"YAWS"

IN TOBAGO, W.I.

With special reference to a series of 850 consecutive cases

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Tobago, said to be so named from its fancied resemblance in shape to a tobacco-pipe - (Spanish, tabaco) -, is with the exception of Trinidad, the most southerly of the British West Indian Islands. Discovered by Columbus in 1498, it was first claimed by the British in 1680, and from that date until 1812, when it was finally ceded to England, was at various times in the possession of the Dutch, the French, and the English. Hardly any other of the Antilles has been the occasion of the expenditure of so much blood and treasure as this now little known colony.

The island, which is 260 miles in length and 8 in extreme breadth, lies in 11° North Latitude and 60° West Longitude. Geologically it consists of two portions. The first, a main central ridge of igneous rock, runs for twenty miles of the island's length, is irregular in formation and reaches an extreme height of 1920 feet. It is clothed to the summit with forest, of which the virgin and is the source of numerous small streams. The second or sandy Point portion is a recent coral-biue plain, stretching southwest towards Trinidad. It is seven to eight miles across and is nearly waterless. Practically the only inhabited part of the island, with the exception of a few settlements in the Sandy Point District, is the north coast.

Tobago lies close to one of the isothermal lines.
lines of mean maximum temperature, its
range being slightly under 80° F. The actual
range of temperature during the past two
years at an elevation of 300 feet has been 28° -
from 62° in March of this year, to 93° in August
of 1889. The temperature of the sea is prac-
tically a constant of 81°. The average
rainfall is about 66 inches and the prevailing
wind is an ESE one which blows nearly all the
year round and is really the NE trade pro-
to these latitudes powered from North to
South by the nearness of the mainland 
or the upward sweep into the Gulf of
Mexico which all winds take in this
neighbourhood.

It may be mentioned incidentally
that Tobago is without doubt the island
selected by Defoe as the scene of the
adventures of Robinson Crusoe.

The population was, at the Census
of 1881, slightly over 15,000 and has probably
remained stationary since then. It
consists almost entirely of negroes and
mulattoes, the latter and persons
of lighter color, of course, relatively
numerous compared with the present number of white.
This is due, of course, to the previous
presence of a much larger European
population. At present there are
not more than seventy pure white
in the island.

The natives live a hand-to-mouth
existence.
existence, working more or less spasmodically on the sugar estates and cultivating a sufficient quantity of native vegetables, yams, sweet potatoes, cassava, for their own consumption. They do a little fishing, a little stock-raising, a little cocoa growing, and a great deal of stealing, and are as happy as the day is long while they can get mangos or coconuts or sugarcane to eat and a little salt fish as a relish to their vegetable diet.

Morally their condition is a curious one. The illegitimate birth rate varies in different parishes from 60 to 80 per cent. As in Scotland, the purely agricultural districts show the highest percentages. Of the marriages, which are few, hardly any are pure, save by accident. The virginity of the women seldom lasts a year beyond puberty, while the men acknowledge no moral restraint whatever. Cohabitation is almost universal and is not confined to the unmarried of either sex. There is, especially among the women, a terrible freedom of speech and quite half of the cases before the magisterial courts are prosecutions for the use of obscene language. And yet these people are not immoral. They possess no moral sense and it is hard to believe that they will ever be endowed with one.
The industries of the island are confined to sugar making, cocoa and coffee growing on a small but increasing scale, fishing, stock raising and the growth of native "provisions," as mentioned above. The vast majority of the blacks are laborers, and laborers of an inferior kind. They seldom aspire to the position of skilled workmen, and when they do, their work compares very unfavorably with that of the negroes in the more civilized islands, such as Barbadoes and Trinidad.

Tobago has had, until within recent years, an undeserved reputation for unhealthiness. This was due chiefly to the excesses and imprudence of the troops while the island was a military station, to the hard lot of newly importeo overseers on the sugar estates, to the life led by the old school planters and white men generally, and to the important fact that, until 1874, when a duty was imposed for the first time, rum could be bought for 2s. per quart bottle. These conditions have now passed away and the island is recognized as being one of the healthiest in the West Indies.

The present death rate is about 21 per mile. The prevalent diseases are intermittent fever, an irregular but very seldom fatal type, relapsing or typhoidal; malaria, rheumatism,
phthisis, mild epidemics of whooping cough and measles, and, especially, all affections dependent on improper nutrition. Diarrhoea, simple and dysenteric, lice, scabies and cutaneous are very common while hardly a child in the island is not the host of numbers of round worms. Cancer is rare; but syphilis,bernan, hereditary syphilis and lupus are constantly to be dealt with. The death rate among children is comparatively high. In 1890, among children under 5 years it was 20% of the whole mortality.

But without doubt the most prevalent, though not the most fatal disease that has engaged the attention of the medical staff of late years has been Yaws. Since September of 1887 I have myself treated 350 persons suffering from this disorder, and the total number of cases attended by the two other medical officers is quite as great. I think that I am probably understating the case when I say that within the last three years, 12 per cent of the population of this island have been affected with the disease, although during that time a more or less systematic attempt has been made by the local government to control its spread to cure persons suffering from it.

This curious disorder, which
which a full description will be given later, is of African origin, was introduced into the West Indies by imported slaves, and has, in many of the islands, found congenial homes. It is still however preeminently a disease of non-civilization. It is unknown in Barbados and almost unknown in Antigua, the respective "capital" of the Windward and Leeward Islands. In Trinidad the Surgeon General says it occurs very rarely, and he is probably right so far as the urban and therefore more civilized communities are concerned. I am led to believe, however, from other sources of information, that in the outlying districts of that island the disease is by no means rare. In Grenada and St. Lucia the disease is common. In Dominica which is not much more civilized than Tobago, D. Alfred Brodhulst, who has for many years been endeavoring to eradicate the disease, states in the last report issued by him, dated 1879, that during the four preceding years 6 per cent of the population had been treated by him in the public hospitals for the disorder. Of Jamaica, the largest and most important of all the British West Indian islands, I can say nothing. I have applied for information but have
have not received any.

As far as I can learn, Tolago has been, till quite a recent date, more seriously affected by Yaws than any of the islands to which I may refer. And the reason is, I think, two-fold. First, this little colony has, from its poverty, its sparse population, the distance between its settlements, its isolated position and the severe effects produced by the sudden emancipation of its slaves in 1837, been left behind in its progress towards civilization by almost all the other West Indian Islands— even by Dominica. And, second, the Government, which ought to have exercised a paternal care over the negroes after their emancipation, has never, until the period of which I am now writing, taken any notice whatever of the spread of this malady or attempted to control it. I have recently had an opportunity of examining numerous official papers dating back to the early years of this century, and have met with no reference to the existence of Yaws in the island.

Yet the disease has probably been known here for at least 150 years, or since slaves were first imported at an even earlier date, from the African coast. Its deteriorating effects upon their labours naturally induced masters of slaves to control it and to prevent its dissemination. Hospitals, known as 'Yaws Houses','
Houses were established on probably all the estates--Charlottesville, Merchiston, King's Bay, Betsy's Hope, Anchorkock and Landart, --(see map)--, certainly each had one, while smaller estates, such as Trois Rivieres and Lucy Vale, supported one between them.

In these hospitals, and within certain recognised bounds all patients were strictly detained. The great majority of the sufferers appear to have been children, who were put under the charge of one or more nurses specially provided by the estate. Curiously enough the treatment of persons suffering from Yaws appears to have been no part of the work of the doctor retained by the estate, but to have been left entirely in the hands of the manager. The evidence of old ex-slaves on this point is conclusive. The doctor seldom if ever entered the Yaws House.

The manager, very wisely, treated the sufferers rather by hygiene and sanitary measures than by medicine. Isolation, strict cleanliness and plenty of good food were mainly relied upon, and an occasional draught of sea water as a gentle aperient was almost the only medicine given.

Naturally, in such circumstances, the disease ran a long and tedious course and its duration was often measured by years. In all probability, while
where adult, and therefore useful, slaves were affected more actively, if not more successfully, steps were taken to rid them of their malady; but the "little creoles" were just as well off in the Hospital as they would have been anywhere else and their recovery was left principally to time. The Laissez-faire policy of proprietors was well expressed by an old slave woman, who had herself been an inmate of the Yaws House, when she said "Massa, if un well, un well: if you dead, I m dead."

In other islands however slaves suffering from Yaws do appear to have received medical aid; for the plates in Baywell Hall's "Rude Essay on Yaws" published in 1839 show clearly the fearful result of a course of treatment which was nothing but a systematice palliation. Hall himself seems soon to have discovered the pernicious effects of indiscriminate administration of mercury, and to have entirely abandoned the use of that drug. I shall refer more fully to his methods and to those of his predecessors when considering the treatment of this disease; but I may say here that the slaves of Tobago appear to have been much better off in the hands of their managers than those of Jamaica who were treated by the best medical skill.
of that time. All very properly remarks —

"Medical practitioners in general receive
very little credit from the blacks for their
skill in the cure of this disease; and it is
not to be wondered at when they daily
witness the distressing results of the
mercurial treatment."

In the abolition of slavery all
to control the dissemination of Yaws
appear to have been abandoned. The slave
became their own masters, and any
interest in their well being ceased
on the part of their former owners. The
Yaw houses were speedily abolished,
and the duty of looking after yaws
subjects devolved on parents and
others, persons quite unskilled by year.
$A$ervitude and the protecting care
of their masters for such an office.
Schools were established, and became
as they often are now, centres for
the propagation of the disease. Adults
became more and more affected
being now of no particular value to
any one, save themselves, were per
mitted to struggle through, unaided,
as best they might. Doctors' fees had
now to be paid — and in those days
they were considerable —, and a laborer
once infected with Yaws very likely
had not the money with which to pay
them, nor had he when disabled
enough to provide himself and his
diseased children with the contagious pod which the old, and dollars, often rejected, Yaws House had afforded.

Under such a system of neglect, prolonged for many years, it is only natural that the people should have become habituated to the existence among them of Yaws and careless of its consequences. To such an extent is this the case that they have at last come to look up on this abominable disorder very much as measles is regarded in Scotland. They say, as said three years ago, that it is just as well for a child to have it early so as to get over it before he comes to an age when his labor will be productive. They have gone even further, and, the strongest children surviving, hold that to have Yaws (and to survive it), makes a child stronger in after life, so that it is on the whole rather a good thing to have the disease and to have it early.

This monstrous theory has had at least one bad effect on the general community. These medical men were willing, as they have been for several years past, to treat cases gratuitously, and by modern and successful agencies, the parents of sufferers and even adult patients themselves declined or neglected to avail themselves of the offer.
Persons with faces and necks covered with the disease were constantly to be seen混写 with their healthy fellows without any feeling of shame or apparent desire to be rid of the malady.

So matters went on from bad to worse till 1882, when the "Medical Aid Ordinance" was passed, providing for patent medicine and medicines for all laborers over 60 and for all children of laborers under 8 years of age. It was anticipated that this enactment would induce parents and guardians to supply children suffering from Yaws with proper medical care; but the results of the Ordinance as far as it concerned this disorder were practically nil. The people had not really begun to learn that Yaws is a disease, and that its treatment ought not to be left entirely to Providence. Children suffering from Yaws were constantly brought to the medical officers for the treatment of concurrent diseases, and many efforts were then made to keep them under observation, but without success. As soon as the "fever" or the "pox, cold" disappeared or the "worms" had been got rid of, the existence of Yaws was denied and the patient was seen no more.

In 1884 I wrote to W. Carrington...
then administering the Government of Tobago, calling his attention to the fact that the disease was in my opinion markedly on the increase especially in the Windward District, with which I was then best acquainted, and suggesting certain measures for its control. Mr. Carrington at once issued a circular letter to all persons in the island as were likely to furnish reliable information asking for their opinion as to whether Yaws was becoming more prevalent or not. The replies were numerous and unanimous. They were all to the effect that the disease was steadily gaining ground. Unfortunately the subject was for the time dropped, and matters went on as before until September 1887, when Dr. Hewelton, who had succeeded Mr. Carrington in the administration of the Government, arranged with the Medical Officer in charge of the several districts that gratuitous advice and medicine should be supplied at specified stations and in certain fixed days to all persons suffering from Yaws. At the same time he published a regulation under the "Medical Aid Ordinance, 1882," making attendance compulsory for all children under eight years of age affected with Yaws.
The results of this simple enactment have been surprisingly good. The people in a majority of cases showed very great willingness to avail themselves of the benefits offered them and their children, and the proportion and the rapidity of the cures which have followed upon a systematic treatment have been no less satisfactory to them than to the Medical Officers in charge. Unfortunately some months elapsed before a sufficiently large stock of drugs could be imported to enable the Medical men in the other districts of the Island to start the treatment of patients, but, when they did get to work, early in 1888, their results were quite as good as those obtained in my own district.

But something more was wanted to give the scheme a fair prospect of ultimate absolute success, and this was added when Mr. Hay, who has directed the Local Government since the annexation of Tobago to Trinidad, passed a regulation through the Financial Board making attendance for Yaws compulsory upon all persons suffering from the disease, irrespective of age. This enactment only came into force towards the end of 1889 and it is as yet too early to speak with certainty of its probable results. These promises however to be good
if the provisions of the Regulation are carried out, and the efforts of the Medical officers adequately backed up by the Auxiliary Justices of the Peace. The increased stringency and the additional surveillances supplied by the new Regulation ought most certainly to place it within the power of the Medical officers to reduce the cases of Yaws in Tobago to a manageable minimum. Of course there are many cases of old standing utterly beyond care, and for which a judicious euthanasia would be the kindest course of treatment; but these must, if necessary, be left out of account and, as far as fresh cases are concerned, the Medical Officers of the Island are unanimous in the belief that if these can only be got at and kept under treatment, Yaws may in a few years be practically eradicated from Tobago.

Description of the Disease.

The disease known as Yaws, Treponema pallens Endemic. Tenergyn, or Pian is a specific, highly contagious disease, allied in its manifestations to Syphilis, running a very irregular course, without
without febrile prodromata or accompaniment and characterized by:

a. Localised epidermic excrescences.
b. Condylomata or tubercles.
c. Ulcerations.
d. Pain in long bones and especially at articular ends, with occasional thickening of these ends.
e. More or less Calciesia.

Etiology.

As far as Tobago is concerned, I am of opinion that it is impossible to associate the causation of the disease with anything except direct contagion. Speculations as to its connection with feeding, soil, race, hygienic conditions, or relative to other diseases are useless and tend to be misleading, save as far as common sense teaches that the worse the sanitary state of a household, the poorer the food and the greater the indifference to the possibility of contagion, the closer is the probability of the disease being acquired, and the sooner and severer is its cause likely to be. The food used by the people in this island—where Yaws is prevalent—is practically the same as that used in Barbados where it is unknown. The consumption of imported
imported salted provisions, — including salt and pickled fish, salt beef and salt pork, — has been for the last seven years at the rate of 25 l. or more per head per annum, which is equal to an average consumption of a little over one ounce each per day. In Trinidad, which is to a great extent Roman Catholic, a much larger amount of salt and pickled fish is consumed; yet the disease is only common in the outlying districts of that island. Besides, the vast proportion of vegetable food in the ordinary diet of the people weakens the force of what I may term the Sorensen theory. In our East the ordinary daily ration of a prisoner at hard labor includes 3 lb. of native vegetables, and this quantity is certainly not greater than would be consumed by an average negro outside that institution.

As regards fresh fish and its influence on the constitution of our population, I may say that the village which has suffered most from Yaws in my experience has been St. George, where the population is almost entirely agricultural. It lies close to the coast but little or no fishing is done there and the people are probably less fish eaters than they are in most other
other part of the island. Again fresh fish is more plentiful and cheaper in Barbados than in any other part of the West Indies and there the disease is unknown. It is true that Charleston, Speyside and part of Plymouth are badly infested, and that fishing is the occupation of a large proportion of their inhabitants; but at the same time, and probably in consequence of the case of making a livelihood by this industry, the people in these settlements are amongst the most uncivilized of our negroes, and their indifference to the presence of disease is not surpassed in any other part of the island. Again the inland ports of Randy Point have always been infested with Yaws, and in these places fish is not a common article of diet.

Race appears to have no influence. I have never seen a white person affected with the disorder. I have however seen respectable children of the slightly colored class suffering from Yaws, but never even these except where there has been carelessness with regard to the chance of contagion. Coolies are said to suffer severely. I have seen only one case of the kind and that was a very well marked one.
The question of the influence of soil may be dismissed in a sentence. The Sandy Point or coraline portion of the island is identical in formation with the greater part of Barbados, yet there is no difference whatever in the prevalence of the disease between that district and the Windward or mountainous region.

The disease is essentially one of uncivilization, and is invariably introduced into the system by inoculation through a broken surface. That it is so conveyed was practically proved to be the case by an analysis which I made some time ago of my first 329 cases, where I found that the disease was attributed by the people themselves to personal contact with affected subjects in 205 cases or 62.2 per cent; and that in addition 53 more, or 16.1 per cent of the whole number, were children attending school, where there was every likelihood of their contracting the disease even without direct knowledge of the source from which it came.

The indifference of the people to the presence of the disorder, the filthy habits of many of them, the carelessness — now much lessened — of schoolmasters as to the presence in their schools of children suffering from Yacoz, the constant and indiscriminate herd
together of affected and unaffected individuals, and the prevalent habit of washing Yaws patients in the river at the same places where washing of clothes and bathing of healthy persons were going on are accountable for the large number of cases directly attributable to personal contamination.

The locality generally first infected is the foot. There, in the bare footed negro, scratches or wounds of greater or less extent are constantly recurring and giving opportunity for the introduction of the disease. The lips in infants, the nipples in suckling women and the pudenda are sometimes, but with much less frequency, the first affected. I have never seen a case where the disease could be attributed to sexual intercourse.

Heredity is never a factor in the causation of the disorder. It is difficult to prove that this is the case as practically all the parents of sufferers, sometime or other, themselves had the disease; but, as over 75% of my patients have been persons under the age of 20 years, and as the possibilities of direct contamination are so frequent, it would seem almost certain that the latter is the
of the Pathology or minute anatomy of the disease I can say little. I have made many attempts to procure specimens of the typical tubercle for microscopic examination, but hitherto with but little success. The sufferers will not listen to proposals for excision, and as patients practically never die from Yaws except at the stage of advanced ulceration, I have not yet been able to procure a specimen from the dead body. nor have I seen any description of the minute anatomy of the disorder. I shall therefore leave what little I have to say on this head till I describe the disease as I have found it in the living subject.

**Incubation.**

The length of the period of incubation is undetermined, but is generally supposed to be between five and eight weeks. In only one case was I able to fix it with anything like accuracy. I successfully vaccinated a child of seven months, living in a badly infected village, with Ysopha from the arm...
of a child in apparently perfect health which had been vaccinated a week before with imported calf lymph. The four marks healed normally; but, nine weeks after the date of vaccination, one of them formed a "boil" and burst, and the child, when brought to me three weeks later, had a typical Yaws tubercle, quite as large as a shilling, on the site of one of the marks. I am certain that the lymph was not to blame in this case, as I vaccinated twelve other children on the same day & from the same arm & under identically the same condition, as those in which this child was vaccinated, and none of them were in any way affected. Nor could contagion have occurred from extra-oral sources until after the vesicles had ruptured, nor, of course, after they had healed. This case would therefore, on the presumption that it was directly inoculated by neighbours suffering from the disease, give a period of incubation of from seven to eight weeks.

The characteristics of this stage are irregular and variable. Sometimes there is pronounced fever, lasting for four or five weeks, with
other precursory symptoms of an acute disorder. Or, there may be merely a feverish feeling, "internal fever" as it is called by the negroes, with some listlessness and loss of appetite. Sometimes no symptoms precede the disease or these may be so slight as to escape notice.

Eventually, however, the characteristic Yaws Pain is present, of varying severity, from slight twinges to absolute agony, chiefly felt in the articular ends of the long bones and always most severe at night. The knees and elbows are most frequently affected, and patients may, in severe cases, be quite unable to move their arms or legs.

**Description of the Disease.**

The disease, however introduced and preceded by whatever symptoms, may declare itself in a variety of ways. Very often the actual seat of inoculation, generally some part of the foot presents a typical and solitary tubercle, or the disorder may first appear as a pimple of a severe and intractable nature. The first Yaws wherever situated, if of all respectable proportions, is called the "Mamma" Yaws.
Yaw, and is supposed to be the parent of its successors. — In some of the other islands it is the largest of the early Yaws which bear this name. Sometimes this tubercle may disappear entirely early in the course of the disease, and sometimes, having disappeared, it may break out again later on; but its presence is not specially important nor does its appearance differ in any way from that of the ordinary tubercle.

Again, the first apparent sign of the presence of the disorder may be an eruption very closely resembling that of lichen planus, and accurately described as being on the black skin like sprinkled whitewash. The appearance of this eruption is indubitably seen on the buttocks of the boy in Photo No. 1. Each spot consists of an eroded and desquaming epithelium resting upon a congested and slightly elevated base. These spots may appear on any or every part of the body. They are very frequently seen on the face and on the extensor surfaces of the leg and arms. They are accompanied by
by some itching
At this stage the disease may abort; but this is rare. Generally increased hyperplasia of the epithelium, the true skin and the subjacent connective tissue goes on and some of the desquamating spots, or some portions of them, enlarge and become more prominent. The disease may again cease to develop at this stage, and especially where cases are under treatment, or only a few tubercles may continue to increase in size, while the majority may remain as small, elevated and often purplish masses, known to the negro as "Corn Yawos" or "Silver Corn Yawos" from their resemblance to the seed of that plant. On the other hand the disease may almost at once appear with a sudden outbreak of typical papillomatous condylomata. Characteristic cases are shown in Photographe No. 1, 2, 3 and 4, Nos. 1 and 2 being back and front views of the same patient. These, the typical tubercles, are joined by hyperplasia of the true skin and subjacent connective tissue under the necrosed epidermis.
epidemic to which reference has already been made, with epidermis into their substance of a viscous fluid which constantly oozes from their surface. The form of the perfect condyloma is always rounded and often exactly circular. In Photo No. 1, the tubercles are recent and moist and some of them have coalesced.

In Photo No. 3 they are of older date and have begun to dry. In both cases the elevation of the rounded masses above the skin is clearly seen, as it is also in Photo No. 3.

In appearance the typical Yaws tubercle bears a fanciful resemblance to a raspberry, and hence is derived the name "Framboesia." Its roughly granular appearance is due to the dilatation by the contained fluid of the connective tissue spaces in the deeper layers of the skin, each of which bulges forward separately. In color the tubercles vary from dirty to brightish yellow. They are firm and elastic to
to the touch. The fluid exuded from them is sticky and mucoid and strongly resembles that secreted in leucorrhoea. Like it, it forms crusts, which vary in color from very dull to bright yellow. When these are removed the subjacent surface has a reddish yellow color with numerous fine bleeding points. The appearance of a typical moist Yaws tubercle is, in fact, almost identical with that of a syphilitic mucoid condyloma. These tubercles are very common on the face, but are almost unperturbed in their distribution, with the exception of junctions between skin and mucous membrane which are their favorite seats. The lips, anus, prepuce and labia are affected with great frequency, and their elevation in these regions is often a bar to successful, or at least to speedy, successful treatment; the combination of moist, ure and movement in the neighborhood of these apertures making it difficult to dress the sores properly and to ensure cleanliness. Tubercles are frequently found on opposing surfaces, as between the buttocks, on the inside of both thighs, on the inner aspect of the arm and on the chest wall. This distribution is evidently due to auto-inoculation.
of one surface by the other. They are very rarely seen separately, but planted on mucous membrane, although they very frequently invade it from the skin too freely or less so. I have seen only two cases of such absolute inv

plantation.

Then occurring in the sole of the foot, as they often do, they are specially modified by the great thickness of the negro's skin in that region. Only the summit of the tubercle projects through the horny epidermis, while its base is confined below.

Ulcerative changes speedily set in, and their products, being denied access to the surface, burrow along beneath it in every direction and are accompanied or followed by a superficial desquamation much more thorough and well marked than in other regions where the epidermis is thinner.

The resulting forms of the disease are very appropriately termed "Crab Yaws" and bear a close resemblance to the serpiginous staphylitis, sometimes seen in the sole of the foot. The sketch on this page gives
a rough idea of the appearances presented by "Tobboe" and "Crab Yaws". Some writers have described an ulcerative, as distinct from a tubercular form of Yaws, but it appears to me that the former is merely a development of the latter. Their tubercles are persistently neglected or very roughly handled, and almost invariably in weakly and serpulous subjects, their epithelial covering gives way, and ulcers are formed, irregular in shape, generally deeply excavated, and, in cases of long standing, with raised and callous edges; but, except that they are more difficult to heal, these cannot, in most instances, be distinguished from ulcers of the ordinary type. Photograph No. 7 shows a case where coalescent ulcers have recently ruptured and formed typical Yaws ulcers.

In the after history of Yaws cases, especially where there have been antecedent serpula and anaemia with neglect, absence of medical treatment and improper hygienic conditions, ulcers, often of an enormous size, are frequently met with, but it
is impossible to say to what extent Yaws, per se, is directly responsible for their existence. At the present time, when some attention is being paid to the prevalence of the disease in the West Indies, all ulcers occurring in revictuated islands are likely to be called Yaws ulcers. In Trinidad where the existence of the disease is denied, and in Barbados where it is non-existent, they are attributed to syphilis or trauma. If my own knowledge I can only say definitely that persons who have suffered from Yaws are very often the subjects of extensive ulceration in after years, and this appears to be due to the fact that it is difficult to get rid entirely of the Trichobacitic cachexia (usually the term in its looser sense of "an unhealthy condition of the blood or general system"), which manifests itself at an early stage by loss of flesh and debility of varying amount.

The process of healing is extraordinary tubercles is simply one of collapse without lesion of the skin and, in consequence, no permanent scar or mark is left behind. The contained fluid is gradually
gradually absorbed and the con-
deyma sticks to the level of the skin. A difference in pigmentation remains for some time, the affected spot being darker in color than the surrounding skin, and generally in the lighter colored cases, of a coppery tint; but this soon disappears. This temporary intensification of color takes place from the centre of the collapsing tubercle outward, and curious effects are in consequence often produced, the healthy surface being surrounded by a nearly white ring with a dark centre.

These actual ulceration has taken place a discolored scar always results, and appears to be frequently followed by lenticulides, spreading from it as a centre. In all events cases of this affection are very common in Toledo and it is generally attributed to Yaws by the people themselves.

**Differential Diagnosis.**

Any mistake in the diagnosis of Yaws ought to be impossible in well marked cases with defined and generally distributed tubercles. In the early stages the squamous eruption may be mistaken for lichen or even for psoriasis, while the small abortive tubercle
Tubercles frequently resemble closely some spots of leprosy. Again, solitary tubercles occurring on mucous membranes surfaces may be readily mistaken for syphilitic condylomata, while the later ulcerations and their resulting deformities may suggest syphilis, leprosy or even syphilis.

The similarity between Yaws and Syphilis has struck all observers, and certainly the resemblance is a very strong one. As I have said, a moist Yaws tubercle bears a striking likeness to a syphilitic mucous condyloma. In addition, the sites most frequently selected by both diseases, viz. the junction of skin and mucous membrane or the regions where the skin is most delicate, the presence of deep seated pains in the long bones, the insidious in direct contagion, the coppery tint of lighter colored skins after healing, and the results obtained by a course of treatment which is practically identical for both diseases, all point to the close connection between Yaws and Syphilis. Some writers have in fact maintained their identity, but the opinion now generally accepted in the West Indies, and undoubtedly the correct one, is that Yaws, though marked by a striking
Similarity to syphilis, is a distinct disease and that syphilis is never hereditary. Its cachexia is never so well marked, nor are its symptoms so severe or so prolonged as those of syphilis. It is never communicated, at least so far as my experience goes, by sexual connection, and the coagery that left after the healing of ulcers is not a permanent one.

The question of the connection between Yaws and leprosy has also been frequently discussed. It has been held that, under certain vague circumstances of predisposing Yaws is capable of developing into true leprosy. I believe, however, that this view is not entirely abandoned. I have never seen such a case in my experience, nor have I heard of one occurring in the practice of other medical men in this island. Leprosy is rare in Barbadoes, where Yaws is unharmful, and in Trinidad— even in its civilized districts— where it is rare. Terrible deformities, closely simulating those caused by leprosy, have certainly resulted from untreated and neglected cases of Yaws occurring in syphilitic and scrofulous individuals, and in the old days of treatment by mercurialised, these were
doubtless more frequently met with than now; but Lepra only as a direct or indirect result of Yaws has never occurred within my knowledge.

As regards Lenses, the differential diagnosis is more difficult. This disease is very common in Toulouse and its ulcerative processes closely resemble those seen in advanced cases of Yaws that it is hard to say, in mixed cases, which are by no means rare, where the one begins and the other ends. The photograph on this page is that of a case of intense superficial lupoid ulceration of face, probably of syphilitic origin, of old standing, and which had numerous typical Yaws tubercles studded over the lupoid surface. Under treatment the tubercles quickly disappeared and numerous superficial ulcerations were rapidly healed, while the patient's general health was greatly improved. The lupoid symptoms were not, however, relieved and the patient, while freed from Yaws, remained in practically the same state as before coming under treatment.

This case will be given in detail later on in this paper.
The natural tendency of the disease is, in healthy subjects, towards recovery. Death from uncomplicated Yaws must be a very rare occurrence and, to me, is unknown. Where floridous and weakly children are affected, and, as is too often the case, are neglected by their parents, death does sometimes supervene on extensive ulceration and exhausting or the child, weakened by the malady may more readily succumb to some other disorder. Under treatment only five deaths have been reported to me and I have no hesitation in saying that in three of these cases the parents were guilty of manslaughter by neglect.

The Prognosis is, in all cases, favorable where the patient is brought under treatment at an early stage of the disease and the conditions are good, the cure is almost certain to be a rapid and a permanent one. Where on the other hand case are neglected, insufficiently fed and ill housed, the disease may run a course to be measured by years and may end fatally or in permanent disfiguration.
Treated

In the early years of the century treatment for Yaws in Tobago was, as I have said, chiefly hygienic and dietetic, with no worse result than a postponement of cure. Here the patient was unfortunate enough to fall into scientific medical hands he was dosed with mercury to an extent which is incredible in these more enlightened days. Dr. Hurtle of Jamaica, who flourished in that colony sometime in last century, writes in "A Description of the African Distemper Called Yaws" as follows: "When the Yaws are at their height, then is the time to throw your patient into a gentle salivation by calomel, without any preparation of the body. I never exceeded five grains at a time in a pill or bolus, and repeated the dose once, twice or thrice a day, as I found the patient could bear it, and never designedly raised the salivation to above a quart of spitting in the twenty-four hours." Other physicians, less heroic than Dr. Hurtle, endeavored to restrict the "spitting" to a pint and a half per day, but, whatever the precise quantity of saliva produced may have been, the general results of this method of treatment were deplorable.
causing such terrible deformities and suffering, that Drayton Hall says, 'The most affecting spectacles of human wretchedness which I ever beheld were traced to the use of this mineral.'

The administration of mercury, with intent to salivate, was continued, however, as practically the only method of treatment, until shortly before the abolition of slavery, when medical men became at last convinced of its pernicious effects. They then appear to have abandoned its use altogether for some time, thus depriving themselves of a drug of the greatest possible value when properly employed. The reaction has lessened since then, and I now find heron a remedy of the highest importance.

In Bolivian, so far as I can learn, simples or 'bush' remedies for the cure of Yaws have not been employed by the people of late years, with the single exception of the 'foot boiling' process to be referred to presently. They say that the roots of the cocaini[palm, the 'dagger bush' - Turbea turbenes - and the bark of lignum vitalis are possessed of curative properties but I have never heard of their actual employment of these remedies.
Patience and theoretical cleanliness, and in many instances, too little of the latter in practice, have, in my experience, been the only agents resorted to. Patients of all ages, and especially children, are supposed to be washed every other day; and persons who have seen— and heard—this operation, in which a linue or a rope corn stick took the place of soap, will not readily forget the piteous cries of the sufferers under this popular method of cure.

The means employed by me have been simple. I endeavoured to inculcate the necessity for habits of cleanliness, regularity, and abundance of diet, and good hygienic conditions with a strict adherence to my orders as to treatment. Internally, Iodide of Potash with Lig. Hydrazo; Perchlor: or Donovan’s Solution, Lig-rof Arsenicali: and Arsenic & Tarca Parilla form our routine preparations. The doses are carefully regulated and increased or diminished as may be necessary, in debilitated cases, iron generally in the form of the Compound Syrup of the Phosphates, is given as well as Cod Liver Oil and other tonics. Turpentine oil has been used but without apparent result.
Locally, iodophor ointment is any sheet antiseptic. Carbolic oil is occasionally substituted for it. If chronic ulcers are present and in "Tobloc" mercurial ointments are frequently used. For the former I have found scraping with the sharp spoon most efficacious.

The affection of the sole of the foot known as Crab Yaws, where the disease is modified by the thickness of the skin in that region, is best treated by the process known as "boiling the feet," the favorite remedy. The essential feature of this process is the constant soaking of the feet in water as hot as the patient can bear it, until the horny epidermis peels off and the ulcers are found, shallow and pruriently below it. The feet are generally placed in a pot, shung over a low fire, which the patient himself replenishes from a pile of fuel placed conveniently within reach. Nine days is said to be the correct duration of this ordeal. Herbs of various kinds are generally added to the water, but these are quite unnecessary and are merely used by the "bush doctor" more importance to his services and as an equivalent for his fee, which varies from half a crown to twopence.
Insistence. It is a curious and instructive fact, as showing the indifference of the people to the existence among them of Yaws, that this case of "Crab Yaws" is the only instance in which an attempt is ever made to cure the disease by means of bush remedies; and the reason is not far to seek! Its existence in the feet interferes with their powers of progression. They are not particularly concerned about the cure of the disease, but they are very anxious to be able to walk about.

Since the emancipation there have been no Yaws Hospital in Tobago, nor do I think their establishment advisable, even if it were possible, in existing circumstances. It would indeed be difficult to provide adequate accommodation for the large number of sufferers, and anything short of absolute and forcible sequestration of all persons suffering from Yaws is pretty well a waste of time and money. In Grenada they have a hospital, but the accommodation is inadequate and the wards overcrowded. Re-inoculation of convalescents by recent cases is said to occur frequently. The system is said to be a bad one.
by the Medical Officer in charge. In
21 per cent the hospital has been
abolished. In Dominica where there
are three hospitals the disease
does not appear to have been materially
diminished. My own opinion is that
where you have, as in Tobago, a very
large number of cases, the best system
is that of compulsory outdoor treat-
ment, backed up by the strictest
possible supervision and punishment
of defaulters. I believe that we are
steadily reducing the number of
cases of Yaws in this island and
that, if properly supported, we can
bring it down to quite a small and
manageable residue. Then, I
think, would be the time to provide
hospital accommodation for those
remaining uncurved but in cases
of ulceration which require proper
attendance and operative inter-
ference.

Results

In estimating the results of treat-
ment it has to be kept in mind
that patients usually belong to the lower
and more ignorant classes, that they
are not under any direct supervision
except on the one day in each week
on which they are supposed to report
that they themselves have no such
coating.
loathing of the disease as would urge them to assiduous care and cleanliness and the regular application of remedies, and that, in consequence, they undoubtedly neglect to use much of the medicine supplied to them. Further, that although legal provision is now made under the Regulation—Appendix A—for the punishment of defaulters, it is difficult to substitute charges of neglect or of absence from the station at which patients are ordered to report without due cause. I have prosecuted in twelve cases, but with partial success in only one and the Magistrate for my district has recently decided that the plea of sickness, which is the excuse invariably offered by parents and guardians for non-attendance is, unless proved by the prosecutor to be false, sufficient excuse, not only for non-attendance but for failing to send a report. In the latter case, the latter being an alternative provided by the Regulation in case of inability to attend. This extraordinary decision has lessened very considerably my control over Yawo patients.

Notwithstanding these difficulties and others of less importance, such as unavoidable delay in procuring...
curing drugs, the distances at which many patients live from the stations, the extremely wet weather experienced here in 1890 and the want of an additional District Medical Officer, there cannot be the slightest doubt that the measures taken by the Government on my suggestion to suppress this disorder have been so far successful as to thoroughly warrant their continuance. The prevalence of the disease has been greatly diminished during the past three years, and the cases now coming in for treatment are not so severe a type or so neglected as they were in 1887. This is the opinion, not only of myself and the two other Medical Officers, but of the public generally.

The effects of treatment on individual cases are surprising. In fact I know of no other disease where drugs exert so distinct, speedy and potent an influence as they do. I shall give in detail the history of four cases which will not only, I think, prove the truth of what I have just said but will give some idea of my method.
Of dealing with Yawo patients.

No. C. 2, a negro boy 12 years of age, came under treatment on the 11th of September, 1888. He was then almost covered with large bright yellow moist tubercles and scaly patches and was, with the exception that he complained of no pain, a typical case of Yawo. He was only slightly cachectic. Three weeks had elapsed since the outbreak of the disorder which he appeared to have contracted from a brother who had already been under treatment and cured. He was ordered the following mixture:

R. Potash: Tolid: pr
Sal: Prepwn: m
Reconst. Yaw Co. (carb 1-15) m fl
Qty. at 3 fl.

To be taken three times a day.

He was directed to wash thoroughly all his Yawo twice a day at his house and to dress them with

Tolidoform: (50 – 5). With these drugs and with a sufficiency of bed he was of course supplied. He was photographed on the 1st of October, by which time he was noted as improved. The following are the dates of his attendance at the station with

Remarks.

1888.

Sept. 25th.

Oct. 2nd.

9th. Improved

16th. Much improved.

23rd.

30th. Practically cured. Tubercles almost entirely subsided.

Nov. 6th. All old tubercles completely gone. Two small fresh sores under lip and eye.

16th. Small sores persist.

23rd.

Fresh sore at finger nail.

Dec. 2nd. Practically cured.

14th.

28th. Cured.

This case has been seen recently and there has been no recurrence. It may be noted that this boy, who was, as can be seen from the photograph, a very bad case, was really cured of the acute disorder in seven weeks and would have been quite well had it not been for the insignificant sores which prolonged the treatment for seven weeks more. I may say that this was not only a typical case of Yaws but is a typical history. We constantly see cases where the attack is
is an acute one with a regular out-
break of tubercles. Under treatment
the patient is in a few weeks time
marked "practically cured," and
then two or three trifling sores
obstacatly resist for a long time.
all efforts to complete the recovery.

2. A.M. photo. no. 5, a laborer, and her
illegitimate child, aged respectively
25 and 3 years, came under treatment
on the 11th of October 1867. The mother
who was photographed on that day,
had dry and moist tubercles in
the face and legs, and the child
had large coalescent moist tubercles
round the mouth. A.M. had suffered
for 18, and her child for 6 months.
The disease was contracted in
the first instance from another
woman's children, and it is to be
presumed that the child was
infected through the mother.
A.M. complained of severe pain
in her hands and feet. They
were put upon the same treat-
ment as the previous case, the
mother taking the full dose and
the child one quarter. I append
their history.

1887

Wet. 11th. Reported for first time. Prescrip. as above
18th. Pain much less. Otherwise unaltered. Repeat
25th.
Oct. 25th. Both improved, sore gradually disappearing. Repeat
Nov. 1st. Both much better.
32. Sore the other several doses disappeared including one or more child almost well.
32. Both cured.
Neither of these cases has relapsed.

3. E. S. Photo n. 3 a negro girl 10 years. Sore had had Yaws for 8 months. The sore was unknown but she had been attending school. There were four moist tubercles on her left foot and she complained of pain in that leg. She was slightly cachectic. Reported for the first time on Jan. 7, 1888 and was ordered half doses of the mixture given in Case No. 1 with the same dressing.

1888 Jan. 22.
31. Improved
Feb. 3. " Photo & today."
10. " "
14. " "
21. Much better
March 6. Practically cured
16. " "
20. " "
27. Cured.

This case has since, given me some trouble owing to the recurrence of the disease in the shape of the
"Tubercle" in the heel. Otherwise she has been free from the disorder.

Dr. J. R. Photo. No. 8, a colored woman 30 years of age had had Yaws "for many years." The source of the disease was said to be unknown. Distribution -- universal. Character, elevated, suppurous tubercle and shallow ulcers. She complained of occasional pain. The affection was in this case complicated by extensive scars. Hypertrophies of the face through which the typical Yaws tubercles were studded.

She reported for the first time on October 9, 1887 and was placed on the same treatment as Case No. 1. 1887.

Oct. 9th: Improved
Oct. 12th: Very much better
Nov. 1st: Practically cured
Nov. 7th: Cured, to return if necessary on 8th. She did not return.

This case relapsed three months afterwards and was again under treatment for two months. At the expiry of that time she was noted as "much better" and then disappeared from my notice.

I could easily multiply cases of cure as rapid and many of them as permanent.
permanent as some of the above, but these are sufficient to prove the general efficacy of the routine treatment adopted in Toledo. In the other hand some cases remain under treatment for long periods without much improvement, or fluctuate between "improved" and "not improved". These are generally cases of old standing, opposed to improver sauntering condition, and whose treatment is neglected by themselves or their guardians. These patients would be much benefited by hospital treatment and proper disciplinary measures.

The result of what the Government is doing for them is however practically invaluable and that is the relief of suffering; and for those poor people whose lives are so often embittered by the constant presence of pain, its abatement, even when not accompanied by absolute cure is a good enough result to satisfy them wholly and no partially.

It is not easy to give accurate statistics of the actual percentage of cures on account of the frequency with which patients disappear from observation when they are noted "almost well" or "practically cured"; but of the 850 cases
cases treated by one, 58 per cent have been marked cured and the results obtained throughout the island have been much the same.

Relapses have occurred in 11 per cent of the total number, and about 7 per cent have relapsed twice with a distinct interval between the different attacks.

The average duration of cases before coming under treatment, which had been 50 weeks in the first 300 cases, has now fallen to about 7 weeks. As a rule the people now bring in their patients as soon as they recognize the nature of the disease.

The average duration of treatment of cured cases is about 9 weeks. In the first series of 300 it was as long as 5-6 weeks, but cases are now kept longer under observation.

I append tables of the ages, residences and occupations of the 500 patients or parents of patients treated by one.

John W. Sullivan
M.D., M.B. C.M.
Col. Surgeon
Tokyo, W.I.
**The Yaws Suppression Regulation, 1889.**

HENRY FOWLER,

Administrator.

2nd August, 1889.

**Tobago.**

A REGULATION to make provision for the treatment of Persons suffering from Yaws.

[30th August, 1889.]

BE it enacted by the Commissioner of Tobago with the advice and consent of the Financial Board thereof as follows:

1. This Regulation may be cited as "The Yaws Suppression Regulation, 1889." Short title.

2. In this Regulation the words "Medical Officer" mean a Medical Officer appointed under "The Medical Aid Ordinances 1882." Interpretation.

3. The Medical Officer in charge of each District shall furnish gratuitously, advice and medicine to all persons suffering from Yaws within his District, such medicine to be supplied to him, on his requisition for the same being approved by the Commissioner, from the Colonial Hospital.

4. The Medical Officer in charge of each District shall from time to time with the consent of the Commissioner appoint places and hours at which all persons suffering from Yaws shall attend for treatment.

5. Every person over fifteen years of age suffering from Yaws who shall neglect to attend for treatment at such times and places as the Medical Officer shall direct or being incapacitated by illness or otherwise shall fail to send or cause to be sent a report as to his condition at such said times and places or who shall wilfully and persistently neglect to carry out the instructions of the Medical Officer as to treatment or who shall bathe himself or his clothes in any river pool or stream except at such place or places as may be appointed for such purpose by the District Medical Officer shall on conviction before a Stipendiary Justice of the Peace be liable to be imprisoned with or without hard labour for any term not exceeding three months.

6. Every person being the father or mother of any legitimate child under fifteen years of age or the mother of any illegitimate child under fifteen years of age or any person having the custody or guardianship of any child under fifteen years of age who shall fail whenever such child is suffering or is suspected to be suffering from yaws to bring or cause to be brought such child to the District Medical Officer of the District in which such child resides and in case such child cannot be brought, to give or cause to be given a report respecting such child to such District Medical Officer at such places and hours as the Medical Officer shall appoint and to continue to bring or cause to be brought or to give or cause to be given a report respecting such child at such subsequent places and hours as the Medical Officer shall direct or who shall wilfully and persistently neglect to carry out the instructions of
The Yaws Suppression Regulation, 1889.

No. 3—of 1889.

the Medical Officer as to the treatment of such child or who shall bathe or permit to be bathed any such child or the clothes of any such child in any river pool or stream except in such place or places as the District Medical Officer shall direct shall on conviction before a Stipendiary Justice of the Peace be liable to be imprisoned with or without hard labor for any term not exceeding three months.

7. It shall be lawful for any Medical Officer or Justice of the Peace who has reason to believe that any person suffering from Yaws is in any house or place and wilfully evading treatment to enter such house or place in the daytime to search for such person or to issue a written authority to any Police or other Constable so to do, and if such person be found therein by such Medical Officer, Justice of the Peace, Police or other Constable, such Medical Officer, Justice of the Peace, Police or other Constable shall arrest or cause such person to be arrested and any such person so concealing himself and wilfully evading treatment shall on conviction before a Stipendiary Justice of the Peace be liable to be imprisoned with or without hard labour for any term not exceeding three months.

8. Every person who shall harbor or conceal any person suffering from Yaws and so enable such person to evade treatment shall on conviction before a Stipendiary Justice of the Peace for every such offence be liable to a penalty not exceeding five pounds.

9. Every person who shall obstruct or molest any person empowered to act under this Regulation in the execution of any duty imposed on him by this Regulation shall on conviction (when not otherwise provided for) be liable to a penalty not exceeding five pounds.

10. Any penalty recoverable under this Regulation may be recovered before any Stipendiary Justice of the Peace in a Summary way and in the event of the same not being paid forthwith the Stipendiary Justice may order the party liable to pay the same to be imprisoned with or without hard labour for any term not exceeding three months unless such penalty and the costs of recovering the same and the charges of the commitment and conveying the party to prison (the amount of such costs and charges being stated in the commitment) be sooner paid; and when recovered such penalty shall be paid to the Treasurer for the use of the Island. Provided that the Commissioner may award any sum not exceeding one half of any such penalty when recovered to any person who shall have afforded such information as shall have led to a conviction.

11. It shall be lawful for the Commissioner by Proclamation to suspend the operation of this Regulation or any part thereof and for such period of time as may be deemed expedient and again to revive the same or any part thereof.

12. Nothing contained in this Regulation shall interfere with the right of any person suffering from Yaws to obtain medical aid from any duly qualified Medical Practitioner registered under the Medical Registration Ordinance 1886 and any such person while under treatment shall be exempt from the operation of this Regulation.

Passed the Financial Board this Eighteenth day of July in the Year of Our Lord One thousand eight hundred and eighty-nine.

JAMES A. P. BOWHILL,
Provisional Clerk of the Board.
Appendix B.

Opinions of various sections of the public as to results of treatment, received in reply to following circular:

Sir,

The attempt begun by the Government in 1887 to control the spread of Yaws has now been in operation for fully three years. What in your opinion, has been the result of the scheme? Has the disease become rarer in your neighbourhood and are the results of treatment sufficiently good to encourage the Government to continue this effort for its control?

Replies:

1. Clergyman.
   1. Anglican. "Disease disappearing fast."
   2. Anglican. "At no very distant date the foul disease will be known only by name."
   3. Wesleyan. "Scheme most successful and of great benefit to the Island. In many localities the disease seems to have disappeared."
   4. Moravian. "All the cases treated in my neighbourhood have been cured and fresh case,
are much fewer than in the past."

2. Schoolmasters.
   1. "Disease greatly lessened. People have unlimited confidence in the scheme."
   2. "Results of the scheme are most encouraging. The disease is on the decline. A few cases are to be met with here and there."
   3. "Disease greatly subsided in this district."
   4. "Community at large have greatly benefited by results of scheme."
   5. "Four years ago this disease was raging in nearly every house here. Now not more than 20-24 cases may be found in the neighborhood."
   6. "My school is now largely attended. The inhabitants of this village cannot find words to express their thanks to the Government for its effort to suppress Yaws."

3. Planters.
   1. "I think the scheme has done some good but that a hospital is required."
   2. "Number of cases has been reduced to a very marked degree. Segregation required."
   3. "Scheme has indeed proved a success."

4. Schoolmasters.
   1. "Disease greatly lessened. People have unlimited confidence in the scheme."
   2. "Results of the scheme are most encouraging. The disease is on the decline. A few cases are to be met with here and there."
   3. "Disease greatly subsided in this district."
   4. "Community at large have greatly benefited by results of scheme."
   5. "Four years ago this disease was raging in nearly every house here. Now not more than 20-24 cases may be found in the neighborhood."
   6. "My school is now largely attended. The inhabitants of this village cannot find words to express their thanks to the Government for its effort to suppress Yaws."

3. Planters.
   1. "I think the scheme has done some good but that a hospital is required."
   2. "Number of cases has been reduced to a very marked degree. Segregation required."
   3. "Scheme has indeed proved a success."
success

1. "Disease very much rarer."
2. "Disease not so prevalent."
3. "Visible decrease in the disease in this neighbourhood."
4. "Scheme has done a great deal of good."

Police and rural constables

1. "Disease rapidly decreasing."
2. "Wonderful success."
3. and 4. "Scheme has done much good."
5. "There are no Yaws now in this neighbourhood."
6. "Disease decidedly on the decrease."
7. "The disease has in a great measure ceased to exist."
8. "In my neighbourhood there is not a single case of Yaws left."
9. "Scheme has been a great success."
10. "The disease was very common here, now it is rare."
11. "The disease is now very uncommon here and in the island generally."
12. "Scheme very successful."
13. "Scheme universally beneficial and highly appreciated."
14. "Scheme successful."
15. "Results thoroughly satisfactory."

Registrar.

"Where I used to see or hear of almost daily cases of Yaws in this
this vicinity. I now hear of none and see none. I think I ought to say that only one death has been returned to me for 1890 as due to Yaws.

Appendix C.

Table showing numbers of patients at various ages.

<table>
<thead>
<tr>
<th>Years</th>
<th>0-5</th>
<th>5-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>Over 60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>239</td>
<td>230</td>
<td>169</td>
<td>62</td>
<td>65</td>
<td>21</td>
<td>25</td>
<td>17</td>
</tr>
</tbody>
</table>

Appendix D.

Return showing occupations of patients or of parents of patients.

<table>
<thead>
<tr>
<th>Laborers</th>
<th>668</th>
<th>Shopkeepers</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenters</td>
<td>35</td>
<td>Bollerchen</td>
<td>2</td>
</tr>
<tr>
<td>Washerwomen</td>
<td>20</td>
<td>Bakers</td>
<td>2</td>
</tr>
<tr>
<td>Sailors</td>
<td>16</td>
<td>Fishermen</td>
<td>2</td>
</tr>
<tr>
<td>Coopers</td>
<td>13</td>
<td>Schoolmaster</td>
<td>2</td>
</tr>
<tr>
<td>Masons</td>
<td>13</td>
<td>Groom</td>
<td>2</td>
</tr>
<tr>
<td>Blacksmiths</td>
<td>12</td>
<td>Managers</td>
<td>2</td>
</tr>
<tr>
<td>Seamstresses</td>
<td>12</td>
<td>Shoemaker</td>
<td>1</td>
</tr>
<tr>
<td>Sailors</td>
<td>12</td>
<td>Apprentice</td>
<td>1</td>
</tr>
<tr>
<td>Domestics</td>
<td>12</td>
<td>Saddler</td>
<td>1</td>
</tr>
<tr>
<td>Beggars</td>
<td>5</td>
<td>Carter</td>
<td>1</td>
</tr>
<tr>
<td>Blacksmasters</td>
<td>5</td>
<td>5</td>
<td>occupation</td>
</tr>
</tbody>
</table>
## Appendix E

Table showing residences of patients and districts.

**District No. 1.**

<table>
<thead>
<tr>
<th>Location</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scarborough and suburbs</td>
<td>123</td>
</tr>
<tr>
<td>Tullibay</td>
<td>20.</td>
</tr>
<tr>
<td>Kinross</td>
<td>1.</td>
</tr>
<tr>
<td>Dunvegan</td>
<td>1.</td>
</tr>
<tr>
<td>Concordia</td>
<td>1.</td>
</tr>
</tbody>
</table>

**District No. 2.**

<table>
<thead>
<tr>
<th>Location</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canaan</td>
<td>1.2.</td>
</tr>
<tr>
<td>Tyson Hall</td>
<td>3.21</td>
</tr>
<tr>
<td>Bethel</td>
<td>29.</td>
</tr>
<tr>
<td>Bethany</td>
<td>16.</td>
</tr>
<tr>
<td>Orange Hill</td>
<td>12.</td>
</tr>
<tr>
<td>Prospect</td>
<td>9.</td>
</tr>
<tr>
<td>M'Pleasant</td>
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<tr>
<td>Mary Hill</td>
<td>2.</td>
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<tr>
<td>Spital Hill</td>
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</tr>
<tr>
<td>Dun Accord</td>
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</table>

**District No. 3.**

<table>
<thead>
<tr>
<th>Location</th>
<th>Patients</th>
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<tbody>
<tr>
<td>Black Rock</td>
<td>18.</td>
</tr>
<tr>
<td>Plymouth</td>
<td>3.2</td>
</tr>
<tr>
<td>Calaba</td>
<td>2.7.</td>
</tr>
<tr>
<td>Runemede</td>
<td>13.</td>
</tr>
<tr>
<td>Indian Walk</td>
<td>11.</td>
</tr>
<tr>
<td>Ins. Klein</td>
<td>2.</td>
</tr>
<tr>
<td>Ins. Ararat</td>
<td>2.</td>
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<tr>
<td>Hooley Bush</td>
<td>2.</td>
</tr>
<tr>
<td>Golden Lane</td>
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<tr>
<td>Coorland</td>
<td>1</td>
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<tr>
<td>Belmont</td>
<td>1</td>
</tr>
<tr>
<td>Back Bay</td>
<td>1.</td>
</tr>
</tbody>
</table>
District No. 2.
Mt. St. George 89. Blewman 3.