O. replied in the affirmative. Buckets should be cleansed and inspected at a Depot. He considered that all latrines for natives as well as others should be made according to a certain standard and should have to be passed. Every latrine should contain an earth box and be systematically disinfected.

MR. TANNAHILL asked the P. M. O. whether he considered the present dumping ground a menace to the town.

THE P. M. O. said he did not think it was. With regard to Nairobi River a river was supposed to clean itself within 2 miles, but he doubted whether this was the case where natives were all along the river. He thought that sooner or later it would be the duty of the town (Nairobi) to discharge its sewage into proper sewage works. The Nairobi River, already polluted, was going to be still more badly fouled when the sewers were

- in operation. Excreta turned on to the plains on the other hand would be equally objectionable (A)  
They would also have to consider the question of proper destructors for rubbish and filth.
- MR. TANNAHILL asked whether they ought to take any steps as regards dysentery.
- THE P. M. O. said latrines should be put up in convenient places for the native community and bush should be cleared. Matters would be helped very considerably by the erection of latrines.
- THE P. M. O. also referred to plague, which he said depended very largely on the Indian. Where Plague.  
there were Indians there was plague. It also occurred amongst Africans but almost always amongst Indians. It was mostly a question of house construction. He regarded the whole of Nairobi as an endemic area.
- THE CHAIRMAN asked whether plague had ever been serious in Nairobi.
- THE P. M. O. said that there had been no severe outbreak. (B)
- MR. WOOD said that in 1902 there were about 50 deaths but the population then was very small.
- MR. ROSS suggested that the disease was generally attributed to rats.
- THE P. M. O. agreed. He said that it was the rat that was endemic. The first epidemic was in 1902 and its origin was then attributed to importation from India. The next occurred in 1905, and it was then found that plague had been known to exist (at Kisumu) for six generations. That gave them the idea that this part of Africa was an endemic area. Another focus was known in the Teita Hills. He did not say that it was due to Indians but they were known to be particularly susceptible. Where there was a collection of Indians the risk was greater.
- MR. WOOD asked whether the P. M. O. considered the whole of Nairobi endemic or whether any portion was worse than another. (C)
- THE P. M. O. said he would regard Nairobi as an endemic area, but that where there was a collection of Indians the risk was greater. They were a much more potential danger. He cited the Indian Bazaar as an example.
- MR. WOOD asked whether the P. M. O. would recommend the removal of the Indian Bazaar.
- THE P. M. O. said he had always advocated that the best interests of the town would be served by Housing Asiatics.  
locations, having wards as far as possible. There should be a new bazaar with proper regulations for buildings and for food storage. If there were an Indian location there might still be cases of plague outside of that.
- MR. WOOD asked whether the P. M. O. considered that would meet the case of the commercial Indian and if it would be as great a menace as a residential area in proximity to Europeans. (D)
- THE P. M. O. said he did not see how they were going to have separate towns:—that, in his opinion, was impossible. His idea was to have wards, each ward containing its recognised location. As regards buildings and factories, it boiled down to a question of rats.
- MR. NEWLAND asked whether the P. M. O. would recommend the removal of the Indian Bazaar.
- THE P. M. O. replied that he had advocated that since 1907.
- MR. NEWLAND: If restricted to a mercantile area?
- THE P. M. O.: No.
- MR. WOOD asked whether the P. M. O. did not consider that would be a proper measure of legisla- (E)  
tion, it being an endemic area.
- THE P. M. O.: Restriction against residence would be a distinct improvement.
- MR. NEWLAND asked what precautions the P. M. O. would consider necessary for prevention of plague in a new residential area.
- THE P. M. O. said that, as regards the Indian, plague with him was a personal question, it depended on the habits of that particular race. He referred to the Bombay model lodging houses, in which plague broke out, in fact it got so bad that people had to be turned out. Taking the Indian Bazaar as a purely commercial area the personal factor would be considerably minimized.
- MR. TANNAHILL asked supposing they restricted one Indian householder to one plot in the existing (F)  
Bazaar allowing him to live on it, would that make it easier?
- THE P. M. O. said that it would make it very much easier to deal with.
- MR. TANNAHILL said that was the system advocated by the Land Office; he referred to the regulations imposed by the Land Office; and asked whether the P. M. O. considered that they were a safeguard.
- THE P. M. O.: Yes.
- DR. ROSS referred to the narrow passages between the different shops.
- THE P. M. O. said he considered these passages should be made wider.
- MR. TANNAHILL: The passages though small could be kept clean?

(A) THE P. M. O.: Yes, they should be tarred and macadamised.

MR. TOOGOOD asked whether control would not be expensive.

THE P. M. O. said he would not think so; he did not think it would be unduly expensive, and it would be simpler than at present. Legislation as regards sub-letting might bear hard upon some Indians.

MR. NEWLAND asked was it his (the P. M. O.'s) impression that the insanitary situation would be met by completely segregating Asiatics and Whites?

THE P. M. O. said that theoretically it would be a solution. It was the ideal.

MR. NEWLAND. Assuming that it was impossible, did he (the P. M. O.) believe that the best way of dealing with the Bazaar question would be to make it a purely commercial area?

(B) THE P. M. O. said that he would certainly welcome the absence of residents in the Bazaar. In that way one of the potential plague factors would be removed; the Indian would be there for shorter hours, and his wife and family would be elsewhere. Over-crowding would be stopped, and where there was over-crowding there was always a risk.

MR. NEWLAND asked the P. M. O. whether he had any suggestion as to the class of building that was necessary.

THE P. M. O. said he considered that the whole place should be gutted.

MR. NEWLAND asked what the P. M. O. would suggest putting in its place.

THE P. M. O. said that he could not give his opinion off hand. He had not been in India and had not therefore been able to arrive at a suitable type of building that could be enforced. He and the D. P. W. had been working to evolve a cheap plan. They would have to be fair to the Indian Community.

(C)

MR. WOOD asked the P. M. O. whether, leaving out the financial question, he would recommend the removal of the Bazaar.

THE P. M. O.: Yes.

MR. NEWLAND asked the P. M. O. whether, if the Bazaar was removed from its present site to the Williams site, it would justify the expense.

THE P. M. O. said he thought it was very doubtful.

MR. WOOD asked the P. M. O. whether, assuming the leases had been drawn up so that people could not be interfered with and reasonable sanitary conditions could not be created, but supposing they could be transferred to another area where proper sanitary conditions could be created, would he be prepared to recommend removal?

(D)

THE P. M. O.: Yes.

MR. TANNAHILL pointed out that in the case of Asiatics and Africans the locations must have shops attached to them. Most of the commerce would be left to the town.

MR. TOOGOOD asked whether it was undesirable to have a large shop area in town.

THE P. M. O. said he thought not. He did not know enough to give a decided opinion as regards locations having shops attached to them.

MR. NEWLAND asked whether the P. M. O. was opposed to a site being left open in the location for shops.

(E)

THE P. M. O. said he was not prepared to give an opinion as yet. He must study the best interests of the community as a whole.

MR. TANNAHILL suggested that it would have the disadvantage of having special supervision of shops. Instead of having one commercial centre, there would be two or three.

THE P. M. O. said his idea would be the division of the town into an Indian Bazaar, a Native Bazaar, and the European shops in the main streets.

MR. TANNAHILL asked whether the P. M. O. had any views on chawls as regards Asiatics.

THE P. M. O. said that as regards Asiatics he did not think it desirable to introduce these into this country.

(F)

MR. TANNAHILL suggested that the result would be that various Indian financiers would start boarding houses. Did he (the P. M. O.) think the State could do any better?

THE P. M. O. said he thought so. What was called the block system he would certainly welcome for the African.

MR. TANNAHILL said that in the same way various municipal bodies erected buildings which they had control of.

THE P. M. O. said that these public bodies got a certain return for their money.

MR. TANNAHILL: It would be well to face that?

THE P. M. O.: Yes, I think the Municipality should consider that.

MR. WOOD, referring to native locations, said the P. M. O. knew the proposed site for a native location below the Public Works and asked whether he considered it a good site for that purpose. Native Location. (A)

THE P. M. O. : Not altogether.

MR. WOOD asked for what reason.

THE P. M. O. Because the ground was water-logged. To make it suitable a good deal of money would have to be spent. If money could be spent on the site, he thought the position was good.

MR. WOOD : Supposing you got another site at far less cost ?

THE P. M. O. A suitable site at a less cost would obviously be an advantage to the town.

MR. NEWLAND said he understood there was a new site proposed for a quarantine camp. in the Military reserve. Was the existing site in the P. M. O's., opinion a proper site and adequate for the purpose ? (B)

THE P. M. O. said he thought it was as good and as convenient as could be found. It was a suitably self-contained area. The proposed new site was an excellent site but hopelessly difficult of access. The fact that the existing site lay to windward of the town was no objection. A distance of 600 yards was regarded as sufficient in any circumstances.

MR. NEWLAND asked the P. M. O. which in his opinion was the better site for a native location—the native location reserve or the present quarantine station.

THE P. M. O. said he considered the present quarantine station better and healthier.

MR. NEWLAND said that his reason for asking the question was that if the quarantine area was taken there would not be such a large proportion of natives passing across the railway line. (C)

THE P. M. O. said that his opinion was that the present quarantine site was quite a good site. He had never considered the present native location reserve as a quarantine site and was not prepared to say that it might not be suitable.

MR. TOOGOOD asked the P. M. O. what his proposal for housing natives in the proposed locations would be.

THE P. M. O. said the nearest approach possible to their own life—huts in compounds with cement floors and cement walls. In other words sanitary huts.

MR. NEWLAND : Grass roofs are bound to carry disease ?

THE P. M. O. : They would always be regarded with suspicion, but they can be easily burnt and easily renewed. (D)

MR. NEWLAND said he had noticed the P. W. D. putting up buildings of galvanised iron with grass roofs but drooping eaves.

THE CHAIRMAN said that 4" concrete walls were very satisfactory.

THE P. M. O. in reply to a question by Mr. Toogood, said that at present there was no supervision over the native villages.

MR. NEWLAND asked what arrangements were made for the burial of natives who died from infectious diseases. Burial of infectious corpses.

THE P. M. O. replied that they were buried at the back of the quarantine camp.

MR. TOOGOOD asked whether native deaths or sickness were always reported. (E)

THE P. M. O. : Not always, unless the cases come under the notice of the medical officers or police.

THE SECRETARY, in reply to a question by Mr. Wood, said that natives taken from the Civil Hospital were buried by the Municipality.

MR. WOOD asked whether great care was taken in the burial of natives from the quarantine camp. He had heard of cases where natives had been buried with their toes sticking out of the ground.

THE P. M. O., said that he was afraid that in the past not much care had been taken. Bodies were probably some times dug up by hyenas.

MR. NEWLAND : Is there any risk of the spreading of disease by badly buried bodies?

THE P. M. O., said that as regards plague or small-pox there was not much chance ; in cases of anthrax there would be. Small pox was a question of contact. It always had existed in this country. During the past year or two there had been a good deal more of it. At the present moment there were various outbreaks in the Kenia district, which was one of the breeding centres. These outbreaks had been introduced into Kenia by returning labourers. Nairobi was a labour collecting centre and as such would always be exposed to sporadic attacks of smallpox. (F) Smallpox.

THE CHAIRMAN referred to the question of an increased water supply.

THE P. M. O. said that a sufficient minimum on which he based his estimates was 3 gallons for an African, 5 for an Indian, and 25 for a European. Water supply

- (A) The present supply of water was in excess of requirements.  
MR. WOOD referred to the question of increasing the water supply.  
THE P. M. O. replied that they must rest content with the new main. The average last year was over 30 gallons per head, and he had therefore dismissed for the present the question of quantity of water from his mind.  
MR. WOOD asked whether the P. M. O., had based his calculation of 25 gallons per head for Europeans on the basis of a population of 30,000.  
THE P. M. O. : Yes.  
MR. WOOD : We could double the present population and still give them 25 gallons per head per day ?
- (B) THE P. M. O. : Yes, that is the case.  
MR. NEWLAND asked whether there was any possibility of using the Nairobi River water by a system of purification.  
THE P. M. O. : Yes, it is quite possible.  
DR. ROSS asked whether it was advisable in the tropics to restrict the water supply.  
THE P. M. O. : No, the supply should be as great as possible but we should have drains to take slop water away.  
MR. NEWLAND asked whether there was any truth in the statement that mosquitoes were carried by rail.  
THE P. M. O. said he thought that it was quite likely. He mentioned Naivasha as an instance.
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2. DR. R. W. BURKITT, F.R.C.S., *Nairobi.*

EXAMINED ON 12TH MARCH, 1913.

(PRESENT :—HON. H. B. TAYLOR, (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS, MESSRS. TANNAHILL AND TOOGOOD.)

DR. BURKITT, called and sworn, said that the first thing that struck one in Nairobi was the want of a (A)  
water sewage system with covered-in drains. Open drains in any country, and more especially  
in tropical countries, were utterly out of the question as regards public health. Drainage.

This was principally due to the house fly: when the drain was open the faeces of  
infected persons were liable to be carried about by the house fly. The house fly  
carried the germ. The outstanding fault in the whole Municipality was the want of  
an efficient underground water sewage system. That of course meant that a big supply of  
water was required to flush the drains, because the town was fairly well on the flat and  
therefore required more water to flush. He could not see, as long as they had an Indian  
and native population, how they were ever to get decent hygienic conditions without a water  
flushing system. The double bucket system was the only alternative, but a bad one. The single (B) Malaria.  
bucket system was beyond words. Dealing with malaria, witness remarked the township was a  
big one, and it was mostly covered with jungle. Jungle was a hiding, not a breeding place.  
For breeding places water was necessary. The water must be there at least a fortnight, other-  
wise the parasite would die. If they had large leaves in which water could lie for a fortnight,  
and in which mosquitoes could pass through their different stages, then it would be  
a breeding place. Again, it was a very grave source of infection for dysentery and typhoid  
because the natives and Indians used it as a convenience and flies carried the infection from  
these infected places.

DR. ROSS suggested that if there was bush or jungle with water it was improving the chances for  
breeding mosquitoes. (C)

DR. BURKITT agreed. He said that bush hid both mosquitoes and natives. Mosquitoes were not  
fond of wind, they sought shelter from it.

MR. TANNAHILL asked whether, if the bush was cleared and quick growing trees such as eucalyptus  
were put in its place, that would be a protection against mosquitoes.

DR. BURKITT replied that anything that gave protection or shelter from wind such as jungle, creepers,  
&c., would harbour mosquitoes. There would be no advantage in trees whatever. Clearing  
was required, not planting. Sufficiently high trees however might make some improvement.

MR. TOOGOOD: The present condition of Nairobi is conducive to the spread of disease ?

DR. BURKITT: Yes, admirably so. That is, the township as a whole.

Referring to the Indian Bazaar, which he said was the greatest sore, he found that as many as 75 (D) Bazaar.  
people were living in one house alone, i.e. a shop with background. Some rented a square  
yard of a verandah and paid Rs. 5 per week for it.

MR. TANNAHILL asked what the result of overcrowding was.

DR. BURKITT said that it was not good for health. It was also common knowledge that when one  
went into the Bazaar at say 6 o'clock in the morning and asked to get into a shop, he found that  
the eatables were all covered with recumbent bodies of Indians sleeping on the foodstuffs.

MR. NEWLAND asked whether Dr. Burkitt had ever seen that himself.

DR. BURKITT replied that he had never been down there himself at that hour. With regard to the Indian  
Bazaar, he had asked questions of Europeans in the vicinity and had been told it was of quite (E)  
frequent occurrence for night-soil boys to spill the night-soil into the open drains. So long as  
they had the open drains he did not see how that was to be stopped. Then again there was the  
present system of cement tanks, connecting with closets by little drains. The whole being open  
led to enteric. With regard to the houses themselves, he thought they could hardly be  
termed houses. Whoever erected them had not had the slightest idea of ventilation. How  
Indians lived there he did not know. In dealing with an ignorant population they had to  
be treated as children. Clean or cleanable roads were necessary: a drain should be put at each  
side; this should be kept clean, and the only way to keep it clean was to have it made of  
cement and kept flushed.

- (A) DR. ROSS asked what Dr. Burkitt had to say regarding sanitary lanes at the side.  
„ BURKITT replied that with every lane, every road, every street the chief aim should be that the prevailing wind should go through it.  
MR. TANNAHILL : If the streets were at right angles ?  
DR. BURKITT replied that in that case the streets should be made as wide as possible. He could not name a minimum width : that depended on conditions.  
„ ROSS : From the point of view of inspection the wider you make the streets the better ?  
„ BURKITT : Yes.  
MR. TANNAHILL asked whether the sun had any effect.  
DR. BURKITT replied that in the case of a number of diseases the microbes died in the sun, while some microbes thrive if kept in the shade. There was quite a number of these diseases ;
- (B) cholera was a very marked one.  
MR. TOOGOOD : As living in a business centre, removal of the Bazaar would be better for the European community from a health point of view ?  
DR. BURKITT replied that if it was situated on a higher elevation it would be much better. He thought it was most detrimental to the public health that Indians should be allowed to live in their business premises.  
MR. TOOGOOD asked whether the bazaar was a menace to the health of Nairobi.  
DR. BURKITT : Yes, it is.  
MR. TOOGOOD asked whether Dr. Burkitt thought it would continue to be so if confined to business purposes only.
- (C) DR. BURKITT replied that that question depended on the summary powers of the Municipal Council, so that every house erected and every room made should be under their control. If that were the case, he did not see why it should be.  
THE CHAIRMAN : Your opinion is that if the Municipality had full powers they could make the town sanitary ?  
DR. BURKITT : Yes, with the bazaar as a residential area removed.  
MR. TOOGOOD suggested that the number of natives coming into the bazaar would increase notwithstanding the fact that they could not live there. Under these circumstances the bazaar would continue to be the business centre.
- (D) DR. BURKITT said that from a health point of view that was not advisable if one looked forward to the future.  
DR. ROSS asked whether Dr. Burkitt approved of the suggestion that there should be another site for a new bazaar and if he thought they should be removed residentially, *i.e.*, shops left and the people removed, one place for living in and another place for the bazaar.  
DR. BURKITT : Yes.  
DR. ROSS : Do you consider that moving the bazaar as it stands and allowing people to live still in their shops would be doing any great good ? (It depends of course on where you move it.)  
DR. BURKITT said that the character of the Indian was such that the same state of affairs would be reproduced if they were allowed to live in their shops.
- (E) DR. ROSS asked whether Dr. Burkitt was of the opinion that Indians should not be allowed to live in their shops whatever happened.  
DR. BURKITT : Yes, that was essential.  
MR. TANNAHILL : With regard to the new bazaar site mentioned in that the Williams scheme (by the Sikh temple), supposing that site were cleaned, would it make a better site for shops ?  
DR. BURKITT replied that it might. The gradients were better, which was a very important matter.  
THE CHAIRMAN referred to Agra where, he said, the shops were shut up and the people resided elsewhere.  
MR. TOOGOOD asked whether Dr. Burkitt knew of any more fever breeding places in Nairobi.  
DR. BURKITT referred to the lane between Hardinge Street and Government Road. The smell there was due to open drains.
- (F) MR. TOOGOOD pointed out that it was at one time intended for a sanitary lane, but now houses were being built fronting on it.  
DR. BURKITT said that it was overshadowed by Government Road and the wind could never get into it. Luckily the prevailing wind here was from the south-east. Hardinge Street, properly built, should have its back premises looking towards the Post Office.  
MR. NEWLAND asked what suggestions Dr. Burkitt had to make in regard to buildings.  
DR. BURKITT said that, with regard to shops, the walls should be made of stone; they should be properly ventilated for a tropical country, and plans of every room and every house should be submitted to the Municipality; the house should be allowed to be inspected by a sanitary inspector at any moment, and the sanitary inspector should know the rules of ventilation in a warm climate. Referring to plague, Dr. Burkitt said that this primarily was a disease of rats and



was carried by the rat ; therefore they had to do away with the rat. The most efficient means for doing away with rats were cats and cement floors and keeping the place clean. All buildings should be rat-proof. (A) Plague.

MR. TANNAHILL referred to the "chawls" or model dwellings which had been erected in India and were supposed to fulfil all conditions, which when plague came were found to be inefficient.

DR. ROSS said it was due to the habits of the people living in the houses.

MR. NEWLAND asked what regulations would require to be framed, if it was not practicable to remove the bazaar as a business centre, to cleanse the bazaar.

DR. BURKITT said that all the inhabitants could not be put into the bazaar under hygienic conditions. The surplus must therefore be removed. (B)

MR. TOOGOOD : Supposing the buildings were altered ?

DR. BURKITT said he thought he would not have doubled-storied buildings. It would mean that the ceilings and floors were made of wood, and that would not be so sanitary as cement floors.

THE CHAIRMAN : If concrete floors and ceilings ?

DR. BURKITT said that of course then there would be no objection except that the double-storied buildings would cast a big shadow and would break the wind.

MR. TOOGOOD asked what Dr. Burkitt meant by ventilation.

DR. BURKITT replied that ventilation meant an outlet at the highest point and an inlet at the lowest point.

THE CHAIRMAN asked Dr. Burkitt whether he knew of any other insanitary spots. (C)

DR. BURKITT instanced all the public latrines. The ground on each side of 6th Avenue was all a marsh. He happened to be down lately inspecting the Y. M. C. A. He found that there the authorities prosecuted owners of houses which had not gutters, but took no account of where the water was to run.

MR. TOOGOOD asked whether Dr. Burkitt considered that 6th Avenue was in an insanitary condition.

DR. BURKITT : Yes. He also said that every house in River Road was insanitary. The Railway landi houses were most filthy, the ventilation being exceedingly bad.

MR. TOOGOOD referred to the new police huts which had been white-washed, and asked if those were bad.

DR. BURKITT said he had not been inside them. (D)

MR. TANNAHILL asked what Dr. Burkitt thought of them.

DR. BURKITT said that the houses appeared to be good, but the site was bad. He found the other day that the expensive cement drains draining the Police and Native Location sites had no flow at all.

MR. TOOGOOD asked whether Dr. Burkitt considered that the condition of River Road was bad.

DR. BURKITT : Yes.

MR. TOOGOOD asked whether it required a properly constituted Municipal Council to deal with these matters.

DR. BURKITT agreed. He considered that the Municipal Council should be given absolute authority and summary jurisdiction : that was the only remedy. (E)

THE CHAIRMAN asked what Municipal area Dr. Burkitt would propose.

DR. BURKITT : The whole of the present area and any other areas in which it might be thought fit to locate Natives or Indians.

THE CHAIRMAN : Would it not be rather expensive ?

DR. BURKITT said that as regards the outskirts of the town, cutting down jungle and keeping it down would not cost much.

DR. ROSS : Would not the rates have to be kept up ?

DR. BURKITT : Supposing the place was not under the Municipality, and disease occurred, and the disease affected the town, would it not be advantageous to have that place under control ?

MR. NEWLAND pointed out that the Municipal area could not be extended indefinitely, and asked why Dr. Burkitt preferred Municipal to Government control. (F)

DR. BURKITT said that apparently the Government had done nothing. He thought that a Municipality was the best way of doing it. There would be a continuity of policy. Irresponsibility was written large all over Nairobi.

MR. NEWLAND, referring to public latrines, asked whether Dr. Burkitt considered them adequate. DR. BURKITT said that he had gone to see all the public latrines except one, and had found that by the middle of the day they were absolutely full with the exception of one at Ainsworth Bridge, which was hidden away in the jungle, and great difficulty was experienced in locating it, it having been covered up with grass. The buckets had evidently not been used for months. With regard to a system, he would have a boy stationed at each latrine with a shovel, and have earth put over. At present infectious faeces were in contact with flies all day long. He also said that more latrines were urgently required. The type was satisfactory. Public Latrines.

- (A) MR. TOOGOOD asked Dr. Burkitt what his recommendations were with regard to boys on private premises where there were no latrines at all.
- DR. BURKITT said it was most important that there should be latrines. Indians and Natives got typhoid into them: that was, the Indian or Native was a carrier.
- MR. TOOGOOD said that the P. M. O. had said that people coming in from infected parts, especially Indians and Natives, were the cause of malaria.
- DR. BURKITT said he agreed with the P. M. O.
- Malaria. MR. NEWLAND asked what action Dr. Burkitt would take with regard to malaria. Would he make notification compulsory?
- DR. BURKITT: Yes. The mosquito was merely a carrying agent. The infected person was the source of the disease, and therefore to destroy malaria they could do two things: either make the infected person uninfected, which could be done by isolating him, treating him with quinine and not releasing him till certified as uninfected, as was compulsory in South America: or they could kill the carrier. The carrier was an insect which laid its eggs in water and passed through three stages. It generally took from a fortnight to a month (depending on temperature) before the egg could become a mature insect. This particular mosquito bred in clean water, not dirty. The water had to be quiet, and the egg must not get dry: if it got dry, it would die. From those premises they could draw conclusions. Gutters probably were the greatest danger of all, gutters which had not the proper slope. These mosquitos bred in still clean water, as *e.g.* in water tanks, and especially in still clean water which had grass round the edges. Jungle was a hiding place for the mature insect. Any shady place, if not windy, would do. Badly ventilated rooms, creepers round houses, and jungle, and even forestshade without jungle. He would mention that a malaria carrying mosquito had been known to fly 500 yards, but the vast majority lived immediately round the premises. The mosquito hatched out in from 7 to 10 days at quickest. Therefore the water which was allowed to lie only for a day was not dangerous.
- (B)
- MR. TOOGOOD: Under present conditions of affairs do you think malaria on the increase?
- DR. BURKITT said he could hardly say. He had not been in Nairobi long enough. There was a lot of malaria in Nairobi, and there was no reason why it should not increase. There was every possible facility for it increasing. Under the present conditions he thought that it would increase.
- (C)
- Notification. MR. TANNAHILL referred to the question compulsory notification of malaria. He understood that private practitioners would require to receive a fee for each notification.
- DR. BURKITT said in his opinion the practitioner should not get any fee, but rather that he should be fined £25 for not reporting a case. He thought that malaria was a highly infectious disease and ought to be notified.
- MR. TANNAHILL asked whether there were any objections to notifying the disease.
- DR. BURKITT: Not on the part of doctors.
- MR. TANNAHILL asked whether Dr. Burkitt would have any objection to an Act being brought into force compelling notification.
- DR. BURKITT: I would not consider any objections. Referring to the question of Indian and Native housing, Dr. Burkitt said that he was very strongly of the opinion that every race should live in separate quarters, both from a moral and from a hygienic point of view. For a Native Location the site near the Police Lines was out of court, because of the levels. The first law in dealing with the native was not to allow him to live near a river, and if he was living near a river to prevent him from getting into it as he would undoubtedly infect it. Cholera was found to go up stream, being carried by fish, and might be spread in this manner.
- MR. TOOGOOD asked whether Dr. Burkitt knew the present native settlements and the conditions under which they existed; there was practically no control. Did Dr. Burkitt think that was a bad state of affairs?
- (F)
- DR. BURKITT: I do.
- MR. TOOGOOD: And it should be altered?
- DR. BURKITT: My idea is segregation under proper control.
- MR. TANNAHILL referred to Dr. Burkitt's statement about cholera going up stream. Why was that, a menace to the Nairobi River? It had one or two dams and one or two waterfalls which would prevent the fish getting up.
- DR. BURKITT replied that it would depend on the jumping power of the fish.
- DR. ROSS: Cholera could also be carried down stream by faeces?
- DR. BURKITT: Yes.
- (G) MR. NEWLAND asked whether the present site of the Infectious Diseases Hospital was safe for the purpose, lying as it did to windward of the town.

DR. BURKITT said that he thought that the only disease that was air-borne to any extent was Small-pox which was known to have been carried 400 yards. Any windy place sufficiently distant from the town would be satisfactory for quarantine purposes. (A)

MR. TANNAHILL asked whether Dr. Burkitt would be prepared to consider the present Nairobi Infectious Diseases Hospital site as a native location.

DR. BURKITT said it would be a very good site provided the river was protected and a proper water supply laid on.

As to water supply, Dr. Burkitt said that the most important thing was the incontaminability of the Nairobi water supply. If it was incontaminable, that practically eliminated disease to a very large extent and saved a lot of trouble. He had not been up as far as the source, but he had cross-examined persons who were capable of giving an opinion and they had told him that the source was not incontaminable by any means. They had also told him that the amount of water could be enormously increased. What he had seen with his own eyes was where the flow of water was broken, that was above the Nursing Home. The point where the water supply came into the open should be very strictly preserved as the lives of all the inhabitants depended upon that point. Every source of contact should be done away with. Nobody should be allowed into it on any consideration, and the person in charge of it should be above suspicion. With regard to the Waterworks, anybody could go in. He had been up there and had seen as many as 40 or 50 natives lying about, and he had been there several times without being asked a question. In any civilised country a person could not possibly enter such a place. (B)

MR. NEWLAND asked whether the water could be contaminated at that point. (C)

DR. BURKITT replied that it could because there were one family and a bachelor living there, also a boy. These were the official persons on the premises. There was a W. C. there. Any body could climb over the Waterworks fence. The surrounding ground was practically jungle, both inside and outside: in other words, he presumed that natives frequently evacuated themselves there.

MR. TOOGOOD: Do you recommend that the time has arrived when the Nairobi Water Supply should be under Municipal Control?

DR. BURKITT: I do.

Referring to the proposed East Africa Township for Indians, (not a business but a residential quarter), witness said that provided it was not too far out from the town he considered it an excellent site. (D)

DR. ROSS: What about its sanitation?

DR. BURKITT said that the location was between two rivers, and sewage could be easily run into either or both.

DR. ROSS asked whether Dr. Burkitt had any temporary measures to recommend for the sanitation.

DR. BURKITT said that if there was no water flushing system there was no alternative but the bucket system, with a trenching ground. He recommended Municipal control: they should see that ventilation of buildings and sanitation were all up to date.

DR. ROSS said that at present the land was outside, under no control whatever, and the Municipality would hardly take the responsibility of dealing with it unless they had control. Some temporary measure was wanted. (E)

DR. BURKITT said that he thought the location would be part and parcel of Nairobi, and the Municipality should certainly have control. It might be possible, if there was a sufficient number of intelligent and responsible Indians, for them to form a Municipality of their own temporarily: but he did not think it was possible.

MR. TOOGOOD referred to the continual cry of 'no money.' In view of the growth of Nairobi money should be forthcoming to carry on control of sanitary matters?

DR. BURKITT replied that money should and must be forthcoming.

MR. NEWLAND asked what the result would be if money was not forthcoming. (F)

DR. BURKITT said he did not think that any European should live in Nairobi.

MR. NEWLAND: If something is not done in the immediate future?

DR. BURKITT said that Nairobi would become worse that it was at present, and at present it was about as insanitary as it could be. The responsibility of carrying on Nairobi was a serious one.

MR. TANNAHILL, referring to the financial question, said that one of the P. M. O.'s points was that it was practically impossible to get a water-borne sewage system in Nairobi and that the P. M. O. had suggested a open drainage system with a flush. Could that be recommended?

- (A) DR. BURKITT said he thought it would be incomparably worse than a system of closed drains. If the Nairobi water supply were 10 times increased, as a matter of argument, he thought it might do. It was all a matter of water. At the same time, where they had a mixed population, it was very much better to have all closed drains. The state of 6th Avenue was very bad and the more houses went up the worse it would become. He must lay emphasis on the fact that strangers coming into the town knew nothing about hygienic conditions. The public should be instructed regarding houses. The white man in East Africa was nearly as bad as the Indian as regards his ignorance of hygiene, and the best way of instructing him was to have a Municipality with powers to fine. Another point was that the health of a European was greatly affected by housing. Government houses as well as private were at fault. It was a great pity that with regard to the health of Nairobi the primary laws of ventilation had not been studied. In almost every instance these were infringed. Plans of all houses should be submitted to the Municipality. The existing Building Rules were quite inadequate. Iron buildings were most objectionable and dangerous, especially to children, who suffered from the sun, not necessarily from heat. Iron was of no value in keeping out the sun unless it was at a great height. It could not compare with wood, tiles, or thatch. Thatch above iron would be best, with 6 inches between.

(B)

MR. TANNAHILL asked for an explanation of the summary powers with which witness desired the Municipality to be invested.

- (C) DR. BURKITT said that no further evidence than the Inspector's should be necessary to secure a conviction; in India the Magistrate did not listen to rebutting evidence.

#### RE-EXAMINED ON 3RD MAY.

(PRESENT :—HON. MR. H. B. TAYLOR, (CHAIRMAN), HON. MR. V. M. NEWLAND, DR. ROSS, MESSRS. TANNAHILL, TOOGOOD AND WOOD).

Bazaar.

- (D) Question by MR. TOOGOOD as to whether he considered it better to remove the Bazaar both as a residential and a commercial quarter, or to remove residents from it and leave it a business quarter, witness stated that after further consideration he was decidedly of opinion that it would be a better plan from every point of view to leave it as a commercial quarter. If the Municipality had supreme power and made such sanitary regulations as were required, things would right themselves. The small man would eventually leave and go to the Indian Location. If there was a Bazaar there, the small man would go where there was most business for him. Removal of the entire Bazaar would be unfair to the better class Indian merchant. It would be suppressive of ambition. If the Bazaar was a purely commercial area it would not be a danger to public health.

MR. TOOGOOD asked if it was not important to make the town as good as possible from a European point of view, and whether as a matter of town-planning the Bazaar was not an obstacle to this.

DR. BURKITT replied that he could not see that there would be any harm if the Municipality enforced regulations against habitation of the premises. There were just as good Indian as European shops in Bombay and Calcutta.

- (E) MR. TOOGOOD suggested that the Bazaar depended upon the native trade.

DR. BURKITT replied that he understood that a separate Indian Location was proposed which would drain off the smaller man.

MR. TOOGOOD suggested that it was of great importance to keep the native trade away from the heart of the town.

DR. BURKITT thought rents would be so high there that it would not pay to cater for the native trade. The Bazaar would become a European shopping centre. The small man would not stay there as he could not sleep on the premises.

MR. TOOGOOD asked whether witness thought the locking up of shops at night would drive the small man out of the Bazaar. The big merchant was his creditor and liked to have him under his eye.

(F)

(See Mr. Grogan's evidence, p. 40.)

DR. BURKITT said that the Municipality could do much in this direction. They could compel the shops to be large enough and they could refuse to allow sub-tenants. The prevention of Indians from living on their business premises would go far to rectify hygiene. Mr. Grogan's scheme was not bad so long as Indians were not allowed to live in their shops.

Witness wished to lay more emphasis than before on the necessity of having different quarters for the different races. Experience in China, Malay, South America, etc., proved that everything went wrong where races were mixed up. It was a law of anthropology that the more distinction there was the better it was for all parties.

MR. TANNAHILL asked if witness approved of Victoria Street as a dividing line between Indian and (A) European areas.

DR. BURKITT said his point was that the residential areas must be distinct. He was opposed under any circumstances to Indians living in their shops. In the Indian location they might perhaps be allowed to live in houses to which shops were attached : but it would be best if shops and houses were kept quite apart. Even in the Indian Location it would be best to have a concentrated shopping centre, locked up at night.

MR. NEWLAND mentioned Mr. Grogan's proposal that there should be a neutral zone between the Indian and European quarters. (B)

DR. BURKITT replied that there would be little risk in this if the Indian was not allowed to live in the zone. This could be effected by making non-residence a condition of transfer.

In reply to Mr. WOOD, witness stated that houses should not be allowed in the flat of the swamp because the surroundings were saturated with water.

If an Indian Location was to be established it would be desirable that the sewage system and water for it should be fixed up and some town planning done first.

Witness wished further to emphasise the necessity for wider streets. There was 10 per cent less oxygen here than in other towns and more air spaces were required. The lane behind Hardinge Street was as insanitary as possible because all air was kept out of it. The space between the drain and the houses in that lane should be cemented. He thought the streets should be laid out east and west so as to catch the wind. The present system of sanitary lanes could only be tolerable if back doors only were allowed upon them. (C)

Witness had inspected Kikuyu Reservoir recently on a wet day and found that the road was a river the water from which ran underneath the iron fence and over the containing wall into the reservoir. There should be a surrounding drain to carry off surface water inside the iron fence. At present there was typhoid in Kikuyu and infectious defecations were liable to be carried into the Nairobi Water Supply. Water.

*(The Chairman gave orders on the spot for witness' recommendation to be carried out).*

Questioned as to the pathological effects of zinc, witness stated that little was known about its toxicology, but apparently it was not very toxic. He had consulted a text-book by an authority (Hale White) on the subject and found that the cases reported were probably due to arsenic, lead and antimony. A prolonged administration of zinc would give symptoms resembling those of lead poisoning. Zinc in Water Supply, (see Mr. Kirkham's evidence, p. p. 23-32.)

Zinc was sometimes prescribed as a tonic in doses of 2 grains taken thrice daily. Nairobi Water Supply contained hydrochloric acid in the proportion of 4 to 10,000. Zinc was very soluble in acids. Nairobi people were drinking 2 parts of zinc to 10,000 of water. To absorb 2 grains of zinc a man would require to drink 10 pints of water daily—a quite abnormal quantity. 2 grains of zinc a day were not a poison—at least it was highly doubtful if that amount could be considered poisonous. Pure zinc is not a commercial article except at exorbitant prices. Commercial zinc contains arsenic, lead and antimony. Witness understood Mr. Kirkham (the Analyst) had only tested for pure zinc. The effects of arsenic and antimony upon the system were cumulative. (E)

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3. T. J. ANDERSON, ESQ., B.S.C., F.Z.S., F.E.S., *Government Entomologist.*

EXAMINED ON 12TH MARCH, 1913.

(PRESENT :—HON. H. B. TAYLOR, (CHAIRMAN) HON. V. M. NEWLAND, DR. ROSS, MESSRS. TANNAHILL AND TOOGOOD).

- (A) **Mosquitoes and Malaria.** MR. ANDERSON, called and sworn, handed in the list of Mosquitoes appended hereto, found within the Municipal area. Three of the species were malaria carriers, one carried elephantiasis and it was thought that mosquitoes carried horse sickness. Malaria carriers were found all over Nairobi. As to breeding places, there were several particular spots, the ditch behind the Magistrate's house, a place behind the Indian Temple, &c. The ditch alongside the Y. M. C. A. was the worst of the lot. His opinion was that mosquitoes bred in any kind of water, dirty or not. This certainly was the case in Nairobi. The Nairobi River was not much of a danger owing to the presence of fish. As regards jungle, it was no use clearing bush unless there were water holes in it; bush only harbours and does not breed mosquitoes. Mosquitoes never flew high, consequently high trees would not be likely to harbour mosquitoes. If the water was cleared away there would be no mosquitoes, and it would not matter what was planted. It was his experience that anopheline mosquitoes seldom bred in rain water tanks, though the Culex did. Mosquitoes were chiefly found breeding in the gutterings of houses. These gutterings were not level; they sagged in places and as the water was shaded, it did not evaporate quickly and remained sufficiently long for larvæ to attain full development. He thought that mosquitoes were on the increase in Nairobi, but was not in a position to say whether anophelines were on the increase as he had only collected for a year. There was no reason why they should not increase as conditions were favourable to their breeding. The breeding places must be got rid of, and control had to be assumed. The actual number of malaria carriers was enormous, though only three of the species were known carriers.
- (B) It was not known how long a mosquito could live as they were difficult to keep in captivity. Anopheline mosquitoes had been proved to travel as far as  $\frac{3}{4}$  of a mile or a mile. Some of the worst breeding places were just outside the Nairobi area. He had not found mosquitoes in banana plants. June, July and August were the worst months of the year for mosquitoes. As regards the Municipal Mosquito Rules, he did not think they could at present be enforced. The Rules should be made compulsory; it was no use leaving it to the individual householder. Mosquitoes could be hatched out, from egg to adult, within 8 to 12 days. It all depended on the weather, temperature, &c. Malaria carriers took about a fortnight to breed.
- (C) **Flies** As regards flies, the conditions were very favourable for the breeding of house flies. The usual breeding places of flies were dung, stable-manure, bins, &c. The fly generally took a week to hatch; it varied with the different species. Stables should be properly controlled, and dung removed in fly proof bins. If it was impossible to remove the manure, iron sulphate should be sprayed on it. The Bazaar was a place where flies could get infection. Flies followed natives a very long way, and natives brought them into town with them. A fly lived longer than a mosquito. It was a carrier of ophthalmia, as well as of typhoid. The open drains in the Bazaar would be good sources of infection.
- (D) **Fleas and Plague.** Plague was carried by a flea which was not the common flea. The flea was carried by rats. As regards plague, iron buildings as compared with stone made little difference.
- Typhoid.** As regards typhoid, the night soil would be a source of danger, if it was not buried in a deep hole. He had seen cases of mosquito larvæ coming through a Nairobi water pipe alive. He had never seen the source, but it was clear that they must breed there. If Nairobi was going to be cleared, it should be done thoroughly. It should be cleared once or twice in the worst months and then the responsibility put on the householder. Where the holes could not be filled up, oil should be used and sprayed on the pools: the effect of this would last for a fortnight. A white man in charge of a gang of 30 boys could do this work. This matter called for immediate attention. If bush was also to be cleared more boys would be required. He would advocate its clearing unless the native could be controlled, as a preventive of typhoid rather than malaria, since the mosquito would harbour somewhere in any case. He advocated the up-rooting of bush instead of cutting it. Empty cans and bottles and even hoof marks of oxen were sources of danger. Black soil compared with red was more conducive to mosquitoes and flies; he mentioned Jeevanjee's stables as an example, and stated that the pools round 6th Avenue were also dangerous. The Duke Street area was bad because of lack of drainage. All three types of malaria were prevalent in Nairobi, and the worst type was the most prevalent.
- (E) The state of the Town, as regards mosquitoes, flies and their breeding places was disgraceful. Given the source of infection there might well be a bad epidemic spread by the agency of the ordinary "House fly."
- (F) Unless stringent measures were adopted at once matters would most certainly become worse.

## List referred to in the foregoing evidence.

*From within the Nairobi Area.*

Anopheles christyi, Theo	...	...	...	4, 5, 7, 8	6	(A)
„ costalis, Lw.	...	...	...	4, 5,	2	
„ funestus, Giles.	...	...	...	4,	1	
„ marshalli, Theo.	...	...	...	5, 8	2	
„ mauritianus, Grp.	...	...	...	5, 8	4	
„ „ var.	...	...	...	4,	8	
„ rhodesiensis, Theo.	...	...	...	4,	1	
„ squamosus, Theo.	...	...	...	4, 5, 8	3	
„ transvaalensis, Carter.	...	...	...	4, 5, 8	4	
Banksinella luteolateralis, Theo.	...	...	...	4, 5, 8	4	
Stegomyia fasciata, F.	...	...	...	4, 5, 8	5	(B)
„ poweri, Theo.	...	...	...	4, 5,	4	
Ochlerotatus quasiunivittatus, Theo.	...	...	...	4, 5, 7, 8	8	
Taeniorhynchus fuscopennatus, Theo.	...	...	...	4, 5, 7, 8	5	
Culex annulioris, Theo.	...	...	...	4, 5, 7, 8	5	
„ decens, Theo.	...	...	...	4,	2	
„ invidiosus, Theo.	...	...	...	4,	5	
„ ornatothoracis, Theo.	...	...	...	4, 5, 7, 8	1	
„ pipiens, L.	...	...	...	8	4	
„ palidocephala, Theo.	...	...	...	4, 6,	1	
„ zombaensis, Theo.	...	...	...	4, 5, 7, 8	14	(C)
„ rima, Theo.	...	...	...	4,	1	
„ salisburyensis, Theo.	...	...	...	4, 8	4	
„ simpsoni, Theo.	...	...	...	4,	2	
„ stoeheri, Theo.	...	...	...	4, 5, 7, 8	9	
„ tigripes, Grp.	...	...	...	4, 8	3	
„ tipuliformis, Theo.	...	...	...	4, 8	6	
„ univittatus, Theo.	...	...	...	4, 5, 7, 8	13	

*Groganville.*

Anopheles christyi,	...	...	...	...		(D)
„ costalis	...	...	...	...	F, M.	
„ funestus	...	...	...	...	F, M.	
„ marshalli,	...	...	...	...		
„ mauritianus, et var.	...	...	...	...	M	
„ squamosus,						
„ transvaalensis,						
Banksinella luteolateralis,						
Stegomyia fasciata						
Stegomyia poweri,						
Ochlerotatus quasiunivittatus,						(E)
Taeniorhynchus fuscopennatus,						
Culex invidiosus,						
„ zombaensis,						
„ salisburyensis,						
„ stoeheri,						
„ tipuliformis,						
„ univittatus,						

*Parklands.*

Anopheles costalis,	...	...	...	...	F. M.	(F)
Banksinella luteolateralis,						
Stegomyia fasciata,						
Stegomyia poweri,						
Ochlerotatus quasiunivittatus,						
Taeniorhynchus fuscopennatus,						
Culex palidocephala,						
„ tigripes,						
„ univittatus,						
„ grahami.						

NOTE.—The figures *e.g.*, 4, 5, 7, 8 refer to the months in which the species was found most prevalent.  
The last column of figures indicates the number of localities, within the Municipal area, where these species were collected.

- (A) *Nairobi Club, Hill.*
- 
- Including the houses of : The Club.  
 Dr. Ross.  
 Town Magistrate.  
 Mr. Stordy.  
 Mr. MacDonald.
- Anopheles mauritianus*, ... .. M  
*Anopheles squamosus*,  
*Anopheles transvaalensis*,  
 (B) *Stegomyia fasciata*,  
*Ochlerotatus quasiunivittatus*,  
*Taeniorhynchus fuscopennatus*,  
*Culex annulioris*,  
 „ *decens*,  
 „ *invidiosus*,  
 „ *ornatothoracis*,  
 „ *pipiens*,  
 „ *zombaensis*,  
 „ *rima*,  
 (C) „ *stoeheri*,  
 „ *tipuliformis*,  
 „ *univittatus*.
- 
- Houses of :—Mr. Jackson,  
 Mr. Harrison,  
 Mr. Gower.
- 
- Anopheles christyi*  
*Anopheles mauritianus* ... .. M  
 (D) *Taeniorhynchus fuscopennatus*,  
*Culex annulioris*,  
 „ *ornatothoracis*,  
 „ *zombaensis*,  
 „ *salisburyensis*,  
 „ *stoeheri*,  
 „ *tipuliformis*,  
 „ *univittatus*.
- 
- Hospital Hill.*
- 
- (E) Including the houses of :—  
 Mr. Thomas,  
 Mr. Martin,  
 Mr. Allsopp,  
 Mr. Battiscombe.
- Anopheles marshalli*,  
*Anopheles mauritianus*, et var. ... .. M  
*Banksinella luteolateralis*,  
 (F) *Culex annulioris*,  
 „ *ornatothoracis*,  
 „ *pipiens*,  
 „ *zombaensis*,  
 „ *salisburyensis*,  
 „ *simpsoni*,  
 „ *stoeheri*,  
 „ *tigripes*,  
 „ *tipuliformis*,  
 „ *univittatus*,  
 M.—*Malaria carrier*.  
 F.—*Carrier of Filariasis which causes elephantiasis*.



4. Dr. J. A. HARAN, C.M.G., M.B., B.CH., (DUBLIN) M.D., (DUBLIN), *Deputy Principal Medical Officer.*

EXAMINED ON 13TH MARCH 1913.

(PRESENT:—Hon. H. B. TAYLOR, (CHAIRMAN), Dr. ROSS, MESSRS. TANNAHILL, TOOGOOD and WOOD.)

DR. HARAN, called and sworn, said he did not think that the present sanitary position of Nairobi was very good. This he attributed in the first instance to insufficiency of the Building Rules. More stringent rules should be passed with a view to allowing of insanitary areas being dealt with. Two years ago, when Plague broke out, buildings had had to be specially erected to accommodate persons displaced. He did not know whether these persons returned to the Bazaar after the conclusion of the outbreak. The Bazaar, as also the River Road area, seemed to be very heavily populated and overcrowded, and the overcrowding had increased liability to epidemic disease enormously. Overcrowding was a factor in the spread of disease. At home, they found that there were certain regulations prescribing the distance—open space—to be left in front and at the rear of buildings. That was not done in the Bazaar. He thought the plan of the Bazaar was that back quarters should abut on sanitary lanes, that a defined space should exist between main buildings and outhouses, and that there should be a certain distance between each plot. Asked if he recommended any specific width of passage between bazaar houses, witness said all passages should be properly paved and drained. (A) Bazaar—Plague.

Wider passages would be better, but they could not be spread out indefinitely. Faulty buildings would harbour rats. He had seen rats in the Bazaar taken from under the floors. This was mainly due to badly laid stone setts. The proper storage of food-stuffs would have a beneficial effect. He attributed the small number of cases of plague during the past two years to the fact that inoculation had been practised and had reduced the number of cases. (B)

Witness had had some experience in dealing with plague. A first step to take was to have the place disinfected, that was within a certain area called the infected area. The place had to be proclaimed infected. Anyone could enter the infected area, but coming out was a different matter. The usual practice was to put them under observation and disinfect their belongings, &c. (C)

MR. WOOD: Do you consider that a wire fence is a sufficient precaution for quarantine? Was it a fact that during the last outbreak in Nairobi people went in and out as they liked through the fence?

DR. HARAN said he was not quite clear about it.

MR. WOOD asked whether it would not be safer if the people were put away in a camp.

DR. HARAN said that in small outbreaks it was not necessary to remove the whole population; it was only necessary to remove the contacts and put them in a place under observation. The actual cleansing was done by those under the orders of the medical officer. The contacts were removed. Asked if he considered the Bazaar a menace to public health, witness replied that conditions there should be rectified: under proper control it need not be a menace. (D)

Removal should be considered as an alternative scheme. More stringent laws in regard to buildings and overcrowding should be enforced. The position could be improved by enforcing laws. The Bazaar could be remodelled to a certain extent, and they could also remove a number of the inhabitants. He considered that buildings should all be ratproof, and that the amount of open space behind should be defined. Sanitary lanes should not be used as highways, and the houses abutting on those lanes should not be inhabited. The minimum width of street should be prescribed so as to give an open space in front of houses. That might mean alterations in buildings. Shops should only be allowed on the main streets. The open spaces between blocks were the means of increasing the air and ventilation. He would recommend open air passages between plots. Six feet would be sufficient, but ten would be better. (E)

MR. TANNAHILL asked whether Dr. Haran thought that any rules could control the lower class of Asiatic.

DR. HARAN replied that it varied with the person to whom they were intended to apply. The better informed the people the better they were able to comply.

MR. WOOD asked whether the Bazaar area could be made clean, by legislation, supposing it was occupied by Europeans.

- (A) DR. HARAN said that it was a question of control, and it would probably cost a great deal.  
DR. ROSS asked whether if the Bazaar were remodelled he would allow the people to live in their shops.  
DR. HARAN said he would allow the people to live in the rooms behind the shops, but not in the shops. The rooms must be well ventilated and separated from the kitchen. The rooms must also be well lighted.  
MR. TANNAHILL referred to a plan of a new building of Mr. Jeevanjee's in the Bazaar and asked whether Dr. Haran considered it a suitable building.  
DR. HARAN said he did not think there was enough space at the back. He would prefer to see the shop cut off entirely. The passages must be lighted, not darkened.
- (B) DR. ROSS asked whether Dr. Haran considered it a good principle having residents in the shops, or whether he would prefer to see the Bazaar as a commercial centre.  
DR. HARAN replied that it would certainly be more desirable to have it purely commercial.  
DR. ROSS asked whether it would be better to remove the residents to a separate place, or whether it would be better to remove the whole Bazaar *in toto*. The ideal thing would be to remove it as it stood and substitute for it two areas, one business and one residential?  
DR. HARAN said that was the ideal. He would insist on the buildings being brought up to a health standard. The residential Bazaar would have to be under control, and the buildings remodelled. If the existing Bazaar was remodelled it would cease to be a plague centre. If a new Bazaar were modelled, and not under sufficient control, it would simply mean shifting of the plague spot. If the Bazaar was not removed but the buildings were remodelled, then the residents who were not concerned with the work of the shops must be cleared out. A fumigator was in use in connection with the last outbreak of plague in Nairobi, and he considered that there should be disinfecting stations here as at home.
- (C) MR. TOOGOOD asked whether, if the plots in the Bazaar were insanitary, Dr. Haran would recommend piece-meal action in the direction of removal, or would prefer to wait till a complete sanitary scheme could be carried out.  
DR. HARAN said he would like to see something done without delay. He would prefer to see wholesale remodelling taking place at an early date. Patching was not remodelling. It would not be advisable to spend money until they were in a position to do the thing thoroughly.
- Enteric. (D) Referring to Enteric, Dr. Haran said that this was very prevalent. It was possibly carried by flies, the Nairobi River, and "carriers." As regards the water supply, he had not heard of any cases arising from that. There was great danger in the disposal of excreta and also in natives easing themselves in the bush. That could be remedied by the provision of latrines and Municipal control to prevent promiscuous defecation. He would advocate the clearing of all bush and undergrowth in the township, because in the meantime it was being used as a latrine. They must have police control, plus latrines. Even though latrines were provided, it would be better to have all bush cleared, otherwise it would be used as a dumping ground.
- MR. TOOGOOD asked whether Dr. Haran considered the present system of removing buckets satisfactory.
- (E) DR. HARAN replied that he thought it was capable of improvement. Water-borne sewage was always the best method. The River Road area was an insanitary one: also that of the swamp, as well as the area behind Victoria Street. It was necessary that 6th Avenue and Hardinge Street should have drains, and the drains all along Government Road ought to be relaid. The area between 6th Avenue and the Bazaar held water, and required draining. The present type of drain was not good.
- Drains. MR. WOOD referred to the drain running past the Post Office from Sadler Street and finishing at the back of the Roman Catholic Church, and asked whether Dr. Haran considered its condition satisfactory.
- DR. HARAN said that he considered that the drain should be prolonged to its outfall. In the meantime it led into an earth drain.
- (F) Referring to the question of a Native Location, Dr. Haran considered that this ought to be established. As regards a site, he understood that a site had been selected beyond the Jail. He had walked over it. A certain amount of drainage existed already, but the ground appeared to be water-logged and would require a certain amount of expenditure. He did not know what the fall was in the drains there. If better soil could be obtained it would be better. As regards a more suitable site, most of the sites round about were in the same condition.
- Native Location. MR. WOOD referred to the ground at present occupied as an Infectious Diseases camp. Would it make a better site? The land could be more easily drained.
- DR. HARAN said that there was more slope, but the approaches were not too good. There was not much to choose as between this and the other site. As regards natives living in town, they should all have to live in locations. Segregation of races was imperative.

MR. TOOGOOD referred to the Somali villages, which he considered very bad, and asked whether (A) Dr. Haran considered the housing of natives an urgent question.

DR. HARAN said that from what he had seen it was an urgent necessity. As regards horses, cows, &c., being in proximity to living houses, there was no question that it was a nuisance. It would encourage the breeding of flies. He would recommend this being covered by a Public Health Act. He would also insist on stringent building rules.

MR. TOOGOOD: Assuming that the money could be found, would you recommend that Nairobi should be under the control of a Municipal Council, or what recommendations would you make?

DR. HARAN said he would recommend that the regulations be revised and new machinery enforced. Sanitary Inspectors would carry out control. It would not matter whether it was Government (B) or Municipal control so long as they had the machinery.

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5. DR. H. A. BÖDEKER, M.B., C.M., GLASGOW, *Medical Officer of Health, Nairobi.*  
EXAMINED ON 13TH MARCH 1913.

(PRESENT:—HON. H. B. TAYLOR (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS,  
MESSRS. TANNAHILL, TOOGOOD AND WOOD.)

Bazaar. (A) DR. BÖDEKER, called and sworn, said that he had been in Nairobi since last July. In his experience the chief trouble lay in the question of sanitation in the Bazaar. A great number of the drains there were defective. They were all shallow and in very bad condition, and he had noticed that the sewage of practically all the latrines went into them, and in times of flood was carried away into the drain leading into Government Road which overflowed over the road. The drains were in need of repair. In flood times the sewage was all over the road chiefly the overflow from buckets. It was not actually sewage effluent, but rather water used by Indians in washing according to their practice of defecation.

DR. ROSS asked how many buckets per head there were in the Bazaar.

- DR. BÖDEKER said that he thought on the average there were about 10 buckets in each plot. That was the maximum number. The maximum number of people in houses in the Indian Bazaar varied from 12 to 15; in certain parts there was an average of 30 people. In one plot or block as many as 75 people would be found living. That was a very bad state of affairs. He had even counted up to 12 beds in one room. There was no means of stopping this. There were rules against it, but it was not considered desirable to enforce them, as if the people were turned out there was no other place for them to go to. He would allow them time to clear out, but accommodation must be provided. He had mentioned all this in his quarterly reports. The general conditions of the Bazaar were very bad, and he would recommend that all buildings structurally defective should be pulled down, and he thought it advisable that the buildings should be used for business purposes only and not as residential quarters. The poorer classes of Indians were the biggest offenders, and he would turn them all out of the Bazaar. In the immediate interests of the whole community he would not recommend the removal of the Bazaar provided the buildings were put up according to regulations: but looking ahead, he would recommend the entire removal of the Bazaar. That was the ideal method and one which they should stick to. The different nationalities should be kept apart—the Africans separate from the Indians. He did not think it was possible to have Bazaar plots remodelled. It would be better to have the Bazaar removed entirely. He did not consider it a good thing to have Indians living in their shops. He would extend that prohibition to every trade. 70 ft. by 25 ft. would be a sufficient minimum space for shops. Even if subletting were abolished and only one family were allowed to live on one plot, he could not recommend retaining the existing Bazaar. It was very difficult at present to control the Bazaar. Control was not of much value with the present construction of buildings but would be practicable if all regulations were strictly observed. Sub-letting was the whole curse and prevented control. He would have it forbidden in any new Bazaar. The buildings were all bad, the foundations being all rotten. The new buildings of Messrs S. Virjie and Sons however appeared to be very satisfactory, as they had taken up the whole space. There were to be residents in the top, and the rooms were large and airy. All plans were under township rules submitted to witness for his approval. As regards buildings which had been put up unauthorised, the M. O. H. had power to recommend that they should be pulled down: but he could not have them actually pulled down. That was for the Municipal Committee. The Bazaar people were most anxious to clear out if there was any other place for them to go to. People had told him that. Regarding cesspools, he would recommend their abolition as early as possible, and that they should not be reproduced in a new Bazaar area. As regards the question of sewage overflow, this could be overcome by putting in proper drains by which it would be carried away into a covered sewer. The latrines at present in use in the Bazaar were not of the proper type. He advocated a water borne system of sewage for the Bazaar provided the sewage could be dealt with at the other end. Little improvement was possible so long as the present bucket system prevailed. In the meantime he was strongly in favour of the double bucket system; but the principal hotels and other large central buildings should be connected with the main sewer under construction.

(F) The public latrines were under the supervision of the Sanitary Inspector, who had recently taken to disinfecting them all with a hand spraying apparatus. The number in use at present was inadequate in proportion to the population. They required a large number

Public  
Latrines.

scattered throughout the town. The town natives used these latrines freely; he (A) had seen large numbers going into them. He would advocate the clearing of all bush areas. The Shamba plots alongside the Nairobi River and in the vicinity of the Slaughter House were insanitary. He had cases of plague and a case of small-pox from there. He had found mosquitoes breeding in standpipes, drains, &c.; they were also fond of breeding in slop water. A special gang of men would be required to carry out the work of removing breeding places. The staff at present under the Municipal Committee was inadequate to the sanitary requirements of the town. He would recommend extended powers. He would recommend Nairobi being a place under the control of a Municipal Corporation; he thought the time was now ripe for that.

Mr. TANNAHILL asked what advantages that would have over Government control. (B)

Dr. BÖDEKER replied that in his opinion things would be done better under a regular Municipality. He considered that disease was on the increase in Nairobi, probably due to increase of population and the insanitary condition of the town. The position was worse than before, and he considered that the rate was abnormal. The mortality during the past four years was as follows :—

1908	236
1909	248
1910	282
1911	326
1912	305

(C)

The population had increased from 13,514 in 1906 to 19,900 in 1913. The number of European deaths was as follows :—

1909	7
1910	8
1911	22
1912	19

He considered that 1912 was a normal year.

As regards notification of diseases, it was compulsory for Government medical officers, but (D) Notification not for private practitioners, of whom there were three in Nairobi. As regards plague, the law compelled notification; but notification in other cases depended simply on the goodwill of the informers. Compulsory notification would be a great help in stamping out disease to start with so that the house could be disinfected. There had been cases of disease breaking out and no notification made.

As regards the water supply, his opinion was that it was very liberal and covered a good distribution of the town. It had been analysed on many occasions, and there was nothing against it except the presence of zinc. There was trouble with one soda water factory due to this. (E) Water.

Mr. TOOGOOD asked whether Dr. Bödeker would recommend that the water supply should be taken over by the Municipality.

Dr. BÖDEKER replied that he considered it would be all right if there was a proper staff.

Dr. ROSS asked whether it was possible to increase the storage of water.

(E)

Dr. BÖDEKER: Yes. The approximate storage capacity was about 100 million gallons; the daily supply was 937,000 delivered into the mains. There were four square tanks each holding 10,000 gallons and one round tank holding 22,000 gallons.

He considered that the old water supply ought to be closed down. The public standpipes in town he did not consider sufficient in number; standpipes inside compounds in such areas as River Road ought to be done away with, as water was wasted. He considered that the standpipe was a good method of distributing water; but the tap system inside houses would be an improvement.

As regards the milk supply of the town, there was no control over it, and no supervision of the distribution from dairies, nor was there any registration. He had reason to suspect the milk supply, but he had no power to deal with it. He would suggest that the milk supply of the town should be under Municipal control and all samples should be tested at a central depot. The Dairies could send in samples bi-weekly, or periodical inspections could be made. A Public Health Act would be a solution of the whole matter. No steps had been taken to introduce a Public Health Act into East Africa: at least he was not aware of any such steps being taken. He considered that the matter ought to be taken up. (F) Milk.

Mr. WOOD referred to a Bill which had been drafted by Dr. Bödeker's predecessor: but Dr. Bödeker replied that he had seen no official correspondence on the subject.

(A) THE SECRETARY explained that this Bill had been submitted to Government. The present position was that the Hon. Attorney General had instructions to draft a Bill.

DR. BÖDEKER (continuing) said that the milk question was urgently in need of attention. It was a danger to the public health.

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FURTHER EXAMINED ON 3RD APRIL.

(PRESENT :—HON. H. B. TAYLOR (CHAIRMAN) HON. B. G. ALLEN, DR. ROSS, MESSRS. TANNAHILL, TOOGOOD AND WOOD.)

(B) In reply to Mr. TANNAHILL, witness stated that all deaths in the township were registered. With regard to sanitary passages, he did not favour passages between plots in such an area as the Bazaar. Passages would lead to insanitary conditions. He could not say whether they were found in Indian towns.

In reply to Mr. TOOGOOD, witness thought sanitary conditions were very bad in European as well as in Asiatic quarters. His power of action was limited to the reporting of nuisances to the Town Clerk, and he had no authority to interfere with the Municipal Staff. He was aware that some of his recommendations would involve expense and that available funds were limited. He had power to take action in cases of large accumulations of rubbish, &c., but considered it generally a matter for the Police.

(C) In reply to Mr. ALLEN, witness agreed that the condition of back premises on the sanitary lane between Government Road and Hardinge street was bad. This was due to exudation from latrines; an alteration in the present system was required. When sanitary cases were taken into court the M. O. H. gave evidence and the Sanitary Inspector also assisted.

Questioned by Mr. WOOD as to the site of the Quarantine Camp, witness stated that its position to windward of the town was a weak point. Small-pox might be carried by wind for a distance of 400 yards.

In reply to Mr. TOOGOOD, witness stated that residents at the back of Victoria Street and River Road did not attend properly to their latrines. A particularly insanitary area was the ground round Agha Raza's soda water factory which was simply a swamp.

6. Dr. W. J. RADFORD, L.R.C.P. LOND., M.R.C.S. ENG., *Senior Medical Officer, Ukamba Province.*

EXAMINED ON 3RD APRIL 1913.

(PRESENT:—Hon. H. B. TAYLOR, (CHAIRMAN), Hon. B. G. ALLEN, Dr. ROSS, Messrs. TANNAHILL, TOOGOOD and WOOD).

Dr. RADFORD having been called and sworn, stated that he would arrange his evidence under (A) the following heads which the Secretary had given him, *viz.*: (1) Condition of Nairobi generally; (2) Segregation of Indians and Africans; (3) Drainage; (4) Public latrine accommodation; (5) Malaria, typhoid and plague.

In reply to the CHAIRMAN, he stated that he was stationed in Nairobi from 1900 to 1907—till June 1904 as medical officer to the troops, and thereafter as M. O. H. He was now senior medical officer in charge of Nairobi and Province. Till 1904 he was a member of the Municipal Committee. He was intimately acquainted with the town.

The condition of Nairobi generally was absolutely insanitary and constituted a grave danger (A) to public health. No system of town planning was apparent, and there was no system of drainage. Houses were defective in form and structure, and no proper attention was paid to alignment of streets. (B) There was a general absence of drains connecting houses with main surface drains. Little or no provision existed for waste water and overflow from standpipes. Generally there was inadequate supervision and control. Disposal and removal of refuse was not thoroughly done. The dumping ground was not defined, and refuse was often found deposited in unauthorised places. Dustbins were found without covers or bottoms. Sanitation of houses and compounds was generally lacking. Overcrowding was general, *e.g.* in Bazaar and on both banks of the river. There was much overcrowding in lodging houses. The number of temporary buildings (of wattle and daub, grass, scraps of tin, &c.) on the river was appalling. He had heard it said that sanitary regulations, *e.g.* as to guttering and waterpipes could only be enforced with difficulty if at all. With this he disagreed.

The chief point he had to emphasise was the lack of control and supervision. From statistics (C) supplied he found that in the last 9 years there had been six medical officers of health and it would be seven within the next month; also 9 Chairmen of the Municipal Committee: this was conducive to absence of control and of the carrying out of a definite policy. The M. O. H. was now generally adviser to the Board, but he most certainly had specified and distinct duties to perform under certain conditions. For instance, if an area was proclaimed an infected area under the Notification of Diseases Act, the M. O. H. had to administer that area. Witness was approached a week ago as to the advisability of the M. O. H. being paid by the Municipality. Regarding the development of Nairobi rather as an Imperial than a Municipal matter, he did not consider this scheme admissible. The M. O. H. here was in relation to the Committee of Nairobi as a M. O. H. under the Local Government Board to a Borough or Township in Great Britain. (D) For general purposes witness did not think it the duty of the M. O. H. to be a Sanitary Inspector. Witness had been told that the application of the Township Regulations has been a failure. He could not admit that entirely: they were enforced without difficulty at Mombasa. He found there was an insufficiency of Conservancy. There was no method of cleansing latrine buckets; they were returned filthy, which was a great danger to the public. Also there was no control of the milk supply. In fact from the Western point of view, the Sanitation of Nairobi did not exist. He could not draw a comparison with what existed in 1907; the town had more than doubled since. On the other hand he found permanent and expensive buildings put up with absolutely no drainage of any sort. There was neither main drainage nor house drainage, and the population had, he believed, very largely increased. The danger to the Community had been more than proportionately increased in the (E) same period, say during the last 6 or 7 years. Against that he suggested that there should be a definite scheme of Town Planning. This was most important. That is, areas for European, Indians and natives respectively,—areas for residential and business purposes, markets, etc. That should be decided at once if not already done. (By Mr. ALLEN)—He believed model schemes could be got from England. Unless there was a definite scheme it was begging the whole question. Then follows the main drain. Mr. Williams' report of 1907 was a result of witness' three years work as M. O. H. in Nairobi. There was not a single point that had not been anticipated in it. For instance, a large road had been made recently and it had been raised some nine inches above the level of the country: artificial lakes had thus been produced which could not have happened if the main drains had been laid down. He regarded the drainage of the town as an imperial matter. The owner of any building, permanent or

(A) temporary, could not be expected to connect with a main drain that did not exist. The Government scheme as laid down was not being carried through. The outfall of the main drain was choked. Even in the surface drains there were bushes 15 inches or more high, growing in between the stones, and drains that had been put down in recent years were cracked and broken. Some in Government Road were choked up with foodstuffs, broken bottles, rags, &c., and had not seen the sweeper's broom for months on end, and this might be avoided by supervision of existing staff. He advocated an increase of Sanitary Inspectors with gangs working under them, under proper supervision, without which African labour was useless; also that there should be a permanent Sanitary Committee, a Sub-Committee of the Town Committee, whose duty should be to carry out Sanitary Regulations. A large Board could not attend to this properly.

(B) Associated with that Committee undoubtedly should be the Medical Officer of Health, as adviser, and all prosecutions should be conducted by the legal adviser to the Committee. A great deal might be done by effective supervision and dividing the Township into Wards, and by stringent building regulations which should be drawn up as to form and type of house, ventilation, internal and external sanitary arrangements, drainage, area, and number of persons inhabiting. Also there must be regulation of the milk supply. Until a complete Public Health Act was introduced there must be a certain lack of coordination between the various enactments, but this was not of vital importance. There were regulations on the statute book that were not operative in Nairobi, e. g. the Mosquito Rules.

Segregation  
of Races.

With regard to the second head, segregation of the Indians, natives and Europeans was not so much desirable as absolutely imperative: there should be special areas in each case. Africans and Asiatic were proved carriers and distributors of disease, their liability to which was fostered by their customs and habits. Malaria was quite the chief cause of the death rate. Indians were particularly susceptible to malaria and plague. They disregarded all sanitary precautions and could exercise no responsibility: but they could be ruled and administered, and that without any hardship. They must be educated by enforcement of Sanitary Rules. Class legislation would not be required: teaching should be universal, and what had been done at Panama and Suakim should be done here. Intimately associated with this was the question of Indian and native locations. Every Indian or native residing in Nairobi and working there was in the opinion of witness essential to the general economy of the place; there were not many loafers; they were all supposed to be workers, and the majority of them were.

(D) There should be definite sanitary areas laid out for native and Indian locations. These areas must be drained, and having regard to the available land areas they would have to be artificially made. Black cotton soil could not be considered a sanitary surface on which to place a large number of natives. It would have to be covered with red earth and properly drained and laid out. They should live in sanitary houses of a sealed pattern and rat proof in floor, walls and roof. The houses should be built so as to allow cleansing, so preventing the necessity of destruction. An area sanitary in all details must be laid out before they were sent to live thereon. Then, and not till then, could the native and Asiatic population be got rid of. To stop overcrowding before the alternative area was ready would be to make things much worse. It was immaterial to witness whether these buildings were built by public or private enterprise. In any case the controlling party must satisfy themselves that they were sanitary before being allowed. There should be a sealed pattern of house, and owners could then come into line.

(E) Witness could conceive of nothing worse than the Indian Bazaar at the present moment; but if it was drained properly and the houses made sanitary he could not see why it should not be used as a non-residential area; he thought nothing could be done with it at the present time without entirely re-constructing it. Questioned as to whether the Asiatic should have separate residential and business areas, Dr. Radford replied that if the two could be dissociated it would be infinitely better.

If the Indian and his family and all dependents were allowed to reside on his place of business sanitation would go out of the door. The Indian Bazaar might be a permanent area, but non-residential. He had been opposed to the site from the start. Foodstuffs should be protected from rats. He recommended a large increase of movable plant for disinfection, as in Bombay and other places, and one or two organised trained gangs with them. Questioned as to the desirability of a building with the ground floor separated from the top floor except for an outside staircase, and with ratproof ceiling, the reply was that if arranged in any other way it would be better.

(F) As to Asiatics and Europeans living over their foodstuffs—the general sanitation regulations of the township should be universally applied, but special regulations could be made for special areas if necessary. This would not be class legislation because it would be in the interests of all concerned.



He was quite opposed to Indians being allowed to live over their merchandise.

(A)

He agreed absolutely with cutting down of bush : even grass should not be allowed to grow more than a foot or so high.

With regard to the fourth head, increased latrine accommodation was needed on the main trunk roads leading into Nairobi and through Nairobi, which would at once necessitate a great increase to the sanitary service. Every latrine should be built on an impervious plinth so as to permit of flushing with water, which should be carried away to a main drain and not allowed to soak into the ground as to-day, when every public latrine was a centre of infection. Until a water-borne sewage was supplied, which would take some years, he advocated a duplicate system of buckets, with dirty ones taken away and properly cleansed ; over and above that the latrine must be an impervious one—not wooden, so as to allow of hosing down. Overflow water must be considered infected water, and good drains provided to carry it away. The number of latrines depended upon the population. 200 public latrines (not buckets) were required, otherwise prosecutions could not be expected to succeed. All grass should be kept down, and it would be better if some areas were brought under cultivation, *e. g.* below Government House, Groganville etc.—until such time as sewage was water borne.

Public Latrines.

(B)

With regard to the 5th head, malaria, typhoid and plague were preventable. Nearly one third of the number of diseases treated in the European hospital was due directly or indirectly to malaria. In 1898-99 breeding grounds were proved to be existing in Nairobi, and the anopheles was found there in 1898. Now there was intermixing of races. Natives came into Nairobi from infected areas such as Embu, and mixed with the Natives and Europeans resident there. Population had greatly increased : there was a lack of drains, and mosquito breeding grounds were to be found in houses as well as compounds. The area of residence was increased. Cannas and other mosquito harbouring plants were common. No provision was made for overflow from stand pipes. He had observed deliberately formed breeding grounds in Nairobi ; he had seen on the Railway Hill water deliberately banked up, in which he had found larvae. The watercourse behind the Treasury had been augmented by the overflow pipe. There was a general neglect of rules and absence of prophylactic measures.

Malaria.

(C)

Malaria was a most serious disease, because it was not only recurrent, but also because it was a latent affection which a new condition would bring to light at any time. Witness emphasised the fact that there was a continual influx of natives known to be infected with malaria. This should not be allowed unless certain things were adopted to safeguard the residents here. There should be a regular dumping ground for natives coming in, who should all be examined and treated with quinine and so on, until they were allowed to move on.

(D)

Typhoid was borne by flies, water, milk and clothing. Typhoid was diagnosed in 1901 and 1902 among the Wakikuyu. Fly breeding must be restricted by greater care in removal of rubbish, etc.

Typhoid.

The safeguarding of the source of water supply was a *sine qua non*, as a carrier soiling water in the catchment area distributes diseases among the whole community. Fly breeding must be restricted by care in the removal of manure, &c. : and for this purpose an increase of the conservancy staff was necessary ; also proper legislation for controlling the milk supply was essential.

Questioned as to "carriers," witness explained that typhoid germs remain active for years in a presumably healthy person, who can thus infect the whole community.

Plague was endemic in Nairobi, outbreaks having occurred in 1902, 1905 and 1906 and subsequently. The Indian is a very susceptible person to plague, and he should reside in rat proof buildings. It is necessary to reside in rat-proof buildings with a further rat-proof portion for food-stuffs. This would make it unnecessary to destroy the whole premises on an outbreak of plague. A large increase of moveable disinfecting plant was required. Trained gangs should be maintained. On an outbreak everything moveable in the house and what was stored in rat proof receptacles should be treated on the spot. A properly constructed building could be treated in one process.

(E) Plague.

Questioned as to whether it would be desirable to make the bazaar a non-residential commercial area consisting entirely of lock-up shops, rat-proof, witness said that the idea was a good one.

Asked if there could be any really satisfactory solution of the sewage question except a water borne system, and whether a water borne system was essential, witness replied that he believed in a water borne system for Nairobi. A double bucket system could only be recommended as a purely temporary expedient until such time as the water borne system was adopted. Septic tanks were liable to break down. With a trench system, solid matter must be separated from the fluid. The ground must be prepared. Experiments had proved that night soil, &c. deposited in shallow trenches in black cotton soil was still offensive after 3 years. The dumping ground should therefore be surfaced with red

Disposal of Sewage, &amp;c. (F)

- (A) earth and systematically brought under cultivation. If there was enough money he would prefer to burn all refuse, night soil and urine, rather than turn it into the main sewer. There had been proposals to carry sewage down pipes into the Athi district, but he could not speak as to the details.

Regarding drains, there must be a continual supply of running water. Channels cut in the earth and not lined are useless and mischievous.

The possible means of disposal of sewage were as follows :—

1st—Water borne system.

2nd—Filter beds : these would require a great deal of supervision.

3rd—Burning.

4th—General distribution over a large area.

- (B) As to the 1st system, that would be making a sewer of the Nairobi River. It was said that the River would purify itself in two miles, but he was not prepared to admit that. In time Nairobi would unquestionably have to dispose of its sewage within its own limits. Even when the sewer system was complete it would be necessary for superficial drains to be flushed with river water. Sewage in open drains was a menace to public health. In reply to Mr. ALLEN, witness considered streams and water furrows should be fenced off. The river should be channelled in masonry. Unlined earth drains were exceedingly dangerous.

- (C) Witness considered the Williams Scheme practical and scientific. It proceeded on correct town planning lines, giving first the areas for the respective races, then the drainage. The formation of locations would be an expensive affair. Areas like the Police site ought to be covered over with a foot of red earth. This was done with the railway track, station yard, and workshop. In a densely populated area such as a native location it would be doubly necessary. The native location site was quite unsuitable in its present state.

Asked with reference to town planning, how he would view proposals to open shops in the residential areas, witness said that generally speaking it was not desirable, but much would depend on how the shops were constructed and conducted. In general, residential and trading centres should certainly be separate, otherwise the various races would be brought too much into association.

- (D) He had found drains lying choked for 3 or 4 months. He thought the municipal staff should do more than they did in the direction of removal of nuisances. He thought the passage of a Public Health Act a matter of urgency.

As to areas for an Indian location, he could not make any pronouncement until he had seen what areas were available. From the point of view of drainage, the banks of the river at some distance from the town would afford a good site.

7. V. H. KIRKHAM, Esq., F.I.C., B.Sc., (LOND.) DIP. AGRIC. (CAMB.), *Government Analyst.*

EXAMINED ON 4TH APRIL, 1913.

(PRESENT:—HON. H. B. TAYLOR, (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS, MESSRS. TANNAHILL, WOOD AND TOOGOOD.)

MR. KIRKHAM, called and sworn, stated that he had made frequent analyses of Nairobi Water Supply. (A) Water Supply.

He had two objections to make concerning the supply. It was contaminated (1) with metallic zinc, and (2) with suspended matter, mineral and vegetable.

1. CONTAMINATION BY ZINC.

His attention was drawn last September to the fact in this way. A gentleman living in the town was taken sick after drinking whisky and soda. The soda water was suspected and a sample was brought to witness for analysis. In that particular sample there was a large quantity of zinc, a considerable amount of lead, a little copper and a lot of iron. There was sufficient cause for sickness in the soda water. Witness suspected at first the apparatus at the factory. He made a very careful examination of the supply and was surprised to find there was zinc in the town water. Zinc.

To account for that he supposed the pipes leading the water to the factory and the town stand pipes must be galvanized on the inside. He made enquiries and ascertained that was the case. He believed it was quite unusual to have galvanized pipes for a Township supply. He was not aware of any other Township where this was found, and he was not surprised that it was not found out before as it was not a thing one would suspect. Since first testing the Nairobi water he had never obtained a sample free from zinc. (B)

In cases of public stand pipes where water had been used in very large quantities the amount of zinc present was just discernible. In cases of private stand pipes where a smaller quantity of water was being used the quantity of zinc reached two parts per 100,000. Witness considered consumption of zinc in such a quantity harmful though he could not speak to that as an expert. Cases were recorded in which a similar amount had given rise to symptoms of gastric trouble. The Nairobi water appeared to have a marked solvent action upon zinc. He had compared the action of Nairobi water tested before it entered any galvanized pipes, and therefore free from zinc, with pure distilled water, and was surprised to find that the Nairobi water after being in contact with a zinc lined iron pipe, (a sample of the identical pipe used in the town), for half an hour, had ten times as much zinc in it as distilled water had which had been in contact with a similar pipe 24 hours. That experiment showed that Nairobi water had very great solvent action upon zinc. (C)

*Mr. Kirkham here exhibited in a test tube a sample of water collected from tanks on the Hill, containing no zinc, as it came down from Kikuyu. He placed it in a section of the galvanised piping used in Nairobi, and allowed it to stand in contact with the pipe for a little while, after which when treated with the reagent for zinc it showed decidedly milky.* (D)

This solvent action of the water upon the zinc witness attributed to the presence of chlorine in the water which was about  $3\frac{1}{2}$  to 4 parts per 100,000; a perfectly harmless substance in itself. Unfortunately it was quite impossible to remove it from the water; that is to say the ingredients of the water that caused the action upon zinc could not be removed.

Witness ascertained by experiment that upon hardening the water, i. e. increasing the amount of carbonate of lime in solution which was naturally very small, (one part per 100,000), the solution of the zinc was greatly reduced, but he could hold out no hope of this system being adopted as a means of preventing the solution of the zinc.

He had experimented with a pipe coated inside with Dr. Angus-Smith's solution, a preparation of tar which dries rapidly. A pipe so coated offered a fairly satisfactory measure of protection against the solution of the zinc, though even after treatment a slight degree of contamination remained. This was the best means of keeping the water from contact with the zinc. (E)

*Here witness exhibited two sections of piping, one treated with Dr. Angus Smith's solution, the other untreated, in both of which, he explained, water had been standing for four days. He poured water from each into a separate test tube. On applying the reagent, the water from the treated section showed almost clear, while the other sample was milky as before, showing, witness explained, four or five parts in 100,000 of contamination. Witness tested in the same way water which, he stated, had been taken from the pipe in his laboratory that morning. The result was as before. This would be the case, he stated, with every tap in Nairobi.*

- (A) As regards coating the pipes, dipping was suggested, but the Chairman stated that the pipes would require to be taken up.

(By MR. WOOD)—Plain iron pipes to replace the present ones would be more satisfactory than treating the galvanized iron pipes, but would cost more. Questioned as to the effect of water upon a plain iron pipe, witness stated that after ten years use only a little rust appeared.

Rain water did not attack zinc with such rapidity as Nairobi water.

(By MR. WOOD)—Treating Nairobi water with lime and so hardening it reduced its action on zinc but did not entirely do away with it, but in time a fur might be formed inside the pipe and so protect it.

- (B) (By MR. TOOGOOD)—All the piping of the supply except the mains was galvanised. Since the first complaint there had been several others. Conditions were aggravated at the soda water factories.

(By MR. NEWLAND)—Witness had tested water kept in a galvanised tank and found zinc, but in much smaller quantities Galvanised tanks should also be coated with the solution.

## 2. CONTAMINATION BY SUSPENDED MATTER, INSECT LIFE, &c.

Suspended Matter &c. Witness exhibited a sample of water which had come through his pipe in the Laboratory on 6th January, in a highly muddy and discoloured condition. He stated that the pipe gave water in this state for 20 minutes. In December he had sent a similar sample to the Principal Medical Officer who communicated with the Railway official responsible for the water supply, when a reply was received that the contamination was due to repairs to the 4 inch main. On 20th December witness made a (C) microscopic examination and discovered a large proportion of alga filaments, animalcules, crustaceans, and remnants of insects, which proved that contaminating material was in the main all the time.

There were two possible methods of remedying this, (1) filtration; (2) storage in the dark, thus avoiding the creation of vegetable matter of which the contamination largely consisted.

Filtration. As to filtration, from a rough calculation it would require one acre of sand filter, for the present population, 3 ft. of sand and 1 ft. of gravel in depth. It was doubtful whether the necessary quantity of sand (5,500 tons) could be procured; still this expedient was well worth consideration, as it would put the Nairobi water supply on a sound basis. This would have to be done at Kikuyu. From an economic point of view storage of water in the dark could be more easily accomplished. It is sound policy to store underground water in the dark. At Kikuyu there was water rising from the ground and it was collected in a reservoir which was really nothing more or less than a shallow pond, teeming with pond life. If it was covered over so that the light could not get to it, more than 90 per cent of the pond life would not exist, and if the water coming from Kikuyu was stored in the dark in the district it would be very clear and give excellent results. The water as it rose was a good water and proper storage might dispense with the necessity for filtration.

Reservoir. The Reservoir was merely a collecting basin which the mains could empty in 24 hours. It was 15 miles distant from Nairobi with which it connected by the mains lying near the surface of the ground. Witness was not at all certain that it was safe to have Nairobi dependent upon the present supply pipe from Kikuyu. A little mischief on the part of the natives could easily cut off the water supply. There was no storage at Nairobi, except one or two small tanks which would last 4 or 5 hours, and then they would have to fall back on the River supply. Witness suggested that the present (E) Reservoir at Kikuyu should be covered and a basin made on the hill behind the present tanks, 100 yards square and 6 feet deep, also covered in, which would hold approximately 3½ million gallons—about a week's supply. If that were covered in there would be a clear water satisfactory from every point of view, and good for a week at a time.

An apparatus might also be fixed at Kikuyu for the automatic admixture of lime with the water—about one part of lime to 20,000 parts of water, say 3 cwt. per day, as the lime obtainable in Nairobi was only partially burnt. It would have time to sediment in the proposed storage tank on the Hill, and the water would be clear and free of disease organisms.

- (F) Means should be taken to guard against natives having access to the Nairobi River water (as supplied to the stand pipes in the Town) for drinking purposes; otherwise there was a possibility of typhoid fever being disseminated.

When water had been standing in the pipes for some time, it should be run to waste for a time to avoid a concentrated amount of zinc. Water containing so much zinc was quite unfit for a town supply.

Kikuyu Reservoir should be cleaned frequently and all gelatinous matter floating about removed until such time as it could be covered in. At present no attempt was made to prevent surface water running into the Reservoir: in fact holes were purposely made to admit it.

(By MR. TANNAHILL)—Addition of the lime at the reservoir would give a cloudy water, and a minimum storage of a week at the tanks would be necessary. If the pipes were of sufficient capacity there would be no occasion to lift them and bury them deeper. The purifying apparatus

at the tanks on the Hill was a system now generally abandoned. Chlorine was universally present in (A) the water of the country and sufficient hardness could not be added to counteract it.

Touching upon sanitation of Nairobi witness remarked on the insanitary condition of affairs near the old K. A. R. lines, just outside the Township. There was no conservancy there, consequently there was a pestilence of flies. Sanitation.

There were 7 or 8 houses there and perhaps 40 people. These employed sweepers who threw the night soil on the ground hard by, resulting in a zone full of accumulations which attracted flies. This zone was rocky in character—there were only 3 inches of soil and pits or trenches were impossible. Among the buildings there was a school. Witness' two children both took dysentery within a week, which he could only attribute to the flies.

With regard to the milk supply, witness had tested some two hundred samples monthly during the last few months. Several of these samples had been adulterated. In one case a prosecution was instituted, but quashed on the grounds that the sample had not been purchased, but taken by the M. O. H. at the laboratory. Since this prosecution no samples had been submitted for analysis. He was of opinion that samples should be taken. (B) Milk.

Generally speaking, a large proportion of the milk supply was in honest hands. Samples coming from known sources showed that the milk supply was so far tolerably satisfactory. The water drawn from the River was highly polluted. Witness did not know whether the public could get at it. He had not analysed samples of the river water below the town, nor of the irrigation trench water. Witness promised to take samples of the water from the river at each of the two bridges. (Mr. Kirkham's report of his analysis of these samples is appended in Schedule I hereto). (C)

The river water supply resembled a sewage effluent.

The River was carrying all the organic matter it was safe for it to carry; to put any more in would probably create a nuisance. With regard to treatment of sewage, a septic tank should be in use in which solids should be brought into solution. The liquid should run through trenches made at an elevation above the river, and a scheme of cultivation should be drawn up for that area to absorb the undesirable elements, after which the water could be run into the River, where it would be harmless. Disposal of Sewage.

Regarding the locality for a sewage farm, there was an area near the Thika Tramway and Nairobi River of 320 acres and an area further south of 2,150 acres. 15 to 20 acres would suffice even if the land was not exactly suitable, unless waterlogged or rocky. There was no method to supersede the septic tank and a profitable scheme on these lines could be drawn up.

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SCHEDULE I—APPENDED TO MR. KIRKHAM'S EVIDENCE.

12th June, 1913.

Nairobi river water. Two samples of Nairobi River Water taken on the 9th instant., (1) at Ainsworth Bridge, (2) at Race Course Road Bridge.

Results of analysis					Parts per 100,000.	
					1.	2.
	Nitrogen as ammonia	...	...	...	·0080	·0130
	" " albuminoid	...	...	...	·0615	·0775
	" " nitrite	...	...	...	Trace	Distinct
	Oxygen absorbed	...	...	...	·4396	·5584
	Chlorine	...	...	...	3·5	3·5
	Hardness	...	...	...	4·0	4·0

Conclusions. These figures shew very great contamination, and it will be observed that the contamination is increased in the passage through the Township.

The volume of water flowing at the time was above the average, and the figures, while indicating heavy pollution, do not indicate the foul state observed during drought.

No offensive smell was observable on boiling.

The oxygen absorbed is about one third that of a good sewage effluent.

V. H. KIRKHAM,  
Government Analyst.

SCHEDULE II—APPENDED TO MR. KIRKHAM'S EVIDENCE.

12th June, 1913.

Nairobi watersupply Analysis of the zinc lining of the distribution pipes revealed the presence of traces of lead, antimony, cadmium, arsenic, iron, &c., the usual impurities of commercial zinc. The zinc is comparatively pure so far as commercial metal goes.

By concentrating a gallon of the Nairobi Supply water it was just possible to detect the presence of lead and the presence of metals giving a yellowish colour with sulphuretted hydrogen after removal of lead—arsenic, antimony, cadmium or tin. A suspicion of a mirror was obtained in the test for arsenic and antimony on the concentrated water, but tests to discriminate between these closely related elements were inconclusive.

It has been demonstrated that the impurities present in the zinc are to be found in the water, but their amounts are so infinitesimally small that only most exacting search can reveal their presence.

The condemnation of the supply must primarily stand upon the quantity of zinc present, an average amount of one part of metallic zinc in 100,000 water being present.

V. H. KIRKHAM,  
Government Analyst

8. A. B. H. BAILIE, Esq., *Sanitary Inspector to the Municipality.*

EXAMINED ON 4TH APRIL, 1913

(PRESENT :—HON. H. B. TAYLOR (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS,  
MESSRS. TANNAHILL, WOOD AND TOOGOOD.)

Mr. BAILIE having been called and sworn, stated that he had been Inspector for the past five (A) months and had been in the country twelve months. He had had considerable experience at Paulpetersburg, South Africa, as Sanitary Inspector. He had served in the Transvaal Police.

Speaking about stand pipes on the impure water supply, he said there was a tap to each hydrant and the public had access to them.

Questioned as to his daily routine of duties, he mentioned inspection of public and private latrines, drains &c., and supervision of the working of the native staff, night-soil boys and road sweepers. The regular hours for conservancy were from midnight to 6 A.M., but part of the work was now being done in the day time as he was very short of carts. The carts turned out earlier than midnight. The badness of the roads was responsible for several carts being smashed. He (B) had once had 3 out of the 4 slop water carts stuck in River Road. The slop water had to be let out on to the road.

At 5-30 A.M., the boys were turned out to work, i.e., sweepers, rubbish carters, cemetery boys, &c., and roll was called.

At 6-30 witness inspected the boys as far as possible, but the majority of the boys at work on the Hill were generally not to be found then.

At 7 A.M., as far as possible he found out from the jemadars if there were any complaints from the staff, which seldom happened.

From 9 A.M., to 3 P.M., he went round on a bicycle and reported any nuisances to the M. O. H.

At 3-30 he went and signed the boys off at the Landies. The slop water carts gangs worked (C) from 6 to 10 A.M., and from 3 to 10 P.M.

There were eleven convictions last month for breaches of the sanitary regulations. In December there were 120 notices served. In two or three cases service of notice could not be proved and the cases dropped. In the remaining instances the notices were complied with.

Regarding latrines, if trap doors were off he reported them and instructions were given to renew (D) them. So also where the floor was covered with excrement : but he generally gave 4 hours personal notice first in such cases. It was not part of the night soils boys' duties to clean out the area under the seat of a latrine.

There were nearly 1400 buckets to inspect and only one man to do it. The Railway did their own, but he had to watch them. Questioned whether there had been any case of an action for excrement found under a seat, he replied that he had had one against an Indian who was fined Rs. 20. (E)

Questioned as to the inspection of the whole of Nairobi, he replied that he divided Nairobi into wards and did one ward each day. It took 3 days to cover the whole town thus. It was quite impossible for one man to do the whole of Nairobi. A great handicap at the present time was the removal of dead bodies, as in each case he had to go to the Landies and see the cart turned out. He supervised the European Burial ground, and the Jeevanjee market. The Jeevanjee market was scrubbed out twice a month. He spent an hour and a half in it daily inspecting vegetables, etc.

The Sanitation of Nairobi was in a disgraceful state : it could not compare with similar places elsewhere. There were not enough carts to cope with the work. The raw native was a good worker especially the night-soil boy. These were paid Rs. 10 per month. The Indian Jemadars (E) of whom there were three (two having been recently dismissed) were not satisfactory. Natives were very much better than the Indian. The Indian accepts bribes and does not make any complaint. Four to five complaints a week were received from the whole of Nairobi about conservancy. These complaints could always be rectified. The number of complaints was not in keeping with Nairobi's Sanitary conditions. People often would not complain until obliged to.

The drains of Nairobi were rotten ; they were wrongly constructed. The bottoms of the drains were flat and they got choked in the corners. He had six boys on the drains daily from 6 to 5-30, but they wanted watching.

- (A) Dustbins were simply a round piece of corrugated iron, no tops or bottoms. This type was satisfactory enough, because there was one boy to each dust cart and he could not lift a dust bin with a bottom alone. He pushed them over and shovelled up the rubbish. Two boys however were really required for each dust cart.

BY MR. WOOD—A lot of the rubbish got blown about if the boy was not watched.

BY MR. TOOGOOD—Rubbish sometimes was deposited in back lanes. Mr. Marcus recently deposited eight loads in a Sanitary lane. Action was taken in this case and it was removed at Mr. Marcus' expense.

- In the Indian Bazaar the rubbish was deposited in the street systematically and the sweepers went along in the morning and cleaned it up. The shop-keepers merely emptied their small tins in front of their shops and the sweepers removed it.

- (B) Private latrines generally were in a bad state and few householders kept proper buckets. In Parklands many people had holes dug in their gardens and night soil was dumped into them; this was principally done to save conservancy fees. The principle was a dangerous one. The night soil boys went to the latrines, removed the buckets and tipped them into the carts. Cases were frequent of boys being bribed to empty buckets, which were simply emptied into holes. So many boys were located to each District, and a Jemadar was in charge of each gang. In Parklands there were 3 carts, each with a boy, and 4 extra boys. There was only one boy to each cart. It was impossible for witness to visit each boy at night on night soil work, his duties were too heavy and it was quite impossible for him to carry them all out as they should be done; at least one more Inspector, in addition to witness and the Compound Manager, was required. At times witness simply let everything "rip" and attended to complaints only.

Burial of  
Natives.

- The Jemadars were supposed to look after dead bodies; they had infected cases to deal with; a little while ago they picked up two cases of plague in Ngara Road, which were taken to the hospital. The cart was not disinfected as it was not then known that the cases were plague. Bodies were taken to the hospital, and thereafter, as neither the Police nor the Medical Department would take them, they were left to the Municipality. In South Africa dead bodies are removed by the Police. Dead bodies were left about until found and sometimes they were reported at least a mile away from where they were found. One body was reported at the Native Market and found at the top of Parklands. In an ordinary case of a native dying in a house or compound, the body was at once removed by witness to the Native Hospital. Natives dying of infectious diseases at the Quarantine Camp were removed direct to the Native Cemetery, about half a mile distant. The route crossed the river and railway, passing close to the Dhobies quarters.

The existing native burial ground was in a very bad state. It was impossible to dig a grave more than from 24 to 30 inches deep on account of rock, with the result that bodies were pulled out by hyenas practically the same night. This was an ordinary occurrence.

- (E) The new burial ground was not yet open, as it was waiting for the P. W. D. to build a ford across the river; the old burial ground was in use still and it was about 300 or 400 yards from the Railway Line past the Gaol; the new cemetery was about  $\frac{3}{4}$  of a mile further on. There was no proper road to the burial ground made yet; it would be difficult to get there in bad weather without one. This was an urgent matter. Most of the way it was black cotton soil, after which it became a lighter colour. The European Cemetery was on the way to the new native burial ground.

Bazaar

The Indian Bazaar was crowded with a lot of useless tin shanties. Indian and native shopkeepers should be compelled to take out quarterly licenses for approved buildings, and the number of licences should be limited; otherwise control was impossible. The shops in the principal Sanitary Lane in the Bazaar should be closed and condemned. The Bazaar could easily be drained by small drains running into the existing main drain which flows into the irrigation canal. Sumps were unnecessary. The drains were far too small.

- (F) In the Indian Bazaar an Indian could open a shop with about Rs. 5 worth of stuff. If the shop was in an insanitary state witness turned him out, and in a few days another man would come along. Witness did not think there was the least improvement in the Bazaar; it was in about the same condition as when he took over. It could easily be improved. The drains and roads in the Bazaar were shocking; also in the Sanitary lanes.

Latrines.

The public latrines were quite inadequate. The double bucket system should be introduced. There were not enough latrines, with the result that the natives used the surrounding country. The condition of the latrines was fairly good—a gang of boys spent their whole time disinfecting them. Buckets were emptied daily. The bathing platform was used as a latrine by passing natives at the present moment. The Jemadars had brought several of them to witness, and he dealt with them summarily.



The natives in the villages along the river had no conservancy at all, and there was no control (A) over them : they used the river.

The majority of European premises were kept in good order.

All bush clearing was supervised by witness. He did not in general attend to water furrows : but he recently cleared out one near the slaughter house.

The chief difficulties in witness' work were the long distances, bad roads, and scattered nature of the town.

As to the native villages, there was practically no control over them. The population was shifting, but on the whole increasing. There was little control, but witness occasionally made them clean the place up. There were several latrines in the Somali village, but they were not used ; it was against their religion to do so. They had had one or two convictions against them, but the convictions (B) had dropped off now. Native Villages.

With regard to the quarantine camp, witness had to remove dead bodies from it, but otherwise had nothing to do with it. Bodies were taken in a Municipal cart by two Jemadars to the native burial ground. The Jemadars were provided with a special uniform by the M. O. H., also dust proof coats, and afterwards these were disinfected and the carts washed and disinfected.

With regard to soda-water factories, these were in some cases undrainable. *e.g.*, Aga Raza's had merely two small cesspools which readily overflowed.

The staff at witness' disposal was not capable of dealing properly with the whole of Nairobi ; it wanted increasing and entire reorganizing.

Last month witness inspected all cattle sheds and stables for the first time. There was no regulation regarding disposal of manure ; owners removed it in most cases ; in others the Municipality removed it and charged owners with the cost. There were 46 cattle owners in the municipal area and all had sheds. Witness did not know how many stables there were. There were some stables within the business area, *e.g.*, Transport Co., Murrow, MacMillan, Ali Khan, and two or three in the Bazaar. (C)

He reported mosquito breeding places monthly ; at present he was not able to do any filling up of holes. When filling in ponds he generally had a gang of about 100 boys from 2 to 5 p. m., but this was generally in abeyance on account of other work.

His reports were sent to the Municipal Engineer, who witness believed forwarded them to the Town Clerk and he in turn sent them to the departments concerned.

9. W. H. TANNER, Esq., *Deputy Director of Public Works.*

EXAMINED ON 10TH APRIL, 1913.

(PRESENT → HON. H. B. TAYLOR, (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS,  
MESSRS. TANNAHILL, WOOD and TOOGOOD).

(A) MR. TANNER, called and sworn, read the following statement :—

Drainage,  
etc.

“I understand that the principal points on which you require evidence from me are:—

Provision of funds and expenditure in previous years.

Proposals for expenditure this year.

This information has been tabulated and copies have now been distributed to Members of the Commission.”

(A copy of the Schedule is annexed at the end of Mr. TANNER's evidence.)

“I should also like to bring the following points to the notice of the Commission.

(a.) The total amount required under the present scheme for drainage alone is £ 65,948.

(b.) I do not consider that the drainage scheme requires any modification except in minor details, but it will require amplification, for example :—

(B)

1. No drains are provided for in the Sanitary lanes running N. and S. from the Town Hall.
2. No drains provided for in Y. M. C. A. Street, Standard Street, and corresponding cross roads on other side of 6th Avenue.
3. No drains in cross roads on Native Location as at present proposed.
4. No provision for soil drains.

(c.) The present system of sewers is intended for the future carriage of surface water only, not for sewage. For several years to come the present sewers will serve for all purposes and pipe sewers can be connected,—in fact provision is made for connexion at the various manholes.

(C)

(d.) The plain round 6th Avenue will always be a nuisance until this area is surfaced over, allowing the water to run off. No system of sub-soil drainage can be carried out at reasonable expense owing to the nature of the soil.

(e.) Many suggestions have been made in the past that drains should be constructed in this area and I should like to point out that had this been done the condition of Government Road and the Sanitary lane behind would have been made far worse than at present. These drains should only be constructed at such a time that their completion will synchronise with that of the sewer.

(D)

(f.) If the Railway Subordinate Quarters are to be moved to the slopes of the hill under the house occupied by Capt. Edwards, then provision should be made for the drainage of this area.

(g.) With regard to the provision of roads I suggest a new road from near the Post Office through the area now occupied by the Railway Quarters direct to the Station.”

Witness explained that the main sewer was costing £ 2,500 more than was anticipated: otherwise the work under the Williams scheme would not exceed the original estimate.

BY MR. TOOGOOD: The question of drainage in 6th Avenue could not be dealt with by sub-soil drainage. It could be much improved by putting a murrum surface on the whole area to give the water a chance to drain off into the drains proposed for that area, but there would always be a certain amount of standing water until the plots were surfaced. They could do away with the “lakes,” but it would always be spongy and a probable mosquito breeding ground, until surfaced. The ordinary agricultural drain would be of no use: it would choke every time. If the drains at the side of 6th Avenue were constructed and carried into Government Road before the sewer was completed, Government Road would be swamped. He proposed that the drains from the near half of 6th Avenue should be led into the main sewer as at present proposed, but that the Sadler Street drain should be carried under the Railway to the Western Valley drain.

(E)

(Here witness produced a map showing the drains which it was proposed to construct this year near 6th Avenue out of the £ 10,548 available.)

In reply to Mr. NEWLAND witness stated that he could not say at the moment whether in the years 1908-09 and 1909-10 more funds were asked for than were actually granted. In 1910-11 money was asked for: he would ascertain how much and inform the Commission later.

(NOTE :—On 2nd May Mr. Tanner wrote saying that (a) in the Draft Estimates of his (A) department for year 1910-11 provision was sought for a second instalment of £21,000 to be approved for the Williams Scheme, of which £3,000 should be available at once; (b) for year 1911-12 his department was informed that a further grant against the Scheme would not be available. They therefore asked for £1,450 which sum would have allowed the connecting up of certain drains already in existence. £700 was eventually passed.)

The reason for not spending the money provided in the year 1912-13 was shortage of labour; but this was now much better. They had tried to get the excavation work done by private contract and tenders were invited from 7 contractors regularly working for the department, but the contractor employed had to throw up the contract. It was considered not advisable to give (B) out other work on the sewer to contract.

MR. NEWLAND : When you found you could not do the work departmentally, did you make no further attempt to get a contractor?—They could have done further work if the excavations had been completed by the contractor who had it in hand. None of the work was completed which had been given out to contract. Other contractors employed by the department were all in the same situation. There was a penalty, but it was not enforceable in cases of labour trouble. They found the contract system unsatisfactory because they could not get the work completed. They got broken stone, etc., supplied by contract. The contractor employed had not finished his section of the main drain. All the work now in hand was being done departmentally. The work on the section of the drain at right angles to Govern- (C) ment Road was held up for the same reason. Things were better now and witness hoped to be lent 200 prisoners.

MR. TOOGOOD : Have you sufficient labour now to continue the scheme?—Unless the labour supply fell off they would be able to.

If £10,000 were spent on the scheme this year the state of the town would be fairly satisfactory as the remaining work was less urgent.

MR. TANNAHILL : After completion of this year's programme the unspent balance of the estimated cost of the scheme will be £33,940. What will that be spent on?—On the River Road main sewer and on outfall sewers. Temporary arrangements would be made to take the drainage of River Road down to the river pending construction of the River Road main sewer. (D) The amount allotted under the current year's estimates was all that had been asked for. It would suffice for completion of the works proposed for the year. The Government Road drains would serve for the time being if relieved by the new 6th Avenue drains. Roughly about half of the Williams scheme would be completed by the end of the current year.

MR. TOOGOOD : Have you any funds for keeping up existing drains?—They had to find money for repairs. When the scheme was complete provision would have to be made for this; at present no provision was made.

DR. ROSS : Does the repairing of the drains in the Bazaar come under you or the Municipality?—It depended on what he called repairing. Repairing in the case quoted would mean re-laying them. He was not prepared to relay them out of the existing vote. The Abdul Hussein (E) Estate would be drained by temporary cuts and pipes.

MR. TOOGOOD : Is this system of doing the Williams scheme piece-meal satisfactory?—No, it was most unsatisfactory and more expensive. Before works were completed modifications were required to suit altered conditions.

MR. TANNAHILL : Could you guarantee to get the scheme completed in three years if the money was available?—Yes, if they could be guaranteed a supply of labour.

MR. TOOGOOD : Is any work going on in the Bazaar?—No actual drainage was being done. Two Sanitary lanes were being made up. Nothing was being done in regard to the Indian shops in River Road. No money had yet been spent for a new bazaar on the site shewn in the Williams Scheme. The road work provided for the current year was as follows :— (F)

Construction of 3rd Avenue, Parklands.

Construction of 10th Avenue.

Resurfacing Kikuyu Road from Ngara Road to Police Station, Parklands.

Resurfacing Ngong Road to Road past Nursing Home.

MR. TOOGOOD : May we ask about the sanitary conditions of the P. W. D. camp?—Provision was being made for the erection of new latrines at once. There was a system of inspection. There were generally about 600 boys there. If they could not get money to construct latrines, they had to do the best they could. The place was well away from the town.

(A)       Witness thought a better site for a native location than the site reserved could be found nearer the river. The site reserved was very undesirable for the purpose.

He thought Capt. Grogan's proposal for a new bazaar an excellent one, but the houses would need to be kept on the higher ground. This Scheme would prevent the growing of vegetables in the swamp which was dangerous from the point of view of enteric.

MR. WOOD: Under the Williams Scheme, they proposed to empty sewage into the Nairobi River?—

Yes. It would be very expensive to provide sewage disposal works. A Sewage farm was not possible and an artificial bacterial method would be required. Witness had no experience of septic tanks. He understood that in a swift flowing river sewage became innocuous in two miles. Plenty of flushing water was being provided for the drains, purposely to dilute the sewage as well as flushing the sewers. The river should be taken in a properly constructed channel through the swamp.

(B)

They hoped to get the sewer in Sixth Avenue completed by September. They would take the drain on the Railway boundary in hand at the same time and they would then connect up the smaller drains. The whole of Sixth Avenue should be satisfactorily drained by the end of the year—sufficiently to take the surface water off.

They proposed to let certain parts of the work out to contract. Extra supervision was necessary in contract work. Additional supervision would have to be obtained in any case.

MR. WOOD: It is apparent that all the drains are equally important. Would not the work be hastened by giving out contracts?—What about supervision? If they had to supervise a larger area they would require a larger staff. It depended on conditions. It might not cost more.

(C)

MR. TOOGOOD: In taking water from the Nairobi River through canals, do people get permission?—The present issuing of permits was a matter of form. The permits gave permission to use a proportion of the stream. There was no policing of these canals. Their upkeep as well as initial expenditure were matters for private enterprise.

MR. WOOD: If we find it necessary to divert the amount of water suggested by Mr. Williams people cannot come down on us?—No.

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## SCHEDULE TO MR. TANNER'S EVIDENCE.

## STATEMENT OF EXPENDITURE ON DRAINAGE SCHEME.

	PROVISION.	EXPENDITURE.	TOTAL.
1907—08	} £20,000 { *	2,890	
1908—09		10,669	
1909—10		6,466	20,025
1910—11	No Provision		
1911—12	£700	700	
1912—13	£7,800	817 †	1,517
			<u>£21,542</u>

\* Carried forward year by year.

† Small expenditure due to labour shortage.

## TOTALS UNDER VARIOUS HEADS.

	£
Sewer ...	9,386
Branch drains West side of river ...	1,519
Overflow to sewer ...	497
Flushing main ...	1,981
Drains Native Location ...	5,067
Western Valley, Main channel ...	916
New Roads ...	2,176
Total	<u>£21,542</u>
New Water main from Kikuyu. ‡	£11,225

‡ Provision for this made separately in Estimates £15,696. Balance being expended by Railway Department on distribution system.

## PROPOSALS FOR CURRENT YEAR.

	£
Completion main sewer ...	6,500
Drain along Railway boundary ...	1,108
New drain from Sadler St. through Railway ...	448
Drains in 6th Avenue area ...	1,422
Drains Victoria St. Market Rd. to Duke St. ...	988
Total	<u>£10,466</u>

NAIROBI :  
9th April, 1913

W. H. TANNER,  
Acting Director of Public Works.

10. E. S. GROGAN, Esq., *Nairobi*.

EXAMINED ON 10TH APRIL 1913.

(PRESENT.—HON. H. B. TAYLOR, (CHAIRMAN) HON. V. M. NEWLAND, DR. ROSS, MESSRS. TANNAHILL, WOOD, AND TOOGOOD.)

Housing (A)  
of Asiatics

MR. GROGAN, called and sworn, explained that about a year ago when he passed through Nairobi he had several discussions with Mr. Hobley, who was then Provincial Commissioner of the Ukamba Province. Suggestions were made for some means of ameliorating the Bazaar question, by means of a private arrangement between witness and other Europeans on one side and Mr. A. M. Jeevanjee and others on the Indian side. He had discussed the matter with Mr. Jeevanjee's brother and understood from him that the Indians were just as anxious as witness to find some satisfactory solution, but felt any forcible means would be a distinct grievance as they had bought these plots in the open market and had since either been actually debarred or had refrained under pressure from using them and they were not prepared to yield to any policy which involved forcing them out of what they considered to be their rights. If anything could be done by consent, without detriment to their sense of dignity, they would be pleased to do what they could. The scheme the witness threw out hinged on a hypothetical division of the town into zones, leaving the Asiatic on one side of an imaginary line and the Europeans on the other. Witness here produced a map showing Government Road as the dividing line, Government Road itself being treated as a neutral zone.

Nearly all the land in what he called the European Zone was owned by Mr. Jeevanjee, and perhaps three other important Indian firms. In the other zone the really important European holdings belonged to the witness. He thought it might be possible for him and the Indians named to arrange some basis of exchange. He would rather have his land in the European Zone, and they might rather have theirs in the Asiatic Zone. The problem would be solved by enforcing restrictions against letting to Europeans in the Asiatic area, and *vice versa*. But there were two or three things to be done. The authorities would have to smile on the proposition. An essential preliminary would be the provision of some place for the small Indians to go to if pressure were brought to bear on the present congestion in the Bazaar. He believed the area he indicated (*viz*: plot 138) was very well situated with regard to drainage etc. It would be possible to lay out and build a Bazaar there. He did not think it would be difficult to finance that operation. It could be financed by private enterprise up to £100,000 and leased at favourable rates to the Government in which case the Government itself or the Municipality would become the ground landlord of the congested area of the Bazaar and everybody there would be permanently under their control. If that were done there would be an outlet for these people and it would then be possible to enforce all regulations strictly without hardship. He thought the natural trend of the native trade always had been that way; at present it was blocked by this area of his which he had held up with a view to the scheme under consideration. There would be no difficulty in getting the Indians to move out in that direction as they had been trying to for a long time. If some such arrangement were possible, it would be advisable in his opinion to arrange it on the basis that he should give these plots back to the Government and take a new lease with an Anti-European occupation condition. He thought it just possible by consent and negotiation to divide the town into two perfectly distinct zones.

MR. TOOGOOD: You refer to certain expenditure. What is that?—He was presupposing the actual erection of a Bazaar on modern lines by the State or Municipality. This would be instantaneously reproductive as they would be drawing rents from it.

MR. NEWLAND: Do you think people who are ground landlords will agree to become mere tenants?—He was supposing the bazaar would be similar in size to the present one. If that were so there would be some place where the small tenants could go to. This would still leave all the rest of the land free for Asiatics to deal in and develop in the ordinary way.

MR. TANNAHILL: Take for instance the 60 or 70 plots in the Bazaar now, would you propose to negotiate with Jeevanjee and exchange?—Witness would negotiate exchanges plot by plot. He had 100 acres on the near side of Swamp road. If the land were exchanged, the only thing left would be the question of the buildings as they existed to-day in the congested area of the present Bazaar. He took it these would have to be scrapped and compensation paid. They might realize some money for the old material, and the balance left would not be such a very big sum.

MR. TANNAHILL: I understand you would make a proper Bazaar first with small shops. How would you induce the large traders to move?—No doubt a strong public health Act would force the smaller shop-keepers to live in a properly planned area. If so a large part of the attractions of the

present site would be removed. A large proportion of the profit to-day arose from the congested conditions. Property, to the extent that this congestion would be relieved, would be depreciated as an interest-producing concern, and legitimately, for the value to-day was an illegitimate one. There was no particular advantage to the smaller people in living in the present Bazaar. The place proposed was in the right direction as it had the native trade, and was also easy to drain. The main line of native movement was through witness' plot. (A)

MR. TOOGOOD : Your scheme, in brief is to change this land for the Bazaar without assuming responsibility for building ?—Yes, but it would be necessary for the Government to intervene and to remove scrapped materials from plots in the present Bazaar. He would not exchange a clean plot for an infested plot in the Bazaar. Somebody would have to see that it was clean. There was no question of compensation in terms of land. The land exchange would be a private matter, but it would be necessary to compensate for scrapped buildings, at their value as scrapped material. (B)

MR. WOOD : After dealing with the small peddler in the Bazaar, there would still remain some who were sitting on their own land. How would you deal with them ?—Leave them. There would be no objection to them if they were putting up good buildings. They would be a constantly decreasing element.

MR. TOOGOOD : The expense of the new Bazaar would be high, new and sanitary buildings being required ?—He only suggested building a sufficient section of a bazaar to draw off the surplus from the present Bazaar, where as much as 30 per cent was being paid as rent.

MR. TANNAHIL : What advantage would you expect to gain ?—He had a large interest in the town. As a future ratepayer on a large scale, he would like to see anything done that would obviate avoidable future expenditure. He did not know how to handle land in the Indian zone. He thought he could handle land in the European zone better. Being interested in the town, it would be good business for him to help remove the present difficulty. (C)

MR. NEWLAND : I understand your proposition is to arrange the exchange, the authorities to arrange the purchase of the buildings ?—Yes. The authorities would raze the buildings and appropriate the debris. His only purpose was to put forward his proposition in order to find out if such a zone system would meet the view of this Commission.

MR. TOOGOOD : Your scheme is that you make the exchange and other matters must be settled outside it ?—He wanted the Commission to say whether the division proposed would be desirable. Thereafter Government would decide whether it was practicable. He was holding up his land meantime but could not do so much longer. There were several 99 year leases to Goans on his plot, and two to Europeans. If the scheme went through, he would be prepared to put up his property subject to an anti-European clause. This seemed to be the only possible solution short of forcible expropriation and a huge loan. He did not expect to get all the Indians to go but once he got even one Indian of standing to remove, he thought others would follow suit. (D)

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11. KASSAMBHAI, A PARTNER OF THE FIRM OF SULEMAN VIRJIE & SONS.,  
*Shopkeepers and Merchants, Indian Bazaar, Nairobi.*

EXAMINED ON 11TH APRIL 1913.

(PRESENT:— HON. H. B. TAYLOR, (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS,  
 MESSRS. TOOGOOD, TANNAHILL, AND WOOD.)

- Bazaar (A) MR. KASSAMBHAI, called and sworn, stated that he had been a shopkeeper here for twelve years. The Bazaar had now been 10 years in existence. When it was built the town and the Indian population were both small. Now Nairobi had greatly increased and the Bazaar was very much congested. The roads and drains were not clean. Gutters were not properly constructed and the roads were bad. It was thickly populated and thus in a very insanitary condition. People from out-stations had to live in the Bazaar, as there was no where else to go to. Where there was room for two there were four, six and eight people. In certain houses they made shelves to sleep on. They had never approached the Government because they were very easy-going people. Outside the Bazaar there were nice roads and drains, but not in it. When it rained heavily the streets were floods. The Sanitary staff only removed half the slop water, and turned the rest into the drains. The gutters were very narrow and got choked. The buildings were not well constructed. The area was too small for the number of buildings. The people did not live like that in their own country where there was plenty of room. Almost all of the vacant plots in the Bazaar area belonged to Mr Jeevanjee.
- (B)

MR. TANNAHILL: If the rest of the land from Jeevanjee's corner up to Tenth Avenue (about 30 plots) was included in the Bazaar, would there be sufficient land to take all the surplus population?—It would be an improvement, but they would still require more space. They required about twenty acres.

Housing of  
 Asiatics

- (C) Land should be allotted to Indian artisans to live on at a distance of about ten minutes from the Bazaar. Price and rent should be low. The wealthier merchants would be ready to build for those who could not afford to build. If these people left the Bazaar the Government could pull down the undesirable houses and make improvements: they could insist upon carrying out the building regulations then. A suitable place would be near the site of the native market, on the plain, and this should be reserved for Indians only. They could afford to pay Rs. 4 or Rs. 5 for a 10 ft. by 15 ft. room. On such terms the majority of them would go there. A small house to yield Rs. 4 or Rs. 5 a month would cost about £ 50. Many of these people had saved £ 40 or £ 50 and could afford to build houses. At present in the Bazaar, they rented small rooms for Rs. 10 to Rs. 12 each. The rooms were 10 ft. by 12 ft. or 10 ft. by 15 ft. and there were ten and fifteen people living in them. Those that were married did not live with their wives in such places, but found separate quarters. Witness had never personally looked into such places as had described. If land were available these people would mostly take separate houses. They could pay Rs. 4. They lived like that because they could not get anything better. Witness had a residential plot in the Bazaar. He had two houses on his plot in which he and his brother lived with their families. The plot measured 28 feet by 100. He lived on it with his wife and five children. His brother also had five children. In his shop (which was on a different plot) he employed four assistants of whom two slept in a room on the shop premises and two slept outside. Fourteen people lived in his house (away from the shop) and he found it crowded. He wanted a better place to live in. He would leave some of his people on the plot and remove the rest. Those that were left would sleep in living rooms, not in the shop. The shop owners would not leave the Bazaar but the persons living on the back premises would.
- (D)
- (E)

MR. TOOGOOD: Do you think it would be possible to reserve the Bazaar for business quarters, providing land elsewhere for residence, and for every one to sleep away?—It would be difficult to carry out. It was feasible but would have to be done slowly.

MR. NEWLAND: Would the merchants with good shops not prefer to have these with no one living in them, and have another Bazaar elsewhere?—He did not favour the idea. It would depreciate property and cause a lot of trouble. Those who had spent money would be put to expense in providing new buildings. Compulsory removal would cause trouble. He himself was spending Rs. 80,000 on his Bazaar property. The merchants had thoroughly settled there and would not like to move.

- (F) MR. NEWLAND: If a bazaar was put up elsewhere, would it take the native trade away from the present Bazaar?—They would always come back to this one.



MR. WOOD : You say the Bazaar is very much congested. Why have so many people sub-let their (A) places in small tenancies if that is so ?—For profit. He had not done so and could only speak for himself. He supposed they must make an income somehow. With regard to River Road and Mr. Grogan's land, in rainy weather you go up to your knees in soft ground. He saw a cart stuck there and the bullocks had to be cut loose. This showed that roads were necessary.

MR. TOOGOOD : Are you afraid of a further outbreak of disease in the Bazaar ?—Much afraid.

MR. TOOGOOD : Do they try themselves to keep the place clean ?—They had sent a petition to Government for more land and had received no reply as yet. He thought it was an urgent matter and something should be done. Small eating-houses and sleeping-houses should be entirely separate from the Bazaar ; it was the people in these who dirtied the place.

MR. TOOGOOD : What do you think of the little shops going up outside the Bazaar, all about the (B) place ?—People who could not afford to live in the Bazaar went outside. If plague broke out again, so far as witness was concerned, it would be better if there was no residence in the Bazaar : but that would cause trouble. It was not practicable for people to sleep away from their shops. The Bazaar would be all right if its population was diminished.

MR. WOOD : If the wealthier Indians built houses for the others on land let cheaply by Government for the purpose, would he, as a landlord, agree to have his rental fixed on a percentage of the cost of building ?—Yes, as far as he was concerned. If land was given all the poorer class would shift at once. Proper roads and water supply would of course be necessary. Witness was ready to put up 40 or 50 rooms.

MR. NEWLAND : What would you consider a reasonable rent and interest ?—He would take the (C) same as other people. He had no desire to speculate.

MR. NEWLAND : What do you suggest Asiatics and others should do to keep the Bazaar clean under existing circumstances ?—Gutterings and roads should be made right. All dilapidated buildings should be pulled down and reconstructed. All accumulation of water should be prevented.

MR. NEWLAND : What could the Indian people, themselves do ?—They could not do anything beyond cleaning each his own premises. In its present crowded state, it was impossible to improve the place at all. Roads were the most important point.

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12. ALIBHOY, MANAGER FOR THE FIRM OF MESSRS. WALJEE HIRJEE & Co.  
*General Merchants, Indian Bazaar, Nairobi.*

EXAMINED ON 11TH APRIL, 1913.

(PRESENT:—HON. H. B. TAYLOR, (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS,  
 MESSRS. TANNAHILL, TOOGOOD AND WOOD).

- Bazaar (A) MR. ALIBHOY, called and sworn, stated that he had been here for twelve years. He agreed with  
 &c. (p 24) what Mr. Kassambhai had said. Those people without shops were having great difficulty. The Government should find some place for the poor men. The Bazaar was very filthy. There was no proper drainage there. Both roads and drains were very bad. There would be great trouble when plague come, owing to the overcrowding. Government must find some other place. It was their business to do so. He was not prepared to say what rent should be asked. Witness was prepared to build himself if land was given by Government on easy terms. Many small shop-keepers were coming and going from the Bazaar. There was no room for the new-comers. Some go away up country. If there was more land for shops, many more shop-keepers would come.
- (B) MR. TOOGOOD: Is the population in the Bazaar increasing?—Yes, greatly.  
 MR TOOGOOD: From a sanitary point of view the place is getting worse?—The more people who come the more dirtier it becomes.  
 MR. TOOGOOD: Is there enough land in this Bazaar for shops, supposing no further land is given out?—We want more. If all the available plots were built over including Mr. Jeevanjee's plots on the other side of the Gardens, the present demands would be met. He did not favour making the Bazaar an area for big shops only and the native trade being carried on elsewhere. The Indians were accustomed to the present Bazaar and disliked innovations. He wanted to see the overcrowding done away with. He was satisfied with the proposal of one shop to one plot. He disapproved of the small traders having stands on verandahs, etc.
- (C) MR. WOOD: Are you in favour of dividing the commercial and residential areas?—It was a very good idea. He approved of a lock-up Bazaar of big shops with no one sleeping in them: but he thought there should be sleeping accommodation in the Bazaar for the shop-keepers themselves and their servants. This was what he always wanted; but people must have a place close by to sleep in. It was necessary to do something quickly. Overcrowding was very bad particularly in the back premises of Mr. Jeevanjee's properties. Everybody was crying out that they could not get a place to live in. The site he favoured was that mentioned by Mr. Kassambhai, near the Native Market and Ngara Road. He preferred this to Mr. Grogan's site.
- (p 42. c.)
- (D) MR. WOOD: You complain of congestion in the Bazaar. The Abdul Hussein estate and others are cut up in blocks and remain unoccupied. Why?—There was no system of drainage or anything and people were afraid to start building. In the Bazaar the system was bad, but they had water; in the other places there was neither water nor drainage.

13. R W. PULTANWALA, MANAGING DIRECTOR OF THE FIRM OF MESSRS.  
MUNSHI RAM, KALA SINGH & Co., *Builders and Contractors, Nairobi.*

EXAMINED ON 11TH APRIL, 1913.

(PRESENT :— HON. H. B. TAYLOR, (CHAIRMAN), HON. V. M. NEWLAND, DR. ROSS,  
MESSRS. TANNAHILL, TOOGOOD AND WOOD).

MR. PULTANWALA, called and sworn, stated that he had resided here for nine years. He (A)  
read the following statement :—

“ 1. CAUSES OF OVERCROWDING.

1. The present plots in possession of Indians and houses built thereon are very inadequate for living. Housing of  
Asiatics.

2. As the population is increasing I see it is getting overcrowded as the houses are comparatively not being increased though a great many vacant plots have been built on.

3. The Indians own the same area of ground when 1,000 Indians were in Nairobi in 1903-04 and 6,000 to-day. My estimate is as follows, excluding Railway and Government employees :—

1899	...	...	75	} and still is progressing.	(B)
1900	...	...	200		
1901	...	...	450		
1902	...	...	750		
1903	...	...	1,000		
1904	...	...	1,500		
1905	...	...	2,000		
1906	...	...	2,000		
1907	...	...	3,000		
1909 to 1912	...	...	6,000		

4. If lease is extended of plots owned by Indians on the banks of Nairobi River, I am pretty certain owners will build barracks and about 1,500 adults can be accommodated very easily. I strongly recommend that Government should extend the lease of these plots ; if not, it will look unfair and people will suffer a great deal. (C)

5. The question of living at present is a very serious one. Even after paying double and treble rent, one cannot get a living place, hence it gets overcrowded. I have got about 150 masons, carpenters and Indian coolies and I have to pack them in the same room, originally meant for 75, because I cannot get a place.

6. As far as the housing question is concerned, I am of opinion that—

(a) The greater part of the overcrowding will be reduced when an extension of the lease of River plots will be given and a lot of buildings built thereon. You might ask why it was not done all the while in the past ; I can say, people got afraid to do so, not knowing what might happen on expiry. (D)

(b). If, as promised by The East Township Company, a main road will be built connecting their Estate and Nairobi, and if Government takes that piece into the Municipal Area, and see that roads, drains, water and sanitary arrangements are done, all the people, specially non-merchants, will go there, and that will also reduce overcrowding. At present there is no sufficient inducement and encouragement as it should be, as far as that Estate is concerned. I consider the sale conditions are fairly good.

(c). If Government reserves a place for Asiatics, somewhere near, not very far, say about a mile and half from the plain and make into plots of 100 by 150 with certain building conditions and auction them, I am quite sure that these plots will be taken over by people like hot cakes. *This scheme I prefer better than the East Township.* (E)

7. Government has reserved Parklands and Hill for Europeans, and though Asiatics arrived long before them, yet no place for residential purposes has yet been reserved. I do not understand the reason of it. It is a very important question and must be done. Some time back a letter was written to H. E. the Governor asking for a personal interview with a deputation on this very subject, to which I did not receive a favourable reply. I cannot help saying that it is the duty of Government to see that sufficient place is given to the subject. The attention of Government is drawn to this very frequently, but without any result.

8. In concluding the housing question, I sincerely request the Commission to strongly recommend the Government to reserve a piece of land somewhere (I presume it is available) at Ngara and near the P. W. D.

## II. SANITARY QUESTION.

Conser- (A) • 1. First and foremost the question is of an insufficient staff. Authorities and papers always vancy. grumble that the Indian locality is very dirty and that is why disease breaks out. I may state that the public is not to be blamed, as they complained verbally and in writing to the officers in charge from time to time, but no attention was given.

2. I myself complained once for non-clearance of the cesspool of Oriental Buildings, River Road, to the Sanitary Inspector, Town Clerk and Medical Officer of Health to the effect that the water was stinking and had lain for six days. Before it was cleared, the water had accumulated for 10 days. Is this not one of the causes of negligence on part of the Government or the Municipality?

(B) 3. Night sweepers always throw water from cesspools somewhere near the houses instead of carrying it away in carts. Several complaints were made to Municipal authorities individually and collectively, but no steps were taken, as we see that that is being still done. I can prove this by getting a lot of witnesses, if desired. I remember a general complaint was made by the Indian Community at large, and the authority did not care even to reply.

Drainage 4. Drains are very shallow and in broken condition, especially in the Bazaar, some require repairing, also a regular flow of water is not supplied at different places. I think each and every house must have surrounding drains which must be connected with Road Main Drains.

(C) 5. There are no drains or roads on private Estates, and I do not know if Government is responsible, or if not, why the proprietors should not be forced to do so. I can give some names of Estates :—Abdul Hussein Estate, Hasrat Estate, Grogan Estate, Cordeiro's Estate, Jeevanjee Estate, Ribeiro Estate, Campos Estate and several others. Some of them are so swampy that water remains accumulated for weeks and forms mosquito breeding places. I give the particular instance of the Abdul Hussein Estate; once there were about half a dozen plots full of stinking water, shrubs and rubbish. I reported to the Sanitary Inspector who could not do anything in the matter. I approached the Medical Officer of Health and took him on the spot to show the state in which vacant plots are kept. He promised me that he would take immediate steps, but I presume it was never done as I see the state just the same.

(D) 6. Jeyes' Powder and Fluid should be liberally supplied for use. Circulars in the vernacular must be printed and circulated showing the benefit of it. I know some time back circulars in English were printed regarding Plague, Cholera and various other diseases, but they were not printed in the vernacular languages, though Government knew that a good many Indians do not understand English.

7. Mucky, dirty and dusty roads are also causes of sickness. Roads should be kept repaired, cleaned and watered.

8. I am of opinion that if *sufficient and efficient* hands are engaged to supervise, and if the number of sweepers, carts, dustbins is increased, it will redeem a great deal.

(E) 9. In concluding I suggest, with a request to consider it seriously, that instead of enforcing laws under the present circumstances, what Government should do is this, that the present Indian Bazaar should be kept entirely for business purposes and for business people to live in,—those who actually work in the shops,—subject to Sanitary Rules. All the surplus people must be given a chance of buying or living at some place, which I already suggested in my remarks on the Housing question, and after this has been done, if people neglect cleanliness that they may be punished; but Government also should see that everything has been done as far as they are concerned."

(p. 40) Housing of Asiatics. Witness went on to say that he considered Mr. Grogan's scheme for a commercial area not a bad idea.

(F) Questioned as to the site near P. W. D. mentioned in his statement, witness explained that he proposed it as a residential site only. As such it would be quite suitable if drained. To everyone willing to buy a chance should be given: but plots should be sold to different persons so as to prevent a monopoly. He suggested that Government should lay the site out in plots measuring 100 feet by 150, which should be put up to auction. 300 plots would be sufficient, and any one, rich or poor, could buy. As ground rental he suggested Rs. 15 a year, and the upset price might be Rs. 75. He saw no objection to Europeans bidding, but the plots might be reserved for Asiatic occupation if desired.

Witness was compelled to accommodate his own workmen on the Abdul Hussein estate. All over Nairobi employers of labour were in difficulties for want of accommodation for labour.

Segregation. Asked whether he advocated segregation of races, witness stated that he saw no reason for it, though he admitted the habits of the races were different. In Bombay, Indians and Europeans lived in the same neighbourhood. Even in a segregated area there would be all sorts of grades. For these reasons he preferred auction to allotment. There was no objection to the various tribes and castes of Indians living together. He did not think conditions should be more stringent in the case of one class of plots than in that of another. It was for the less moneyed classes that provision was required, as most people with means already had their houses.

Asked how, he would provide for the smaller tradesmen, and whether there should not be (A)  
be a separate Bazaar for them, witness admitted that a new Bazaar of small lock up shops would  
partially relieve the existing Bazaar.

He did not think there would be any difficulty in doing away with the small traders on the  
verandahs, etc. They took these places because there was a chance of making money, and they  
could not get places elsewhere. On the other hand the small tradesmen depended on the native  
trade. The existing Bazaar was a general Bazaar, and as such would continue to be the centre of  
the native trade.

If property holders were restricted to one shop on each plot, witness did not consider that  
people would object. He did not think this would give enough room in the existing Bazaar for  
all the shops required, but those living in the back streets of the Bazaar would go to River Road, (B)  
both sides of which he believed were owned by Indians. He thought they would be able to build  
200 shops there, each with a 28 feet frontage. The petty shop-keeper would to some extent follow  
his customers.

The sanitary condition of the Bazaar was very bad. Witness knew of cases of subletting of  
verandahs, but not to more than two separate tenants. When the plots were given out there were  
no stipulations restricting the number of shops or plots.

Asked if he knew the corner shops in Stewart Street where there were 20 shop-keepers on  
a plot with two frontages, witness replied that he knew of no shop with less frontage than 12 feet.

Asked if he could not acquire land to house his labour, witness replied that it was not to be  
rented, and he could not afford to purchase. (C)

MR WOOD: You say a lot of the Abdul Hussein estate has been taken. Why are the Indians  
not occupying the vacant plots that belong to them?—Because on this as on other private estates  
there were no drains and no roads. If these were made he thought they would build. Artisans  
should provide their own accommodation. They were well paid here. The cost of living was not  
very different to what it was in India. If land was made available all Rules should then be  
enforced. The richer men would build barracks for the poorer who would have thus been driven out.  
Renewing the leases on the swamp would help matters to the extent of 25 per cent. About 1,500 could  
be accommodated. They should have one good road of a certain width, and all plans for building  
should be sent in for approval. He saw no reason why Government should instead of renewing the  
leases hold up this land for a comprehensive scheme to be drawn. He did not think the ground was (D)  
exactly healthy on the river, but it was all right 100 feet above.

MR. WOOD: How many do you propose to accommodate on a plot?—Ten in two houses  
on plots 100 by 150 feet. There would be sufficient high-lying ground to accommodate 1,500 persons  
at this rate. He agreed that it was a reasonable condition that a lessee should not be allowed to  
build over more than a certain percentage of his plot.

MR. WOOD: Do you think the present site of the quarantine camp would be suitable for  
an Asiatic area?—Yes, provided the small-pox hospital was removed. It would not be too far away.

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14. ALIDINA VISRAM, *General Merchant, Nairobi.*

EXAMINED ON 21ST APRIL 1913.

(PRESENT :— HON. H. B. TAYLOR (CHAIRMAN), DR. ROSS, MESSRS. TANNAHILL AND WOOD.

- Bazaar. (A) MR. ALIDINA VISRAM, called and sworn, stated that he had been in Nairobi for the last twelve years as a General Store-keeper. He owned about ten plots in town and two shambas on the Ngara Road, as well as some other land. He also owned a quarter of the new East Township Estate. All his plots in the Bazaar had been built on. He was not satisfied with the Bazaar. The drains were not as they should be. The sanitary boys taking away slop water threw it all over the road. Indians should supervise the sanitary work. Referred on this point to the evidence of Mr. Bailie, Sanitary Inspector, witness adhered to his opinion, stating that Indians could be got from Bombay who would work satisfactorily at Rs. 15 or so per month. The Sweepers were a distinct class in India. The houses were badly overcrowded, 12 or 16 persons were living in houses only big enough for four. They wanted more plots. Artisans and small tradesmen—barbers, carpenters, &c., should be shifted from the Bazaar and allowed to live separately. They should have a separate Bazaar for small people. In Bombay the living places were separate from the shops, and it would be better to have them so here, but this could not be insisted on without excessive hardship. The reason why those who could afford to move lived in this overcrowded state was that they could not get land allotted to them—at present a man could not get a shop in the Bazaar. Some of them paid Rs. 1,000 premium for a shop, on one-quarter of a plot. Interrogated, witness said he referred mainly to Mr. Jeevanjee's plots. Mr. Jeevanjee made a rule of never raising the rent, the premium was charged by the out going tenant on assignment of his rights. There was no security of tenure, but in actual fact Mr. Jeevanjee did not interfere with his tenants or raise their rents.
- (p. 33. E.) (B) DR. ROSS : Are your five plots in the Bazaar used for shops or dwelling houses ?—Two plots were used as stores and three as shops. The latter were divided and let out each in four sub-plots. The shops were partitioned off.
- DR. ROSS : Do the tenants sub-let to other people ?—No, they were not allowed to. He did not allow them to have small traders sitting on the verandah.
- DR. ROSS : Would it not pay some of them to put up buildings for artisans ?—Yes. He did not know why Mr. Jeevanjee had not built on his plots on the other side of the Garden. It would pay him to do so. He had just heard that Mr. Jeevanjee was building 14 houses on the River Road. Five years ago this would have been sufficient to relieve the congestion.
- (D) THE CHAIRMAN : Would you like shops to be separate from living residences ?—It would be a splendid thing. It was like that in Bombay. But they must have efficient police supervision to protect the shops at night.
- MR. TANNAHILL : Can you make any suggestion for improving the Bazaar now ?—First of all the crowd must be taken out. Also the back premises must be kept clean. Some time ago he applied for 100 residential plots to the Governor. They were nearly sanctioned, then other Indians said he wanted to make some profit, so he handed the matter over to the Indian Association. He had intended to put up houses worth Rs. 1,000 and to charge a monthly rent of Rs. 10. Afterwards he went in for the East Township Scheme.
- Housing of Asiatics. (E) MR. TANNAHILL : Do you think the Indians will go to this area at Egerton Estate ?—If there were some means of travelling—such as a tramway—people would not mind the distance. In Bombay shop-keepers lived 12 miles from their shops. People came in to business and went out again at night. There the police arrangements were so good that they did not mind locking up their shops and leaving them at night.
- If land were allotted, the Indian Association would build for the smaller tradesmen. They would agree to a small fixed rental. Many of the smaller shop-keepers in the Bazaar could afford to build for themselves, but not stone houses. They should be allowed to build on stone plinths.
- MR. TANNAHILL : Supposing the Government found a suitable place for an Indian residential area and put it up for auction, would these people be able to buy ?—It would be sold in no time. Under the present conditions they would require 300 or 400 plots. If more were offered they would be sold. Not more than 4 or 5 persons should be allowed to live on one plot—say one family one plot, and no more.

MR. TANNAHILL : How long would you give them to build the houses ?—18 months. (A)

MR. TANNAHILL : Are there enough builders in town to build say 300 houses in 18 months ?—He thought iron houses could be built in that time.

MR. TANNAHILL : If Government said they must build in two years or else lose the plot altogether, would that be a hardship ?—It would be hard because one man might buy two or three plots, and he might build on two and want to keep the others for some time.

MR. TANNAHILL : Would not the erection of 300 houses in two years upset the building all over the town ?—Most of the work would be for carpenters and not masons. There would, of course, be a shortage of carpenters. The size of small plots might be 50 feet by 14 feet. Every man would be able to buy a small plot like this. But they might have some with a 28 feet frontage. He himself required not less than 42 feet by 50—he would need as much (B) as that if he lived here. At present he was lodging his servants in the store of an old shop.

MR. TANNAHILL : Would you suggest two areas, one for the small shop-keeper and one for the higher class merchant ?—Yes. For Asiatic residences his choice would be (1st) Ngara Road, (2nd) near the Dhobies quarters, (3rd) Egerton Estate.

THE CHAIRMAN : Are you in favour of the Bazaar being shifted to a more healthy place ?—He would not suggest that because the Indians had strong feelings about it. With regard to Capt. Grogan's proposal, the Indians would agree to remove if Government compelled them to, but they would not like it. He could not say why, but was sure it would be so.

MR. TANNAHILL : Supposing Government introduced a very stringent health law to the effect that buildings in the Bazaar must be used only as shops and not living places, would they (C) object ?—If the police arrangements were satisfactory and the residential sites were suitable, he did not think they would object.

As a site for a special Bazaar for small shop-keepers he suggested the neighbourhood of the proposed Indian residential area somewhere near Ngara Road or equally near to the town. They could build a good many shops on Capt. Grogan's land, but it would be crowded again in the future. It was too near the Bazaar. He did not favour it, but it might do for the smallest class of African retail trade. The larger tradesmen should stay in the Bazaar.

THE CHAIRMAN : Would you do away with eating-houses in the Bazaar ?—They should be kept separate. Prostitutes should not be allowed to live anywhere there. They should have their own separate lines. Prostitutes were not necessary for the Asiatics and if they were not (D) in the Bazaar Indians would not go to them.

He agreed that Indians and Africans should have separate locations, and accepted the principal of segregation of races. He would suggest the Ngara land for Indians and the Dhobies quarters area for Africans. Segregation

MR. TANNAHILL : I do not ask you to commit yourself on the spur of the moment, but supposing Government decided that your land in the Ngara Road District (plot 154) was a suitable place for Asiatic residence, would you be prepared to fall in with the Government ?—Yes. He would like to do the best he could for the Indians.

MR. TANNAHILL : Even if you had to sacrifice a third of the area for roads ?—It was all the same. If the Government wished to build on any of his plots he would come to some arrangement with them. He had never considered any sub-division Scheme for the plot No. 154. There was a bungalow with servants' quarters upon it.

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15. R. M. GEATER, Esq., *Architect, Nairobi.*

EXAMINED ON 21ST APRIL, 1913.

(PRESENT:—HON. H. B. TAYLOR, (CHAIRMAN), DR. ROSS, MESSRS. TANNAHILL AND WOOD.)

- (A) MR. GEATER, called and sworn, stated that he had been here since 1906 practising as an architect. He had a good many Asiatic clients. He found that Asiatic women liked to be closed in, and in building houses for them this should be remembered. Back to back premises should not be allowed. They prevented through ventilation. Passages between houses should be as wide as the buildings were high, both from a health and a police point of view. He preferred a stone party wall to a passage, and no passage at all to a narrow one. This could be effected by having blocks of six buildings with cross streets between. Witness saw no reason for a party wall Act in this country, to enable a proprietor to put his footings etc. on the adjoining owner's plot. This was a matter for private negotiation. As regards shops, he believed they would find a good many Indians living up in the roofs. The so-called kitchens and boys' rooms were largely occupied by native prostitutes. In regard to open drains, if they must have them these should be egg-shaped, not square as at present, the reason being that this would give a better flow of water and the drains would be easier to flush. He had been in the Bazaar a good deal at different times. At the back, in between the two sides of the buildings, there were a good many drains taking the overflow from buckets. Some of these were simply awful. The Indians were very keen on small shops. He thought he was right in saying they got about Rs. 30 per month for these. He could not swear to that, but he thought it was so. The cost of the shops would be £40 or £50, giving an interest of over 50 per cent. The average rate of interest amongst them, he believed, was about 2% per month.
- (B) DR. ROSS: Do you mean the sub-let corners of one of the larger shops, or a tin shanty?—He meant, say, a building 28 ft. long. They liked to divide it into three shops, getting about Rs. 30 for each. Witness considered the minimum frontage for a shop should be 15 feet, and he thought Bazaar plots should be paved with stone. Indians preferred to build in wood and iron as it was much quicker, and as they put up the iron without lining it was also much cheaper.
- DR. ROSS: Could a building like that be made fairly rat-proof?—With a stone plinth he would say it was practically rat-proof. The lining was a danger, as once they got rats into it, it was difficult to get them out.
- MR. TANNAHILL: Has the cost of building gone up?—Yes, especially in stone. It had risen about 20 per cent in the last 6 months. There were not enough men for the work to be done.
- (D) MR. TANNAHILL: You heard Allidina Visram's evidence. If Government put up all those plots in two or three years, would it affect European building very badly?—He thought the Indian contractor had first call on Indian labour, therefore the European contractor would be affected. At the same time if there was enough work, European contractors could engage European artisans. He believed one European carpenter could do the work of three Indians, and do it more effectively. The reason why European artisans were not coming was that the contractors could not afford to give guarantees. In this scheme for 300 houses, the trouble would be the timber. They could not get it now for love or money. The contractors were now using imported instead of native wood. It was not so cheap, but there was more of it. He believed there was a certain royalty on timber which had to be paid before it was touched. He was not quite sure, but he believed this had to be paid immediately the tree was cut. The consequence was they did not cut any timber unless it was actually wanted. If that order was allowed to stand over for twelve months, the timber could be felled and it would have time to season.
- (E) MR. TANNAHILL: What does the Indian want when he sends to you?—He brings a sketch of his building. Witness would say "You cannot have this and that done". The Indian would say "Send it in and try to get it passed." Witness would send it in, and it would be passed or not, but if he gave his candid opinion he would not recommend the plans nine times out of ten.
- MR. TANNAHILL: Do they make a great fuss when restrictions are put on their buildings?—They did not like modifications. The argument often was that the plans would be passed for wealthy Indians but not for poor men.

Housing of  
Asiaties.

(p. 49. A.)



MR. TANNAHILL : Would it simplify your work if you had a hard and fast definition ?—It would (A)  
be easier because he could say “ You cannot have that.” If he said that now, they would go  
to some one else who said differently. He thought the building regulations should be revised  
and stiffened, on the lines of English regulations.—Any day in the Bazaar they would find 14  
to 20 people sleeping in a small room.

MR. TANNAHILL : What is your opinion of the proposed new building regulations ?—As far as he  
could remember some of them were rather stiff. Witness had no objection to 3 storey or 4  
storey domestic buildings if the open spaces were sufficient, but he would only allow one family  
to each floor.

MR. TANNAHILL : In a town like this are they building for more than ten years ahead ?—He  
thought or hoped that all Government Road would be scrapped in about ten years if the (B)  
town progressed.—He would prefer to see blocks of half-a-dozen shops with party walls and  
cross-streets.—In the new regulations it was provided that there should be one house to two  
acres in certain residential areas. Such plots were all right for people who could afford to  
build on them, but there should be other plots for people who could not afford this. If they  
did not provide for terraced property, people would either have to live at hotels or get rooms  
somewhere. It was not everybody who could afford to pay a rent of £ 5 per month.—The  
average price of an acre now was £ 100. One could not build a house for less than £ 200,  
and there was the ground rent to be considered.

With regard to the future development of Nairobi, witness thought that the level crossing in  
Sixth Avenue would have to be done away with in time, and suggested as there were object- (C)  
ions both to bridging and tunnelling, that the line should be diverted, so as to skirt the Hill  
instead of running across the plain. It could thus go under Sixth Avenue and other roads in  
a cutting.

APPENDIX II.



STATISTICS.

	PAGE.
1. Statistics of Rainfall ... ..	54
2. „ Vital and Mortal, &c. ... ..	56

1.—TABLE SHOWING RAINFALL AT NAIROBI FOR THE YEARS 1900—1912.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Total.	Average per month.
1900.														
Inches ...	5.04	10.38	4.34	3.59	5.85	1.88	0.12	...	0.17	0.47	6.48	6.16	44.48	3.70
Number of wet days ...	8	11	10	13	13	4	1	...	1	2	15	13	91	7.6
1901.														
Inches ...	0.99	7.47	6.58	13.59	4.50	1.29	0.21	0.24	...	0.17	3.16	3.18	42.18	3.52
Number of wet days ...	3	9	11	19	11	2	3	1	...	1	13	9	82	6.8
1902.														
Inches ...	...	5.16	2.28	2.14	4.94	1.99	1.34	0.70	0.43	2.05	6.84	15.14	43.01	3.58
Number of wet days ...	...	8	6	8	9	5	6	2	2	4	12	12	74	6.2
1903.														
Inches ...	3.25	4.31	1.21	8.17	4.63	6.36	0.88	0.10	2.06	2.40	3.23	2.92	39.52	3.29
Number of wet days ...	6	7	4	12	15	12	7	2	10	8	9	8	100	8.3
1904.														
Inches ...	0.25	1.02	2.67	4.80	4.35	0.41	0.46	1.02	0.19	3.59	5.60	1.51	25.87	2.16
Number of wet days ...	1	3	8	14	12	5	5	6	1	8	15	5	83	6.9
1905.														
Inches ...	1.42	...	11.55	9.61	8.10	1.67	0.24	1.51	1.23	1.51	6.19	4.84	47.87	3.99
Number of wet days ...	3	1	19	14	16	4	2	3	2	6	18	9	97	8.1
1906.														
Inches ...	1.6	4.87	9.03	13.93	3.47	1.75	0.87	0.64	0.18	4.27	3.11	1.52	45.24	3.77
Number of wet days ...	2	14	15	21	14	6	3	2	2	7	10	8	104	8.4
1907.														
Inches ...	3.80	2.10	...	13.16	8.6	1.52	0.48	0.24	...	2.41	5.96	0.45	38.72	3.225
Number of wet days ...	10	3	...	18	19	5	1	1	...	9	12	2	80	6.6
1908.														
Inches ...	...	2.22	2.84	5.40	4.65	0.57	0.33	0.53	0.09	2.73	3.92	3.63	26.91	2.24
Number of wet days ...	...	6	5	12	15	3	1	6	2	6	14	10	80	6.6
1909.														
Inches ...	1.45	...	0.15	5.92	0.52	1.18	0.60	2.09	1.95	2.34	7.59	5.38	29.17	2.43
Number of wet days ...	4	...	1	16	3	10	3	9	6	7	17	13	89	7.4
1910.														
Inches ...	3.02	0.04	1.27	5.87	5.96	1.03	2.58	0.38	0.04	0.88	4.89	1.39	27.35	2.28
Number of wet days ...	7	1	5	17	13	3	8	3	2	5	19	10	93	7.75

D.—TABLE SHOWING RAINFALL AT NAIROBI FOR THE YEARS 1900—1912.—*ctd.*

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Total.	Average per month.
1911.														
Inches ...	...	2 60	4 90	7 96	4 20	2 35	0 52	0 33	2 10	0 58	1 50	1 05	41 29	3 44
Number of wet days ...	...	5	13	15	17	8	2	11	5	4	18	4	132	8 5
1912.														
Inches ...	0 78	14 68	3 74	11 24	6 89	2 51	...	0 79	2 37	...	5 78	5 43	54 21	4 52
Number of wet days ...	6	16	5	25	12	5	...	7	6	...	18	17	117	9 75
TOTAL :														
Inches ...	21 6	54 85	49 66	105 38	66 66	24 51	8 63	9 17	10 81	23 4	78 55	52 6	505 82	3 24
Number of wet days ...	50	84	102	204	169	72	42	53	39	67	190	120	1192	7 7
AVERAGE :														
Inches ...	1 66	4 22	3 82	7 72	5 13	1 89	0 66	0 7	0 83	1 8	6 04	4 05		
Number of wet days ...	3 8	6 4	7 8	15 7	13	5 5	3 2	4	3	5 2	14 6	9 2		

## II.—EXTRACTS FROM ANNUAL REPORT.

OF

DR. H. A. BODEKER, MEDICAL OFFICER OF HEALTH FOR NAIROBI TOWNSHIP.  
YEAR 1912.

## VITAL AND MORTAL STATISTICS.

## I. RESULTS OF CENSUS POPULATION.

<i>Year taken with date.</i>	<i>Europeans.</i>	<i>Eurasians.</i>	<i>Goans.</i>	<i>Asiatics.</i>	<i>Africans.</i>	<i>Totals.</i>
November 2nd 1906 ...	579	63	510	3071	9291	13514
August 30th 1909 ...	729	76	591	3071	8524	14161
April 1st 1911 ...	1011	78	565	2718	12240	16612

## ESTIMATED POPULATION.

1912	1200	90	610	3000	15000	19900
------	------	----	-----	------	-------	-------

It may be taken for granted that all classes have increased in population during 1912. This is evident from extensive building operations conducted in all parts of the Township, which has given employment to a large number of Asiatics and Africans

Moreover it is notorious that the housing accommodation is markedly insufficient to meet the growing demands of the population of today.

## 2. BIRTH RATE.

Registration of Births is compulsory only for Europeans, other classes are unrecorded. It is to be regretted that no measure has yet been taken to keep a complete record of all births occurring in the Township.

## TABLE OF REGISTRATION OF EUROPEAN BIRTHS.

<i>Year.</i>	<i>Male.</i>	<i>Female.</i>	<i>Total.</i>	<i>Rate per 1000.</i>
1908.	14	12	26	34.5
1909.	17	13	30	41.1
1910.	10	15	25	30.3
1911.	16	23	39	38.7
1912.	24	24	48	40.0

From the foregoing figures it will be noticed that the Birth Rate is steadily increasing.

## 3. REGISTRATION OF EUROPEAN MARRIAGES.

1910.	.....	19.
1911.	.....	14.
1912.	.....	29.

## 4. DEATHS.

Total number of deaths registered during the year 305.

Total death rate per 1000, 15.3%.

## TABLE OF MORTALITY SHEWING COMPARISON WITH PREVIOUS YEARS.

<i>Year.</i>	<i>Europeans.</i>	<i>Eurasians.</i>	<i>Goans.</i>	<i>Asiatics.</i>	<i>Africans.</i>	<i>Totals.</i>
1908.	9	...	5	51	171	236
1909.	7	...	5	62	174	248
1910.	8	2	6	73	193	282
1911.	22	2	11	77	214	328
1912.	19	...	6	102	178	305

## TABLE SHEWING DEATH RATE PER 1000 FOR EACH CLASS DURING FIVE YEARS 1908 TO 1912.

			1908.	1909.	1910.	1911.	1912.
Europeans	...	...	15.5	8.7	8.3	21.	15.8
Eurasians	...	...	...	...	25.6	25.6	...
Goans	...	...	9.8	8.4	9.3	19.9	9.8
Asiatics	...	...	16.6	19.5	21.5	22.4	34
Africans	...	...	18.4	18.2	16.5	17.5	11.8

A study of the above table will show that there has been an increase in the death rate for Asiatics and a decline for Europeans, Goans and Africans during the year.

## INFANTILE MORTALITY.

Among Europeans only one death under a year was recorded during the year, from Gastro-enteritis complicated with malaria. Age 6 months.

## 5. RELATIVE MORTALITY IN THE DIFFERENT SEASONS FOR THE PAST FIVE YEARS.

			1908.	1909.	1910.	1911.	1912.
First Quarter	...	...	75	45	82	74	71
Second "	...	...	67	119	65	113	77
Third "	...	...	57	35	71	79	83
Fourth "	...	...	37	49	64	60	74
Total	...	...	236	248	282	326	305

## 6. TABLE OF CASES FOR THE PRINCIPAL DISEASES WHICH ENDED FATALLY AND THEIR SEASONAL INCIDENCE FROM 1908 TO 1912.

Disease.

		First Quarter.					Second Quarter.					Third Quarter.					Fourth Quarter.				
		1908.	09.	10.	11.	12.	08.	09.	10.	11.	12.	08.	09.	10.	11.	12.	08.	09.	10.	11.	12.
Malaria	...	5	0	14	3	4	8	9	2	10	10	10	4	2	10	7	2	3	3	3	9
Pneumonia	...	18	19	29	24	27	20	19	33	45	25	22	16	37	21	26	8	14	27	31	20
Dysentery	...	9	4	10	7	5	1	8	4	14	14	6	1	4	5	24	6	13	10	2	5
Enteric F.	...	1	0	0	0	1	0	0	0	0	1	0	0	1	1	0	1	0	0	2	1
Tubercle of Lung	...	3	4	5	8	2	2	3	4	3	1	3	1	3	5	1	...	3	5	1	4
Plague	...	0	0	0	0	0	0	0	0	14	0	0	0	8	2	0	0	0	0	0	4
Smallpox	...	0	0	0	0	0	—	67	0	0	0	0	0	0	0	0	0	0	0	0	2

## MALARIA.

During 1912, this disease contributed 9·8 % of the total number of deaths—the following were notified, Europeans 3, Asiatics 10, and Africans 17. A fair number of African deaths was complicated with other diseases, either respiratory or digestive.

THE FOLLOWING TABLE OF MALARIA WILL SHOW THE COMPARISON FROM 1908 TO 1912.

Year.	EUROPEANS.				CIVIL HOSPITAL RETURNS (ASIATICS AND AFRICANS.)		Grand Total.	
	Native Civil Hospital Returns.		European Hospital.		Total admissions.			
	Total admissions.	Mortality.	Total admissions.	Mortality.	Indoor.	Outdoor.	Admissions.	Mortality.
1908.	106	nil.	17	1	139	581	843	25
1909.	56	"	17	0	99	502	674	16
1910.	130	"	16	1	76	825	1647	21
1911.	77	"	27	0	53	688	845	28
1912.	...	"	37	3	...	...	...	30

In spite of the striking figures quoted in the Table it is difficult to express any opinion regarding primary infections in the Township. It is quite reasonable to believe that a fair number of cases may have been primarily infected in the Township especially among Africans and Asiatics inasmuch as several anopheline breeding places were frequently found in the populated parts: but at the same time there can be little doubt that a large percentage of cases contracted the infection elsewhere. This may be said regarding the bulk of European cases, many of which were probably imported and old infections.

## DYSENTERY.

This disease contributed 15·7 % of the yearly total number of deaths; the number notified was 48, 2 Asiatics and 46 Africans.

The following Table will show the total number of admissions and deaths in each year, for the whole community.

Year.	Admissions.		Mortality.	
	Europeans.	All others.	European deaths.	Total number.
1908.	10	102	<i>nil.</i>	22
1909.	11	162	"	26
1910.	14	335	"	28
1911.	14	199	2	28
1912.	...	...	2	48

It will be noticed that the mortality in Dysentery chiefly affected Africans: and really it is not to be wondered at, as taking into account the migratory movements of natives from all parts of the country to Nairobi whether by foot or rail it is more likely that the disease was contracted outside the Township than in it.

It is a wellknown fact that the Wakikuyu are extremely susceptible to Dysentery, which in all probability may be found lurking in many polluted drinking places along the roadside. In the Township itself the majority of the native population is sufficiently civilised to know to avoid drinking the polluted Nairobi stream.

Amongst Europeans the cases on record are comparatively slight and it is impossible to give any definite information regarding the sources of infection.

#### ENTERIC FEVER.

This disease contributed 9% of the total number of deaths in the year. 2 Europeans and 1 African were notified.

#### COMPARISON OF ADMISSIONS AND DEATHS FROM 1908 TO 1912.

		<i>Admissions.</i>					<i>Deaths.</i>					
		1908.	1909.	1910.	1911.	1912.	1908.	1909.	1910.	1911.	1912.	
Europeans ...	...	?	4	10	13	21	1	0	...	2	2	
Eurasians ...	...	?	1	0	0	0	0	0	...	0	...	
Goans ...	...	?	1	2	0	0	1	0	...	0	...	
Asiatics ...	...	?	1	2	2	7	...	0	1	1	...	
Africans ...	...	?	1	0	0	3	...	0	...	...	1	
Totals		...	23	8	15	15	31	2	0	1	3	3

A study of the above table will show that there has been a steady increase among Europeans year by year: but it must be remembered that quite a fair number of cases have been sent to the European Hospital from outside the Township.

A notable increase is also observed for Asiatics.

		1908.	1909.	1910.	1911.	1912.
Deaths per cent for Europeans	...	?	<i>nil</i>	<i>nil</i>	15.3	9.5

#### PLAGUE.

This disease contributed 1.9 % of the total number of deaths in the year.

After a lapse of almost a year it reappeared in the Indian Bazaar on the 5th of September. Previous to the outbreak on the 14th of May 1911, it had been in abeyance for over five years in the Township.

The Epidemic in 1911 ceased on the 16th of September and altogether 39 cases were notified with a mortality of 22.

The following table will shew the admissions, mortality and Death Rate per cent for 1912

	1911.			1912.		
	Admissions.	Mortality.	Death Rate per cent.	Admissions.	Mortality.	Death Rate per cent.
Goans ...	3	1	33.3	...	...	...
Asiatics ...	12	7	58.3	7	5	71.4
Africans ...	24	14	58.3	2	...	...
Totals ...	39	22	...	9	5	...

#### DISTRIBUTION OF THE DISEASE IN 1912.

Indian Bazaar .....	6 cases (all Asiatics)
Sanitary lane back of Victoria Street .....	1 " "
Old Jeevanjee stables " .....	2 " (Africans.)

After the first case of Plague was notified in 1912, prophylactic measures were vigorously carried out amongst the community living in the Indian Bazaar; over 1400 persons were inoculated with Haffkine's Serum, which, in my opinion, proved itself an extraordinary influence in preventing a serious outbreak of the disease, as not a single case occurred among those whom had been inoculated. In every Plague case notified it was found that the individual had not been inoculated.

### **APPENDIX III.**

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#### **Previous Reports etc. dealing with Sanitation of Nairobi.**

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	Page.
1. Dispatch by H. E. Sir James Hayes Sadler ... ..	60
2. Report by Asst. Deputy Commissioner and Acting Land Officer, on removal of Bazaar, with relative Estimate ... ..	64
3. Minute of meeting of Sites Committee ... ..	66
4. Report by Special Committee on the minute No. 3 hereof ... ..	68
5. Report by Land Ranger, with relative Estimate ... ..	69
6. Report by Special Committee on removal of Bazaar with relative memorandum by the Principal Medical Officer ... ..	73



DESPATCH BY HIS EXCELLENCY, SIR JAMES HAYES SADLER, K. C. M. G., C. B.,  
H. M. COMMISSIONER FOR THE EAST AFRICA PROTECTORATE  
TO THE SECRETARY OF STATE FOR THE COLONIES  
DATED 18TH MAY 1906.

NAIROBI  
18th May 1906.

MY LORD,

In view of the unsatisfactory and, as I now consider, dangerous state of the drainage and sanitary condition of the township of Nairobi and the continued endemic presence of plague, I deemed it necessary to telegraph to Your Lordship on the 9th instant requesting that an expert sanitary engineer be engaged for one year and sent out at once to advise as to the best means of dealing with a question which is in my opinion of great moment for the future welfare of the whole Protectorate.

2. In order to give Your Lordship some idea of the history of Nairobi during the past few years, I have the honour to submit the following report.

3. At the commencement of 1902 plague broke out in the Nairobi bazaar. There were 69 cases and between 50 and 60 deaths. The Commissioner, Sir C. Eliot, was strongly of opinion that the site, which had been selected three years before by the Manager of the Uganda Railway without consulting any medical or sanitary authorities, was, with its inadequate drainage, unsuitable for a large and growing population. He consequently called upon the Doctors then in Nairobi for a report on the sanitary aspect of the township. For easy reference I enclose a copy of the report herewith. Your Lordship will observe that the Doctors were unanimous in condemning the site. They pointed out that it was a depression with a very thin layer of soil on rock. The soil, they remarked, was water-logged during a greater part of the year, and the decomposition of animal matter was abnormally slow, in consequence of which it was difficult to eradicate plague germs, and it was a favourite breeding ground for mosquitoes. They added that the conditions of the soil were such that should cases of typhoid, enteric or cholera occur, an epidemic of serious proportions would inevitably ensue. The Doctors concluded their report by recommending the removal of the town to some point on the hills. As an alternative scheme, which however they did not consider nearly so satisfactory and which they thought would be much more expensive, they suggested that the present site should be effectively drained.

4. Sir C. Eliot telegraphed a precis of this report to the Marquess of Lansdowne on April 26th 1902. He at the same time recorded the fact that Mr. Jackson, General Manning, the late Mr. Baly and he himself endorsed the views of the Medical Officers, whilst Mr. (afterwards Sir F.) O'Callaghan and other Railway authorities disagreed, arguing that Indian townships managed to prosper in spite of insanitary conditions and chronic plague.

5. Several telegrams passed between the Foreign Office and Sir C. Eliot regarding the proposed alterations to Nairobi with the result that a board sat on May 17th and 18th to discuss a compromise suggested by the Marquess of Lansdowne. The following points were raised :—

(1) Removal of the Military bungalows and lines to a site on the slopes in the rear of the Railway officials' residences.

(2) Removal of the Indian bazaar to a site adjoining the high ground beyond the English cemetery.

(3) Subordinate Railway officers' quarters to remain on the present site with improved drainage and sanitary precautions in accordance with the recommendations of the Medical authorities.

(4) Movement of the Coolie landies to a convenient site.

(5) No further native buildings to be permitted on Railway land.

6. In calling together the board Sir C. Eliot reminded the members that this was a critical point in the history of Nairobi, and he asked them to recommend nothing which they did not consider thoroughly satisfactory.

7. After much discussion the board decided in favour of draining the present site, instead of moving it, provided that the details of the scheme were satisfactory to the Medical authorities and provided that the present coolie landies and military lines were removed. There appears to have been a good deal of personal feeling shown, and the opposition of the Railway authorities made it impossible to discuss the removal of the subordinate houses, though this was recommended by Sir C. Eliot and Dr. Spurrier. In this connection Sir C. Eliot telegraphed as follows to Lord Lansdowne on June 22nd: "A scheme can hardly be successful if those principally concerned are determined to make it a failure". I enclose herewith a copy of the report of the board together with a letter from Dr. Spurrier, in which he states that he signed the recommendations of the board with certain reservations.

8. On July 2nd Lord Lansdowne telegraphed to say that he agreed with the conclusion which under the circumstances had been arrived at, and he accepted generally the proposals of the board. His Lordship also consented to a proposal of Sir C. Eliot's that Dr. Low of the Sleeping Sickness Commission should be requested to inspect and report on the town of Nairobi on his way to Entebbe. I enclose copy of this report from which it will be seen that the author was of opinion that if certain improvements were carried out it would be unnecessary to alter the present site.

9. Local measures were at once taken in pursuance of the recommendations of the board. The Military officers' bungalows, the Government offices, the jail, the police lines and the Protectorate subordinate quarters were removed and re-erected, whilst the expenditure of the general drainage scheme and the scheme for a general water supply was provided in the Railway Estimates.

10. On April 1st 1903 Dr. Moffat was appointed P. M. O. of the East Africa and Uganda Protectorates, and on May 19th following he submitted a report in which he described the state of Nairobi as a dangerous one and he condemned the site of the town as very defective. I have the honour to transmit herewith a copy of this report. Your Lordship will perceive that Dr. Moffat disagreed with the finding of the board held on May 17th and 18th 1902. As stated by Sir C. Eliot in his despatch No. 438 of September 17th 1903, he was of opinion—and this opinion was generally shared by the Medical Officers (as opposed to others)—that the best course would have been to move the town (*i.e.* the Railway subordinates' quarters) out of the plain. Dr. Moffat, like Sir C. Eliot, "regretted that the opportunity of the plague was not utilized to carry through this somewhat heroic measure," but they both agreed that the time was now past.

11. Notwithstanding the recommendations of the Medical authorities, very little appears to have been done towards improving the sanitary condition of the town before June 1903. In that month Sir C. Eliot called a meeting, at which he presided. Dr. Moffat, the P. M. O., Mr. Rawson, the Manager of the Railway, and Mr. Anderson, the Chief Engineer, were amongst those present. It was agreed:—

- (1) that the present system of drainage was inadequate and that a better system was desirable;
- (2) that as a provisional measure a sanitary gang should be formed to sweep the existing drains;
- (3) that the houses ought to be connected with the main drains by pipes.

12. As a result of this meeting the Uganda Railway Committee voted £2,000 in June and July 1903 for the purpose of making a concrete invert as a lining to the main drains. This money was however not touched. The Manager deferred starting until certain experiments in lime had been carried out, and the £2,000 merged later on in a larger scheme.

13. Later in the year (1903) Major Pringle was instructed by the Foreign Office to proceed to East Africa to inspect and report on the Uganda Railway. In the course of his report, which he submitted on October 31st, he urged the Government to further consider the question of the site of Nairobi "before the construction of numerous buildings of a permanent type would pledge them hopelessly to adopt the town—condemned alike by sanitary engineers and medical experts—as the site for the future capital of East Africa." He suggested that the wisest course to pursue would be to accept the present site as temporary only, and to appoint a commission to select a new site for the permanent township, one to three miles away. An extract of his report is enclosed.

14. In October 1903 Mr. Currie was appointed Manager of the Uganda Railway, and four months later Major Will, R.A.M.C., succeeded Dr. Moffat as P. M. O. of the East Africa and Uganda Protectorates. Both gentlemen had been instructed by the Foreign Office to report on the township of Nairobi.

15. Major Will submitted his report in April 1904. He deplored the selection of the site, but gave as his opinion that, owing to the enormous expense it would entail, it was too late to entertain the proposal of moving elsewhere. "Permanent buildings have been erected," he wrote, "and trade and other vested interests have arisen all of which would demand compensation for compulsory removal. I do not consider the result gained by removal would now be anything like commensurate with the expenditure it would entail." Major Will further submitted a scheme for drainage and made various recommendations, but his estimate was based on a wrong hypothesis. His report is of interest, and as it is referred to in later papers I enclose a copy herewith.

16. The Manager in consultation with the P. M. O. then forwarded a memorandum for draining the Railway Subordinate Quarters, and estimated the amount required at £ 7,500 plus £ 7,000 for a main drain. I enclose a copy of this memorandum. Major Will in another letter stated that, as only measures of a practical nature should be advocated, and that anything involving a large expenditure would be regarded as inopportune, he considered Mr. Currie's scheme the most practical solution of the difficulty.

17. Sir C. Eliot resigned a few weeks after the receipt of these reports, and I regret to say that with the appointment of a new Commissioner they were lost sight of and were never submitted to the Secretary of State. The sum of £ 7,500 for the drainage of the Railway Subordinates' Quarters was nevertheless sanctioned in Treasury No. 12354-04, and of this amount £ 2,200 had been expended by the 31st March 1905. The work has since then progressed but slowly owing to the difficulties experienced in obtaining lime, and it is at present almost at a standstill.

18. When I assumed charge of the Protectorate in December last I found, as I have reported elsewhere, that the sanitary condition of Nairobi was in a backward and unsatisfactory state. Plague had been endemic since September 1905 and one case of enteric had also been reported, whilst dysentery and malaria are very prevalent. When the rainy season commenced, the whole town was practically transformed into a swamp; and an inspection which I made of the Indian and native quarters revealed an appalling state of things. I therefore called on Dr. Milne, the Deputy Principal Medical Officer, to report (in the absence of Major Will) on the sanitary state of Nairobi township. I have the honour to transmit herewith a copy of this report with the P. M. O.'s covering letter. The large plan accompanying Dr. Milne's report is not quite applicable to the present state of affairs as it was drawn up nearly three years ago and only shows the block plan of sites as then projected—not what is in actual existence to-day; it is, however, sufficient for the purpose.

19. We have now been considering, but with little practical result, the question of the drainage and sanitation of Nairobi for the last four years. In the meanwhile the town has considerably increased in size, new shops, hotels and other permanent buildings have been erected on the plain, the population is much more numerous, and the resident European community, partly living on the plain and partly on the hill and in Parklands, at present numbers some 380 persons. And plague to a certain extent may be said to be endemic in the plain. The state of affairs revealed by the reports submitted with this despatch can no longer be allowed to continue, the situation must be seriously faced and dealt with without further delay.

20. Attached is a contoured plan of Nairobi, shewing in colours the portions occupied by the various communities: that portion of the plan comprised within the dotted blue line is the inhabited part of the plain with which this despatch is almost entirely concerned. Railway hill, Nairobi hill and Parklands, which are the residential quarters of the official and part of the non-official European community, are elevated ground, and the conditions here are quite different from those which obtain on the plains.

21. Station road, with Victoria road running parallel to it on the East, Government and Market roads, and the Indian bazaar form the business centre of the town. Within this area are situated the Government offices, such as they are, and the European hotels and shops, and on the outskirts are located on one side the Railway offices and on the other the jail and police lines. Between the Railway subordinates' quarters and the Indian bazaar is an open plain, where it was lately proposed to build our new Government offices.

22. The drainage of this area and the sanitation of the crowded Indian bazaar are the matters which call for urgent attention and remedy. Practically the only efficient surface drain is the masonry drain built by the railway running down Government and Station roads. The smaller drains in the Railway Subordinate Quarters are useless in their present state and are blocked by being continued into unlined trenches cut into black cotton soil. During the late rains in April and May the whole area was water-logged and the state of the roads was such that traffic was almost suspended. The roads are now being energetically taken in hand, and so far as these are concerned the construc-

tion at present being done should remove all impediments to traffic before the next rains are due. To carry off the storm waters from this area we require a proper system of drainage ; levels are being taken for the drains that are most urgently wanted, but the whole system requires careful and expert consideration, and the present outlet into the Nairobi river is a source of danger to the public health.

23. Owing to the want of drains, private building has been suspended in a number of cases, because the building conditions require the owner to connect his drain with the public drains, and these in places have only been marked out. This has naturally given rise to a great deal of dissatisfaction. The insanitary state of the Indian Bazaar is evident from the reports of the P. M. O. and Dr. Milne. The latter has taken some photographs showing the dangerous system of cesspits, which of itself is an aggravating cause of disease, and it is consequently not suprising that plague frequently makes its appearance in this quarter. The question of the removal of night soil, too, is an important one, and if the town continues to increase largely, will cause trouble. Probably the best solution will be found in Major Will's suggestion of using destroyers.

24. It is, I admit, too late to consider the question of moving the town from the plains to the higher position along the line some miles to the North. We had the chance in 1902, and I think it was a pity that we did not do so then as advocated by Sir C. Eliot, leaving the Railway to remain on the Nairobi plain as they decided to do.

25. What we have now to do is to make the town as sanitary as we can at the least expense, and it is here that expert opinion is necessary. I do not advocate the spending of large sums of public money on a system of perfection, but I do hold that measures are necessary, on the lines recommended by the Medical Officers, to remedy the defects brought to notice in the enclosures to this despatch. Otherwise as has been pointed out, we may suddenly find ourselves confronted with a disaster.

26. I do not consider that Nairobi town, from its position on the edge of the European settlement area, will ever become a city like Johannesburg, or a large commercial centre, for if there is a rapid development of industries or minerals in any of the districts, the centres would spring up round them. But we shall always have a town peopled partly by Europeans and partly by Asiatics and natives. The present resident population is about 6,000, with a large daily influx of natives. Moreover the surroundings of the town, the elevated parts of Railway and Nairobi hills and Parklands, will form the future capital of the Protectorate, and as soon as it is feasible to do so, I want to move most of the public offices remaining in Mombasa to this quarter. We have already here the head-quarters of the Military, the Railway, the Medical, Land, Survey, Forest, Veterinary and Agricultural Departments and the current office of the Commissioner. Probably the best site for our public offices would be on the slope of the hill along Club road, but if my request for the services of an expert Sanitary Engineer is favourably considered, I should prefer to defer building until he has studied the situation. But funds are available this year for building a portion of the offices, and I do not wish to delay and allow the money to lapse.

27. Mr. Grogan has lately come forward with a scheme for laying out a new township for Europeans on his land running along the railway about two miles from the Nairobi town. This may help matters, and I am considering the suggestion. Nairobi town would then remain mainly an Asiatic and Native township ; but whether this is found possible or not does not affect the main objects of this despatch.

I have the honour to be,  
My Lord  
Your Lordship's most obedient humble servant  
J. HAYES SADLER.

2. REPORT BY THE ASSISTANT DEPUTY COMMISSIONER, NAIROBI AND THE  
ACTING LAND OFFICER, TO THE COMMISSIONER FOR LANDS, ON  
PROPOSALS TO ACQUIRE THE INDIAN BAZAAR,  
DATED 2ND NOVEMBER, 1906.

NAIROBI :

*2nd November, 1906.*

CONFIDENTIAL.

Sir,

In accordance with your instructions that we should investigate and estimate the cost of the compulsory acquisition of the Indian Bazaar, Nairobi, we have the honour to submit herewith a memorandum dealing with the subject, and giving the estimate required.

The estimate gives also the probable value of the land re-acquired, and the amount which, in our opinion, will be realised by the sale of it.

Against this has to be considered the value of the land to be granted to the Indian lessees in exchange for that which they at present hold.

In the memorandum we have referred to the total value of vacant Crown land within the Municipal Area estimated by Mr. G. B. Williams.

This sum is £80,000, and although based upon current prices, we consider some years will elapse before it can be realised.

We have the honour to be

Sir

Your obedient servants,

C. W. HOBLEY,

*Assistant Deputy Commissioner.*

E. L. WARING,

*Acting Land Officer.*

## MEMORANDUM.

*Compulsory Acquisition of the Indian Bazaar, Nairobi.*

## ESTIMATE OF COST.

**Indian Bazaar.—**

Total No. of Plots	...	...	...	...	130
Total No. of Private Buildings	...	...	...	...	69
Do. Government Buildings	...	...	...	...	2
No. unoccupied	...	...	..	...	59

It is estimated that a total of £500 for Front plots and £400 for Back plots will represent the average price to be paid for the compulsory acquisition of each plot built on, and £10 for those not built on. This sum is based upon the fact that a plot of land of equal value is to be given in exchange to each Lessee involved.

The following is the total valuation—

			£	s.	d.
69 Plots with buildings	...	...	30,000	0	0
59 Plots unoccupied	...	...	590	0	0
Subsidiary acquisition of three acres on site of proposed					
New Bazaar, and two plots on Nairobi Hill	...	...	1,000	0	0
Expenses, 5 per cent.	...	...	1,580	0	0
TOTAL			33,170	0	0

Against the above sum can be placed the credit value of the land re-acquired as follows :—

130 Plots, Average price £75, based on Mr. Williams' estimate ... 9,750 0 0

This credit sum is in respect of the area covered by the Indian Bazaar only, and from it must be deducted the cost of the land to be granted in exchange. This may be taken at one-third leaving the credit value at ... 6,400 0 0

Mr. Bransby Williams, in his memorandum, dated the 24th September, has estimated the value of the whole of the Crown Lands still available for disposal within the Municipal Area. His estimate amounts to £80,000. This sum includes the figure of £9,750 for re-acquired land of the Indian Bazaar.

It is not proposed to question Mr. Williams' figures, but at the same time it may be pointed out that the realisation of his estimate would be spread over a number of years—fifteen to twenty.

Taking the number of years at fifteen over which the estimate of £80,000 may be spread, an annual return of £5,333 may be expected. It may be pointed out that at present roughly two-thirds of the trade of the town is in the hands of Indians, and it will need a very considerable influx of Europeans with capital to realise the amount. Indications at present do not point to this influx as certain, or that the sum of £80,000 will be realised. It is therefore speculative, although based upon the current price of property.

In the foregoing figures nothing has been allowed for possible litigation.

C. W. HOBLEY,  
E. L. WARING,

3 MINUTE OF MEETING OF SITES COMMITTEE AS TO THE EXECUTION OF  
THE WILLIAMS SCHEME, DATED 22ND JULY 1907.

A meeting of the Sites Committee was held at the Land Commissioner's Office on 2nd July, 1907.  
The following were present :—

The Commissioner for Lands, President.

The Acting Senior Commissioner.

The Acting Provincial Commissioner.

The Manager, Uganda Railway.

• The Land Officer.

The Director of Public Works.

The Executive Engineer.

Mr. T. A. Wood.

The Medical Officer of Health.

The question first discussed was whether the removal of the Indian Bazaar should be proceeded with during the present year, in accordance with Mr. Williams' first method of dealing with this matter, or whether Mr. Williams' second scheme should be adopted—*viz.*, allowing this to stand over for the present and putting the Indian Bazaar in a more sanitary condition meanwhile.

Mr. Currie moved that scheme No. 2 be adopted. Mr. Wright seconded this.

Mr. Ross moved as an amendment that "in view of the strong representations that have constantly been made during recent years as to the desirability of moving the Indian Bazaar from its present site, and of the sanction indicated in the current estimates for the expenditure of a sum of £8,000 for the acquisition of the site, this meeting wishes to express the opinion that the acquisition should be proceeded with, and that the abandonment of this opportunity will be a matter for lasting regret in following years, and that scheme No. 1 should be adopted".

Mr. Espeut seconded this.

On a vote 2 members voted for the amendment and 6 for Mr. Currie's proposal which was therefore carried.

Mr. Currie next proposed that the following steps should be taken for the carrying out of the scheme involved in his motion—*viz.* :—

"The roads and drains of the new Indian Bazaar site ;

"The preparation of the new native location site ;

"The drainage of the new Government buildings site ;

"The laying of the 9 inch pipe (flushing water main) ;

"The improving of the roads and drains North and South of Government Road."

Mr. Wright seconded this motion, which was carried *nem. con.*

It was further proposed that steps should be taken with as little delay as possible for establishing the new Native location and the new Indian Bazaar and this was agreed to unanimously.

The Medical Officer of Health asked what steps in the opinion of the meeting should be taken, in view of the adoption of Mr. Williams' second scheme, to put the present Indian Bazaar in a better sanitary condition. The meeting decided that this question might be left over until it is seen how matters progress towards the establishment of the new Bazaar.

Mr. Currie then stated to the Committee that he proposes to reconstitute the distribution of the Railway Subordinates' quarters, so that the Indian Subordinates shall live on the sites nearest to the Station Road, and the site nearest to the Railway *i.e.*, the northern portion of the site, shall be occupied by White Subordinates.

Mr. Currie accepted Mr. Wood's suggestion as a good one that a strip of land near to the Government Road should be kept for a better class of buildings.

Mr. Hobley proposed that after these recommendations had been submitted to His Excellency, and approved by him, Mr. Williams' report be no longer regarded as secret, and further that the private land situated within the bounds of the site of the new Indian Bazaar be acquired as soon as possible.

These proposals were agreed to unanimously.

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• 4. REPORT BY SPECIAL COMMITTEE ON THE REPORT NO. 3 HEREOF  
DATED 10TH JULY 1907.

A Committee consisting of the following officers met today at the office of His Excellency the Governor to consider the report of the Nairobi Sites Committee and the letter of the Director of Public Works on its proposals :—

The Acting Senior Commissioner.

The Commissioner for Land.

The Manager Uganda Railway.

The Principal Medical Officer.

The Acting Provincial Commissioner.

The Land Officer.

The Executive Engineer.

As the Principal Medical Officer had not been present at the meeting of the Sites Committee he was asked to give his views. He said that having regard to the previous sanitary history of Nairobi and all that had been written thereon, also to the strongly expressed opinion of Mr. Williams, it would be a pity not to adopt the first scheme of complete expropriation of the Indian Bazaar.

In the discussion it was pointed out that we were quite in the dark as to the sum of money that would be needed for such expropriation, and that it might be a much more costly scheme than Mr. Williams anticipated. It was added that the laying out of the new Indian Bazaar and preparation of its roads and drains, were an essential preliminary to the moving of the old Bazaar, and money must first be spent on these objects.

It was also urged that the works recommended by the Sites Committee were all of importance as a part of Mr. Williams' scheme, and until the new Native Location was formed we could not really deal properly with the Bazaar question.

Moreover the state of Nairobi during heavy rain is so bad that we ought to do something towards the improvement at all events of the parts North and South of Government Road.

The flushing water main was also most necessary.

After some discussion the following scheme was agreed to :—

The sum of £8,000 having been allotted for the expropriation of the Indian Bazaar, this amount should be set apart for laying out the new Bazaar, and the balance if any paid in compensation

Instead of spending the whole of the £12,000 allotted for the main intercepting sewer, on that project, part of the money should be diverted to the following most important objects :—

1. Laying out and draining to some extent the new Native Location, and the sites of the Government buildings to be erected this year.
  2. Flushing water main.
  3. Some improvement in the roads and drains in the neighbourhood of Government Road.
- The balance if any to be spent on the commencement of the main intercepting sewer.

NAIROBI :  
10th July, 1907. }

J. MONTGOMERY,  
Commissioner for Land.

**5. REPORT BY THE LAND RANGER ON THE INDIAN BAZAAR.  
DATED 8TH DECEMBER 1911.**

1. It is unnecessary more than to briefly summarise the proceedings leading up to this valuation.

2. 128 plots, each 28 feet frontage and 100 feet depth were leased by the Crown as an Indian Bazaar (in the leases to Jeevanjee, for 99 years, in all other leases for 50 years), in all cases the term dating from 1st June, 1903.

In addition, two are reserved for a Police Station, making the total plots in the Bazaar, 130.

3. The rental reserved to the Crown is Rs. 24 per plot per annum.

4. In 1907, Mr. G. Bransby Williams strongly condemned the insanitary state of the Bazaar, and recommended its removal to a site on Race Course Road and Duke Street.

An estimate of the cost of acquisition of the entire Bazaar was prepared in November, 1906, which worked out at £26,770.

The negotiations for the removal of the Bazaar are most concisely summarised in Mr. Barton Wright's report, dated the 16th June, 1910, pages 4 to 10.

5. I find that the structural value of the buildings at present existing in the Bazaar is £20,526, so that presuming :—

- (1) that plots of equal value elsewhere will be granted to each of the present plot holders so that no compensation will have to be made for land, and
- (2) that litigation is not unduly expensive and can be covered under the 10 per cent compulsory purchase,

I make up the estimate of the cost of removal as follows :—

*Estimate of cost of removing Indian Bazaar from its present site to some other site.*

(1) <i>Present structural value of buildings—</i>			
excluding	(1) Agricultural Offices	...	...
	(2) Game Warden's Office	...	...
	(3) Police Station	...	...
	(4) Jeevanjee Market	...	£2,100
	(5) Mohammedan Mosque	...	562
	(6) 2 substantial Godowns near the Mosque	1,814	...
		£4,476	...
			20,526
(2) <i>Compensation for Compulsory Purchase—</i>			
	Loss of trade during removal, 10 per cent. of	...	£20,526
			2,052
(3) <i>Compensation for loss of rents by sub-letting—</i>			
	This is extraordinarily high ; nearly every holder sub-lets, and the minimum rental is 20 per cent. per annum on structural value.		
	Allowing 6 months for removal 10 per cent. on	...	£20,526
			2,052
(4) <i>Cost of preparing, metalling and draining new site—</i>			
	Say	...	1,000
(5) <i>Cost of survey and preparing new deeds—</i>			
	130 plots less 5 used by Government	...	...
	125 plots @ £3	...	375
			£26,005

	Brought forward	...	£ 26,005
Less—			
Value of materials capable of being used in re-construction. In the ordinary course of events I should have said 10 per cent. but in this Bazaar I doubt if anything more than 5 per cent. would be realised; say £20,526 @ 5 per cent., cost exclusive of exceptions in item 1			
...	...	...	1,026
			<hr/> £ 21,979
In addition, supposing it was deemed necessary to acquire sub-items 4, 5, and 6 of item (1), there would be a further expenditure of			
...	...	...	£ 4,476
Plus 10 per cent	...	...	447
Plus cost of deeds and survey 8 plots @ £3	...	24	4,917
			<hr/>
	Total estimated cost	...	£ 29,926
			<hr/>

6. It has been argued that as a further set off against this figure of roughly £30,000 it would be fair to calculate the price to be received from the sale of these reverted plots. Such an argument is, however, unsound, as the valuation is based on the fact that plots of equal value are being substituted. If the plots are not of equal value then a further item of "Compensation for decrease in value of substituted plots" would have to be added.

7. This is a very large sum of money, and I venture most respectfully to suggest that the benefit to be gained is not worth it. The question naturally arises, "Why is it necessary to remove the present Bazaar?" I have asked this question of a great number of people, and find there are two reasons given:—

- (1.) It (the Bazaar) is insanitary and therefore a menace to any surrounding European plots.
- (2.) It is not desirable to have Indian shops in close proximity to European Traders.

8. Taking this second objection first, I have never been able to obtain a really satisfactory reason why it is not desirable. I believe in fair competition neither party cuts into the other to any great extent. It is argued that the Indian living expenses are much less, and therefore he can afford to undersell the European, but on comparing groceries, for example, I find although the price lists differ the European gives discount which the Indian does not.

It is also said that Messrs. Mackinnon, *e. g.* erect an expensive stone building at a large capital outlay, whereas the Indian carries on in a tin shanty, but presumably this stone building attracts a certain class of customer which are rather shy of the Indian tin buildings, and further Messrs. Mackinnon save in cost of maintenance. Further if this proximity is a menace, apart from sanitation, then the site selected by Mr. Williams does not remove this menace, and a site should be reserved much farther away from European Settlement, *e. g.* near the Offensive Factory Sites, or possibly on the East of the Fort Hall Road and North of the Race Course.

It practically resolves itself, therefore, into sanitation.

9. In regard to sanitation, I do not consider any very great advantage is going to be gained by shifting over to Duke Street. True, it has this very great advantage of being able to start absolutely afresh, also there is a deep level drain running through the site. As against that the Bazaar is not being removed any farther from the centre of the Town, and has the disadvantage of being placed to the windward of the European business quarter instead of to leeward as at present.

10. I believe one of the great causes of the present insanitary state of the Bazaar is brought about by the Indian custom of washing after defecation, and in consequence the ordinary bucket which provides ample accommodation for several Europeans is hardly sufficient for more than one Indian, with the result that the ground is saturated with urine effluent.

11. Added to the above the Indian land speculator finds it of infinite advantage to hold up 49 out of the available 128 plots (or 38% of the available Bazaar space) in order to get a tremendously increased rental on the remainder at a less capital expenditure in building.

12. In this the Government have, to certain extent, aided by very properly refusing Indian plots elsewhere, with the result that the poorer shopkeeper is forced to sub-rent from the Bazaar, and the working artizan to sleep there.

13. Supposing the Bazaar is removed to the present suggested site, I see no means by which we can compel the whole of this site to be built upon, and so in any way mitigate the present congestion; as a matter of fact, the principal idea of removal is that an efficient check may be exercised on overcrowding,

14. I venture, therefore, most humbly to suggest that the necessity for removing the Bazaar is not proved, and that it should be allowed to remain on its present site.

15. That if this is agreed to, it will be necessary to carry out Mr. Williams' recommendations comprised in sub-paras 1, 2, 3, 4 & 5 on pages 24 & 25 of his report, *viz:*—

- (1.) The insanitary back premises would have to be condemned and demolished.
- (2.) The present excessive overcrowding would have to be put a stop to.
- (3.) The courts and back areas would have to be paved.
- (4.) New and sufficient latrine accommodation would have to be provided in all the houses.
- (5.) A new system of drains would have to be laid.

16. Portions of items 4 & 5 will have to be borne by Government; I feel very diffident about naming the probable cost, but I should think £ 5,000 would be an outside figure.

17. I would recommend, in order to induce further buildings to be erected, that immediate action be taken in continuation of the Notice served in September, 1907, on all plots not yet built upon or on which buildings do not comply with the stipulation.

In the leases a covenant is inserted, in the case of Mr. Jeevanjee that "he shall forthwith erect solid stone buildings with iron roofs" and in all other leases "to forthwith erect a building of wood and iron on a solid stone foundation."

The action I suggest is that double rent be demanded until such time as the approved building is completed.

18. Further, as a help towards removing the excessive overcrowding, I would suggest that the Municipality erect on the site adjoining the Jeevanjee Market an Indian "Arcade" for small shopkeepers in soft and hardware (not vegetables or meat.) I found in the course of my inspection that a small tailor would pay as much as Rs. 10/- per month for the privilege of using the space occupied by two sewing machines. My suggestion is to erect a building about 300' long and about 50' wide which shall have a well lighted central avenue 20' wide with lock-up shops on either side about 15' square, to be sub-let to the small trader.

If properly run, it should pay for its own upkeep, sinking fund and cost of supervision. It could be opened at 6 a. m. and closed at 8 p.m.

This should do away with the overcrowding by day. £1,500 should cover the initial cost of this building.

19. To do away with the overcrowding by night and to supply sleeping accommodation for the small shopkeepers mentioned in paragraph 18, and also the numerous artizans and carpenters in Nairobi, I would recommend a scheme of Municipal Landies on the same lines as adopted in the Uganda Railway.

The situation I suggest is either near the new Gaol and Native Location, or near the Native Market on Ngara Road, the former for preference.

The Municipality or Government to erect the Landies and collect rent therefor.

NAIROBI :  
8th December, 1911.

ARTHUR C. TANNAHILL,  
Land Ranger.

*Land Officer,*

As per instructions received through the Secretariat, I personally inspected, measured up and valued every building in the Nairobi Bazaar, and attach my report hereto.

I much regret the delay in completing this report, but quite apart from the fact that the valuation involves the working out of an immense volume of figures, the Office during your absence on leave has been flooded with an unprecedented amount of urgent work, and I have been forced in consequence to put this report to one side.

NAIROBI :  
9th December, 1913. }

ARTHUR C. TANNAHILL,  
*Land Ranger.*

*Estimated Government Expenditure to put the present Bazaar into a sanitary condition and provide housing accommodation for Indians.*

(To be annexed to Land Ranger's report of 8/12/1911.)

Paragraph in L. R's. report.	Details.	Estimated Expenditure.	Estimated Income from such expen- diture per annum.
16	New system of Drainage and Latrine Accommodation. ...	£ 5,000	£ Nil
17	Penalties for breach of building covenants in the lease—say 45 plots @ Rs. 24/- each. ...	Nil.	72
18	Indian Arcade 300' long 50' wide to accommodate 40 lock up shops. Receipts from say 30 continually let @ £ 5 per annum each. ...	1,500	150
19	Landis as living quarters for Indian Artizans. Each unit to contain 2 rooms each 12' x 14', front verandah, back verandah and store 6' x 6', kitchen bath room and E. C. Seven units to make one block 98' long by 60' deep which allows for a yard 16' x 14'. 7 blocks making 49 units which would probably be used by at least 147 people. Receipts from say 35 blocks continually occupied @ £ 8 per annum each.	3,150	280
		£ 9,650	£ 502
5	NOTE:—The estimated expenditure for removing the Bazaar to another site is £ 29,926 from which no revenue would be derived		

NAIROBI :  
6th December, 1912. }

ARTHUR C. TANNAHILL,  
*Land Ranger.*

## 6. REPORT BY SPECIAL COMMITTEE FOLLOWING ON REPORT NO. 5

HEREOF. DATED 23RD APRIL 1912.

WITH RELATIVE MINUTE BY THE PRINCIPAL MEDICAL OFFICER,

DATED 9TH FEBRUARY 1912.

## ASIATIC BAZAAR, NAIROBI.

*COMMITTEE* consisting of the Honourable the Provincial Commissioner, Ukamba, (Mr. Hobley) in the Chair; the Land Officer, Mr. R. Barton Wright; the Principal Medical Officer, Dr. Milne; Members of the Municipal Committee, Messrs. Allen, Bayldon and Beaton. Also present:—the Town Clerk, Mr. Watson; and the Land Ranger, Mr. Tannahill.

Owing to the fact that the Asiatic land-holder finds it to his advantage to keep undeveloped 49 out of the available 128 plots in the present Indian Bazaar, it appears, from evidence before the Committee, that a population of \*3,000 people is crowded into 79 plots each 28ft. by 100ft., or an area of 5.99 acres excluding roads, on which there is only one double storeyed building (recently erected).

With few exceptions these buildings are constructed of either roughly faced stone held together with mud or most inferior and worn out corrugated iron, supported on a wood framework of just sufficient strength to support the iron.

\* NOTE. Taken from the Census returns as far as possible, which returns are believed to be underestimated.

2. The evidence before the Committee proved that in this grossly overcrowded area the lack of sanitation and habits of the occupants had made the sites insanitary in the extreme; so much so as to be an ever present menace to the health of the whole town.

3. That the Municipal Regulations in respect to sanitation and Public Health have not been rigidly enforced up to the present in the existing bazaar because it has been felt that a grave and unjustifiable hardship would be inflicted on many of the occupants (chiefly lodgers of the poorer classes), who would be turned out into the streets with no possible chance of finding lodging elsewhere.

4. That this Committee considers the area of the present bazaar is inadequate to provide for proper sanitary accommodation for the present occupants, and allows of no expansion.

5. This Committee has studied very carefully the Principal Medical Officer's report dated 15th February 1912, (annexure A), which confirms and strengthens the opinion already held by the Committee, and in consequence thereof is unanimously of opinion that, *if such a scheme is legally and financially possible*, the recommendations of the Medical authority should be put into effect in their entirety, i. e. that an Asiatic Quarter shall be declared and that no Asiatic shall be allowed to reside or trade outside that area.

6. Arising out of this general recommendation, which it must be clearly understood is put forward only on the supposition that it is "*legally and financially possible*", the Committee makes the following recommendation:—

(a) That such Asiatic Quarter shall be confined to land East of the line coloured blue on attached plan A. and North and East of the Uganda Railway Main Line.

(b) That within this Asiatic Quarter a new Asiatic bazaar shall be surveyed and planned in such manner as to allow of expansion.

(c) That this bazaar shall be situate South of Thika Tramway, on the East side of the Uganda Railway Main Line, opposite to, but separated by the railway from, the African Quarter (*vide* plan A).

NOTE.—The site suggested by Mr. Bransby Williams was carefully considered; but this Committee is unanimously of opinion that it is barely sufficient for the present needs, and allows of no expansion in the future.

(d) Provided that those Asiatics already actually trading on or holding plots in Government Road, Station Road, Victoria Street and Sixth Avenue be allowed to carry on business on such plots as heretofore; but not elsewhere in the European Quarter.

(e) Provided also that the Government shall retain the power to allow those Asiatics, whose mode of living conforms with European standards, to reside and carry on their business within the European Quarter.

Reason of overcrowding in present bazaar

Reason for insanitary state of present bazaar,

Reasons why Public Health Regulations have not been enforced.

Area of present bazaar inadequate

p. 76, Recommendation to form an Asiatic Quarter.

Position of proposed Asiatic Quarter.

Proposed new Asiatic bazaar.

Position of proposed new Asiatic Bazaar.

Exemption of certain Asiatics.

Further exemption of certain Asiatics.

Prohibition of transfer.	(f) That if necessary legislation be introduced prohibiting the transfer, except <i>mortis causa</i> , to an Asiatic of any land within the European Quarter.
Prohibition of Europeans in Asiatic Quarter.	(g) That no person or company other than Asiatic shall be allowed to reside or hold land in the Asiatic Quarter.
Advantages to be gained by the formation of an Asiatic Quarter.	<p>7. This Committee desires to call special attention to the following advantages which, <i>inter alia</i>, will accrue from the formation of an Asiatic Quarter.</p> <p>(a) The segregation of Races considered so urgently necessary by the Principal Medical Officer.</p> <p>(b) The removal of a plague spot from the centre of the European Quarter.</p> <p>(c) The opportunity of causing a new bazaar to be created on approved sanitary lines on a clean site.</p> <p>(d) The expansion of the European Business Quarter on approved lines which the removal of the present Indian bazaar would allow and which will be urgently required in the immediate future.</p> <p>NOTE.—In regard to expansion, it should be noted that at present the European Business Quarter is hemmed in between the Railway Subordinate Quarters on the South, the Railway on the West, the Indian Bazaar on the North and Government Road on the East. This Eastern boundary is capable of a slight extension towards the Nairobi River, but the present trend of business lies all in the opposite direction. The land unalienated being hatched in blue on the attached plan A.</p> <p>(e) The opportunity which this suggested site will give for forming a location suitable for the erection of bungalows and proper sleeping accommodation for Asiatic artisans and others.</p>
Question of hardship to Asiatics by enforced removal.	<p>8. The Committee is aware it may be urged that this recommendation to remove the Bazaar to the outskirts of the town will impose an unjustifiable hardship on the Asiatic shopkeeper, but the Committee feels that such a contention cannot be maintained in the face of the following facts, viz:—</p> <p>(a) That practically the entire business of the smaller Asiatic shopkeeper (which class has been almost the entire cause of the insanitary state of the present Bazaar) is derived from natives, and that within the next few months all natives other than domestic servants will be removed to the African location. That far from a hardship being imposed upon this class of Asiatic a real financial benefit will accrue by placing them in a Bazaar adjacent to the dwelling places of their customers.</p> <p>(b) That in regard to those Asiatic firms who cater for the European trade many of them already hold business plots in Government Road and Sixth Avenue, and in regard to the few who do not, provision has been made in sub-sections D. and E. of para. 6.</p>
Scheme for carrying into effect the proposal.	<p>9. That this Committee puts forward the following scheme as, in their opinion, an equitable basis of compensation for compulsory removal to the Asiatic Quarter, and recommend that if not already in existence legislation should be introduced to make the proposal effective.</p> <p>(a) The buildings on the existing Asiatic plots as shewn in pink on the attached plan A to be compulsorily acquired.</p> <p>(b) Each of the present plot-holders to surrender his lease and receive in exchange a new lease for his plot, which shall contain a clause excluding any but a European from trading or residing on the plot.</p> <p>N. B.—This proceeding may not be necessary if legislation as recommended in para. 6, sub-section F is brought into force.</p> <p>(c) A plot of standard size in the proposed new Bazaar to be granted to each of the present plot-holders.</p> <p>(d) Compensation to be paid for the cost of removal and loss of earnings during removal.</p>
Cost of scheme	10. The Committee estimates that the cost of carrying out this proposal will be £ 83,100.
Cost of compulsory acquirement.	11. Should it not be possible to acquire buildings without the land they stand on, the Committee estimates the cost of compulsory acquisition of buildings and sites at £ 184,717.
Method of valuation.	12. This figure has been arrived at in cases where no recent sales have determined the value by adopting the annual rental as the basis of valuation.

The buildings in each case have been measured and valued, and 10% on their structural value has been taken as the letting value.

The balance after deducting the letting value of the buildings from the total rental received is considered as ground rent, and capitalised at 20 years purchase.

13. The Committee wishes it to be noted that these rentals must be considered as inflated for the reasons stated in para. 1 *ante* and not in true proportion to the values of European plots in the vicinity as borne out by recent sales. Rentals inflated.

14. Further the Committee wish it to be understood that in the event of land and buildings being acquired, although the site value under its present conditions has been estimated at roughly £100,000, it would be impossible to realise that amount except by a judicious series of sales extending over a considerable period of years; but the demand at present existing is sufficient to justify the belief that an immediate sale of a limited portion of the land recovered would realise a sum which would materially decrease the amount required for compensation. Receipts from sales land.

15. The Committee is of opinion that, owing to the large capital sum required immediately to carry out such major works as the completion of the Williams scheme of sanitation, the re-imbursement of the cost of the water scheme, the construction of new roads, etc., (an estimated minimum expenditure of £50,000), it is absolutely impossible for the finances of the town to bear any portion of the burden of this acquisition, and, if the scheme is to be carried out, Government assistance will be required. Inability of Town to meet Expenditure

16. This Committee desires to place on record that they have not made the foregoing resolutions without first considering at great length various alternative proposals whereby a saving in expenditure could be effected; but they have come to the conclusion that such alternative proposals would hardly mitigate the present evil and certainly would not eradicate the insanitary state of the bazaar, and they unanimously endorse the opinion of the Principal Medical Officer in para. 11 of his report, *viz* :—“that if any radical improvement is to be effected, and not a policy of tinkering, the question of wholesale removal must be faced”. Alternative proposals do not fulfil requirements.

17. In conclusion the Committee desire to record their indebtedness to the Land Ranger Mr. Tannahill for the services rendered by him throughout the course of their deliberations. The arduous work of collection and arrangement of all the facts and figures in the Report has fallen entirely to Mr. Tannahill and has been carried out by him with a thoroughness and mastery of all the details of the problem, which call for special acknowledgment. Conclusion.

Nairobi, 23rd April 1912.

C. W. HOBLEY,  
R. B. WRIGHT,  
A. D. MILNE,  
B. G. ALLEN,  
R. C. BAYLDON,  
D. BEATON,



**MINUTE BY THE PRINCIPAL MEDICAL OFFICER ON THE REMOVAL OR REMODELLING  
OF THE INDIAN BAZAAR.**

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1. Consideration of this question of remodelling the Bazaar at once brings forward the very pertinent question of How and To What Extent can sanitary improvements be effected so as to bring within reasonable cost, what Mr. Williams, in his Report, characterises as "the very little with which, from a sanitary point of view, it is possible to express even a qualified satisfaction, much that it is necessary to condemn, and some things that can only be considered as a danger to the community"—to bring such a lurid state of matters into conformity with the standard of sanitary reform demanded now-a-days of every tropical town.

2. In 1908, before the advent of Mr. Williams—the expert sent out by the Colonial Office to advise on the sanitation of Nairobi—I studied the question of the remodelling or removal of the Indian Bazaar as thoroughly as I could. The conclusion I then came to was that to remodel would involve such drastic measures and imperil so many interests that the better and more economic proposition was to advocate removal to a new site. It would be wiser to commence afresh on a new site, and see that the rules and regulations laid down were properly carried out, than to suddenly enforce (if it could be done) what would appear to be their vexatious provisions on an existing state of matters.

3. Mr. Williams, as a result of his investigations, definitely recommended the removal of the Bazaar from its present site.

4. Again, last year, in his report on the outbreak of plague, the Acting Principal Medical Officer drew attention to the necessity for the removal of the Bazaar, or its "wholesale remodelling, preferably the former".

5. At the present day I see no reason to modify the conclusion come to 6 years ago, *viz* :—that the remodelling of the Bazaar is *not* a practicable scheme. To do this satisfactorily, absolutely necessary improvements would have to be carried out, *viz* :—

(1) insanitary back premises demolished.

(2) excessive overcrowding put a stop to.

NOTE.—The establishment of a native location will undoubtedly have a great influence in removing the parasitic Africans who hang about the Indian Mart, but won't touch overcrowding of Indians

(3) the paving of courts and back areas.

(4) new and sufficient latrine accommodation provided.

(5) new drains and sewers.

The above are what Mr. Williams considered essential; I would go further and add,

(6) a certain standard of construction of building being observed, rat proof plinth and floors (as far as practicable) in place of the present flimsy erections; and stringent building regulations.

6. To put the matter plainly, short of wrecking and gutting each building and re-erecting it, I do not see how these improvements are to be effected. Nor do I suppose that the losses and expenses would be cheerfully borne by the owners.

7. Another factor which influences me against the retention of the Indian Bazaar on its present site, is the fact that what Mr. Williams calls the "Business Quarter" (in which the Bazaar is situated) of the town, is rapidly being taken up by European firms. Whether it be right or wrong, it seems to me that there are clear indications at the present day that the ultimate destination of this part of the town is to be that of a purely European town run on English lines. The European firms will increase in number and importance, while the Indian and Goanese trading community will relatively decrease.

8. As a result of previous Tropical Medicine progress it is an accepted axiom in the planning and laying out of all towns in the tropics that the European population should be segregated from the natives, who should be made to reside a certain number of hundred yards away. Rigid sanitarians in West Africa and India would even exclude domestic servants from sleeping in the European quarter at night. This rule is mainly to avoid malarial infection; as the native and especially his children are so frequently reservoirs of infection, and are so notoriously careless of the attacks of mosquitoes as to constitute a definite danger. Though Nairobi is not a malarious town in the sense that other places in the Protectorate are rightly so regarded, yet malaria does occur, and from the figures at my disposal the number of cases are yearly increasing,

9. In addition to malaria, the Indian is notoriously susceptible to plague. The various outbreaks which have occurred in Nairobi have shewn that the heaviest incidence occurs where Indians are in residence together.

10. Thus, to retain, in what I believe will be the heart of a business and more or less residential European community, a restricted and overcrowded Indian colony, surrounded on all sides by a white population, will be pointed at as where the sanitary authorities of the town in the light of our present knowledge gravely failed in foresight in planning the development of the town.

11. So it seems to me that if any radical improvement is to be effected and not a policy of tinkering, the question of a wholesale removal must be faced.

12. The decision to remove cannot, however, be come to until it is perfectly clear that there is a sufficient area and suitable to accommodate the dispossessed owners and occupiers. The choice of such an area must, of necessity, be extremely restricted. Without pinning myself down to a definite expression of opinion, I think Mr. Williams' choice of this new area, as laid down in his report (p. 25) is one that would be very well adopted.

13. I wish to make it quite clear that I do not wish to see any change effected, unless the authorities are quite clear as to every single detail of the move and what is expected; that there is not a reproduction in a new part of the town, in however less degree, of the grave defects now in existence. It must be always borne in mind that we may change the habitation of the Indian, but we cannot change his habits; and too much must not be expected of merely a new locality.

14. To conclude, with the exception of the principle pointed out in paragraph 10 of this minute, a principle which, as a sanitary officer, I regard as really vital—the whole issue resolves itself into a financial conflict between the cost of efficient remodelling, and the cost of expropriation and coming to terms with regard to a new site.

MOMBASA :  
13th February, 1912. }

A. D. MILNE,  
*Principal Medical Officer.*

## APPENDIX IV.

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### Reports presented to the Sanitary Commission:

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	Page.
1. Letter from the Chief Engineer, Uganda Railway ( <i>Water Supply</i> )	80
2. Letter from S. Price Williams Esq. ( <i>Sewage Disposal</i> ) ...	81
3. Report by J. A. Watson Esq., Town Clerk. ( <i>Municipal Affairs</i> )...	83
4. Report W. W. Ridout Esq., Municipal Engineer. ( <i>Municipal Dumping ground and trenches</i> ) ... ..	85

( 80. )

1. LETTER FROM THE CHIEF ENGINEER, UGANDA RAILWAY, TO THE SECRETARY TO THE COMMISSION, AS TO NAIROBI WATER SUPPLY.

No. 7280/10.

SUPERINTENDENT OF WAY AND WORKS OFFICE,  
Nairobi, 13th February 1913.

THE SECRETARY OF SANITARY COMMISSION,

NAIROBI.

SIR,

In accordance with your letter No. 108/10, dated the 27th January 1913, I have the honour to forward you summary of works carried out to augment the Nairobi Water Supply subsequent to Mr. Bransby Williams' report of 1907.

1. A nine inch main has been laid between the Kikuyu reservoir and the storage tanks on the hill, Nairobi; the old 4 inch pipe line along the Railway still remains.

2. The nine inch main delivers 765,000 gallons per diem at the storage tanks and the 4 inch delivers 136,000 gallons at mile 330.

3. At mile 330 the supply will be divided equally between the Muthaiga Estates and Parklands. At present the whole amount passes through Parklands and on to the town.

4. When both the 9 inch and 4 inch mains are running full there is a tendency to empty the reservoir at Kikuyu.

5. At the present time there is an overflow at the storage tanks at the rate of 360,000 gallons per diem at midday: this overflow is undoubtedly increased during the night hours.

6. This overflow is undoubtedly due to the service mains in the town being insufficiently large to distribute the water.

7. A seven inch main is now being laid from the storage tanks down 6th Avenue to opposite the Town Hall, and about two miles of four inch main is being laid throughout the bazaar and business centres of the Town. About four miles of four inch main with 2½ inch branches has been laid in Parklands.

8. I doubt whether the supply can be augmented from Kikuyu, but the storage could be larger at Nairobi. If it is anticipated to increase this storage the present storage tanks should be moved back to a higher site along the Ngong road as there are several houses along the Ngong road at too high elevation to be supplied from the present position.

I have the honour to be,

Sir,

Your obedient servant,

A. F. CHURCH,

Superintendent of Way and Works,  
Uganda Railway.

2. LETTER FROM S. PRICE WILLIAMS ESQ., M. INST. C. E., TO THE SECRETARY TO THE COMMISSION, AS TO SEWAGE DISPOSAL AND TREATMENT.

NAIROBI, BRITISH EAST AFRICA.

July, 29th 1913.

DEAR SIR,

SANITARY COMMISSION.

In answer to your request I have written the following Memorandum on the subject of the Treatment of the Sewage of Nairobi.

I read the Report of Mr. George B. Williams some years ago in England and have had the opportunity of reading parts of it again since my arrival in Nairobi.

As I think you already know, for the past 22 years I have been with the well known firm of Civil Engineers in Westminster, James Mansergh & Sons, whose speciality is Water Supply and Sewerage of towns both in England and in the Colonies.

Perhaps the most important sewerage work which this firm in carrying out abroad at the present time is the drainage of Colombo, Ceylon. The late Mr. James Mansergh, F. R. S. A., President of the Institution of Civil Engineers, reported on the scheme in December 1897.

His report was accepted and the work with the various extensions by enlargement of the District is still in progress and is being carried out by administration.

In giving expression to my views on the Drainage of Nairobi, I have not of course had access to any plans or data, which no doubt are in the hands of the Municipal Authority, but I should like to say at once that I consider Mr. Williams' Report an excellent one : but you must remember that it was written as far back as 1906 and the conditions are now vastly different from those then existing.

I most strongly however disapprove of the sewage of Nairobi being discharged into the Nairobi River *without treatment*.

At the present time, the dry season, the Nairobi River at the Bridge on the Kyambu Road would flow comfortably through a 24 inch dia. pipe and the present scheme when it is finished will abstract a good proportion of the river water above this point for flushing purposes and the flow will be still further depleted.

I am not sure of the size of the Outfall Sewer as I have not Mr. Williams' Report by me, but my recollection is that when running full its discharge would far exceed the volume of water in Nairobi River itself at the proposed outlet and the River below this point would become a sewer, and I do not doubt but that many Indians and Natives at the present time use the river water for domestic purposes.

Again, the precedent set up by the chief town in the Protectorate discharging its sewage untreated into its river, would be an extremely bad one and one which in my opinion ought not to be thought of for a moment.

I am not of course in the confidence of the Medical Authorities as to the state of health of Nairobi at the present time, but from various sources I learn that it is far from good and that cases of Enteric fever are not unknown.

Briefly then I am of opinion that the Sewage of Nairobi as brought down by the Outfall Sewer now under construction should be treated by storing in sedimentation tanks similar to those in use in Colombo and now very generally adopted in modern Sewage Works and then filtered by continuous filters, automatic and preferably circular in shape, and then discharged into the Nairobi River at some point probably a little further down-stream from the point at present proposed.

Nairobi is fortunate in being able to have a gravitation scheme of sewerage, no pumping whatever being required, and though I have not had any opportunity of personally examining the line of the Outfall sewer and the land at its point of outlet into the river, yet from the general levels obtainable from the coloured plan published in Nairobi, I have little doubt that there would be sufficient fall to work the tanks and filters by gravitation.

I of course admit that the extra cost of Treatment Works such as I have outlined will be considerable ; but I am confident that it will have to be faced sooner or later.

If the Colonial Office would take the matter in hand, complete it and hand it over to the Municipal Authority to work, on lines similar to which the Drainage of Colombo has been done it would be greatly to the benefit of the health of the inhabitants of Nairobi.

I do not for one moment believe that any English Civil Engineer reporting afresh on a scheme of Drainage for Nairobi would advise the discharge of crude sewage into the Nairobi River.

If those notes imperfect as I know them to be, are of any help to the Commission now sitting I shall be much honored by their accepting them.

I have only recently arrived in the Colony and intend making it my home for some years.

If there are any points which I can further enlarge upon I shall be glad if you will let me know, but please remember that I have only had Williams' Report and my own observations to help me in the writing of this memorandum.

I am,

Yours faithfully,

SEYMOUR PRICE-WILLIAMS, M. Inst., C. E.

The Secretary,

Sanitary Commission.

Nairobi, July 29th, 1913.

### 3. REPORT BY J. A. WATSON, ESQ., TOWN CLERK, NAIROBI AS TO MUNICIPAL AFFAIRS.

I have been Town Clerk of Nairobi since 1st June 1911.

The Municipal Committee as at present constituted is primarily an advisory body to the Government, by which its members are nominated annually : but it has also been entrusted with the conservancy and to a certain extent with the general administration of the town, the Town Clerk as its executive officer having had various administrative powers conferred upon him by Township Rules.

The revenue of the Committee is at present about £6,500 and its normal recurrent expenditure is about £4,500. The Committee has no borrowing powers. At the beginning of year 1913-14 its savings amounted to £3,000. It is not a corporation and has no common seal. It is not responsible for the construction and maintenance of the roads, lanes or drains nor for the water supply or street lighting of the town, though it pays for the street-lighting. It is not in a position to undertake any public works except on a small scale. Such public works as it has carried out since its establishment in 1901 include erection of the Dhobie Quarters, Slaughter House, Municipal Stables and Landies ; and a number of public latrines. There are no rates and the fees charged for sanitary removals (Rs. 3 per bucket per month) are the main source of revenue.

The Sanitary condition of Nairobi has constantly engaged the attention of the Committee since my appointment. In the records of the 41 General Meetings held during the 18 months following 1st June 1911, there are over 60 Minutes dealing with the subject.

As a result of pressing representations forwarded to Government by the Committee towards the end of 1912, a large amount of bush clearing has been recently carried out. An equally pressing request was made for a subsidy towards erecting a large number of additional public latrines, the Medical Officer of Health having recommended expenditure which would probably amount to at least £ 1000 : but in this case Government were unable to supply the necessary funds.

The Committee has consistently maintained the view that the establishment of a Native Location is the first sanitary essential for the township, and to this end their savings have generally been dedicated since the publication of Mr. Bransby Williams' Report. The project however has been in abeyance since September 1912, no definite decision having yet been given by Government upon the Committee's application to be allotted for the purpose the site at present reserved for the Medical Department for Quarantine purpose.

The Committee has not overlooked the necessity for adequate building regulations. Until the appointment of its present Engineer in September 1912 however it was unable to secure for any sufficient period the services of a person equipped with the technical knowledge and experience necessary for the required drafting. A complete set of rules, adjusted after consultation with Professor Simpson, the Government's expert adviser on Sanitation has recently been passed. The main sanitary features of the new rules are restriction of height of buildings and provision for open spaces.

Under the old Rules the Committee was obliged to pass plans of which it did not approve, showing such objectionable features as frontages on sanitary lanes, and lack of air space and of adequate drainage.

The Committee has not until recently been consulted on subdivisions of town plots, except in isolated cases : but Government has now arranged that it shall be so consulted, and a town planning Sub-Committee has been appointed.

The Committee has considered the advisability of adopting the double bucket system of conservancy and is awaiting the advice of the Sanitary Commission on the point. The estimated savings of the Committee as at the end of the current year (Rs. 29,929/50 or roughly £ 2,000) are mentioned in the estimates as " Balance available for public latrines, double bucket conservancy, Native Location, and other major works ".

Important changes in the working of the Municipal staff have been effected since the date of the evidence given by the Municipal Sanitary Inspector. Mr. Bailie has resigned his appointment. A new Government Sanitary Inspector having been appointed, Mr. Bailie's successor confines his attention to superintendence of conservancy work. The Committee has decided to provide him with a colleague and to increase the native staff from 162 to 216. The Indian Jemadars have all been got rid of but permanent new arrangements for burial of natives have not yet been effected. The office staff is adequate.

Following on Rules gazetted in December 1912, some 200 householders have been compelled to provide themselves with new sanitary dustbins, with good results. The keeping of unlicensed cattle-sheds and the erection of unauthorised buildings have been checked by numerous prosecutions. Rules establishing a commercial area and providing for the sanitary control of all trade premises by registration have been brought into operation.

The indifferent condition of the sanitary lanes and some of the roads in the town has been the direct cause of extensive damage to municipal carts, resulting in impaired sanitary services. A large number of new carts is on order and one of the principal sanitary lanes has been repaired.

The worst feature of the present system of sanitary services is the difficulty of preventing sweepers from emptying filth on to the ground or into street drains instead of removing it in the tank carts. Constant direct supervision of the work of removals is of course impracticable. Offenders are invariably dealt with severely when detected : but as comparatively few complaints on this or any subject are made by the public, it is not easy to deal effectively with the mischief. The conservancy staff consists of Wakikuyu. There are probably few if any important towns in the world where the unskilled labour available is of so raw a type.

Part II,  
p. 25D.

With regard to existing Township Rules I agree with Dr. Radford that the Sanitary Rules are on the whole adequate. In fact the only substantial defects in existing legislation of which I am aware are lack of a Public Health statute to control among other things the milk trade, and want of codification. The latter is a defect which is in course of being remedied.

J. A. WATSON.

Nairobi, 1st November 1913.



**REPORT BY W. W. RIDOUT, Esq, C. E., MUNICIPAL ENGINEER AND SURVEYOR, NAIROBI,  
AS TO MUNICIPAL DUMPING GROUND AND NIGHTSOIL TRENCHES.**

To

**THE SECRETARY,  
SANITARY COMMISSION,  
NAIROBI.**

I have the honour to submit the following particulars of the above for your information:—

The night soil trenches are situated on the North side of the Thika Railway and at a distance of about 600 yards West of the lime kiln erected by Messrs. Cook & Co., upon one of the offensive factory sites.

They cover an area about 500 yards long by 250 yards wide, or roughly speaking about 25 acres.

The trenches are each about 12 feet long by 7 feet wide, between 15" and 18" deep. They are laid out in rows with a space of 10 or 12 feet between each row to allow the passage of the night soil carts.

Although the soil is very heavy, there is a considerable soakage as, during the dry weather, two trenches are found to be sufficient to take 32 cart loads representing about 12,000 gallons of night soil, this being the average amount deposited nightly upon the site.

During the past 12 months night soil has been laid over about two thirds of the area; there is therefore, at the present rate of progress, a space of about 18 months between the times that any one spot is made use of for the deposit of excreta.

The work on the site is carried out by 10 natives in charge of a Kikuyu jemadar, and, with the additional work of digging holes for the burial of animals upon an adjoining piece of land, occupies the whole of their time.

Each morning after the night soil has been tipped into the trenches, it is covered with 4 or 5 inches of earth and upon the top of this is spread all the stable refuse collected during the day.

The very little smell arising from the new trenches is no more than one would find upon a well managed sewage farm.

After the trenches have been covered a day or two nothing offensive is noticeable and, although the whole area must have been turned over and used several times, it is with great difficulty, and often impossible, when excavating to locate the site of the former trenches.

It has been suggested that the area should be utilised for the cultivation of crops such as mahindi. I do not think that this would pay for the extra labour entailed.

At present the place is covered with coarse vegetation about 2 feet 6 inches in height, the growth of which is encouraged by the stable manure.

This enables the site to be burnt over at the end of each dry season when the fire consumes all rank grass, the remains of the stable refuse, &c., and thoroughly purifies the whole area. The construction of a road between the Municipal Landies and the trenches is urgently required.

The Rubbish including trade refuse, sweepings, &c., was formerly tipped into the old Municipal Quarries near the Indian Burial Grounds, but since July last it has all been dumped upon the town side of the night soil trenches. About 32 cart loads are deposited here daily and as much as possible is disposed of by burning.

Owing to the lack of a good road, a great deal is dropped on the way after leaving the Municipal Landies. The construction of a road and the adoption of covered carts will prevent this evil.

I am not of the opinion that the immediate erection of a destructor for refuse disposal is an absolute necessity.

In crowded countries a destructor is no doubt necessary but where so much room is available for dumping grounds I think that the money could be spent with more advantage in the cause of sanitation in other directions for some time to come.

The prevailing wind carries any smell arising from the rubbish heap away from the town.

I would suggest that as soon as a road is constructed, a site upon the far side of the night soil trenches be used as a dumping ground and enclosed upon the leeward side with wire netting to prevent the scattering by the wind of paper and other material that will burn across the Railway line.

**WALTER W. RIDOUT,  
Municipal Engineer.**



# THE SANITATION OF NAIROBI.

MAP No. 2.

PLAN ACCOMPANYING REPORT BY

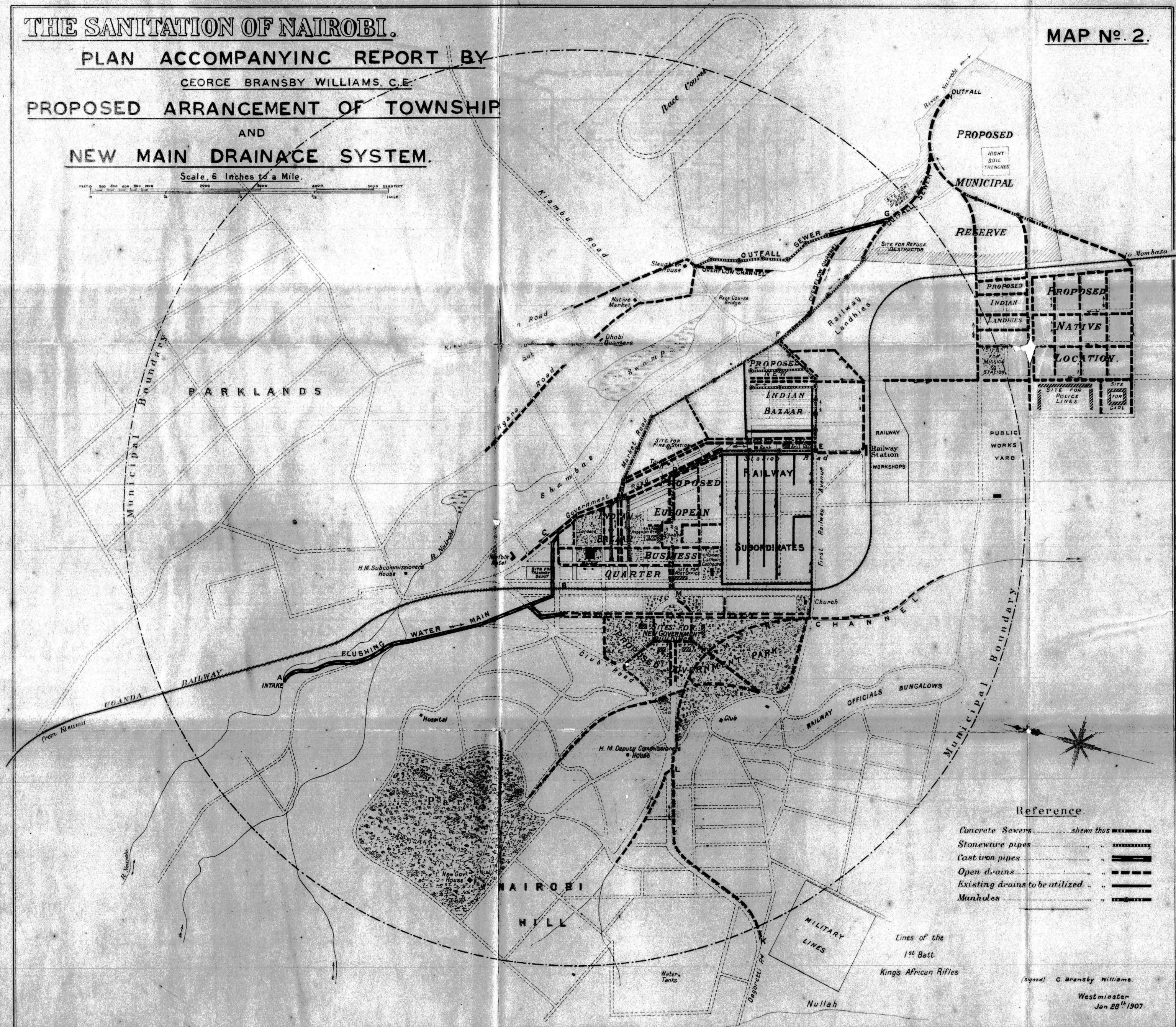
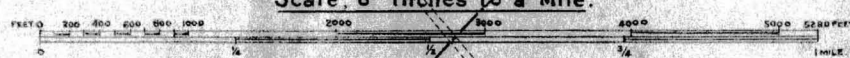
GEORGE BRANSBY WILLIAMS, C.E.

PROPOSED ARRANGEMENT OF TOWNSHIP

AND

NEW MAIN DRAINAGE SYSTEM.

Scale 6 Inches to a Mile.



## Reference.

Concrete Sewers	shown thus	—————
Stoneware pipes	"	—————
Cast iron pipes	"	—————
Open drains	"	—————
Existing drains to be utilized	"	—————
Manholes	"	—————

(signed) G. Bransby Williams.

Westminster  
Jan 28<sup>th</sup> 1907.



EAST AFRICAN PROTECTORATE  
NAIROBI

MAP



Scale 1 Inch to .986 Mile

1 Centimetre to 2.5 Kilometres

4 Miles  
7 Kilometres



# NAIROBI SANITARY COMMISSION REPORT

Scale 1 in 10000 or 6.33 inches to 1 Mile.

NOTE: Open spaces existing and to be conserved, shown with hatched edges.

