2nd report follows.

THIRD REPORT

OF THE

DOMINICA

MEDICAL SUPERINTENDENT

OF

YAWS HOSPITALS.

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MEDICAL SUPERINTENDENT OF YAWS HOSPITALS.

DURING the year 1878 the Yaws question, which has caused much anxiety on account of its vital importance to the welfare of Dominica, may be said to have arrived at that stage at which a solution may be discerned at no very distant date.

Within the last few years the disease has attacked so many of the families of the peasantry that considerable alarm has been felt among all classes throughout the island. The disablement by yaws of a great number of agricultural labourers could not have but a deteriorating influence upon the commerce of an Island in which the staple products are raised from the soil; and the willing acquiescence of the Legislature in adding to the burdens laid upon a heavily taxed and impoverished community, by the imposition of a special yaws tax, testifies to the gravity of what has not inaptly been termed "the yaws question."

The efforts made a year or so ago to hold in check, and if possible subdue the ravages of the disease were unhappily not successful, and in consequence of this failure considerable doubts as to the practicability of grappling with the malady were entertained by many persons in Dominica and elsewhere.

As will be seen by a study of the various papers upon the subject already made public, the failure of the first efforts was due mainly to the ill-chosen sites of the hospitals and to the imperfect organization of the yaws administration.

SECTION I. THE HOSPITALS.

When I assumed the superintendence of the yaws hospitals at the end of April 1877, two hospitals were in existence, one at Morne Bruce, which had been working for several years, and the other at Prince Ruperts, which was established on June 12th, 1876. Soon after my appointment the erection of a Central Hospital within two miles of Roseau was commenced, and it was opened for the reception of patients on October 11th, 1877. Upon the same day the Morne Bruce Hospital was closed and all the inmates to the number of 50 were drafted into the new establishment.

Thus, at the opening of the year 1878, the Central and the Prince Ruperts Hospitals, each capable of accommodating one hundred patients, were in operation. On May 20th the new wing of the latter hospital, erected only a few months previously, was destroyed by fire—the work of an incendiary, and during the remainder of the time that the establishment was kept open many of the patients were housed in wards hastily extemporized for the purpose. The hospital was finally closed on May 16th, all its inmates being transferred to the Central Hospital, so that there is now only one yaws hospital in the Island.

The following tables will show the work of the hospitals both previous and subsequent to my appointment as Superintendent in April, 1877.

MORNE BRUCE HOSPITAL.

In hospital on April 27th, 1877	23	Discharged	30
Admitted to Oct. 11th, 1877	60	Absconded	3
		Removed to Central Hospital on Oct. 11th, 1877.	50
	83		83

PRINCE RUPERTS HOSPITAL.

Admitted from, June 12th 1876 to April 21st, 1877	133	Dischrged	46
Born in Hospital	2	Died	3
		Absconded	49
		In Hospital on April 21st, 1877	37
	135		135
In Hospital on April 21st, 1877	37	Discharged	219
Born in Hospital	1	Absconded	1
Admitted to May 16th May 1878.	255	Died	13
		Removed to Central Hospital on May 16th, 1878	60
	293		293

CENTRAL HOSPITAL

Admitted from Morne Bruce	50	Discharged	471
Admitted from Prince Ruperts	60	Died	24
Born	3	Absconded	2
Admitted to Dec. 31, 1878	493	In Hospital on Dec. 31st 1878	109
	606		606

By making an analysis of these tables the following results as regards admissions, &c. to all the hospitals are arrived at:—

Admitted.			**Discharged.**		
Morne Bruce		83	Morne Bruce		30
Prince Ruperts		388	Prince Ruperts		265
Central		493	Central		471
		964			766
Born in Hospital.			**Absconded.**		
Prince Ruperts	3		Morne Bruce		3
Central	3	6	Prince Ruperts		50
			Central		2
					55
			Died.		
			Prince Ruperts		16
			Central		24
					40
			In Central Hospital on Dec. 31st 1878		109
		970			970

That which first strikes one's notice in these tables is the great number of admissions. Unfortunately, I have been unable to obtain any satisfactory statistics concerning the work of the Morne Bruce Hospital prior to April 1877, so that the figures furnished by the Central and Prince Ruperts Hospitals can alone be dealt with. The latter hospital was in operation for 23 months and 3 days, and the former was working for 14 months and 21 days from the time of its erection to the end of the year under consideration. As regards accommodation both the hospitals may be said to have been on an equality, but while at Prince Ruperts 388 patients were admitted in more than 23 months, at the Central Hospital, 493 were admitted in less than 15 months. It must be mentioned, however, that upon several occasions the latter establishment was overcrowded, but this fact alone does not account for the remarkable difference in numbers. The true cause of the disparity may be discerned when the administration of both the hospitals is passed under review. At the Central Hospital the organization is made as perfect as possible, and the medical visits are frequent. At Prince Ruperts, in consequence of its

isolation, the organization could not be nearly so closely attended to, and a long interval elapsed between the visits of the medical officers.

The act of absconding from the hospitals has been fortunately all but stopped of late. Formerly it was a frequent thing for patients to leave the hospitals uncured, as may be seen from the statistics of the Prince Ruperts Hospital; and I believe great numbers of the patients admitted to Morne Bruce before April 1877 ran away uncured.

Two yaws constables were appointed during the year 1878, one to the northern district of the Island, and the other to reside at the Central Hospital, which is the headquarters of the southern district. The principal duties of these officers are to collect yaws patients, to keep a surveillance on those persons discharged cured so as to detect any fresh attack of the disease, to obtain information concerning yaws and yaws patients, and to arrest any person who may run away from the hospitals. Besides the patients mentioned as having absconded from the Central Hospital several others effected their escape; they were however speedily brought back by the constables, assisted by the Police Authorities, although in some instances the runaways had reached a remote part of the Island. During the year I have received much assistance from the police in getting yaws patients into the hospitals, Inspector James having instructed the men under his command to lend their aid when called upon to do so.

The number of deaths next claims attention. In the Central Hospital there were 24 deaths to 493 admissions and 3 births—about 4·8 *per centum*; and at Prince Ruperts there were 16 deaths to 338 admissions and 3 births—about 4·2 *per centum* Thus it would appear at first sight that the death-rate of the former hospital was slightly in excess of the latter; but it must be remembered that all the old standing cases to the number of 110 were removed from Morne Bruce and Prince Ruperts to the Central Hospital, so that the mortality at the last named establishment was really 24 deaths out of 606 inmates, or only 3·9 *per centum*.

Altogether 61 patients have been re-admitted, but of this number only 17 were treated in the first instance at the Central Hospital; of the remaining 44 cases, 19 were re-admissions from Morne Bruce and 25 from Prince Ruperts. As I am not in possession of correct returns from the Morne Bruce Hospital, I cannot form an estimate of the per-centage of re-admissions, but at Prince Ruperts it was 9·4, and at the Central Hospital it was only 3·6.

Of these 61 cases, 3 were admitted a third time, each of the three cases having been first treated in a different hospital.

In some instances it may be that the patients have been discharged imperfectly cured. The utmost vigilance is exercised by every member of the staff to prevent an inmate from leaving the hospital unless the disease is thoroughly eradicated from the system. but in spite of the greatest care some few cases of imperfect cures may escape observation. I am confident however that most of the re-admissions to the Central Hospital are genuine examples of fresh attacks of the disease, as the history of the two interesting cases given in the appendix will tend to show. [See Appendix A.]

In these two cases the second attacks of the disease occurred too long after the first to be ascribed to a relapse. Neither can it be said that the patients were sent away imperfectly cured, for when the boy was discharged I made a very careful examination of him, and no sign of the disease was visible; and the woman was under the observation of the medical staff from the date of her discharge on Oct. 18th, 1877, until February 9th, 1878, and during this time no symptom of the disease manifested itself. In each of these cases therefore it may safely be inferred that the second invasion was distinct from the first and that

it was due to a second infection. It would appear that ordinarily one attack gives immunity from a second, but in some cases, it may be on account of the greater susceptibility of the individual, two or more attacks may occur. Several adult patients of the Central Hospital have informed me that they had yaws during their childhood, and they did not seem to be surprised that they were again suffering from the same malady. In this respect yaws would seem to be analogous to small pox—for vaccination before puberty does not usually protect an individual from attacks of small pox during adult life, and it is now a generally recognised fact that a second vaccination after puberty is necessary.

From calculations based upon the re-admissions to the Prince Ruperts and Central Hospitals, it would appear that 5·7 *per cent.* are liable to a second attack of yaws, and 0·4 *per cent.* to a third attack. At a future time I hope, as the result of more extended experience, to give further information on this important subject.

There can be no doubt that the closure of the Morne Bruce and Prince Ruperts Hospitals and the establishment of the Central Hospital have done much to enable the yaws administration to be carried on in an efficient manner. The hospital at Prince Ruperts was situated in so isolated a locality that, as a rule, a visit from the Medical Officer could not be made oftener than once a week. This circumstance alone was sufficient to condemn the site and to account for any maladministration and inefficient medical treatment, and when to all this is added the want of a proper and adequate water supply it may be a matter of surprise that the hospital could have been carried on at all.

Although the Morne Bruce Hospital was within easy reach of Roseau, the condition of the buildings and the scarcity of water were such as to render its abandonment a necessity.

The Central Hospital is situated at the mouth of a river within forty minutes ride of the town, and it has extensive grounds attached to it. The patients can therefore be occupied in cultivating various plants and vegetables. At first considerable alarm was excited in the public mind by various sinister reports which were circulated as to the unhealthiness of the locality chosen for the site of the Central Hospital. This matter I dealt with in a letter addressed to the Colonial Secretary, and the letter was published, by order of the Governor, for general information. The views I set forth at the time have happily been shown by the course of events to have been correct. From the time of the erection of the hospital, which was destined to become the home of many hundreds of people, it has been my constant anxiety to improve the healthiness of the place by the employment of every sanitary measure which came within my knowledge. The efforts which have been made to this end have borne fruit, and now I know of no locality on the leeward littoral of the island which is under better sanitary conditions than the Central Hospital.

Section II. THE PATIENTS.

The majority of the patients admitted into the yaws hospitals belongs to the labouring population. Nearly all the inmates are negroes or dark coloured persons, but a few are of light color, and one of the patients of the Central Hospital was born of white parents. No statistics as to the liability of any particular race or class to be attacked by the disease can however be arrived at from these facts, because the native peasantry run far greater risks of infection, and they also compose the bulk of the population.

On account of yaws being so prevalent among the negro races its origin has often been assigned to the diet and mode of life of these people, and the opinion is held by some authorities that bad diet and the non-observance of sanitary laws can produce *de novo* an outbreak of the malady. As will be seen from the third section of this report my experience leads me to reject this theory, and to hold the opinion that yaws can alone can be produced by infection from an antecedent case. There exists no doubt however in my mind that the food and the mode of living of numbers of the peasantry of Dominica predispose them to the accession of yaws as well as to most other like maladies.

The food of the people consists mainly of vegetables, and salted fish which is sometimes eaten half rotten. As regards the supply of good and nourishing vegetables no labouring population in any part of the world is better off than the

peasantry of this island. The nitrogenous food, such as meat, fish, &c., is however deficient both in quality and quantity, for the amount of nourishment in the dried salt fish is very small in comparison with that in fresh animal food. Occasionally fresh fish is obtained by the people, and more especially by those living on the leeward coast of the island, but the number of meals of this food partaken of in a month is, as a general rule, small. There is however an exception in the case of those who are the possessors of a canoe and a basket fish-pot, but these persons are not ordinary labourers, for they have their vegetable 'gardens' in the interior, and they rarely work upon the estates. In many parts of the windward coast, fresh fish cannot be caught on account of the high surf, and in these districts it is found that the disease prevails to a much greater extent. The people have no dislike to fresh meat, on the contrary it is eagerly eaten when it can be obtained, and I have known cases where it has been devoured in a semi-putrid condition.

In the country parts of the island the people have no chance of procuring meat except when an animal meets with an accidental death, or when a goat or pig is killed on a festive occasion. On the other hand salt fish is sold in every village shop, and as it may be kept for some time without spoiling it is always obtainable. Under these circumstances there is no help for the people but to make salt-fish their principal animal food. It is much to be regretted that cattle and goats and sheep are not reared in greater numbers for the purpose of food. There is not a single stock estate in the whole island, and the butchers of Roseau have to scour the country for animals to slaughter, and when found the meat is generally sold by engagement to the principal residents of the town and its environs.

The labouring population have two principal meals—breakfast and dinner, the former eaten at about 11 a. m., and the latter at sundown. The labourers are in the field soon after sunrise, and they work till the breakfast hour upon an empty stomach, only a roasted plantain or a small piece of bread, with perhaps some coffee, being taken early in the morning. When the time for the meal comes round hunger is usually very keen, and so large a quantity of food is consumed that the stomach becomes overloaded, and as a consequence digestion is but imperfectly carried on. The people of Dominica are especially liable to affections of the stomach and to bowel complaints, and I believe this may be explained in a great measure by the nature of the diet and the way in which the food is taken. Were it possible to induce the peasantry to take their food in smaller quantities and at lesser intervals of time, I believe much would be gained in point of health.

As will be seen from the appendix, the dietary of the hospital is a great improvement upon that in ordinary use by the people, but it might be rendered more nourishing by the substitution of fresh meat for salted fish and pork, the necessity of economy in the expenditure will not however permit of a more costly diet.

In the case of children, and those who are in a debilitated condition a special dietary is allowed, from which salt food is excluded. Two extra meals are also given in these cases, one at 7 a. m. consisting of arrowroot and milk, or eggs and milk, and another at noon which consists of soup made from fresh meat, and to which is added rice or vermicelli.

The yaws hospitals are excellent schools in which to teach the people better and healthier habits, and it is often seen that the dirty, indolent, and insolent boy or girl soon becomes so changed as to be scarcely recognisable, the bright intelligent look and the polite greeting indicating that example and precept are not utterly thrown away.

At the Central Hospital none of the patients are allowed to go without exercise. The grounds are cultivated in farine manioc, sweet po-

tatoes, eddoes, pigeon peas and plantains, by the stronger men and women, and the children are made to weed the land and to cultivate flowers in several beds which have been set apart for the purpose. Some of the women act as nurses to the children, and others are employed at needlework. Several of the men and boys follow the occupation of fishing, a small boat having been bought for the use of the hospital, and by their exertions fresh fish is often substituted for salt in the dietary. Some of the basket fish-pots were made by the patients, and the rope by which these pots are buoyed in the water has been manufactured out of the indigenous "dagger bush" by several of the male inmates.

I cannot close this section of the report without expressing my acknowledgement for the willing manner in which every member of the present staff has co-operated with me in my efforts to render the yaws administration as successful as possible, and I would especially mention the efficient way in which Dr. Duke, the medical officer, has performed his duties.

Section III. THE DISEASE.

In several particulars the following description differs from that usually given by writers on the disease. The appearances I depict are however those constantly met with in Dominica, and they agree in every important point with the disease as described by Dr. Imray in his monograph upon yaws.

It may be that climatic influences, mode of living, treatment and other like powerful causes may so modify the disease as to make one symptom more prominent in one country than in another.

Characters of the Disease. At first the eruption appears as small papules with a somewhat broadened base, usually no larger than a pin's head, and but slightly elevated above the surface of the skin. In a few days these papules enlarge, and the epidermis cracks upon the summit, disclosing a small yellowish point, which has been likened to a globule of pus. The growth of the young tubercle necessitates the pushing aside of the superficial layers of the skin, and this is accomplished by the epidermis splitting in lines radiating from the central prominence—the resulting segments curling away before the rapidly increasing yaw. The mature eruption consists of a number of yellow scabs elevated above the surface of the skin, flat or sometimes depressed at the top, and rounded off from the edges to the base. At first the mass is smooth, slightly viscid, and of a light colour, not unlike a piece of yellow cheese; but after a time the crust becomes fissured, and the colour deepens, so that before the scab falls it is frequently brown or brownish black. This change in colour is due to the accretion of dust, dirt, epidermal scales, blood cells, and other foreign matter upon the surface of the crust, and it is not in consequence of any change in the structure of the eruption itself. As would be imagined the crusts become much darker in the negro than in the mulatto, on account of the deeper colour of the pigment of the skin.

In size and shape the tubercles vary much. They may be as small as, or even smaller than, a split pea—which at first they resemble, except that they are somewhat flatter and rougher; or they may attain to so great a size as to occupy nearly the whole of the cheek with an encrusted mass half an inch thick. Their shape is rarely irregular, a circular form being the most common, and next in point of frequency are ovoid or reniform masses. Sometimes they are disposed in a circle enclosing in the centre sound skin. At other times they form a ring round the mouth or anus, and in consequence of the greater moisture in these situations they do not become dark and dry as when they develop elsewhere. When in the anal fissure they are always moist, but when they exist round the mouth, or at the orifice of the nostrils, they dry in some places and remain soft in others. It sometimes happens that the tubercles sprout from the matrix of either the toe or the finger nail, and then unless carefully and judiciously treated they are extremely

liable to be succeeded by ulceration which in many cases is indistinguishable from onychia maligna. The toes are more often affected in this way than the fingers. Very rarely the terbucles are pedunculated, or elongated with a broadened base. In the latter case the disease may be confounded with rupia, but the diagnostic laminated appearance of rupial crusts is always wanting. When the tubercles grow from the soles of the feet they have great difficulty in forcing their way to the surface on account of the thickness of the epidermis, consequently they spread laterally and form a hard and painful tumour which causes lameness in the person attacked. This condition is called by the negroes "Tubboe," and by the French creoles "Crabe," but the latter term is also applied to a fissured state of the epidermis which is totally distinct from yaws. If by accident, or otherwise, a portion of the superficial crust of a tubercle become detached, there is sometimes seen underneath a moist creamy yellowish substance which however soon hardens by exposure to the air.

A peculiarly disagreeable odour enamates from a person afflicted with yaws, and I have frequently identified a case of the disease merely by this characteristic smell.

The eruption may be met with on any part of the superficies of the body, but it is commoner on the anterior surface. The more exposed parts are those usually obnoxious to the disease, the tubercles not being found very often upon those parts of the body protected by the dress. I have made a careful analysis of a hundred cases in the fully developed primary stage. with well marked characteristic crusts, and the results are both valuable and interesting.

Of the 100 cases, 58 were males and 42 females, and the ages varied from 14 months to 50 years.

On the Face and Head,	the	eruption	occurred in	49 cases.
" Trunk	"	"	20	"
" Genitals	"	"	16	"
" Perineum	"	"	20	"
" Upper Extremities	"	"	29	"
" Lower Extremities	"	"	70	"

In three cases only were the tubercles found on the scalp, and they were not once met with in the axilla. The results arrived at by these statistics differ from the observations of most writers on the disease.

If a yaws crust be removed, which can easily be done without giving rise to much pain, there will be seen underneath either a foul ulcerating surface, or the framboesial excrescence as described by the old writers. This appearance although common is by no means general, and a case of Framboesia may occur without showing any sign of the fungoid growth from its commencement to its termination. The excrescence, which has given rise to the name Framboesia, writers having likened it to a wood-strawberry or raspberry, is as far as my experience goes never found alone, one or other of the stages of the disease always being present at the same time. The yellow crust is however invariably seen in pure uncomplicated cases of yaws, and it is rare for what I have termed the "framboesial excrescence" to exist without at least a portion of its characteristic covering. As the disease is observed in Dominica the crust is a much more constant sign than the red tuberculated growth.

The fungoid masses are seen in their simplest form where they are brought into view by the forcible detachment of the yellow crusts which always cover them in their earlier stages. Then they may fairly be described as like a strawberry in colour and a mulberry in shape, except that they are often streaked with reddish lines. In persons who have been subjects of the disease for a considerable time, the fungus is much commoner, and it is most common in those who have been brought to a cachetic condition by the combined effects of bad and scanty food, defective sanitation, and the irritation caused by the long existence of a loathsome malady. When a case of yaws terminates favourably the crusts commence to fall off in about a week or ten days, and this process is accomplished in the following way. The fissures deepen, the crusts become darker, they dry and shrivel up and detach themselves from the circumference towards the centre, until they finally fall, leaving their site indicated by a smooth and shining macula, or by a reddish scarred surface slightly hardened, elevated and tuberculated; and in the last case there remains for several weeks or even months an induration of the skin which extends for some distance around. The maculæ are black in the negro. but, in light coloured persons they are nearly white, in both instances being an exaggeration of the colour of the individual

In unfavourable cases, and more especially when the patients have been treated ignorantly with mercury and other lowering medicines, the crusts remain for a long period, and then give place to moist fungoid tuberculated growths of a pale pinkhis or reddish colour, and often of a very large size. These masses may ulcerate or become absorbed, the former being the most frequent termination.

When ulceration takes place it may extend for a considerable distance beyond the site of the fungus, and the ulcer is usually excavated with thick livid inverted edges. A last bone and tendon may be exposed, or nearly half the foot—which is most commonly affected in this way—may be converted into a huge ulcer with a foul yellowish centre. The disease is then a most formidable one, chronic abscesses often form in various parts of the body, and the bones may become nodular; the ulceration then extends, and if the disease be not arrested, the joints enlarge and the flexors contract. At last the patient becomes a pitiable object of deformity, emaciation and disease, and life is terminated by the advent of some foreign symptom—fluxes from the bowels and dropsy being the most common.

When the disease is on the decline, many of the tubercles abort, and give rise to two conditons which some writers have described as distinct varieties of the eruption,—they are styled 'dartres' and 'pian gratelle.'

The pian gratelle consits of papules similar in every respect to the commencing yaws tubercles. Sometimes they look like mere elevations of the skin giving rise to a roughened appearance like *cutis anserina*, and hence the name 'gratelle.' At other times they have a small yellowish point at their apex, but they rarely proceed beyond this stage. I have seen instances, however, where one or more of these papules have developed into genuine encrusted tubercles.

Dartres consist of slightly elevated portions of skin covered with furfuraceous scales of partially exfoliated epithelium, and they may be mistaken for spots of lepra or psoriasis. Usually they occur as small round patches, but they may occupy a large area—in some instances indeed they may be so general as to give the skin the appearance of having been dusted over with flour. When the dartre is small the epidermis at the circumference may frequently be noticed to be split and curled up in the same manner as when the young tubercle forces its way through the skin, and the same appearance may frequently be observed when the gratelle is on the decline.

Both dartres and pians gratelles may occur at any period of the disease, but they are most common at the time when the scabs are falling. Dartres are seen oftener than pians gratelles.

From the foregoing description of the disease it will be seen that the different appearances, which some writers have considered distinct varieties, are only stages of the same malady. The old designations may therefore with advantage be discarded in a scientific description of the disease, for to speak of the respective stages as squamous, papular, encrusted, tubercular and ulcerative would simplify the description and make it more exact.

Constitutional Symptoms. There is rarely any constitutional disturbance at the onset, unless the eruption be general, when the irritation may give rise to slight febrile movement; the case is very different, however, if the termination be not favourable, or if the disease be aggravated by bad treatment and the non-observance of hygienic laws. Then, obscure pains in the muscles and bones, fever, and anemia ~~anemia~~, supervene, and unless appropriate remedial agents be employed the patient passes into the last stage of the disease. During the progress of an ordinary case of yaws there is little suffering, for the tubercles are seldom painful, and in most instances the same may be said of the ulcers. In the last stage of the disease the patient becomes the subject of cachexia, and an air of listlessness and indifference is more often seen than one of suffering and distress.

Duration of the disease and the ages of persons affected. I have had a series of calculations made, so as to show with some degree of certainty the age of those attacked and the duration of their stay in hospital. The statistics were drawn up from 466 cases discharged from the Central Hospital, and it was found that the average time of detention was only three months and nineteen days. From the details of these calculations, which are given in the appendix in a tabular form, [Appendix C.] it will be seen that the shortest time occupied in a cure was 27 days, and that the longest was over 16 months.

Period of Life.	*No. of cases.*	*Average time in hospital.*
Under five years	82	2 months 26 days
Five years and under ten	142	2 " 25 "
Ten years and under fifteen	82	3 " 21 "
Fifteen years and under twenty	37	5 " 10 "
Twenty years and under thirty	49	4 " 22 "
Thirty years and upwards	74	4 " 6 "

The information furnished by these statistics will doubtless be considered of some interest by the profession, although the results are not in accord with the observations of many who have written on the disease. The latest authorities state that persons of all ages are equally liable; but, as will be seen from the statistics of the Dominica yaws hospitals, most cases occur during the first fifteen years of life, and another important fact elicited by these calculations is that the disease is cured in a shorter time in young persons.

Origin of the Disease. In those instances where it is possible to get an intelligent account of the onset, the disease is invariably traced to direct contagion. My enquiries on this head have been careful and minute, and I have never yet found a case where yaws could be satisfactorily referred to a spontaneous origin. It would appear that the malady is the result of a specific *virus* which is absorded into the system through some wound, abrasion, or break of the skin, and my own observation leads me to adopt this theory.

From a study of the cases which have come under my notice the minimum period of incubation would appear to be from seven days to two weeks, but I cannot as yet speak with any degree of certainty as to the maximum period.

The disease is not hereditary, for I have never heard of an infant being affected from birth. Several of the patients, while in the hospital, or just before admission, have borne fine healthy children, and in only one instance did the disease attack an infant during the stay in hospital. In this case the child received a scratch on the face, and my attention was immediately directed to the incident. I watched the case carefully as I thought it likely that yaws might become developed, and it was as I surmised, for in about thirteen days the abrasion was covered with the typical yellow encrustations.

In the following cases there can be little doubt that the disease owed its origin to direct contagion.

Cases No. 227 and 228 in the Prince Ruperts Hospital. A woman aged 26, and her daughter aged 14 months, were admitted on Feby 15th, 1878. The mother with encrusted tubercles on both breasts, the left arm, left cheek and right hand; and the child with a mass of crusts on the abdomen. The following history of the cases was given. The child got burned on the abdomen, and before the resulting sore was healed up, she was placed by the mother under the charge of a girl who had yaws in the drying-up stage, and in three weeks the burn was covered with yaws crusts. The parent was suckling the child, it being a common thing for negresses to keep their offspring at the breast for a considerable time. In about three weeks or a month after the child was attacked, the mother noticed yaws tubercles commencing to grow upon her breasts. Both patients were discharged cured on May 9th.

Case 184. A man 26 years of age was admitted into the Central Hospital on November 6th, 1877, with encrusted tubercles on the face, scalp, breast, arms and genitals, and a large mass of tuberculated growths on the inner side of the left foot. The man gave the following account of himself. He was wading along the beach when he knocked his left foot against a sea-urchin, and one of the spines pierced the skin of the ankle. A small ulcer the size of a six-pence resulted, and about three

weeks afterwards yaws crusts appeared upon the ulcerated surface. There were many cases of yaws in the neighbourhood at the time, and the man believes he became infected by direct contagion.

Case 443. A man aged 24 years was admitted into the Central Hospital on August 8th, 1879, with large yaws crusts upon the chin—just over the spot where a mole formerly existed. He scratched the mole so that it bled, and about 2 weeks afterwards the yaws appeared. He was living near to persons affected with the disease. This case was discharged cured on on 4th September.

It is thought by some that yaws may become developed sporadically, but my study of the malady leads me to conclude that this is is not the case. If yaws were developed *sponte suâ*, then I do not see how that islands in which the disease once existed are now free from the infection. Take for instance Barbados, Antigua, and Saint Kitts, three largely populated islands where yaws were once rife, and where now the disease is unknown. In these islands the peasantry are under conditions similar to those of their brethren in Jamaica and Dominica where yaws prevail. The people are of the same race, they lead much about the same lives, eat the same food, and are under similar sanitary conditions. Yet one colony is affected, and the other is not. Bad dietary, bad hygiene and bad sanitation, unquestionably by lowering the vital powers predispose to the accession of yaws as to every other like disease, but it appears to me that they cannot develop the malady *de novo*, or isolated cases would appear in Antigua and other places where the disease existed in past times.

The disease is most common amongst the negroes, but coloured persons are frequently affected. I have known cases to occur amongst the poor whites, and the East Indian coolies, of which there are only a few in Dominica, are sometimes attacked.

Pathology. I am unable at the present time to say much about the pathology of the disease. I hope however to give some definite information concerning this important subject upon a future occasion.

Diagnosis. The characteristic appearances of the yaws eruption are themselves sufficient to distinguish the disease from all other maladies. The dartre, and the elongated crust, may be confounded respectively with psoriasis and rupia, but the distinguishing marks of these two stages have already been so described as to prevent any error if a careful examination be made.

Many of the old writers on the disease, and especially the French, have confounded yaws with syphilis. Père Labat in his "Nouveau Voyage aux iles de l'Amérique," published in 1742, states distinctly that "Epian," as yaws is called by the French, is the venereal disease, and he is quoted as an authority by other French writers. By a careful perusal of Père Labat's chapter on Epian, it will be seen that he describes syphilis, and it is therefore questionable whether the priest really saw a case of yaws at all. Labat says that the Charib infants are nearly all attacked from birth; but although there is a small Charib community in Dominica, as far as I know, yaws have never appeared amongst these aborigines. From syphilis the disease differs in its history, its mode of onset, the great proportion of children attacked, the small number of cases in which the genitals are affected, and the rarity of the implication of the mucous membranes. The undeviating march of a special train of characteristic symptoms will always enable the observer to distinguish yaws from syphilis, and I do not think it is possible to make an error in diagnosis if due care be taken.

The affections known as Delhi sore, Bouton de Biskra, Bouton d'Alep, Cancotica, and the Parangi disease of Ceylon, bear in many symptoms a

remarkable likeness to yaws. The yellow crust, which I have shown to be a constant sign of yaws, would also appear to be a characteristic of these diseases. The careful perusal of Dr. Gavin Milroy's articles in the *Medical Times and Gazette*, and of Dr. Vandyke Carter's valuable researches published by direction of the Secretary of State for India, goes far to prove to my mind the identity of these several diseases. At a future time I hope to have an opportunity of writing at greater length on this important subject, and I can only record in this report my strong suspicion that yaws is closely allied to, if not identical with, these little known African and Asiatic diseases.

Prognosis. Yaws is not a disease of much gravity if the patient be properly treated from the first. When, however, the constitution is abused by the excessive administration of mercury, the symptoms become inveterate and the prognosis is unfavourable. In the latter stages, when the general system is debilitated by bad and insufficient food, want of cleanliness, and the non-observance of hygienic rules, the malady is indeed a grave one, and if the patient do not die, many months or even years will be occupied in the re-establishment of health. The contraction of the flexor tendons and the cicatrices of the large ulcers, often produces deformity, one or other of the forms of talipes being especially common; and, when the ulcerative process has gone on unchecked for a long time, fingers and toes, or even half the foot, may slough off and leave a sore which will take months to heal. When appropriate treatment is had recourse to from the commencement of the disease, from one to three or four months will be occupied in the cure, but in complicated and old standing cases very little progress can be expected for many months, and the disease may linger on for several years. At the end of the last stage exhaustive diarrhœa sets in, or general anasarca due to the vitiated state of the blood carries off the patient.

Treatment. In many instances yaws will end in recovery without medicinal treatment, if the patient be placed under proper sanitary and hygienic conditions. There can be doubt, however, that the disease may be arrested, or its duration abridged, by the administration of certain drugs which experience has shown to have a curative effect. But, it is hopeless to expect any benefit from direct treatment when the patient is in a cachetic condition, brought about by the injudicious administration of potent medicines, and by the abject state of misery in which the sufferer has dragged on an existence for months or years. In these cases, tonic medicines, good and nutritious diet, and the strict observance of the laws of hygiene, must be allowed to have their effect before curative remedies are exhibited. A most useful tonic mixture is the combination of the sulphates of quinine, iron, and magnesia, with dilute sulphuric acid, but in some cases it will be better to commence the treatment by giving tincture of chincona and carbonate of ammonia. In many instances the syrup of the phosphate of iron and strychnia and quinine (Easton's syrup), the syrup of the iodide of iron, and cod liver oil, may be administered, a markedly beneficial effect often following soon after the exhibition of these remedies.

When the patients have had their systems abused by excessive mercurialisation, it is better to give chlorate of potash and tincture of cinchona for some time, great improvement of all the symptoms generally being the result of this treatment.

It may not be out of place here to make some remarks upon the question whether mercury ought, or ought not, to be administered in any stage of the disease. There exists no doubt in my mind that some cases of yaws can be cured by mercury, but I am equally confident that in many instances its effect is positively injurious. We are told by the old writers that when mercury is administered before all the eruption has been thrown out, it will convert a mild case into a serious and most intractable one. This evidence is peculiarly valuable for it was

the old practice to place all the patients under a course of mercurials —indeed one writer specifies the number of pints of saliva that should be spat daily, when the drug had manifested its effect upon the system. Under these circumstances it is scarcely to be wondered at, in studying the literature of yaws that one finds an occasional lament that the disease in some cases baffled the skill of the physician. It may be difficult to determine accurately when all the eruption has been thrown out, consequently the commencement of the mercurial course must sometimes be delayed, and thus valuable time will be lost, or the risk will be run of doing harm to the patient. In addition to this disadvantage, the administration of mercury must be watched with great care, in order that it may be stopped before it has time to do mischief to the constitution—consequently it is an unsafe medicine to be employed in a large hospital where there is no resident medical officer.

The continued action of mercury has the effect of reducing in number the red corpuscles of the blood, and we find that, when yaws exist for a long time, the patient becomes the subject of anæmia. Mercury is therefore contra-indicated in the latter stages of the disease, and I think it is rarely indicated in the earlier ones. It may be beneficial when the red tuberculated growth—the true framboesial excrescence—exists in strong plethoric individuals; but, even in such instances, I would prefer trying other remedies before having recourse to mercury.

The treatment by corrosive sublimate was the one generally adopted in former years by medical practitioners in the West Indies, and no doubt to this circumstance may be referred the line of treatment pursued by the self-constituted native yaws doctors. In Jamaica, it is stated by Dr. Bowerbank, mercury in some form or other is the basis of the various nostrums given for the purpose of curing the yaws, and the same may with truth be said of Dominica. The mischief which is done by this indiscriminate use of mercury can scarcely be over estimated. The worst cases of yaws that have come under my notice have been those which the native quacks have failed to cure. These patients would have been far better off if they had never undergone any treatment at all, for then their constitutions would not have been ruined by the reckless administration of powerful poisons by persons ignorant of all principles of medical science.

The treatment generally adopted at the Central Yaws Hospital is to administer sulphide of calcium, or sulphur and cream of tartar, until the crusts commence to fall, when a mixture containing iodide of potash is given. The following cases treated in the hospital will show the effect of these medicines upon the disease.

Case 396. A boy 12 years of age was admitted on July 2nd, 1878, with several encrusted tubercles on the face, a large one on the neck, another on the scrotum, and several on both legs. The left great toe was the subject of onychial ulceration. There were a few dartres on the limbs; and many dark maculæ, the site of the old tubercles, were seen in various parts of the body. The boy was attacked with the disease five months before admission. Sulphide of calcium, in the form of pills in doses of one seventh of a grain twice a day, was ordered, and the toe-nail was removed on July 8th. On the 24th, the yaws were dry, and the onychia was cured, but a general eruption of dartres occurred, and the skin appeared as though dusted over with flour. Iodide of potash was ordered. On August 5th, the following note appears in the Case-Book,—"The dartres are now fast disappearing," and on August 18th, it is recorded that "the dartres are nearly gone, no tubercles." On August 26th, the sulphide of calcium was again ordered, and an entry was made that the boy was "all but clean." No more symptoms of the disease having developed themselves, on August 30th the iodide of potash mixture was repeated, and the patient was discharged on September 4th.

Case 406. A boy, aged 3 years, was admitted on July 5th with encrusted tubercles on the thighs, genitals and round the anus, and onychia of the right thumb. The disease had existed a month. He was ordered to take sulphur and cream of tartar. On August 5th, the tubercles were in about the same state as on admission, but the end of the thumb was a mass of unhealthy ulceration partially covered with dirty yellow crusts, and there was an abscess over the right mastoid process. The abscess was opened, the sulphur and cream of tartar was stopped, and sulphide of calcium was ordered. On Sept. 7th, as the thumb was still very bad, although the yaws were dry, black wash was applied locally, and the iodide of potash mixture was ordered to be taken. The ulceration was improved on Sept. 17th, but as the general health was affected cod liver oil with steel wine was ordered, and an acetate of lead lotion was applied to the sore. The patient was discharged cured on Oct. 24th.

Case 417. A boy 16 years of age was admitted on July 15th, 1878, and he had been suffering from yaws for six months. The following description appears in the Case-Book—"Yaws crusts on both feet. "Third toe of left foot has commencing onychia—the result of a tu- "bercle. Left forefinger has a tubercle sprouting out from the matrix "—the nail being raised on one side. Crusts scattered about face. "No dartres." Sulphide of calcium was ordered, and on July 24th the yaws commenced to dry. On August 5th the following note appears— "Yaws on forehead not yet dry. The tubercle on the left forefinger "dry—and progress of onychia arrested. The finger nail is slightly "pushed to the side opposite to the tubercle, and it is corrugated on "the affected side." On August 18th iodide of potash was ordered; on August 26th the onychia was cured; and the boy was discharged on November 4th.

From these cases it will be seen that sulphide of calcium has a most beneficial effect on the disease. This drug has never before been recommended as a remedial agent in yaws, and I have not heard of a case in which it has been employed. I was induced to prescribe it because, unlike sulphur, it is not liable to produce excessive action of the bowels, and because of its known potency for good in cases of unhealthy ulceration. Its beneficial action is strikingly shown in the following case. A man thirty years of age was admitted to the Morne Bruce Hospital on Jany 20th, 1877, and he was treated with corrosive sublimate. When I took charge of the establishment at the end of April, the man came to my notice, and I wrote the following description in the Case-Book.—"Large tubercles on body and limbs and nose and "mouth. There is a huge open sore on the right leg, with a piece of "necrosed bone in the centre." On June 18th the man was sent to the Prince Ruperts Hospital. Drugs of various kinds were administered, and yet no effect was made on the disease. Pedunculated tubercles, attached to the eyelids, hung down over both eyes, the man was pitted from small pox, and he presented a hideous appearance. On July 24th, I ordered sulphide of calcium, and within a week the yaws commenced to dry, and on August 26th he was discharged cured. At the time of writing this report the man is under my care in the Roseau Infirmary with injuries received by the upsetting of a canoe, but there is no sign of the yaws to be discovered except various scars about the skin.

In chronic cases, which are unaffected by the various agents I have mentioned, arsenic may be given with advantage, as will be seen from the following instance. A girl 14 years of age was admitted into the Central Hospital with the perineum and gluteal regions nearly covered with yaws crusts. Various remedies were administered with very little effect, and the girl remained in the Hospital for several months without any apparent benefit from her stay. At last Dr. Duke who had charge of

the case ordered Liquor Arsenicalis, and within a few weeks the crusts commenced to dry up and disappear, and the girl who before was unable to walk began to move about. Arsenic seems to be especially valuable when the squamous and the papular stages persist for a long time.

At the commencement of the disease very little local treatment is required, it is advisable however to brush over the encrusted tubercles with carbolized oil—one part of carbolic acid being added to nineteen parts of oil. This application, besides having a beneficial effect upon the disease, serves the useful purpose of dispelling the disagreeable odour, and of diminishing the risk of contagion. The ulcers, when foul, are usually poulticed with linseed meal until they become covered with healthy granulations, when a weak astringent ointment or lotion will promote cicatrisation. A small proportion of the carbolized oil is usually mixed with the poultices. If the ulcer be a very large one, when clean it may be grafted with sound skin taken from the arm or some other part where the disease has not yet manifested itself. I have obtained most unexpectedly beneficial results by adopting this line of treatment. When an ulcer becomes indolent the best stimulating application I have found to be lint well soaked with the carbolised oil, the part being firmly bandaged at the same time. The tubboe is treated by soaking the foot in warm water for about an hour—in order to soften the hard skin of the sole, and then applying pure carbolic acid so as to produce a cauterising effect, and one or two such applications will usually be found to be sufficient.

From a consideration of this report it will be seen that the yaws administration is now settled upon a satisfactory basis. The hospitals which could not be worked in an efficient manner have been closed, and a large Central Hospital has been established. The account already given of the fifteen months work of this hospital, is most reassuring, and it will doubtless be received by the people with feelings of satisfaction.

The large number of cases admitted to the hospitals has taken every one by surprise, for the extent to which the disease prevailed in the country was not properly known until special yaws constables had thoroughly explored the districts which were thought to be free from the infection. Then, when patients were brought in by dozens from their hiding places, the extreme gravity of the question was felt, and the hope of subduing the disease within the short time estimated was seen to be futile.

During the year 1878 twenty-nine yaws patients were admitted to the Central Hospital from the town of Roseau, and in two instances I had to issue warrants for the forcible removal of the patients before the relations would consent to deliver them up. These facts will give an idea of the number of infected persons concealed in the country, and of the difficulties which beset the authorities in dealing with the matter.

Now that the prevalance of the disease is known to its fullest extent, effectual measures can be taken to subdue its ravages.

The present organization is working in a satisfactory manner, and I see no reason why the efforts now being made to rid Dominica of this loathsome malady may not finally be crowned with success, if these efforts be continued for a sufficient period of time.

H. A. ALFORD NICHOLLS, M. D.
Medical Superintendent of Yaws Hospitals.

APPENDIX

A.

HISTORY OF TWO CASES IN WHICH THE DISEASE APPEARED A SECOND TIME IN THE SAME INDIVIDUAL.

Case 550. A woman, 23 years of age, was admitted to the Prince Ruperts Hospital on July 1st, 1877, with encrusted tubercles on the right inner ankle. She was discharged cured on October 1st, and she was then engaged as sub-nurse. Soon afterwards she was removed to the Central Hospital, and she acted as a nurse of this establishment until July 9th, 1878, when she was discharged for misconduct. On November 26th, she returned to the hospital, having again become affected with yaws, and she was about two months advanced in pregnancy.

Case 93. A boy 5 years of age was admitted to the Central Hospital on October 16th, 1877, with tubercles forming a ring round the mouth, and other tubercles on the perineum. He was discharged on December 18th. Before sending the boy away I made a careful examination of him, and as I could discover no sign of the disease, I wrote a note to that effect in the Case-Book, it being the only occasion upon which I made such an entry. It was, therefore, much to my surprise when the child was re-admitted, with fully developed yaws on both extremities, on Nov. 5th, 1878, nearly eleven months after his discharge. As I felt confident that the boy was thoroughly cured on the first occasion, I determined to spare no trouble in discovering, if possible, the source of the second infection; and, to that end, I sent the Master of the hospital to the village from whence the boy came, to make careful enquiries into the history of the case, and the following facts were then brought to light.

A sister of the boy was found concealed, in a hut, in a terribly diseased condition. She had large framboesial tubercles about her face and limbs, her feet were nearly full of chigoes, she was in a state of great emaciation and unable to stand on account of pain and contraction of the flexors of the legs, she was moreover in a most filthy condition and swarming with lice.

The girl had been attacked with yaws before her brother, and when the police removed him to the hospital the girl was hidden away by her friends. After the discharge of the boy he was allowed to associate freely with his diseased sister, and at night he slept by her side. Under these circumstances it is not to be wondered at that the child became infected a second time.

B.

DIETARY OF THE CENTRAL YAWS HOSPITAL.

Breakfast, taken at 9 a. m.

Sunday— 8 ounces of bread, 1½ ounces of syrup and 1½ ounces of chocolate.

All otherdays—8 ounces of bread and 1½ ounces of syrup.

Dinner, taken at 4.30 p. m.

Sunday— 2 ounces of fresh meat and 4 plantains.

Monday— ½ pint of vegetable soup seasoned with salt pork and ¾ pint of farine.

Tuesday— 4 ounces of salt fish, ¾ pint of farine and ½ pint of lemonade.

Wednesday—same as Monday.

Thursday— 4 ounces of salt fish, 4 plantains and ½ pint of lemonade.

Friday— same as Monday.

Saturday— 4 ounces of salt fish and ¾ pint of farine.

Fresh is substituted for salt fish when it can be obtained.

C.

STATISTICS SHOWING LONGEST AND SHORTEST TIME UNDER TREATMENT, PERIOD OF LIFE, &c., OF 466 CASES DISCHARGED FROM THE CENTRAL HOSPITAL.

Class.	Period of Life.	Number of Cases.	Per centage.	Average time in hospital.		Longest time in hospital.		Shortest time in hospital	
				Mos.	Days	Mos.	Days.	Mos.	Days.
I.	Under five years.	82	17.6	2	26	8	3	1	
II.	Five years and unde rten.	142	30.5	2	25	13	8		29
III.	Ten years and under fifteen.	82	17.6	3	28	15	21	1	6
IV.	Fifteen years and under twenty.	37	7.9	5	10	13	14	1	7
V.	Twenty years and under thirty.	49	10.5	4	22	14	8		27
VI.	Thirty years and above.	74	15.9	4	6	16	1		28
		466	100.0						

(Catalogued as part of previous item)

7 (a) this report precedes

APPENDIX TO THE MINUTES OF THE LEGISLATIVE ASSEMBLY DATED 29TH JANY., 1878.

SECOND REPORT OF THE MEDICAL SUPERINTENDENT OF YAWS HOSPITALS.

THE disease *Frambœsia*, commonly called "Yaws," was introduced into the West Indies by negro slaves imported from Africa. The date of its ingress into Dominica is unknown, but it existed in the Island early in the present century. The disease did not, however, make any great head-way before emancipation, for each estate of considerable size had its "yaws-house," and the affected negroes were there segregated, and treated by a nurse under the direction of a medical attendant.

Upon the abolition of slavery, and the consequent impoverishment of many estates, and the total abandonment of others, the medical surveillance of the negroes came to an end, and the number of persons affected with yaws increased considerably.

The rugged conformation of the country of Dominica, the smallness of the population as compared with the area, the facilities for squatting, and the absence until recently of a medical service, all tended to favor the spread of the disease.

About eight years ago the number of cases had increased to such an alarming extent that measures were taken for the repression of the disease. Hospitals were established, yaws patients were admitted and cured, and it was hoped that the disease would be extinguished; but the system adopted was stopped too soon, and the malady reappeared and spread with great rapidity.

It is now suspected that when the institutions were closed cases of yaws still existed in the remote parts of the country, the persons affected being hidden by their friends to prevent their removal to the Yaws hospitals.

If the hospitals had been kept open for a considerable time longer than they were, and if there had been constables perambulating the country, ready at any moment to arrest a yaws patient when found, there can be but little doubt that the spread of the disease would have been finally arrested. Unfortunately, no such measures were enforced, and the Government in a few years had to grapple with a contagious disease, which was present in every district of the country, and which held hundreds of victims in its grasp.

Happily the disease is one amenable to medical treatment, and the yaws hospitals now in full working order are fast removing the blot which has existed upon the public health for so many years.

That the disease will be finally eliminated from Dominica, is disbelieved in by many, but I see no reason why this desirable event should not really occur. In former days the disease existed in all the islands of the West Indies, and now it is confined to few. There is, therefore, nothing to prevent yaws from being stamped out of Dominica, as it has been from Barbados and Antigua. The disease is curable, and the necessary stringent enactments are at hand for gathering into the hospitals, by force if necessary, those suffering from the affection. Such being the case, unremitting and prolonged diligence in putting into operation the means is all that is necessary for attaining the much-to-be-desired end.

There are now two hospitals in existence, the Prince Ruperts and the Central. The establishment at Morne Bruce was closed on October 11, 1877, the patients being transferred to the Central Hospital. It will be well to consider the work of these hospitals separately and in detail.

Morne Bruce Hospital.

This institution was established for the reception of the few lingering cases remaining in the hospitals after the attempt to stamp out the disease some years ago, and for treating the few cases which it was thought might have been overlooked in the country. The site and buildings were ill-adapted for their purpose, and when the disease reappeared in the country there was no machinery for gathering in the patients. Those persons who came for treatment left the hospital at will, or were taken away at the caprice of their friends. Some were unquestionably cured, but many absconded with the disease still upon them, and they formed centres for the spread of the malady. When I took over the charge of the establishment from Dr. Keelan on April 28, 1877, there were 23 patients in the hospital, and of this number three ran away between my first and second visits. The institution was finally closed on October 11, and its inmates were removed to the Central hospital, which was opened on that date. The following table will show the work of the establishment:—

In hospital on April 27	23	Discharged cured	30
Admitted to October 11	60	Absconded	3
		Removed to Central Hospital	50
	83		83

Prince Ruperts Hospital.

This hospital was opened on the 12th day of June 1876, and patients were speedily gathered in from the northern district of the island. At first the working of the institution was all that could be desired, but after a time the affairs became from various causes very unsatisfactory. The following table will show the work of the hospital from the date of its opening until the time of my appointment.

Admitted from June 12, 1876 to April 21, 1877	133	Discharged cured.....	46
Born in the hospital	2	Died	3
		Absconded	49
		In hospital on April 21, 1877	37
	135		135

From April 21, 1877, until the end of June, when Dr. Flynn was appointed, there was no medical officer to the hospital, and I performed the duties myself as far as I was able; the distance from Roseau preventing me from making very frequent visits. Dr. Flynn only performed the duties of his office for a short time; he having died at the end of August On October 1, the present medical officer, Dr. Elliott, assumed his duties, and he has visited the hospital regularly ever since. Under Dr. Elliott's charge the hospital has improved in every particular, and, as will be seen from the following table, the institution has been of great utility.

In hospital on April 21	37	Discharged cured	125
Admitted to the end of the year 1877.....	195	Died	6
		In hospital on Dec. 31	101
	232		232

Of this number of inmates remaining in the hospital at the end of the year only 97 are affected with yaws, 4 being young children free from the disease, who were admitted with their mothers.

The number of deaths may seem somewhat large, but many of the people are in so debilitated a condition upon their entry into the hospitals that the wonder is that so few of them die. In referring to this matter, Dr Elliott says in one of his reports —"I have no doubt but that their lives were prolonged by the care and attention they received." And to this truthful remark I would add that numbers of lives are not only prolonged but saved by this care and attention. Many of the persons who are admitted would inevitably die in a short time if left in their own dirty hovels to the indifference and inattention of their friends, but under the treatment which they receive in the hospitals they are often restored to the viger of health.

The labouring population greatly appreciate the efforts of the Government to take away the disease from their midst, and the patients and their friends invariably express satisfaction at their treatment and care.

The Central Hospital.

This institution was opened on Oct. 11, 1877, with the 50 patients transferred from the Morne Bruce hospital. Numbers of patients were speedily gathered in from the leeward district of the Island, and, as will be seen from the following table, 168 new cases were admitted to the end of the year.

Transferred from Morne Bruce hospital	50	Discharged cured...	81
Admitted to end of the year 1877	168	Died	3
		In hospital on Decr. 31 ...	134
	218		218

Of this number, 218, there were 124 males and 94 females.

The medical work of the Morne Bruce and Central hospitals was, until recently, performed entirely by myself, but at the end of the year Dr. Duke was appointed medical officer, the duties being more than I could accomplish without professional assistance.

As will be seen from the table, the hospital has done excellent work, considering the short time that has elapsed since its establishment.

The hospital is situated at the mouth of the Canefield River, and the patients are able to take advantage of the fresh water and sea bathing. Although the position of the institution has been disapproved of by many persons, it is nevertheless the most eligible site within a convenient distance of Roseau.

From a consideration of the foregoing facts, it will be seen that during the past year much and lasting good has been done by the Yaws Hospitals In 1877, from the end of April to Decr. 31, a period of about eight months, 236 patients have been discharged from the hospitals : and of this number only six have returned to Prince Ruperts for further treatment. In most of these cases the disease broke out afresh

in consequence of the carelessness of the late Master of the hospital, the treatment not having been properly carried out. In the other instances the disease was no doubt contracted afresh. Like small-pox, one attack of the disease does not give absolute immunity from a second attack. Small-pox has been known to occur thrice in the same individual; and in like manner, on account of a peculiar idiosyncracy, some few individuals are capable of being affected with yaws more than once. This is of course rare, but it does occur; and when it is remembered that many of the patients discharged from the yaws hospitals go back to the same insanitary conditions under which they lived before their admittance, and probably associate with persons affected with the disease from which they have just been cured, it cannot be wondered at that in rare instances the yaws return again.

I do not propose in the present report to enter into any particulars descriptive of the nature and characteristics of the disease; it may not however be out of place to give a brief sketch of the treatment now generally adopted in the hospitals. This is as simple as it is efficacious, and except in some minor details it is the same as recommended by Dr. Imray.

At the commencement sulphur and cream of tartar are exhibited until the characteristic eruption shows signs of drying up, then a mixture containing iodide and chlorate of potash is given, and the cure is usually complete. The so-called 'crab-yaw' on the sole of the foot, is treated with applications of pure carbolic acid, and it is readily and speedily cured thereby. Cod-liver oil, ferruginous and other tonics, with the mineral acids, are given in suitable cases, and the patients are placed under proper hygienic and sanitary conditions. The time occupied in the treatment is from five to ten weeks in cases of the uncomplicated disease. But when the disease is of long standing many months treatment is required.

The rules and regulations, as will be seen from the appendix,* are stringent; but they are necessary, and they do not press heavily, except upon the evil-doers.

Every day the patients are bathed, and those who are able to do any work are kept occupied in gardening and other pursuits for several hours every day. The inmates are thus always kept healthily exercised, and the beneficial effects thus produced are most striking.

It cannot but be admitted that the recent working of the Yaws Hospitals is most satisfactory. The people are being cured of the disease, and at the same time they are being taught to be cleanly in person and habit. The leeward coast of the island is now nearly free from the disease; and in a few years it is to be hoped that in Dominica, the 'Yaws' will be a thing of the past.

H. A. Alford Nicholls, M. D.,
Med. Superintendent of Yaws Hospitals.

January 16, 1878.

* *Published in Official Gazette, 27th Nov. 1877.*

LETTER FROM DR. NICHOLLS TO THE COLONIAL SECRETARY RESPECTING THE SITE OF THE CENTRAL YAWS HOSPITAL.

Roseau, 24th January, 1878.

Sir,

My attention having been directed by you to certain rumours which are in circulation in the Island to the effect that the position of the Central Yaws Hospital is a bad one in consequence of its unhealthiness, I have the honor to lay before you for the information of His Excellency the Governor the following remarks upon this important subject.

In selecting the site for the erection of the hospital, a near supply of fresh and flowing water was one of the most essential conditions; and proximity to town was necessary in order that the medical officers and other authorities might not only visit frequently, but also be within easy call. It was also necessary to fix upon the mouth of a river: for, if a place higher up were determined upon, the water would be contaminated below. In a report to the Colonial Office upon Yaws in Dominica, dated 16th May 1877, Dr. Gavin Milroy bore out these views, and thus the medical opinions in England and Dominica, arrived at independently of each other, coincide in these important particulars.

To the south of Roseau there was no river; the Roseau river itself was undesirable as being within the town, therefore the only two eligible sites were the mouths of the Canefield and Belfast rivers. Of the two, Canefield was selected as being nearer to Roseau, and as being considered healthier and less marshy than Belfast. Before finally deciding upon the site, Dr. Imray, who is the only medical man upon the Board of Yaws Commissioners, was consulted, and he expressed approval at the selection.

At the time the land was in cane cultivation, and some period elapsed before the canes could be reaped. This fact is interesting, for it is scarcely in accord with the

statement which has been made that the place is a swamp,—for sugar-canes do not grow in swamps. A small portion of the land was marshy, but this was thoroughly drained and filled in, and now the grounds surrounding the hospital are planted in sweet potatoes, manioc, pigeon-peas, plantains, and other vegetables, and their thriving condition shows that the soil, which is a sandy one, is not so sodden with moisture as it has been represented to be.

There is a lagoon to the south-west of the hospital grounds, but it is small in size, and it may easily be filled up in a short period of time. On the leeward side of this body of water there are houses which have been occupied for years, and one of these habitations is nearer to the lagoon than the latter is to the hospital, yet the occupants and their families enjoy good health.

It is commonly supposed that malaria exists only where there is stagnant water, but this opinion is an erroneous one, for some of the most malarious districts have a dry and parched soil and subsoil. The medical history of the armies engaged in the Peninsular War afford convincing examples of this fact. Many marshes and lagoons are also quite innocuous, as for instance, the Dismal Swamp of America which is remarkably free from malaria, whilst the neighbouring country is the reverse. There is no marsh, nor is there stagnant water on the south side of the Canefield river near to the hospital; for the water in the lagoon is scarcely stagnant, a feeble current being often observed in dry weather, and during rains the water flows freely into the sea. All the marshy land of the Canefield Estate lies to the north of the river, and it is a known scientific fact that malarial poison does not readily find its way across rivers, its progress being arrested by fresh running water. It will thus be seen that the hospital is not placed, as it has been said, in the midst of a swamp exhaling quantities of noxious poisons. Malaria does exist at the mouth of the Canefield river, for no portion of the littoral of Dominica is free from its influence. It is present in the most healthy localities of the coast, and in order to ensure the yaws patients perfect immunity from malaria it would be necessary to erect the hospitals on the hills at an elevation exceeding that of Morne Bruce. Were this done it would be impossible to command the necessary water supply, and this fact alone precludes the idea of such a position.

That the site of the Central Hospital is not so obnoxious to malaria as some would have it supposed, the mildness of type of the cases of fever which have occurred will alone testify. Instances of fever of a much worse character have within the last few months occurred in my practice in Roseau, and there have been several fatal cases in the town; whilst no deaths from fever have happened at the hospital.

Fever is prevalent all along the coast line of Dominica, and the town of Portsmouth and some of the populous villages of the Island are in no wise healthier than Canefield. An interesting fact in connection with the subject is the healthiness enjoyed by the penal gang whilst working (on and off from June to the beginning of December) in digging trenches for draining the land, and in performing other arduous work in the hospital grounds: only four trivial cases of sickness took place amongst these men, and about forty cases occurred during the same time amongst the other prisoners confined in the Gaol.

One of the most important considerations in connection with this subject is the question of race. It is recorded in Holy Writ that all the various races peopling the earth, although differing widely in many particulars, are nevertheless descended from one common stock; and this statement is in accord with the results arrived at by the independent investigations of some of our greatest men of science. The changes which have taken place in the characteristics of the various people of the world have not been accidental, nor have they been sudden; on the contrary, they are the result of the impressions made upon successive generations for many ages by the operation of causes produced by locality and mode of living. Thus it comes to pass at the present day that some members of the human race are capable of living in places and under conditions which to others of the family would be incompatible with health and life. Men are born on the coast of Africa, and they live and thrive in the climate which was congenial to their forefathers; but take these men to cold climes and make them live as the inhabitants, and they wither and die, as would the denizens of such lands were they placed under the same conditions as their southern brethren.

These facts have received their explification in this Island. When Prince Ruperts was garrisoned with white troops, the mortality was so great that Dominica was spoken of as the grave of the soldier in the West Indies. After a time the home troops were withdrawn, and their place supplied by detachments of the West India regiments, when all was changed, and it was found that the native soldier lived as long at Prince Ruperts as any where else.

The bearing of these facts upon the subject in hand will at once appear evident when it is remembered that the yaws patients are drawn from the native labouring population. The Central Hospital is not altogether free from malaria, but it is constructed for those who are accustomed to malaria, and who are almost free from its impression. Dr. Pickford, in his work on hygiene, states that "the African and the Creole are, in a great degree, exempt from, and very rarely

"amenable to, those influences which generate in Europeans intermittent, remit-
"tent, or yellow fever."

Thus it will be seen that the Central Yaws Hospital, although it might not be suitable for Europeans, is nevertheless not ill adapted for the purpose for which it was built.

The statements which have been so freely circulated as to the swamps, and the fever, and the malarial poison, are, as will be seen from this letter, quite erroneous and misleading; and the course of events has shown that the malaria has not been more potent at the hospital than at many other parts of the coast.

Considering the importance of the matters treated of in this letter, I would suggest that a copy of it be appended to my recent report upon the Yaws Hospitals.

I have, &c.

H. A. ALFORD NICHOLLS, M. D.
Supt. Yaws Hospitals.

Hon. E. D. Baynes, C. M. G.
Colonial Secretary.

MEMORANDUM UPON YAWS, FOR THE INFORMATION OF THE GOVERNOR AND THE BOARD OF YAWS COMMISSIONERS.

There is perhaps no matter connected with the well-being of this country at the present moment of more importance than the measures that are now in progress for the extinction of the Yaws disease that has so long afflicted our people. I do not purpose entering into any discussion here of the causes that led to the failure of a former attempt to extinguish this disease. The Board of Health on a former occasion dealt with this subject, and it has received attention from Doctor Nicholls in his Report recently published.

It is well known to all in this island that yaws had been steadily extending from year to year, that our towns and villages abounded with it, that cases existed even in the town of Roseau, and occasionally might be seen in the streets to the terror of its inhabitants. Complaints were heard on all sides that no means were taken for the arrest of the malady, and the authorities were loudly blamed for their supposed inactivity. At length the Government considered that the time had arrived to take action, the evil was generally acknowledged having become very formidable. Legislative enactments were passed and after mature deliberation it was decided that the measures to be adopted should be based upon the principle of segregation, that is, separation of the diseased from the healthy, in ordinary language *stamping out.*

Before proceeding to speak of the measures resorted to by the Government, it may not be inappropriate to make a few remarks on the all-important principle of segregation for the extinction of contagious disease. Sir James Simpson, the discoverer of chloroform, was the first, I believe, to bring this subject prominently before the public, at least the medical public. He strongly advocated the establishment of special hospitals for the reception of persons affected with contagious disease as small pox, and suggested other expedients of a similar nature. Since that time, the knowledge of the great power of this agency in suppressing disease has gained ground rapidly amongst the public generally, and is very commonly acted upon where practicable. Even in families when contagious disease appears, such as scarlet fever, the affected portion of inmates of the house are often placed in quarantine, where convenient, no communication being allowed with the uninfected members of the family; and with the happiest effects.

The history of the Board of Health of this island, (now extinct), will show that on six different occasions small-pox was introduced into Dominica, and was each time extinguished by segregation and seclusion. But the treatment of this disease—yaws—in former times, affords a striking example of the power of the separation of the sick from the uninfected. Every estate at that time had its yaws house, to which every one showing the least symptoms of yaws was immediately conveyed,—and in point of fact the same method so effectual then is now being carried out. Our hospitals are simply large Yaws Houses. It is deeply to be deplored however that a salutary feeling of shame and repugnance in the minds of our people with regard to being affected with yaws has now, I fear, all but died out among our labouring population. This, in my opinion, was one of the most powerful factors in the prevention of the spread of yaws. In these days people affected with the disease associate readily with their neighbours, who appear perfectly careless whether they contract the contagion or not.

My reason for bringing forward these observations is, that I believe there are persons in this colony who have no faith in this method of "stamping out" for the extinction of the disease, considering the principle unsound, and likely to be ineffectual,—an opinion that can only exist from ignorance of the facts of the case.

In adopting this principle then in dealing with the disease, it followed as a necessity that hospitals should be established in different districts of the island

for the reception of yaws patients, and that these hospitals should be as few in number as possible, and as large as the means of the colony would admit; for the fewer the number of hospitals, the less the chance of the disease extending, and the less the expenditure—and the greater the number of patients under treatment, the sooner the malady would disappear. At first it was decided to erect three hospitals; one near town, one at Prince Ruperts, and one at the windward of the island. Finally, it was determined that the latter should be dispensed with, and the patients be brought from windward to the hospital near Roseau. It remained then for those on whom the responsibility rested of choosing sites for these hospitals, to select such as upon the whole appeared best suited for the treatment of yaws, under the special circumstances of the case. Taking into consideration then all the requirements absolutely demanded for a hospital intended for the reception of patients in large numbers, and which have already been submitted to the Government by the superintendent,—as the senior member of the medical profession in the island, and with such knowledge as I may have been able to gather during a practice of some forty years, I came to the conclusion that the portion of land at the mouth of the Canefield river was the most eligible for the large Central Hospital and this position I recommended to the Inspector, Dr. Nicholls. I should therefore wish it to be distinctly understood that Doctor Nicholls is not alone responsible for having selected this locality,—whether judiciously chosen or the reverse, the responsibility, whatever it may be, attaches chiefly to me, and which I willingly accept. At the same time, it must not be supposed that Doctor Nicholls selected this locality from my recommendation simply, but from his own judgment, considering it the best under the conditions that could be chosen. It must not, however, be understood that the land at the mouth of the Canefield river would have been recommended under ordinary circumstances and with the selection untrammelled by certain indisputable conditions. It should be borne in mind that the disease and the circumstances attending its treatment are special, and differ materially from the requirements of hospitals established for the treatment of disease generally. It is indisputable that more salubrious localities could be found on our mountain slopes and summits, but the indispensable abundant supply of water could not then be obtained and other requirements fulfilled. The buildings formerly used at Prince Ruperts as a yaws hospital were again fitted up for the reception of the patients in the northern district of the island.

The results of the measures taken by the Government to free the island from yaws are very re-assuring. That 236 cases should have been dismissed cured since the hospitals have been in full operation, and nearly the whole of the leeward side of the island cleared of this incubus, is a measure of success that must be gratifying to the public as well as the Government, and points unmistakeably to the final extinction of the disease at no distant period.

Unhappily, several cases of dysentery have lately appeared in the hospital at Canefield, affecting chiefly the children, but the proportion of fatal cases has been such as to cause some anxiety. I have no desire to cast censure upon any one, I speak merely to the facts when I say that the construction of the hospitals at Canefield is ill-suited for the treatment of disease, especially when the subjects are weak, half-starved children, greatly reduced in strength from the presence of disease and want of care previous to admission,—and the transition from the close small huts in which they are usually shut up at night to a long ward full of crevices and openings, with currents of air passing in all directions from the floor and the sides, is not only likely to give rise to disease, but also greatly lessen the chance of recovering if proceeding from other causes; and children being more readily affected by morbid agencies than adults are the first to suffer.

I should wish specially to observe upon this point that it is not to be concluded that because dysentery has appeared in the Canefield Hospital therefore an improper position has been chosen for its establishment. Dysentery always exists in this country, and may appear epidemically in any part of the island, along its shores all round, or in the uplands, and more frequently and probably with greater intensity in the low-lying districts. I have found dysentery to prevail in the town of Roseau when no particular reasons could be assigned for its appearance, certainly not essentially malaria according to the ordinary acceptation of the word, that is—poison emanating from marshes or marshy land. On one occasion I had under treatment for dysentery a large proportion of the children in the convent during an epidemic, a locality from its position as free from malaria as any part of the town, and notwithstanding the more than usual care taken of the children in this excellent institution. During the same epidemic a gentleman residing at Morne Bruce lost three of his family from this complaint. Formerly when the barracks at that locality were occupied by troops, dysentery was for a long time the scourge of the soldiers. It prevails occasionally at Grandbay, and on the windward side of the island, and to such an extent at times as to call for the interposition of the Government, as the records of the former Board of Health would show.

It must not be lost sight of that cases of dysentery are met with in many parts of the island at present, and that the weak and diseased children brought

to the hospital might have been attacked at their own homes and have died without any blame being attached to locality. But when a number of such children are conveyed from various parts of the island to one spot and several cases of dysentery occur among them, an event likely enough to happen if an epidemic influence exist, it is at once rashly concluded that the locality is at fault.

The island of St. Christopher is certainly not considered a malarious country, and yet by the report of Dr Boon for 1876 I find it stated that for several years previous dysentery had prevailed in the island. Dr. Boon in his Report says :- "Dysentery for the last four years has been very prevalent in the island. It has "prevailed about the fall of the year, and the mortality from this disease among the "population has been very considerable, especially the children. *It always extends "to the hospital*, and the old paupers with broken down constitutions when attacked, "in spite of all treatment and care, often fall victims to it"

The number of patients admitted to the Cunningham Hospital in that island was 335, of whom died 54 and of that number no less than 19 were carried off by dysentery ; 23 were admitted with disease of the bowels, of these 19 died.

It is therefore clear that dysentery prevails and is very fatal in hospitals comparatively free from the influence of malaria. No matter where a Yaws Hospital might be placed in this island it certainly would not be beyond the reach of the morbid causes that give rise to dysentery.

Canefield having been chosen as upon the whole the best position for erecting a Yaws Hospital, it is evident that every means should be taken to remove as far as possible all known causes of disease. I would therefore urgently recommend the filling up of the swamp in the neighbourhood of the hospital, which is limited in extent and for most part shallow, and is not likely to be an undertaking of great magnitude. It has been already agreed to by the President and the Board that this work should be carried into effect with the sanction of the Governor. It might be advisable to remove for a time to the Yaws building at Morne Bruce as many of the children as it will accommodate, until the new wing of the Hospital is completed, and while the epidemic dysenteric influence lasts I believe these suggestions have already been made to the Governor by the Medical Superintendent. I may add that perhaps it may be useful to divide the wards of the hospital into separate compartments by wooden partitions in order to break in some degree the currents of air that pass in all directions.

It is to be regretted that the measures of the Government for the extinction of yaws should have been bitterly censured, and the site of the hospital at Canefield altogether condemned by some in this island, and yet that those who have so acted have proposed no reasonable or practicable plan of their own, nor suggested any site for a hospital more eligible than that which has been chosen. It is difficult to understand what object it is sought to attain by thus opposing and thwarting the measures that had been decided upon by Government for ridding the country of yaws. The effect that might naturally be looked for from such proceedings would be to excite a feeling of distrust and hostility among our people and a disinclination to enter the yaws hospitals, fortunately such a result has not followed ; on the contrary, those of the people who are affected with the disease eagerly desire admission, and the hospitals if twice as large might be readily filled. I cannot but allude to the groundless and unwarrantable attacks that have been so persistently made on the Superintendent of the Yaws Hospitals. Having had ample opportunities of judging of the manner in which this officer performs his duties, I should be wanting in my duty to the Board of which I am a member were I to fail in bearing testimony to the ability and energy he has displayed in the performance of his duties in the face of no ordinary difficulties and discouragement. I sincerely trust that he may continue his services as Superintendent of the Yaws Hospitals of this island.

JOHN IMRAY, M. D.,
Member of the Board of Yaws Commissioners.

January 28th, 1878.