

A PUBLIC HEALTH SURVEY OF RURAL BRITISH GUIANA.

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VOL. II.

SEWAGE DISPOSAL.

NOTES ON CHIEF DISEASES.

PUBLIC HEALTH ACTIVITIES NOT
DIRECTLY UNDER GOVERNMENT CONTROL.

ADMINISTRATION.

CONCLUSIONS.

V.

SEWAGE AND REFUSE DISPOSAL.

It is well to state at once that at the moment of writing there is no sewer in British Guiana and every building either has independent arrangements or has none at all. There are exceptions to this statement for in a small part of the capital the pail system is operated by the municipality and in certain government compounds both in town and in the country the same system is employed.

It may be said at once too that outside Georgetown there is no systematised handling of household rubbish which too often lies where it falls, and which at best is used to fill up depressions in the house lot.

There are several methods in use in rural districts for the disposal of sewage. In the wilder settlements the inhabitants are content with the privacy afforded by the bush, and leave the rest to natural agencies which perform the functions of scavenger and cleanser with astonishing efficiency. It is quite the exception to find any nuisance offensive to the senses in the neighbourhood of these primitive places.

Perhaps the oldest organised system of dealing with sewage in British Guiana is that still largely employed in plantations. The arrangements are well illustrated/

illustrated in the photographs and consist of latrines built over drainage trenches. The system works well if certain conditions are observed. The latrines must be over a large trench kept free from weed and always retaining water; they must be built sufficiently far over the trench so that excreta may always fall into water and not lie exposed on mud banks.

The trench selected should be if possible the main drainage outlet or should communicate with the main outlet as directly as possible, without meandering through the lines for children and ducks to play in. Further the latrine trench should be connected to the high level conservancy canal so that thorough flushing may be carried out.

This system is admirably worked in many estates and for plantations is, in the writer's opinion, the best that can be adopted without a heavy capital expenditure. On Plantation Blairmont in Berbice the manager has given much personal attention to these arrangements, and every morning after the coolies have gone out to work a strong flush of creek water is sent throughout the latrine trenches and again at night some hours after the return of the workers to the lines.

There is nothing offensive to eye or nose about trenches so regulated, and fish thrive in them.

Badly handled, this system has obvious dangers and it is unfortunate that many villages have adopted

a modification with all the disadvantages and none of the good points, and call their system "The water carriage system of sewage disposal".

In such villages the latrine of each house is placed over the nearest drainage trench which is generally the small inter lot drain of at largest 2 feet breadth, and more commonly 9 inches.

If these inter lot drains are cleaned and graded as they should be they do not retain water long in the wet season and are always dry once the rains are over. If, as more commonly happens, the inter lot drains are not maintained, they become silted up, overgrown with grass and rushes and blocked by coconut husks and other rubbish. Parts of such drains may retain water which has no egress during the rains and quickly evaporates in dry weather.

Whether an inter lot drain is maintained or not the deposit in it of excreta is a grave menace to health and would be a disgusting offence more often than it is save for the scavenging of pigs which spread hook-worm via their own excreta and cleanse the caked faeces from their bodies by wallowing in the drinking water canals. The worst villages are those where few, if any, of the smaller drains function at all. Throughout the dry season the dreadful accumulation continues and on the advent of the rains the entire/

entire surface of the land is covered with water which distributes broadcast the sewage of the community.

Some attempt has been made in a few places to deepen inter lot drains so that they always contain water. They generally become weed grown and in any case the slow current of small trenches which meander through densely populated areas and are liable to be blocked by carelessness, accident or design, is quite unsuitable for the conveyance of sewage.

On the outskirts of a few villages where houses are close to the main side line trench, the estates' system is sometimes successful.

What then can be suggested as an alternative? Financial considerations rule out anything elaborate.

The ordinary privy placed over a pit has been tried. The constant high level of the ground water and the periodic flooding of the whole land surface have ruled it out except in unusually high and sandy places.

The villages have not the funds to install a pail system, nor to maintain and run it if once installed. The system adopted by the Health Authorities some years ago and still in use, with fair results, is a modification of the pit privy.

A mound of earth six feet square and 2 feet high is made and well rammed. Grass is encouraged to grow on/
on/

on the mound which should be left undisturbed for some weeks. A hole two feet across the top and tapering somewhat towards the bottom is dug through the centre of the mound to a depth of three feet or until ground water is met with. On the top of the mound, and over the pit, is erected a light structure whose roof should have a single slope and should at all sides project beyond the margin of the mound. If the soil is unusually light a barrel or box with base removed may line the pit. Carefully constructed and used such a privy gives 8 months to a year's service; in light soils often longer. It has been the custom here to recommend the use of some crude petroleum in the pit to prevent the breeding of flies or mosquitoes. The writer prevers to use crude carbolic acid, having found the larvae of several large flies apparently enjoying the petroleum.

The common mistakes made in building and using privies of this kind are as follows:-

- (a) Instead of making a mound and digging through it, a pit is dug and attempt made to build up a wall around the mouth. This always collapses.
- (b) The mound is insufficiently rammed and not allowed to set. Collapse follows.
- (c) Too large and too heavy a structure is placed on the mound resulting in caving in of the pit or toppling over of the closet.

(d)/

- (d) The edges of the closet roof do not extend beyond the limits of the mound and rain drips wash the mound away. This disaster follows quickly when a small gable roof is made.
- (e) The closet is used as a bathroom, resulting in rapid filling up of the pit, the discomfort of splashing and often the breeding of mosquitoes.

The greatest success with these privies is obtained by one Sanitary Inspector who never allows any structure to be erected until he has inspected the mound, and who carries about with him in miniature the uprights, sills etc. required for the building, putting the model together before each proprietor.

In the village of Christianburg, Demerara River, the soil is rather light. Mounds do not stand up well and pits fall in, and the custom for long was to put latrines over creeks or the river itself. The river is the only drinking water for settlements below, and big as is the volume of water, risk was present. Wood is very cheap in Christianburg and now every latrine is of the type described, but the mound is boxed outside and the pit inside with the most satisfactory results.

Whenever the pits are full to near ordinary ground level, a deep hole is dug alongside the mound, connection/

connection made with the pit and the contents are drawn off into the hole. This is done at the back and at each side, and thereafter a new mound is made on a fresh site.

It is easy to think of objections to this method in a country where hook worm and bowel complaints abound, but it is very difficult to think of an efficient and practicable substitute. The writer has waded through a foot of water to one of these privies which stood up like an island in the general flood, and found some water in the pit but only up to ordinary ground level. Recent research work on migration of hookworm larvae through soil seems to indicate that the dangers of this type of privy are less than had been supposed.

Many large houses in the country have proper sanitary arrangements indoors, connected to a cesspit. These cesspits are seldom if ever watertight and are generally what is locally known as "bottomless pits". They are made by sinking in the ground a 400 gallon oil tank made of thin iron and known as a "coolie tank" which before being placed in the hole has its bottom removed.

Although the nature of the soil is in most places such as to make much percolation appear unlikely, it is a fact that these bottomless pits rarely require emptying.

To/

To refer to Georgetown for a moment, there are at Government House and at the A.D.C.S. house two cesspits receiving bath and sewage water which have neither overflowed nor been emptied within the memory of any one the writer can trace, and to his own knowledge not for two years.*

The drawing of water from shallow wells is of such rarity in the colony that these cesspits do not form the danger which they would in other places.

There have been from time to time a number of trials made of special arrangements for sewage disposal.

For the small household there was designed (I think in Trinidad) the "one family septic tank". This consisted of one concrete tube inside another with a concrete base, the two communicating by means of a vertical slot in the inner tube. The outlet was placed near the top of the outer tube and was by means of a T piece dipping well below the surface of the contents. A wooden lid covered the top and an aperture over the inner tube formed the seat. Each user was expected to pour two pails of water through the seat after use. Under very careful supervision a fair effluent resulted, but the necessary water was seldom added by the ordinary user and the appliance was found to possess more interest than usefulness.

* Since this was written one has had to be emptied.

A large edition of the same idea was built for a school at Den Amstel with a pump to fill buckets, and the flushing is done by the school children as a sort of drill under the master. The installation is a success.

The scum which forms in the inner tube is not pleasant to look at, but the latrine is clean and inoffensive and the effluent is piped to a large draining trench without nuisance. This latrine formed the subject of a communication by Minett to the Royal Society of Tropical Medicine and plans are here shown.

The unpleasant nearness of scum and recent faecal deposit to the seats of this latrine, the labour, and the wetting of the seats involved in flushing by bucket and the constant supervision required have led the writer to try another form of school latrine.

Money became available late in 1922 and it was decided to try a trough-closet standing on the top of a septic tank at the Wesleyan School, Kitty Village. No glazed earthenware parts were available in the colony and an automatic flush is out of the question in the absence of a pressure water supply. The tank, trough and urinal were made of concrete and a wooden structure built on top. The section of the trough is not egg-shaped as desired, owing to lack of labour sufficiently skilled to carry out that shape in concrete. It was unfortunate for this latrine that its/

its construction was the first piece of actual work of a junior officer of the Public Works Department. This officer departed from the original plans and placed the tank low in the ground, with the result that it was flooded by heavy rains. The tank was raised eleven inches and satisfactorily completed. The flush is from a 40 gallon drum controlled by a cock and filled by pumping from a near-by trench. The effluent is disposed of 2 feet underground in a soakage trench filled with tins, clinker, etc., but immediately on leaving the tank passes through a vessel containing large lumps of coarse rock salt. It has been shown that ordinary septic tank action does not destroy hookworm eggs which pass out in the effluent and hatch out on contact with oxygen and it was hoped that by the means described a sufficiently strong solution of salt might be obtained to destroy the eggs. The results of observations are as yet incomplete.

The domestic septic tank, as a means of sewage disposal, was ardently advocated for large houses, estate hospitals and similar buildings by Minett, the writer's forerunner in the Health Department, and tanks are to be found all over the coast lands.

Septic tank effluents without further treatment are always putrescible, and it must be admitted that insufficient water supply, incorrect correlation between/

between size of tank and amount of use, intermittent use and other factors have been responsible for some smell nuisance. Chemical analyses too are unfavourable, but bacteriological analyses have proved the efficiency of these tanks as destroyers of the ordinary intestinal disease germs. Minett claimed for the tanks (a) that they destroyed the germs of disease (hook worm excepted), (b) that they were continuous in action and avoided disgusting emptying processes, (c) that they reduced sewage to a form in which it could be conveniently dealt with, and (d) that the effluent could be disposed of into large volumes of water without nuisance or risk. His claims were justified in the main though much criticism has been levelled at him by both professional and lay opinions. Certainly no critic has been able to suggest anything better.

Recently the Government ordered an enquiry into the working of septic tanks on Government property. The Director of Science and Agriculture conducted the chemical analyses, the writer's Department collected the data as to water supply, size of tank etc. On this occasion no simultaneous bacteriological work was done. The results of correlation of the findings are summarised below.

- (1) That as a rule the contents of the tanks are too concentrated. The water entering the tank should be approximately 8 gallons per day per person using the tank.

(2)/



- (2) That most tanks are too large, the time required for a complete change of contents being often very excessive. This would in many cases be partly remedied by an increase of water supply, but the size should be calculated to give approximately 5 days stay in the tank.
- (3) That even where some filtering appliance is provided for aeration purposes, little if any nitrification takes place even when the amount of dissolved oxygen is high. It is realised that in nearly all installations no pretence is made at a proper aerobic filter, but in no case does there seem to be any appreciable action by nitrifying organisms. The substitution of coral marl for burnt earth in filters is being tried, as well as "seeding" of the filters by use from time to time as contact beds.

There is no doubt that many tanks are very irregularly used. For instance a tank at a Magistrates Court may be heavily over used on a court day and hardly used at all for a week afterwards, and one at the jail receives the contents of all the pails from cells in the course of half an hour and nothing more till next day.

The value of this inquiry has been to show that there is much to learn about the working of the domestic/

domestic septic tank in the Tropics and that money might be well spent upon an experimental plant.

The improvement in the general sanitary condition of Government buildings, estates' hospitals and similar places, as well as private houses, since the pail system or cesspit was abolished in favour of modern water flushed fittings communicating with septic tanks has been very noticeable and worth while from the educational point of view if from no other.

For rural British Guiana there is at present no more satisfactory system of sewage disposal for those who can afford it than the installation of a septic tank and the fall in price of cement has put such within the reach of many. The engineers and chemists are crying for aerobic filters to complete the purifying of the effluent. Aerobic processes however do not greatly improve septic tank effluents so far as disease bacteria are concerned, but they do provide for the hatching of inactive and comparatively non-resistant hook-worm eggs into the very lively and exceedingly resistant larvae so that failing the perfecting of some method of killing out eggs and larvae, the writer leans towards the conducting of the effluent by pipe direct from the tank to some large drainage trench so removing the danger as far as possible before the active and dangerous larvae develop.

The/

The Manager of Plantation Leonora on the West Coast, Demerara, has been able in 1923 to find money for extensive sanitary work on the estate and approached the Government Public Health Department for designs for latrines for one large yard of labourers' dwellings, stating that he wished to have the excreta carried away from the yard, and promising to provide water supply under pressure.

It was found that four separate latrines of six seats each were required to serve the yard, and that the nearest place where sewage could be disposed of was a big side-line trench about 150 yards away.

In completely flat country the difficulties in the way of obtaining sufficient gradient to carry crude sewage for any distance and then to get rid of it without pumping are enormous if not insuperable. It was therefore decided to build four latrines, each standing on its own septic tank, and to pipe the effluents just above ground to the side line trench.

The general plan was the same as for the school trough latrine already described, but in this case a trough of egg-shaped cross section was managed and arrangements for coolies to squat were provided in lieu of seats.

Water supply is from a raised tank filled by wind-mill and the flushing is controlled by a cock at/
at/

at each latrine requiring a key to turn on the water. The estate authorities have appointed a man whose duty it is to go round and flush as required.

The installation is working well and congratulations are due to Mr Bratt the manager whose enterprise was responsible for this, the most ambitious disposal system as yet attempted in the colony.

To those familiar with other parts of the tropics but not with British Guiana, it may appear that little attention has been paid to pail systems and subsequent carting away of excreta. The cost of labour in this colony is such that in Georgetown the cost per pail emptied is £2: 10/- per annum, and this is prohibitive so far as our rural communities are concerned. It must be remembered too that here extra high wages are asked for specially unpleasant work, there being no large caste who perform the menial duties as in India.

Summing up the position it seems that for the present, plantations should continue the trench system, gradually replacing this by trough closets with septic tanks, the villages will be best served by pit privies on mounds, and larger houses should have private septic tanks.

Efforts are being made to obtain from Government sufficient funds to erect an experimental plant in which may be studied the problems which present themselves in existing installations.

85 a.



Well placed latrines over large trench.



Latrines over trenches at Plantation, Blairmont.
These trenches are flushed twice a day and
fish abound in them.



Badly placed latrine. At low water filth is deposited on mud bank.



Latrine over large drainage trench. Note "dripping-board" on opposite bank showing that water is drawn from the same trench.



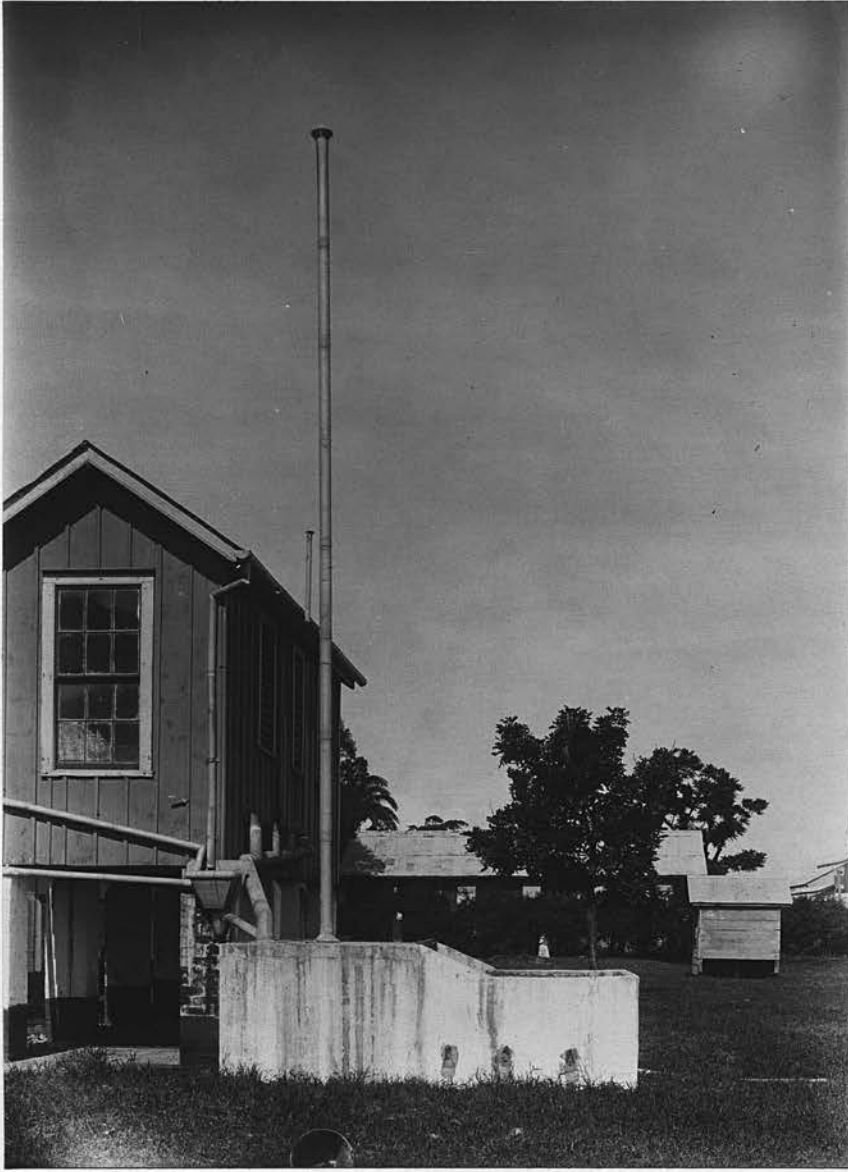
"Departmental" type of pit privy built upon a grass grown mound.



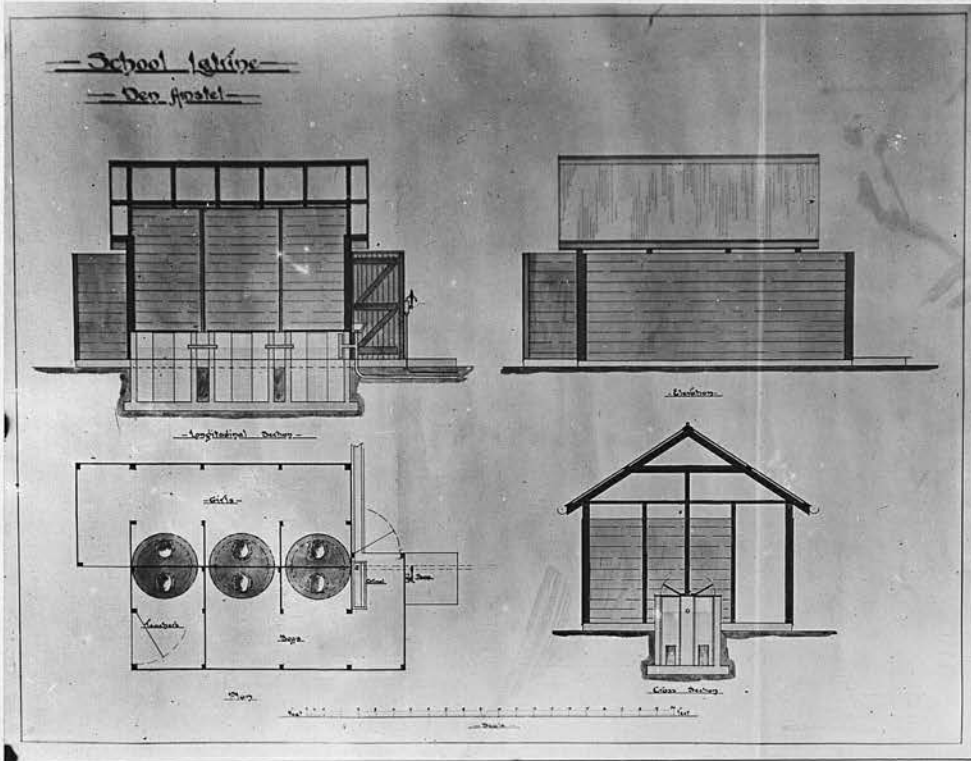
Village privy over a small drain.



Privies awash in the wet season. The right hand privy is built on a mound.



Septic tank at a plantation hospital.



Plans of the school septic tank latrine described in the text. This type has been superseded by trough closets.

VI.

NOTES ON THE CHIEF DISEASES.

The diseases notifiable are as follows, and of these alone would it be possible to give figures of incidence:-

| | |
|--------------|-------------------|
| Cholera | Enteric Fever |
| Yellow Fever | Paratyphoid Fever |
| Plague | Diphtheria |
| Smallpox | Chicken pox |
| Alastrim | Tuberculosis |

Of these, the occurrence of all save Tuberculosis and Enteric fever has been so rare of recent years that they are almost negligible as factors influencing the public health.

There are however other and non-notifiable diseases which are of common occurrence, and this group includes those which play the chief part in the causation of sickness and mortality within the colony.

In this paper discussion is limited to these diseases which largely influence the public health.

MALARIA.

Undoubtedly this disease merits first consideration. Figures of incidence cannot be given but those for mortality are quoted and these and a study/

study of local medical literature show how widespread is the disease, and that the medical men of the colony have all along been as alive to the menace of malaria as public men and public bodies have been indifferent and obstructive.

TABLE I.

| Year Period | Number of deaths from Malaria per year. | Rate per 10,000 living persons | Percentage of deaths from all causes. |
|-------------|---|--------------------------------|---------------------------------------|
| 1881-85 | 1,074 | 42.1 | 13.4 per cent. |
| 1896-90 | 1,423 | 53.1 | 17.1 " |
| 1891-95 | 1,621 | 58.0 | 16.1 " |
| 1866-1900 | 1,112 | 38.6 | 13.5 " |
| 1901-05 | 1,368 | 47.3 | 17.2 " |
| 1906-10 | 1,998 | 67.9 | 21.1 " |
| 1911-15 | 1,339 | 41.6 | 15.2 " |
| 1916 | 1,230 | 39.1 | 13.5 " |
| 1917 | 1,436 | 46.0 | 15.1 " |
| 1918 | 1,680 | 54.0 | 13.3 " |
| 1919 | 1,241 | 41.0 | 10.0 " |
| 1920 | 1,004 | 33.0 | 12.7 " |
| 1921 | 1,096 | 37.0 | 11.9 " |
| 1922 | 1,292 | 43.0 | 14.9 " |

TABLE II. CITY OF GEORGETOWN.

| Year. | Number of deaths from Malaria per year. | Rate per 10,000 living persons. | Percentage of deaths from all causes. |
|-------|---|---------------------------------|---------------------------------------|
| 1911 | 171 | 35 | 9.0 |
| 1912 | 107 | 22 | 6.4 |
| 1913 | 70 | 1 | 4.9 |
| 1914 | 63 | 1 | 4.1 |
| 1915 | 67 | 12 | 4.3 |
| 1916 | 93 | 17 | 5.9 |
| 1917 | 83 | 15 | 5.1 |

TABLE III. SUGAR ESTATES.

| Year. | Number of deaths from Malaria per year. | Rate per 10,000 living persons. | Percentage of deaths from all causes. |
|---------|---|---------------------------------|---------------------------------------|
| 1906-10 | 328 | 45 | 17.8 |
| 1911-12 | 261 | 35 | 17.0 |
| 1912-13 | 103 | 13 | 8.5 |
| 1913-14 | 93 | 12 | 7.8 |
| 1914-15 | 87 | 11 | 7.4 |
| 1915 | 155 | 20 | 11.7 |
| 1916 | 162 | 21 | 11.9 |
| 1917 | 176 | 23 | 1.14 |

TABLE IV.DEMERARA VILLAGES (East Bank, West Bank, East Coast).

| Year. | Number of deaths from Malaria per year. | Rate per 10,000 living persons. | Percentage of deaths from all causes. |
|-------|---|---------------------------------|---------------------------------------|
| 1910 | 268 | 66.3 | 19.7 |
| 1911 | 158 | 42 | 15.7 |
| 1912 | 154 | 41.3 | 15.8 |
| 1913 | 118 | 39.3 | 15.6 |
| 1914 | 149 | 42.3 | 17.3 |
| 1915 | 184 | 49.6 | 18.2 |
| 1916 | 156 | 41.3 | 17 |
| 1917 | 163 | 44.3 | 17.5 |

TABLE V./

TABLE V.

| Year. | Deaths from Malaria. | Rice Acreage. |
|-------|----------------------|---------------|
| 1884 | 854 | 2,500 |
| 1885 | 881 | 2,500 |
| 1886 | 1,084 | 2,500 |
| 1887 | 1,084 | 2,500 |
| 1888 | 1,332 | 2,500 |
| 1889 | 1,323 | 2,503 |
| 1890 | 1,228 | 2,500 |
| 1891 | 1,479 | 2,500 |
| 1892 | 1,864 | 2,500 |
| 1893 | 1,900 | 2,500 |
| 1894 | 1,763 | 7,490 |
| 1895 | 1,117 | 7,490 |
| 1896 | 1,004 | 7,490 |
| 1897 | 1,064 | 7,490 |
| 1898 | 1,470 | 7,490 |
| 1899 | 1,092 | 15,020 |
| 1900 | 861 | 15,020 |
| 1901 | 975 | 15,020 |
| 1902 | 1,482 | 15,020 |
| 1903 | 1,566 | 17,503 |
| 1904 | 1,488 | 23,016 |
| 1905 | 1,331 | 25,347 |
| 1906 | 1,894 | 27,898 |
| 1907 | 2,306 | 31,196 |
| 1908 | 1,735 | 39,746 |
| 1909 | 1,968 | 27,540 |
| 1910 | 2,066 | 33,864 |
| 1911 | 1,624 | 37,826 |
| 1912 | 1,391 | 44,020 |
| 1913 | 1,080 | 35,582 |
| 1914 | 955 | 47,037 |
| 1915 | 1,264 | 50,737 |
| 1916 | 1,230 | 57,022 |
| 1917 | 1,436 | 58,090 |

A comparison of Table II with Tables III and IV make plain the heavier incidence of malaria in rural districts as compared with the city which is what one would/

would expect from a knowledge of the habits of the malaria carrying mosquito.

A comparison of Table III with Table IV shows the greater intensity of malaria in the villages than in the estates. Two factors account for this. Firstly, the much better conditions on the plantations as regards anopheline breeding grounds in the immediate neighbourhood of dwellings and secondly the giving of quinine to labourers which was rather irregularly carried out in the years considered. Constant supervision by the estates' staff ensures more regular weeding of small drains throughout coolie lines than is ever obtained in villages, and the efficient main drainage of estate lands which has to be maintained for commercial reasons of course benefits the labourers.

Nearly every village too is heavily overgrown with vegetation while it is the exception to find any bush, or cultivation actually in the estate labourers' yards.

The comparative dangers of rice cultivation and cane growing as regards malaria is often discussed in the colony.

Here as elsewhere the breeding of anopheline mosquitoes in rice fields seems to take place more in the grass grown irrigation channels than among the rice itself, while Bodkin, a former Government Entomologist showed that the channels between rows of sugar/

sugar canes which hold water for most of the year seem to form an ideal breeding place for *Anopheles Tarsimaculatus*, the chief malaria carrier of the coast.

Table V supports the view that increased rice cultivation has not increased malaria.

The influence of malaria can never be gauged by its direct mortality alone.

In 1919 Wise, then Surgeon General of the Colony, published an able and striking account of the sinister effects of this disease, drawing attention to these under the following headings:-

A. Excessive number of deaths from Malaria, especially in infants and children.

(see Tables V and VII).

B. Excessive sickness from fever.

C. Destruction of Vital organs.

In this connection it is important to note that the annual death rate attributed to Bright's disease is 3.2 per thousand living and as a result of many years experience as Government Pathologist Wise attributed most of this to Malaria. In 1922, 11.1% of all deaths were due to renal disease.

D./

D. Decrease of births and increase of abortions; still births; premature births; and debilitated infants.

The total annual death rate attributable to premature birth and infantile debility amounts to over 2 per 1000 living and about 40% of all deaths of infants are annually due to these causes.

The part played by malaria in causing abortion cannot be doubted and in the account quoted Wise points out (as Malcolm Watson did in Malay) that this and other ill effects of malaria are often wrongly laid at the door of quinine. Wise also showed that the fertility rate among women on sugar estates fluctuated in close relation to the intensity of malaria, an observation which is again borne out by Watson's work in Malay.

E. Excessive sickness and deaths from all other diseases.

It is an all too frequent occurrence here that some comparatively slight ailment rapidly develops into a serious if not fatal malady.

F. Epidemics.

Besides the chronic malaria which is always with us, and the acute cases occurring here and there all the time, there occur at intervals sudden epidemics which flare up in one locality or/

or another with disastrous results.

In 1917 in the Skeldon Medical district there occurred such an outbreak.

| <u>1917</u> | <u>Deaths from all causes.</u> | <u>Deaths from Malaria.</u> |
|-------------|------------------------------------|---------------------------------|
| 1st Quarter | 74 | 23 |
| 2nd Quarter | 45 | 7 |
| 3rd Quarter | 109 | 57 |
| 4th Quarter | <u>154</u> | <u>64</u> |
| | 382 | 151 |

In that year the number of deaths from Malaria was four times greater than in any of the three preceding years, and fifteen times greater than in 1914. Of the 151 deaths 95 were of infants and children under 16, which is characteristic of these outbreaks. In the first quarter of the year there were in that district 105 births and 74 deaths; in the fourth quarter with its 154 deaths the births dropped to 68.

There was another epidemic in Leguan in early 1918. In the first quarter the deaths numbered 82, or four times the quarterly average, and of these 36 were due to malaria.

In 1907 Malaria became epidemic throughout the colony.

The births and deaths of that year and the preceding year are compared below:-

| | | |
|--------|-------------|-------------|
| | <u>1906</u> | <u>1907</u> |
| Births | 10,113 | 8,606 |
| Deaths | 8,844 | 11,262 |

G. Diminished mental and moral capacity.

It is important to mention this effect of Malaria.

Measures for prevention of this disease are so much a matter of administration and for the Government rather than for the doctors, that stress must be laid upon the loss of individual efficiency and the recurring loss of prosperity of which this disease is the primary cause.

Quoting Wise once more. "Malaria steadily increases the sickness of the people while diminishing the population; increases the demand for expenditure on relief, while diminishing the power to supply the revenue; increases its own licence for damage while diminishing the power to resist. Malaria has indeed stolen the life of this country."

All of what has been written about malaria is well known to the medical profession here, but it is one of the most striking phenomena of this colony that the public has no real grasp of the importance of malaria in every day tropical life. There seems to be almost a deliberate closing of the eyes to facts; certainly a timid hesitancy about facing actualities. Public men proclaim that the "mosquito theory" is nonsense/

nonsense and in 1923 the Mayor of Georgetown publicly described as a joke the request of his Medical Officer of Health for a sum of money for anti mosquito work. Many old colonists sleep without a net and are half contemptuous of the doctor searching pools with a ladle. Their view is often "Rum is the thing and plenty of it".

Even educated people in the town are unaware that Malaria is widespread, and the Creole-born seem to resent the suggestion that their colony is other than a health resort.

The writer on mentioning that he has been laid up with Malaria has frequently been told that his hearer never gets malaria, "only a little fever".

This is perhaps accounted for by the average person's idea of malaria being the classical tertian ague, while the commonest manifestation here is what locally passes as "low fever". In this the temperature seldom exceeds 100°; there is a feeling of heat and malaise, digestive disturbance, and it may be a slight chill.

The microscope puts the nature of these cases beyond doubt, and it is a common experience for the "low fever" subject to develop the classical symptoms in a cold climate.

The malaria problem has never yet become a vital factor in colonial policy. It is not to be expected that/

that moral and financial support on this question will be forthcoming either from the legislature or from the public so long as passive indifference and prejudiced scepticism play the part they do to-day. In face of these, practical malaria control is impossible.

Within the last few months the Public Works Department through its employees has destroyed a neat effective drain on the East Coast and by haphazard digging has left innumerable ideal breeding places for mosquitoes.

In 1923 the Superintendent of the Government industrial school in his enthusiasm for agriculture led numerous grassy irrigation trenches to within a few yards of the school and of his own house. Six cases of Black water fever followed, including the Superintendent, which is not surprising as the trenches teemed with anophelines, the boys have no nets and the Superintendent preferred not to use one.

Such being the state of mentality among the educated public and in Government departments, what can be expected of the very ignorant villagers.

Of course in such a country as this, any anti-malarial work attempted can be little more than tinkering with the problem until the main drainage of the land is undertaken. There is hope in this respect as a complete survey of the drainage and irrigation of/
of/

of the coast lands is in course of preparation and the present Governor has set himself to tackle this cardinal difficulty.

Once given proper main drainage, it will be both possible and reasonable to put in force the provisions of the law which deal with mosquito breeding, and there is at present before the legislature a measure to give control of the vegetation in close proximity to dwellings.

Further mosquito survey work is required so that proper measures may be adopted, and wasteful expenditure be avoided. I have been unable to find any record of an enquiry into the habits of the local anophelines at all comparable to the work done for Malay by Watson and others.

Survey work of the kind indicated is the more necessary as the interior of the colony is being opened up and the different physical conditions may mean an entirely different malarial problem from that encountered on the coastlands. Already there is reason to believe that while the virgin forest in the hilly country is free from anophelines the opening up attendant upon the establishment of mining camps is followed by the breeding of *Anopheles Argyrotarsis* and severe malaria.

The "Potaro Fever" which causes so much sickness in/

in the mining camps on that river was shown by Bodkin, the Government Entomologist, to be malaria carried by that mosquito, and the writer has recently seen patients from the Mazaruni who give cause to think that malaria is being contracted in that district.

Malaria has for so long stood out as the main barrier to development of our tropical possessions and still so successfully disputes with man every foot of progress into lands of great promise, that it is tragical to find this colony which boasts the name of "The Magnificent Province", hoping and straining after development and yet almost criminally negligent of the very measures which have paved the way to prosperity for other more far seeing lands.

FILARIA.

This disease thrusts itself into public notice by reason of the very obvious elephantiasis it causes, and which may be seen in exaggerated form in every street of Georgetown. When the writer arrived in this colony a special commission from the London School of Tropical Medicine had just completed its work of investigating this disease in the colony, but two years have passed without any report being published.

Various filarial worms are found in this Colony and one (*Filaria Ozzardi*) is permanently associated with/

with the name of a Medical Officer still in the Service. The one however which is of importance is *Filaria Bancrofti*.

Any observer noting the cases of elephantiasis encountered must realise that the disease is mainly one of the city and also that Blacks are more frequently affected than East Indians, the other main section of the populace.

This is quite in accordance with the habits of the chief carrier of the disease, the *Culex fatigans* which is by preference a town dweller.

Lee of the London School of Tropical Medicine Commission gave the following table of blood examination for Georgetown where the micro-filaria is nocturnal.

| | | | | |
|-----------------------------|-------|---------------------|----------|--|
| Out of 150 Chinese examined | 7 | were found infected | | |
| | | | or 4.7% | |
| 104 East Indians | " 14 | " " | or 13.5% | |
| 38 Portuguese | " 7 | " " | 18.4% | |
| 400 Blacks | " 100 | " " | 25% | |
| 116 Mixed | " 32 | " " | 27.6% | |
| Total 808 persons | " 160 | " " | 19.7% | |

As regards Races, this order corresponds with that given by Daniels in 1896 except that Daniels gave no figure for Chinese. The positive blood infection of 19.7% of these examined is high. Daniels's figure in 1896 was 14.9% and Wise's figure in 1909 13.0%.

When/

When the final report of the Commission is published the percentage is likely to be lower as a highly infected quarter formed a large part of the survey at the time the figure was given. In the quarter mentioned, positive infections were 83.2% of those examined.

There certainly seems to be no evidence that infection is decreasing. Indeed the record of deaths for 10 years indicates an increase.

Deaths due to Filaria 1913-1922.

| <u>Year</u> | | | | <u>Deaths.</u> |
|-------------|---|---|---|----------------|
| 1913 | . | . | . | 60 |
| 1914 | . | . | . | 52 |
| 1915 | . | . | . | 63 |
| 1916 | . | . | . | 63 |
| 1917 | . | . | . | 70 |
| 1918 | . | . | . | 102 |
| 1919 | . | . | . | 105 |
| 1920 | . | . | . | 83 |
| 1921 | . | . | . | 92 |
| 1922 | . | . | . | 56 |

In the city of Georgetown one of the chief breeding places of *Culex fatigans* used to be the cesspits and much was hoped from the regular oiling of these. It is true that larvae are rarely found in cesspits/

cesspits now but there are so many alternative breeding places that the nett diminution of mosquitoes is negligible. The use of nets has not so far become sufficiently general to affect any improvement.

In the course of examining recruits for the local militia, the writer has found enlarged inguinal glands in over 20% of those presenting themselves, and Minett in 1921 recorded that filarial glands had been among the chief causes of rejection for service overseas when he was militia surgeon before the War.

In this part of the world the expression "fever and ague" more often applies to the paroxysmal fever of filarial infection than to an attack of malaria.

The apparent immunity of Europeans other than Portuguese is probably to be accounted for by the fact that there are practically none of such of the class who sleep without the protection of a net. None the less it is very striking that one meets with filaria and indeed with elephantiasis among people apparently white, but really of mixed extraction even when such are of the net using class, while a member of the Commission of the London School of Tropical Medicine informed the writer that only a single case in a pure Anglo Saxon had been discovered in British Guiana.

The limitation or eradication of the disease depends upon adequate drainage and the provision of

a pure piped drinking water so that the innumerable improperly protected water storage vessels may be abolished, and the education of the people to the use of nets.

YELLOW FEVER.

It is convenient to mention this disease along with others that are mosquito borne, although no case has occurred for very many years. There is now only one doctor in the colony who saw the disease here about 1887, and it is to be hoped that it will never make its reappearance.

The *stegomya fasciata* mosquito is one of the commonest in British Guiana, particularly in Georgetown, breeding freely in vats and tanks, roof gutters, old tins and other odd receptacles. There is a large slum area in the city which is low lying, and on a river bank, and the whole population is non-immune. Indeed conditions are such that if infection were introduced a serious outbreak might well occur. Sources of infection exist near at hand.

Cases have occurred in the past two years in Brazil, /

Brazil, in Venezuela, in British Honduras and in Columbia, but fortunately, at least from the health stand point, communication between British Guiana and places other than the British West Indies islands is difficult and small in amount.

Should railway communication with Brazil be established, as has been proposed, a new and difficult problem will arise.

In the meantime a permanent quarantine is maintained against all Central and South American ports except British, French and Dutch. These last are regarded as trustworthy and to be depended on to report any serious disease.

The disappearance of Yellow Fever from the colony appears to have been fortuitous.

Once a pure piped water supply is made available in Georgetown the removal of the present risk should not be very difficult.

LEPROSY.

There has been a leper asylum in the colony for about 40 years, but no legal measures for the notification and segregation of cases were taken before 1905.

The 1905 ordinance made provision for lepers who could be satisfactorily isolated and maintained at home/

home to be so kept under a bond of £20, and the usual conditions as to separate utensils and exclusion from certain occupations or trades. The amending ordinance of 1910 made detention in the asylum absolutely compulsory for any leper suffering from ulcers, and placed the obligation of notification upon "every person except a minister of religion who knows or who has good reason to suspect that any person is a leper", instead of only upon fellow residents in a house. The ordinance of 1911 made provision for the Governor on the S.G.'s certification to grant a "conditional discharge" from the asylum on certain conditions and for a certain period. It is under this ordinance that stationary or apparently cured and non-infective cases are discharged. The following records of the disease controlled as described are available, and on the whole are encouraging.

Daily average of patients in the Asylum.

| <u>Period.</u> | <u>No. of lepers in asylum.</u> |
|-----------------|---------------------------------|
| 1886 - 1890 | 347 |
| 1891 - 1895 | 371 |
| 1896 - 1900 | 383 |
| 1901 - 1905 | 418 |
| 1906 - 1910 | 407 |
| 1910 - 1911 | 424 |
| 1911 - 1912 | 423 |
| 1912 - 1913 | 403 |
| 1913 - 1914 | 378 |
| 1914 - 1915 | 373 |
| 1915 (9 months) | 332 |
| 1916 | 306 |
| 1917 | 285 |
| 1918 | 276 |
| 1919 | 260 |
| 1920 | 241 |
| 1921 | 248 |
| 1922 | 277 |

LEPROSY.

| Year | Deaths in colony. | Admitted to Asylum. | Readmitted to Asylum | Discharged by Governor. |
|------|-------------------|---------------------|----------------------|-------------------------|
| 1916 | 18 | 24 | 3 | 5 |
| 1917 | 26 | 61 | 10 | 3 |
| 1918 | 20 | 65 | 14 | 21 |
| 1919 | 14 | 58 | 14 | 18 |
| 1920 | 41 | 80 | 7 | 9 |
| 1921 | 26 | 63 | 26 | 12 |
| 1922 | 29 | 75 | 21 | 15 |

For the three most recent census years the rate per 1000 living is as follows:-

1891, 1.26; 1911, 1.42; 1921, 0.82.

The rate per 1000 living compares favourably with that of most other countries possessing the physical characters which Rogers regards as predisposing to a high leprosy rate, namely a rainfall of 60 ins. or over, and lying within or close to the 80° isotherm.

The fall in the rate per 1,000 is evidence of the value of the prophylactic measures in force.

The conditions of home life of most of the discharged lepers is such that satisfactory isolation and maintenance is impossible, and in the writer's opinion too great leniency has been shown in making recommendations to the Governor. The careful and frequent supervision of all discharged lepers presents such great difficulties in practice that there are very/

very few lepers whose discharge from isolation can be regarded as safe from the public health standpoint.

ANKYLOSTOMIASIS.

This disease is common as might be expected in a country possessing the physical characters and primitive conditions existent in British Guiana.

Accurate figures dealing with incidence and mortality are naturally not easily come by.

Recently some excellent observations have been made by Dr Giglioli, Medical Officer to the Demerara Bauxite Company, and his work shows conclusively that the infection rate among the general population is very high.

The observations were made upon employees of the Bauxite Company who are drawn from all over the Colony, and since the Company employ no men who show obvious signs of anaemia it is certain that the general infection rate is even higher than among these examined. Taking only one smear from each stool, Dr Giglioli found that the rate of infection was 65 per cent and there can be little doubt that a really diligent search of each stool would give a considerably higher figure.

These figures are of serious import for the effects upon the population of heavy and widespread infection with this parasite cannot fail to be grave, although it is not possible to reduce them to /

to statistical terms. The part played by ankylostomiasis is in a manner similar to that played by malaria, and by its insidious undermining of the efficiency and vigour of the people it is perhaps more dangerous to the general weal of the colony than some of the more alarming and more rapidly fatal diseases from which this colony is free.

Preventive measures under present conditions are hardly practicable to any great extent. In Carbon Tetrachloride however we now have a curative drug which is cheap and effective, and which is so well adapted to employment for "Mass Treatment" that on sugar estates and similar limited areas it is possible to greatly reduce both the chances of infection and the severity of it.

The great mass of the labour of British Guiana is employed by a relatively small number of private enterprises each within a fairly definite area, so that systematic Mass Treatment by the chief employers of labour offers a very good prospect of success. The problem of the villages is likely to remain a difficult one until the people themselves demand to be freed of hookworm disease.

BOWEL COMPLAINTS. (excluding Enteric fever).

Under this heading are accounted for a large number of deaths every year, the death rate ranging round/

round four per 1000 of the population.

In a colony such as this it is impossible to separate with accuracy the true dysenteries from severe diarrhoea.

Many persons die without medical attention, and many persons regard as dysentery any severe complaint accompanied by looseness of the bowels.

Of 110 cases diagnosed as Dysentery in the Georgetown Public Hospital, 37% are recorded as Catarrhal, 15% as Bacillary, and 39% as Amoebic. Dr Field, whose cases these were, estimates that of the cases called dysentery in the plantation hospitals, at least 75% are really simple colitis.

From enquiries made by the writer for the purpose of this thesis, it appears that a large proportion of cases of severe diarrhoea clinically diagnosable as dysentery show microscopically none of the organisms usually associated with that disease.

There is a severe and often fatal type of diarrhoea met with among gold and diamond miners from the interior. These cases show neither pathogenic amoebae nor any recognisable dysentery bacilli, but the miners live a life of great exposure and hardship, with food of the poorest quality and are frequently heavily infected with both malaria and hookworm, so that difficulties present themselves to anyone seeking to find/

find the root cause of the sickness.

There can be little doubt that the large amount of gastro-intestinal sickness is associated with bad drinking water and bad conservancy systems, and with the improvement of these diminution of the bowel complaints death rate may be confidently looked for.

ENTERIC FEVER.

This disease is much less rife than might be expected. Its death rate ranges round .3 per 1000 living. Being a notifiable disease prompt measures are taken in every case for disinfection of premises and clothing, chlorination of water supplies and inoculation of contacts. A considerable amount of preventive inoculation of school children and of estate labourers has been done, and at one time Government granted to Medical Officers sixpence for each inoculation performed. Considering the trouble and travelling involved if this preventive method is widely employed, the reward was small enough, but even that encouragement has been removed.

YAWS.

This disease is present in the colony, being seen most commonly on the Essequibo Coast and in the islands of the Essequibo river, but now plays no very great part in death or sickness rates, and is of course/

course easily amenable to treatment.

Beri-Beri, Pellagra, Scurvy and Rickets are seen from time to time, but are noticeably rare.

Plague has not occurred for many years, and though Cholera is spoken of as having occurred years ago in epidemic form, it does not seem certain that it was of real Asiatic type.

Schistosomiasis does not occur, although reported to be present in the neighbouring territory of Dutch Guiana, and the writer can find no good evidence of the occurrence of Dengue, although that too is reported by our Dutch neighbours.

No human trypanosomiasis has been found but an epidemic of Mal de Caderas (Tryp. Equinum) occurred among mules in Berbice in 1913-14.

Dermal Leishmaniasis occurs and granuloma pudendi seems to have been very common at one time and is by no means rare now.

VENEREAL DISEASES.

These are regrettably wide-spread. Dr Delgado recently made observations over several months and found that 70% of all males admitted to hospital for medical complaints were in addition suffering from Venereal Disease. The same observer noted that over a period of some months all female prisoners in the Georgetown jail were infected with one form of this complaint/

complaint or another.

Gonorrhoea and syphilis are very lightly thought of, and there is no demand for early and thorough treatment. Sixty per cent of policemen reporting sick for other causes were found to have venereal disease but did not mention it voluntarily.

This view of venereal disease as something trivial makes it difficult to start or to maintain any active campaign against these maladies. Local conditions too are all in favour of easy spread.

The capital is a seaport town in which there is an excess of young females. Irregular sex relationships are the rule, while the stigma attaching to unmarried motherhood is as nothing compared to the reproach of sterility.

The little town of Bartica through which all traffic to the Mazaruni diamond fields must pass, has of late become a distributing centre for Venereal Disease.

During 1923 over twenty thousand men visited the diggings and returned and obeying the laws of supply and demand city prostitutes moved to Bartica and it is certain that from this centre Venereal disease is being conveyed to every village of the coast lands.

It is interesting, though so far unexplained, that in British Guiana (and I believe in Barbados) although syphilis is common, the nerve affections
Tabes/

Tabes Dorsalis and General Paralysis, and in particular the latter are noticeably uncommon. It has been suggested that infection with malaris may have something to do with freedom from General Paralysis since some success has attended the treating of that disease by deliberate infection with Malaria.

It is difficult to maintain this view since malarial infection does not occur in Barbados where no anopheline mosquitoes are found.

A considerable awakening of public opinion is required before there will be forthcoming in British Guiana the moral and financial support required for a successful anti-Venereal diseases campaign.

VII.

PUBLIC HEALTH AGENCIESNOT DIRECTLY UNDER GOVERNMENT CONTROL.INFANT WELFARE AND MATERNITY WORK.

In 1909 an infant clinic was started at the Georgetown Public Hospital but it was not until later - in 1914 - that any organised work of this kind was begun in the rural areas.

The need of work directed towards the preservation of infant lives is apparent from the colony's vital statistics and while the mortality during the first year of life has never in this colony reached the truly ghastly figures returned from some Indian towns it is nevertheless far too high and is a predominating cause of the absence of any natural increment to the population.

The maximum infant mortality for Georgetown was reached in 1907 when 325 infants died for every thousand births. In 1922 the lowest rate was recorded, namely 186.

For the whole colony the highest recorded infant mortality was recorded in 1907 namely 256 infant deaths per 1000 births. The 1922 figure was 186 .

The causes of infant mortality here are much the same/

same as all the world over. Certain of these causes however, play a larger or a lesser part in this colony than elsewhere.

That ignorance on the part of the mother which is everywhere a root cause of infant deaths is specially operative in our rural districts.

Many defects in general surroundings, housing, feeding and attention at time of birth and immediately afterwards will disappear when the general standard of education and knowledge has been raised.

Mrs Minett, the first Medical Officer of the Baby Saving League stated that her experience showed that superstitions had more influence than is generally believed among the ignorant people, and expressed the opinion that many of the practices carried out were rooted in some ancient propitiatory form of worship.

It is by no means uncommon to discover instances where extraordinary and even filthy practices are carried out.

Thus, a new born child may have its eyes bathed with urine or with the lochial discharges. The cord may be dressed with urine or with milk.

East Indians sometimes rub a mixture of butter and lamp black into and around an infant's eyes. A rectal injection of a decoction of hot peppers may be given "to strengthen the back" and amulets are often/

often tied tightly around the abdomen of both child and mother.

Debility and prematurity figure very prominently among causes of death. It seems probable however that the word prematurity is often loosely used on account of the small size of full time infants. Among East Indians new born infants average three to five pounds in weight at full-time.

The East Indians carry thrift too far and a pregnant woman will often save instead of taking the amount of food requisite for the proper nourishment of herself and her unborn child. The average diet in any case is in Mrs Minett's words "extraordinarily poor in flesh and bone forming elements".

This easy use of the term prematurity plays a special part as a cause of mortality for when a child at full time is of very small size and shows only feeble movements the midwife says it is premature and she and the mother consider it "born to die" and take no steps to preserve the new life. In such cases the child is put on one side and scarcely regarded.

Syphilis undoubtedly accounts for many of these weakly children and for many infant deaths and as yet almost nothing has been done by way of anti-syphilitic treatment for expectant mothers.

Hookworm, malaria and filaria among mothers of course contribute to the number of children born with little/

little chance of survival. Illegitimacy which all the world over diminishes the chance of survival plays a large part in this colony.

In 1921, of all births registered 60.5% were illegitimate, in 1922 the figure was 56.8% and even these high figures compare favourably with those of some neighbouring places.

ILLEGITIMATE BIRTHS.

| | | | | |
|----------------|------|-------|------|-------|
| British Guiana | 1921 | 60.5% | 1922 | 56.8% |
| Jamaica | 1919 | 70% | 1922 | 71% |
| St. Vincent | 1920 | 70.1% | 1921 | 70.2% |

In 1914 Lady Egerton, the wife of the Governor of that time founded the Baby Saving League which at first confined its efforts to Georgetown. Voluntary subscriptions and a grant from Colonial funds enabled the work to be extended to the country districts and gradually subsidised and properly trained nurse midwives were settled in the chief villages. A Medical Officer and a Superintendent were appointed and these besides controlling the work of the midwives held infant clinics, one a month in each district, where a nurse-midwife was established.

At first the midwives experienced difficulties and obstruction from the local "grannies", attempts were/

were made to boycott newly installed nurses and many of these found difficulty in obtaining sufficient private work to adequately supplement the subsidy paid by the League.

Much of this opposition has now been lived down. The old type of "granny" is dying out and no one can now register as a midwife without proper theoretical and practical training. A few dangerous "grannies" have been prosecuted and struck off the register and the whole outlook in this work is encouraging.

The respect in which this work has had a success not oft achieved by any other public health activity in British Guiana is in attracting the sympathy and support of the elected members of the legislature.

In this way funds have become available in the last few months to widen the scope of the League's activities.

The League's own Medical Officer now confines his attention to the capital city and every Government Medical Officer has become the Infant Welfare Officer for his own district, holding anti natal clinics as well as those for infants.

The number of nurse-midwives appointed and subsidised has been increased by fifteen and it has been possible to increase the subsidy as well as to provide entirely new and up-to-date equipment for each nurse.

An/

An "Early notification of Birth's Ordinance has been in existence for a number of years but being adoptive was at first largely a dead letter. In 1922 this Ordinance was put in force in all districts in which the Infant Welfare League was operating. Its provisions now apply to most of the inhabited parts of the colony and along with recent regulations for the control of midwives have been of great service for the protection of child life.

Although, as stated at the commencement of this section, maternity and child welfare work is attended to by a charitable society and is not controlled by the official Medical Service, no statement of that service's work would be complete without mention of these activities. The Surgeon General is president of the League, the Resident Surgeon, Georgetown, and the Government Medical Officer of Health and a district Medical Officer are on the executive committee and all district Medical Officers now give their services. Funds come almost entirely from Government sources and control is centralised in the Surgeon General's Office.

It may well occur that a gradual evolution will make Infant Welfare and Maternity work one of the official activities of the Health Department, but splendid progress is being made at present and the help and support now accorded by the general public is a factor of great value.



Infant Clinic in Village.



Group at Infant Clinic in Village.

TUBERCULOSIS WORK.

Special tuberculosis work has been going on since about 1905 and while there has been considerable expansion since that date the Society's activities do not as yet cover so wide an area of the colony as do those of the Infant Welfare League. The position of the colony as regards Tuberculosis has been outlined in the section on diseases and while the amount of that disease is not excessive the overcrowding of small ill ventilated houses and the wellknown susceptibility of negroes make it all too easy for the disease to obtain a dangerous hold in British Guiana.

The Society for the Prevention and Treatment of Tuberculosis is governed by a central Committee in Georgetown with a Branch in New Amsterdam, and it has always been part of the Society's policy to have a layman as Chairman though he is supported by the Surgeon General as Vice President and for long the Government Medical Officer of Health has been Hon. Secretary.

The Society has a dispensary in Georgetown which is open on three days a week and which is attended gratuitously by visiting physicians some of whom are private practitioners and others Government Officers.

There/

There is also a dispensary in New Amsterdam similarly staffed, a dispensary at Buxton the biggest village, attended by the District Medical Officer and a dispensary on the West Bank Demerara River attended by the Medical Officer of that area.

In addition to these dispensaries there are six District Health Visitors each of whom has a district and who visit each notified case of tuberculosis giving the usual advice and assistance.

At first domiciliary visits were resented as an objectionable interference in private affairs but the writer cannot speak too highly of the tact of the visitors which has overcome this opposition. It is now by no means uncommon for messages to be received asking for Health Visitors to call.

The years 1922 and 1923 showed the lowest Tuberculosis death rates ever recorded and though it may yet be too early for self congratulation the Society may fairly take encouragement.

Mention must be made of the special Tuberculosis Hospital. Although now an official Government institution this hospital was the outcome of the Society's work.

The British Red Cross Society offered a very generous donation and by this means a disused quarantine building was reconstructed as the special hospital/.

hospital. The site is the best that our coastlands provide. The general arrangements and equipment are the best any hospital in the colony has yet known and the results of treatment of early cases there are very encouraging.

There is great need for the addition to the staff of the Medical Officer of Health of a special officer for Tuberculosis Work. At present the hospital is attended by the two nearest district Medical Officers and the dispensaries as stated by district men or by private practitioners. The work however is too extensive and too important to be properly carried out in spare time snatched from other and very pressing duties.

It seems likely that in the process of evolution this voluntary and successful organisation may with advantage to the work be gradually absorbed in the official activities of the medical service.



Georgetown Tuberculosis Dispensary.



Exterior of Tuberculosis Hospital
showing 25,000 gallon rain water tank.



Interior of Tuberculosis Hospital.

VIII.

ADMINISTRATION.

Having considered the public health problems now existing in the colony let us turn to the machinery which has been set up to deal with them.

The curative side of health work hardly falls within the scope of this thesis, but as that side and the preventive side always overlap to some extent, it is necessary to study at least the outline of the arrangements.

A consolidated Medical Ordinance is now before the legislature which enacts that there shall be a Government Medical Service consisting of a Surgeon General appointed by the Secretary of State for the Colonies, and of such Government Medical Officers as the Governor may appoint from time to time. Provision is made for the Governor-in-Council to declare any part of the Colony a "medical district" and for any Government Medical Officer to be posted to any such district.

It is worthy of note that no provision is made for one or more Medical Officers of Health, and though it would be competent for the Governor to allocate to any Medical Officer the duties ordinarily performed by a Medical Officer of Health, it would be equally competent/

competent to remove the officer acting as Medical Officer of Health to an outlying district or to a hospital. In practice there are two Medical Officers of Health (one post vacant) for rural British Guiana, Georgetown municipality having its own officer. There is too a large Government Public Health Department with clerks and Sanitary Inspectors working under the Government Medical Officer of Health and Surgeon General. The origin and working of this Department will be fully considered later.

The organisation of the ordinary medical service of the Colony is briefly as follows. The Surgeon General is the head and may appoint a deputy when absent from headquarters.

There is in Georgetown a large hospital with Resident Surgeon and Assistant Resident Surgeon, Bacteriologist and several other medical officers.

The first three named are more or less permanent, but may be sent to districts. The others carry on the ordinary work of the hospital and form a sort of depot from which vacancies due to sickness or leave are supplied. There is a Public Hospital at a central point in Essequibo, and in Berbice, and also at Bartica which is the starting point for most traffic to the interior, and at Mora Whanna in the far North West. The Leper Asylum at Mahaica has a Medical Superintendent and the Asylum for the insane has generally a staff of three Medical Officers.

The/

The coast lands are divided into 15 medical districts with one Medical Officer to each.

When indentured labour was coming to the sugar estates one of the first duties of the district Medical Officers was the free care of the labourers and each plantation had to maintain a hospital.

Now, although the cessation of indentured immigration has relieved estates of the compulsory maintenance of a hospital, a large part of a district Medical Officer's duty still consists in visiting these hospitals which are voluntarily and excellently maintained. For the rest, the district Medical Officer attends to the sick of the villages and is allowed to charge fees according to a scale. The sanitary condition of plantations was in the old days a matter for the district men who were supervised by a Medical Inspector. This officer has been abolished but despite the institution of a Public Health Department, a plantation is still considered as the exclusive domain of the district doctor, who is also supposed to report upon and to keep an eye upon the villages in his area. It is but natural that a district man should develop his private practice and this along with estate hospital work, leaves him little time or inclination for sanitary supervision.

It results from present arrangements that district medical men tend to pay little attention to the troublesome/

troublesome and unremunerative duties of sanitary supervision, concentrating rather upon the more profitable work of general practice, but sometimes resenting any interference by the Medical Officer of Health or his staff regarding sanitary matters upon plantations.

Public Health work is however only in its infancy in this colony and in the meantime any awkwardness or friction that arises can generally be got over by personal conference and tact, but for the future it appears to the writer that a strong preventive service of whole time health officers and sanitary inspectors will prove eventually to be a very real economy.

Turning now to the present administration of public health matters, we find an astonishing fact. The colony is very undeveloped, its people have a very low standard of education and are in the main miserably poor, but there is a decentralised system of local Government on the lines obtaining in modern European countries.

The towns of Georgetown and New Amsterdam have each a Mayor and Town Council, and are outside the scope of this paper. The largest village has a population of about 5000 but the great majority are much smaller.

The Local Government Ordinance of 1907 established the present form of local administration and is also the/

the equivalent of the British Public Health Acts.

This ordinance divided the Colony into Urban Sanitary Districts, Village Districts, County Districts and Rural Sanitary Districts, subjecting these to the jurisdiction of Authorities similarly named, and it established a Local Government Board.

The Urban Sanitary Districts are the two towns mentioned. There are 23 Village Districts, 76 Country Districts and many Rural Sanitary Districts. These last are those parts of the Fiscal districts left after exclusion of declared villages and country districts. Each plantation growing 40 acres or more of sugar cane forms by itself a Rural Sanitary District.

The central administrative authority is the Local Government Board, consisting of not less than eight members appointed by the Governor, who selects a Chairman and deputy Chairman from among the members. The Board delegates most of its powers to, and conducts its business by means of a Districts Committee and has a secretary who is also Inspector of Districts.

Village Councils consist of not less than four councillors, one of whom is appointed Chairman by the Board, which reserves the power to appoint all the councillors or to permit all or some to be elected. Country Authorities consist of not less than three members appointed by the Board, which selects one as Chairman. The Local Government Board is itself the Local/

Local Authority for all Rural Sanitary Districts.

It will be seen at once that the Central Authority retains the power to exert the controlling influence in any district and Section 10 of the 1907 Ordinance gives the Board power to exercise in any district all the powers of a Local Authority, whether or not there is a Local Authority in existence. In practice Section 10 is useless owing to a decision of the courts and indeed the elected members of the legislature are so imbued with the principle of self-determination that they would oppose tooth and nail any but the most discreet and tactful exercise of the Board's controlling powers.

Power is conferred upon Local Authorities to appoint officers to carry out the duties imposed by the Ordinance and such officers have ~~the~~ legal standing, power of entry, and other usual protection, and it is in this capacity that Sanitary Inspectors of the Health Department act.

The composition of the Local Authorities is interesting. The Board itself generally consists of about six senior civil servants and four or five others among whom are included a few elected members of the legislature. The whole forms a body of men experienced in local affairs and trained in the technical matters which require consideration, and is without doubt a very efficient instrument of government.

The/

The same cannot be said of Village Councils and Country Authorities, of which there are about one hundred administering local Government over some hundreds of square miles and over many thousands of the population.

In a good many districts some government officer such as the doctor or commissary is the chairman but in the majority the Chairman, like each Councillor and member, is a villager of greater or less standing in his small community, with a minimum of general education, of doubtful solvency and with no administrative training or experience. Here and there is found a councillor who combines natural intelligence with long experience of village affairs, but others hardly able to read or write are perhaps as easily found.

It is the experience of the Local Government Board that it is extremely difficult to find suitable persons to appoint to Local Authorities, and even when found the suitable men are frequently unwilling to serve on account of the fierce bickering and strife which ensue in small backward communities when any person is put in authority over his fellows.

It must regretfully be said that a position of authority is often regarded as a means of personal aggrandisement rather than as an opportunity for working for the common good.

It occurs, I suppose, in all small communities, but certainly in British Guiana villages, that the handling/

handling of local affairs leads to the formation of rival cliques and parties, and while it may be useful for political purposes to have sharp divisions of opinion, it is disastrous to health administration when sanitary matters become involved in local strife.

Insistence upon Sanitation in unenlightened places is never popular. No one likes to be made to give up life-long habits, even dirty ones, and any Chairman or Councillor in British Guiana who identifies himself with a vigorous sanitary campaign brings a hornets' nest about his ears. It is easier and more pleasant to drift along and retain popularity by disturbing nobody.

Almost the only villagers who willingly come forward to take part in village administration are the young hot-heads, filled with partially digested teachings of the Negro Improvement Association, exacting as to the niceties of procedure and debate, and fulminating against Government and all who curb or check their noisy advocacy of self-determination.

These new brooms sweep clean for a little and then resign, or are removed when their administration has become chaotic.

In 1923 there were ⁸⁴ changes in the personnel of village and county districts and this continual changing makes the carrying out of any considered and continuous sanitary policy an impossibility.

There/

There can be no proper sense of responsibility when an Authority is seldom composed of the same members for more than a few meetings.

No local authority is really financial. It is true that most of them make ends meet each year, but that desirable end is brought about by neglecting most of the work for the performance of which the authority exists. The rate-collector and ranger are paid, interest on loans from government must be paid, and the very barest necessities of road and trench maintenance are carried out. Funds cannot be raised for more than this, and numbers of people, including councillors, are always in arrears in payment of rates.

Not even a modicum of the duties, sanitary and otherwise, imposed by the 1907 ordinance are ever thought about.

The above may appear to be an exaggeration of the present position, but anyone familiar with the colony's daily press must realise that the picture is not over-coloured, and that as each district authority gets its affairs into a mess it has to be rescued by a grant from Government only to lapse once more at greater or less speed into insolvency and administrative chaos.

It is the writer's opinion, supported by the Inspector of Districts who has very many years' experience that there is to-day no single Village Council/

Council or Country Authority which is making a success of its administration.

Less than ten years ago the Government Bacteriologist offered to the Local Government Board his services as advisor on health matters, and shortly afterwards he was given the additional title of Government Medical Officer of Health. Then the offices of Bacteriologist and Medical Officer of Health were separated, one or two sanitary inspectors and a clerk were appointed, and the nucleus of a public health department was so established.

At first the embryo department worked as a foster child of the Local Government Board, but was later declared by the Governor to be a sub-department of the Medical Department, with the Surgeon General as head.

Local administration being as outlined, it was necessary for the inspectors of the new Public Health Department to be officers of the Local Government Board and of the various Local Authorities in order to have the necessary powers, and although the Health Department has steadily grown in size and activity its inspectors still work under the aegis of the various authorities very much as is the case in England.

There is here one essential difference from the arrangements in Britain. There, each Local Authority appoints and pays its own sanitary officers who none the/

the less are protected from unfair dealing at the hands of their employers.

In this colony no local authority is financially strong enough to pay even one Sanitary Inspector though none are averse to demanding removal of one paid from colonial funds.

At present the Health Department consists of one Medical Officer of Health, three County Sanitary Inspectors (Class I) and 4 Sanitary Inspectors (Class II), a clerical staff of three, and two disinfecting assistants, all of whom are appointed and paid by the Government. In addition there are twenty Class III Sanitary Inspectors to whose salaries in bulk the Government contributes about \$ 10,000 per annum, the balance of about \$ 3000 being contributed by various plantations and some village and country districts, none of whom contribute individually more than a fraction of one inspector's salary.

This anomalous position seems to have come about gradually through the scheming of an enthusiastic Medical Department to enlarge the effectiveness of the Health service without appearing to ask too much of either government or the local authorities. There is also on record in writing a pious hope that, when once converted to the benefits of sanitation, local authorities would appoint and pay their own sanitary inspectors. At present nobody quite knows whose servants the Class III inspectors are, and the recent dismissal/

dismissal of one of them by the Surgeon General was the cause of much dissension. There is a feeling among some of the members of the Board that that body retains the right to review or reverse the Surgeon General's decision as regards the Class III inspectors,* and even as regards questions of sanitary policy.

Since the Local Government Board is at present the legally constituted controlling body in all sanitary matters, this view is theoretically sound. In practice however there are grave objections. There are several members of the Board whose political interests cloud their vision as to sanitary requirements and instances are not lacking in the colony of administrative heads flying in the face of modern knowledge despite all their technical advisors could do or say.

The practical results of the present organisation of the health service and of the present administration of the sanitary laws are poor, and often very undesirable, which is perhaps to be expected when it is remembered that most of these laws were drafted before there was a health department. All of the laws, as well as their method of administration are very far in advance of the civilisation of those upon whom they operate/

* Since this section was written the legislature has agreed to the writer's recommendation that all inspectors should be paid wholly from Government funds, which is the first step towards a unified and properly controlled service.

operate, and of those supposed to administer them.

The Medical Officer of Health has no legal standing arising out of his office. Once or twice in the 1907 ordinance a Medical Officer of Health is mentioned, but this is only when a section has been taken bodily out of the English Public Health Act and no provision is made anywhere for local authorities to have such an officer. As things are, the Medical Officer of Health has to make the best of his being a registered practitioner and an officer of the Local Government Board. In village and county districts he has little authority, not even possessing power of entry into insanitary premises.

Since the growth of the Public Health Department to its present size, with a considerable annual expenditure, there has been a natural desire on the part of the Financial Representatives in the legislature to see results produced and an equally natural placing of responsibility upon the Department which officially deals with Health matters. The head of that department however has no effective powers to bring about necessary improvements, but finds his plans continually thwarted by the local authorities in whose hands lies the real control.

Those authorities while clinging tenaciously to their powers, are not unwilling that a government department should shoulder the responsibility.

It is worth while to look briefly at the ordinary working/

working of a Village District. There we find a Class III Sanitary Inspector of the Government Public Health Department who has been appointed an officer of the Local Authority (Village Council), and who also works in several adjoining Village and Country Districts.

The daily work of dealing with nuisances and the like is supervised by visits of the Chief Sanitary Inspector, and less frequent visits by the Medical Officer of Health who expect the inspector to carry out their instructions. It may well happen that in one village the Chairman and one or two Councillors have views of their own about sewage disposal, and the Local Authority refuse to support the Sanitary Inspector in his efforts to get privies built after departmental pattern.

The Inspector serves statutory notices and the Chairman goes round informing delinquents that they need not worry as he will not sign a Summons, and nothing is done. Much talk and tact, well seasoned with flattery and cajoling will often overcome such an impasse but the process has to be repeated over and over again.

As to housing in particular, there is the greatest difficulty in getting the law observed and healthy conditions provided. Increased building means increased rates and many local authorities turn a blind eye to irregularities, even when such are pointed out by/

by the Sanitary Inspector. The unfortunate Sanitary Inspector knows well that his superiors in the Health Service will come down on him for permitting breaches of the law, but can do nothing in face of an obstinate authority except report the facts.

The Medical Officer of Health in his turn can do nothing but report the matter to the Board who may reprimand the Local Authority and rescind the permission to build, while meantime the house has been completed. It can only be pulled down after a complicated procedure before the Supreme Court.

There is a growing tendency for Local Authorities to regard contribution to a Sanitary Inspector's salary as empowering them dictate his work and the manner of it. When a council which is frequently changing and always very ignorant of health matters takes charge of sanitation and runs counter to the Medical Officer of Health's advice, the position becomes absurd even if legally sound.

In fact a district Sanitary Inspector is now placed in the impossible position of trying to serve not two but several masters, and as a rule pleases none.

Each district man works in the areas controlled by several Local Authorities, each of which demands his allegiance, and he also has to follow the dictates of the Department which appoints and pays him and find time/

time and place to report to and take instructions from the District Government Medical Officer.

For a number of years the present system achieved a certain amount and this much may certainly be claimed, that sanitation as a theoretical good has been well established in the minds of the public. Its practical application cannot as yet be considered popular.

Since the war the cry of self-determination has reached even the back waters of our Village communities which have become conscious of the powers entrusted to them, and as is common in such cases they are inclined to be intolerant of any guidance in the exercise of their newly realised authority.

The rise to some degree of notoriety of certain members of the legislature, and the influence of sections of the press, have tended to encourage those entrusted with local government in an attitude of revolt against any guidance whatever in the exercise of their rights and powers.

In the face of present day conditions it is becoming less and less possible for any sanitary advance to be made unless those who are specially trained in such matters and who are held responsible for health conditions, have adequate power to get what is necessary carried out.

In this connection it is interesting to note that there/

there is a movement on foot in Scotland to centralise health control to some extent, the multiplicity of sanitary authorities having proved unwieldy.

It is not infrequently asked why the Health Authorities in British Guiana have not shown the results obtained in Panama. Without considering financial difficulties or the great extent of our coast lands compared to the small area dealt with in Panama, it should be remembered that the results in Panama were achieved after repeated failures and then only after supreme charge was placed in the hands of the Health Officer who wielded almost absolute power.

It is not suggested that similar action is possible or desirable here; the two places are not comparable. It is however urged that present arrangements in British Guiana are very futile.

The conditions under which the Health Department works give birth to a feeling of helplessness and strangle enthusiasm; they make the head of that Department a purveyor of trite advice and reduce the members of his staff from the position of active instruments for the colony's good to that of unimportant village servants who may be flouted with impunity although useful on occasion as weapons against an enemy.

The present staff possesses splendid qualifications which would be hard to surpass in any tropical colony. The thirty sanitary inspectors of all grades hold/

hold the following certificates.

Royal Sanitary Institute Certificates.

| | |
|--|----|
| as Sanitary Inspector | 9 |
| as Meat and Food Inspector | 4 |
| in Tropical Hygiene | 2 |
| in Sanitary Science of Buildings & Public Works | 1 |
| Local Certificates in Hygiene | 24 |

How then is the colony to get a return in improved conditions for the money expended on its Health Department?

It seems clear to the writer that so far as administrative matters are concerned, until the small communities are better educated, more experienced in self government and financially stronger, health matters should be removed from their control, and be made a colonial question.

Even those who cherish most fiercely the strange form of representative government of this Colony, realise that such matters as sea-defence and road maintenance cannot be entrusted to local councils, and it is but reasonable to urge that the Public health is a matter neither less specialised in nature nor of less importance than these.

There is required a new Ordinance recognising the existence of a Public Health Department, embodying the teachings of science and experience as to tropical hygiene, free from cumbersome matters of village politics/

politics, and with its provisions adjusted to local conditions and not extracted holus bolus from the English Acts.

It is to be anticipated that in the Colony the constitution of the Surgeon General or Government Medical Officer of Health or even a central board as the Sanitary Authority for all districts would be made the subject of political agitation with much editorial vehemence and talk of bureaucracy, dictatorship and the like. None the less such could work smoothly in practice. In their heart of hearts village Chairmen would be pleased to be rid of the unpleasant responsibility entailed by their present duties. In small communities local interests make it difficult and embarrassing for any villager to keep his neighbours up to the sanitary scratch. Can one blame a small-grocer chairman who overlooks the filthiness of his best customer's cow pen? Villagers too would soon realise that it is preferable to fall into the hands of a neutral officer responsible to government than into those of a local authority inevitably party to village cliques and quarrels. It is the writer's firm belief that most Local Authorities would be glad to get rid of the odium and unpleasantness which attach to the management of their sanitary affairs, and to be no longer torn between their hope for official approval and their desire for local popularity.

It/

It will be remembered that the Local Government Board is the Local Authority for all Rural Sanitary Districts and the sanitary administration of such districts affords a good example of the working of a central sanitary authority. In practice these areas come under the direct control of the Government Medical Officer of Health and his staff. Financial and what may be called business matters are managed by the permanent staff of the Board and health matters are delegated to the Government Public Health Department. Of course when legal proceedings are to be taken the authorisation must be signed by the Chairman of the Board in his capacity of Chairman of the Rural Sanitary Authority concerned. All complaints are scrutinised by a Chief Sanitary Inspector and by the Government Medical Officer of Health,*** the latter accepting responsibility and the Chairman always signs. No complaint has been made of harshness or injustice in the Rural Sanitary Districts where work progresses comparatively easily and well. The knowledge that neglect to comply with a notice means certain appearance in court has operated as might be expected in reducing the number of summonses requiring to be issued. In particular it has already been possible to bring house building under effective control in the Rural Sanitary Districts, while in the great majority of Villages and Country districts the councillors neither know/

know nor care what the Building Bye laws demand.

It will be remembered that under Section 10 of Ordinance 13 of 1907 it is open to the Board to assume in any district all the powers of a Local Authority whether or not any Local Authority exists. It might have been possible to use this section to get over the difficulty of a refractory Village Council. This way out of the trouble is closed by a decision of the courts that as the law stands (section 320, Ordinance 13 of 1907) the Chairman of the Board exercising in the area of any Local Authority its powers under Section 10 cannot sign an authorisation to prosecute. Pending the passing of an Ordinance dealing frankly with Public Health and its administration, some immediate relief from a difficult situation would be afforded if amendments were made to the 1907 ordinance to the following effects:-

- (a) An amendment which shall make plain that when the Board is, in any district, exercising the powers now conferred by Section 10, the Board may take or defend any proceedings as though it were in fact the Local Authority of the district, and for that purpose the Board may appear in any Court by its Chairman or by any person authorised by him in writing either in general or in respect of any special proceeding.

(b)/

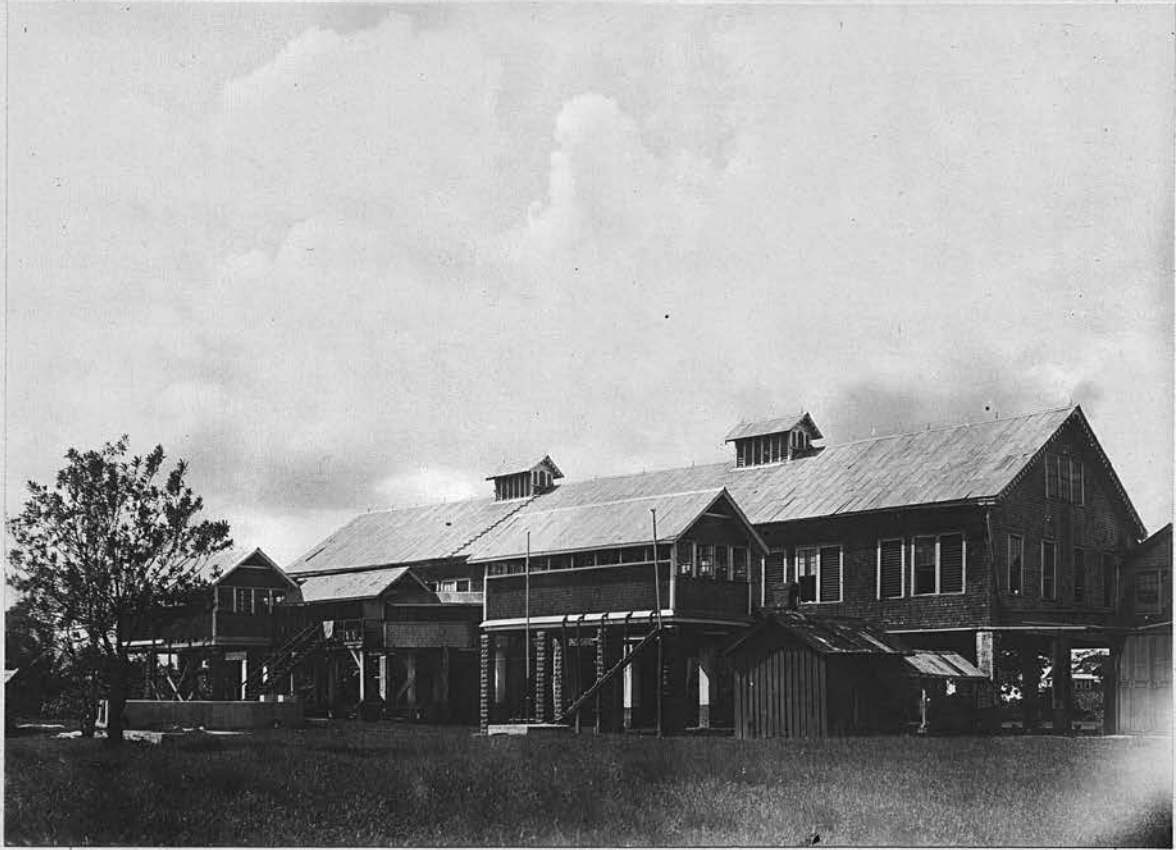
(b) An amendment which shall provide that any Medical Officer of Health and any Sanitary Inspector who is appointed an officer of the Board as provided in Section 17 of ordinance 13 of 1907 shall have and may exercise in any district the same powers as an officer of the Local Authority of such district.

The effect of these amendments would be that once a Sanitary Inspector had been made an officer of the Local Government Board, he would immediately have all necessary power and standing under the ordinance, no matter to what district he might be posted, nor would he be in any way dependent on the Local Authority for such standing and power.

Secondly, in a district where the Local Authority supported the Health Department and cooperation proceeded satisfactorily the Chairman of the Local Authority would still be responsible and would sign complaints when necessary. But in a district where the Local Authority was obstructive the Board would itself assume control, treating the district exactly as Rural Sanitary Districts are now handled.

In a tropical colony straining after development and with deaths annually exceeding births, hygiene and public health are matters of too great consequence to be allowed to be a sort of instructive game at which local authorities play during their administrative childhood.

143a.



Plantation hospital showing disposal of sewage
in septic tank and modern concrete rain
water tank.



Cottages in the Leper Asylum.



Work shop in the Leper Asylum.

143 d.



Female hospital in Leper Asylum.



Recreation grounds in Leper Asylum.



Part of the Asylum for the Insane.

CONCLUSIONS.

It is plain that British Guiana offers almost unlimited scope to the public health workers and it is equally plain that a very great deal must yet be done before results are reflected in colonial statistics.

There is a feeling among many of the public and even among responsible government officers that sanitation is an abyss into which millions may be poured without appreciable result. This feeling finds expression annually when departmental estimates are considered and the question is asked "What results can be shewn for the thousands of dollars spent last year?"

This brings me to say that perhaps the most necessary requirement for the hygienic progress of British Guiana is steadfastness on the part of the public health officers.

It would be easy to become discouraged for healing of the public health follows, as it were, after a prolonged course of treatment rather than with the instancy of a surgical cure.

Belief in the cause and a temperate pressing of the claims of hygiene upon both administrators and the public will bring to British Guiana the same benefits which have already accrued to the Gold Coast and/

and other territories. As to actual measures to be adopted, the most important have been initiated in 1924.

The general drainage scheme for the coastlands has been adopted by Government and work has actually commenced, and this measure alone breaks the back of the mosquito problem, makes reasonable conservancy schemes a possibility and will remove from the rural population that sense of the hopelessness of effort which the periodic inundations make inevitable.

The scheme for the supply of good water to every settlement of any size has been adopted and no stress need be laid upon the importance of this improvement.

Housing is now under fair control in Rural Sanitary Districts. Its improvement to any extent in villages and country districts having their own local authorities must await either the slow progress of education of these authorities (perhaps several generations) or the placing of all sanitary measures under a central health authority.

This institution of a central health authority is probably the most important measure required now that drainage and water supply have been provided for.

It may appear a retrograde step to remove from local authorities powers and responsibilities already laid upon them. It has been strongly impressed upon the/

the writer that the education, social organisation and finances of the rural population are not such as make it possible for them to administer their own health matters. Indeed it seems clear that the expensive and intricate drainage and water supply plants when installed must be controlled and maintained by a central and really responsible authority.

Infant Welfare work and the control of Tuberculosis are progressing on hopeful lines.

Indeed the outlook for health improvement is bright.

It is likely that financial stringency will make progress slow and that the entanglement of health matters with politics will make difficulties and sometimes unpleasantness but mutual encouragement and support by the medical and administrative services cannot fail to bring to British Guiana the advantages which medical science has brought to other lands.

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