

## LEPROSY IN ST. CROIX

### A STUDY OF THE INMATES OF THE LEPER ASYLUM

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During the month of February, 1932, it was my privilege to make a brief survey of leprosy in the island of St. Croix.<sup>1</sup> In the following report I have attempted to follow the outline of the epidemiological survey given in the report of the Leonard Wood Memorial Conference on Leprosy<sup>(1)</sup>. Most of the general information has been obtained from the report of a former Governor, Captain W. Evans, published in 1928 by the Navy Department<sup>(2)</sup>. Information about the history of leprosy in St. Croix and the present leper asylum is taken largely from a report by the Danish leprologist, Dr. Edvard Ehlers<sup>(3)</sup>.

My report deals only with St. Croix and does not include St. Thomas or St. John, the other important members of the Virgin Island group. In these islands leprosy has always been principally confined to St. Croix, only a few patients having been transferred from St. Thomas. Furthermore, although St. Croix is politically part of the Virgin Island group it is isolated at a distance of forty miles from St. Thomas and St. John.

#### EPIDEMIOLOGIC DATA

*Geography.*—St. Croix (called Santa Cruz by the Spaniards) is an island, 22 miles long and 6 miles wide, lying in latitude 1° 45' N. and longitude 64° 45' W. It is the ridge of a chain of submerged mountains, the highest elevation being 1,164 feet. Most of the island, however, consists of fertile plains of rich soil. The southern part is low and rolling and well adapted to modern agriculture. Most of the large sugar plantations are located in this region.

<sup>1</sup>The suggestion to undertake this work was made by Mr. Perry Burgess, President of the Leonard Wood Memorial, who wished to know whether the leprosy situation in the islands warranted subsequent study by some trained leprologist. It was my good fortune to have been the guest of the Governor of the Virgin Islands, Dr. Paul M. Pearson, for whose hospitality I am greatly indebted.

The island is composed of two distinct geological formations, the older rock of volcanic origin consisting of sandstone, shale and limestone hardened to a dense rock. The newer formation consists of limestone, chalky beds and marl which is generally soft and contains sea fossils and coral.

*Climatology.*—The climate of St. Croix has the reputation of being delightfully cool, although it is in the tropics. I can personally vouch for this, at least for the month of February. The heat is tempered by trade winds from the north, northwest and northeast during the greater part of the year. The thermometer in summer seldom rises above 91°F., and in winter it ranges between 67° and 74°F. at night.

The rainfall varies greatly. During the years from 1852 to 1925 the average was 49.92 inches. However, periods of drought continuing for a number of years are common. Hurricanes occur at times from June to November, though severe ones are not frequent. The last severe hurricane occurred in 1928. Earthquakes are not common, the last one of importance having taken place in 1867.

*Population.*—The total population of St. Croix according to the 1930 census was 11,413, showing a loss of 3,488 in 13 years. At present there is a definite migration of young adults to the United States. The chief immigration at present consists of Puerto Ricans of mixed negro and Spanish blood from the nearby Vieques Island. During the Danish occupation there was a constant importation of negro laborers from the neighboring islands of the British West Indies. At one time there was an importation of Hindoo and Chinese coolie labor, evidences of which are still noted. There is considerable white blood in the natives, mainly Danish and Irish.

The racial distribution according to the last census was as follows: white 9.1 per cent, negro 78.3 per cent, mixed white and negro 12.4 per cent, others 0.2 per cent. The birthrate was 26.9 and the death rate 22 per 1,000. There were more females than males, in the ratio of 100 to 86.5 per 1,000 of the population.

*Social customs.*—The inhabitants of St. Croix are practically all Christians. There are no castes and no peculiar religious or social customs. The town dwellers live in small rooms and houses which are usually over-crowded, little attention being paid to ventilation. The rural population live in villages on the various estates. These villages consist of rows of single rooms, for the most part in poor

repair, dirty and unsanitary. Marriages are common, though 67 per cent of the children born in St. Croix are illegitimate.

*Occupations.*—The great majority of the people are engaged in agriculture, chiefly sugar raising. Most of them work at infrequent intervals, at the planting, weeding and cutting seasons. Many of the estates are operated on the tenant system, and it is exceptional for a native negro to own any land. At the present time, however, there is a homesteading project to divide some of the estates into small plots.

Fishing is much less important than agriculture, there being perhaps 200 fishermen on the island. Fish, however, is a daily article of food throughout the island. There are a few artisans such as carpenters, cabinet makers, wheelwrights and blacksmiths. There are also a few tradesmen among the natives, but there are no factory workers except in the sugar mills.

*School survey.*—Statistics for the entire Virgin Island group (1930 census) showed that 98.2 per cent of children from 7 to 13 years and 64.5 per cent of those from 5 to 20 years attended school. Separate figures for St. Croix are not available except that during the past year there were 2,105 children in eleven schools. One child with leprosy, nine years of age, has been admitted to the leper asylum subsequent to my visit.

*General diseases.*—There appear to be only a few tropical diseases in St. Croix. Malaria was introduced last year from Puerto Rico and at first spread like an epidemic, though it is now under control. Filariasis with resulting elephantiasis is unusually common. Hookworm is present but is not a serious problem. Pellagra is not very common. According to Dr. James Knott, chief municipal physician of the island, yaws, sprue, yellow fever, schistosomiasis, amoebic and bacillary dysentery, trypanosomiasis, leishmaniasis and beri-beri have not been observed.

Tuberculosis is not uncommon. Many of the cases acquired the disease in New York and returned home in hope of regaining their health. Chicken pox is common, while smallpox is so rare that no case has been observed for the past fifty years. Of the venereal diseases, syphilis seems to be quite prevalent, while gonorrhoea is not uncommon. Granuloma inguinale has not been observed.

Among skin diseases scabies, I should say, ranks first. It was almost universal in all the small villages I visited. Impetigo, tinea

versicolor, bites of sand fleas, and ringworm of the glabrous skin were also common. I also saw quite a number of cases of prurigo and a few well marked ones of ichthyosis. I am inclined to think that two of the supposed leprosy patients I saw were suffering from pinta, though this disease of the American tropics has not been previously reported.

#### LEPROSY IN ST. CROIX

From the available records it is impossible to state how long leprosy has been endemic in the Virgin Islands. It is probable that the permanent occupation of the islands dates back to 1734. Previous to that time St. Croix had been occupied and controlled by several European powers. From 1734 to 1803 there was constant immigration from other parts of the West Indies. Leprosy was prevalent in the Windward Islands before appearing in St. Croix. Many natives (negroes) came to St. Croix because of agricultural opportunities and doubtless many leper fugitives also came, for there were no quarantine restrictions against leprosy in St. Croix as there were in most of the other West Indian Islands. In 1873 there was a large importation of labor from the neighboring British West Indies. From 1878 to 1884 the prevalence of leprosy in St. Croix was sufficient to arouse comment.

There had never been any segregation of lepers in the island until 1907, when an attempt was made to isolate them in their villages. One of the difficult features of this project was the fact that the natives had no fear of the disease and did not consider it to be contagious.

In 1902 a survey of leprosy in the Virgin Islands was made by Dr. Edvard Ehlers, a distinguished dermatologist from Copenhagen. He found a total of 106 cases, of which 81 per cent were in St. Croix. Four years later Dr. Ehlers returned to St. Croix and was authorized by the Colonial Council to choose a site for a leprosarium, the money for the construction of buildings being furnished by the Danish Order of Odd Fellows. The site which was chosen is that of the present asylum.

The asylum at St. Croix is situated on a ten-acre plot of land on the seashore about one mile from the town of Christiansted. The buildings consist of a dispensary and hospital ward, several concrete three-room pavilions, a school room, dining room, serving room, laundry, shops and sheds. The asylum is enclosed by a wire fence,

though there is seldom any attempt on the part of the patients to abscond. None but lepers are allowed to live in the institution, the nurse living in a house just outside the wired enclosure. The land within the reservation is cultivated by the patients who raise various fruits, vegetables and chickens.

There were 82 undoubted lepers in the asylum in St. Croix at the time of my visit. Although there were actually 83 patients at that time I have omitted one who showed no evidence of leprosy.<sup>2</sup> Subsequent to my visit one patient, a boy of 9, has been admitted to the asylum. In addition, there were 4 cases of leprosy under parole; these have not been included in my statistics.

Of the 82 asylum inmates 34 were males and 48 females. The average age was nearly 40 years. With the exception of two white persons and one Hindoo all were negroes, the majority, nearly 80 per cent, being apparently of full blood. Ten were classed as three-fourths negro and four were mulattoes.

Of the group 59 were born in St. Croix, 3 in St. Thomas and one in St. John, while 19 came originally from neighboring islands of the West Indies. These included 6 from Nevis, 3 from Barbados, 3 from Antigua, 3 from St. Kitts and 2 from St. Bartholomew.

There was apparently no special focus of infection in St. Croix. At the time of admission to the asylum 30 patients were residents of one or the other of the two principal towns, Christiansted and Fredericksted, and 44 were living in small villages scattered over the island. Seven patients had been sent from St. Thomas and one had been transferred from the old asylum at St. Croix.

The contagiousness of leprosy was exemplified by the presence in the asylum of 22 persons who were related in various ways. These relationships included a father and son; mother and son; two brothers; an aunt and niece; an aunt and nephew; three pairs of cousins; one set of three cousins; two sisters and the son of one of them. In addition, there was a woman whose son was on parole, two daughters with their mothers on parole, a man whose wife and one whose father had died in the asylum.

The occupations of the majority previous to admission had been those of field laborers or housewives, though most of the latter also

<sup>2</sup> This patient was a woman 83 years old with senile dementia who presented extensive pigmented and depigmented areas very suggestive of pinta. The Wassermann test was also strongly positive, which occurs almost invariably in this disease.

worked on the farms like men. Other occupations included laundress 4, seamstress 2, cook 2, school boys or girls 3, and school teacher, porter, blacksmith and fisherman 1 each.

The duration of the disease in 71 patients who could give reasonably accurate dates varied from 1 to 46 years, with an average of 14.6 years. The duration of stay in the asylum varied from a few months to 32 years, the average being 11.3 years. Sixteen patients had been there more than 20 years, and eight of them 30 years or more.

The types of leprosy, following the classification of the Manila Conference, were: cutaneous type 27 cases, neural 36, mixed 16 and secondary neural 3. The subclassifications are shown in Table 1. Smears for bacilli had been positive in 87 per cent of the cutaneous or mixed cases and in 50 per cent of those of neural type. A number of the patients were candidates for parole.

TABLE 1.—Types of leprosy in 82 patients in the St. Croix asylum.

Cutaneous		Neural		Mixed		Secondary neural
C-1	7	N-1	16	C-1 N-1	3	3
C-2	5	N-2	8	C-2 N-1	2	
C-3	15	N-3	12	C-2 N-2	1	
				C-3 N-1	5	
				C-3 N-2	2	
				N-2 N-1	3	
Total	27 (32.9 per cent)		36 (43.8 per cent)		16 (19.6 per cent)	3 (3.7 per cent)

The proportion of purely neural cases (43.8 per cent) was similar to that which I had previously observed in another island of the West Indies, Jamaica. Several of these patients were crippled and unable to get about except in wheeled chairs. Some degree of facial paralysis was noted in six cases, five of them being of the neural type. In two cases there was bilateral paralysis of the orbicularis palpebrum muscles. In three predominantly neural cases there were gyrate and circinate, slightly elevated, smooth, reddish brown patches on the trunk. Dr. H. W. Wade, who saw my photographs of these cases, felt convinced that they were examples of the so-called "tuberculoid" lesions.

The ulnar nerve of one or both sides was enlarged in 22 cases of the cutaneous type, 26 of the neural, 16 of the mixed and 3 of the secondary neural. The great auricular nerves were enlarged in 5 cutaneous cases, 4 neural, and 3 mixed.

Of the patients with the cutaneous type, nodules were observed on the palate (usually hard palate) in 15 cases and on the buccal mucosa in one case. In 9 cases there were nodules on or about the

nipples, and in four advanced cases similar lesions were present on the glans penis, prepuce, or scrotum. Tissues were excised from one patient with extensive nodules and ulcers on the prepuce and scrotum, and on microscopic examination the presence of *Mycobacterium leprae* was demonstrated. This case will be published later.

Thinning or loss of eyebrows was much more common in the cutaneous than in the neural type. A slight thinning was noted in 12 cutaneous and 10 neural cases, while in patients whose eyebrows were extremely sparse or entirely lacking the proportion was 21 cutaneous as opposed to 6 neural cases.

The eyes were affected in 16 cases, equally divided between the two types of the disease. There were 5 instances of corneal ulcers of varying degree of severity, 5 of bilateral pterygium, 2 of cataract, 2 of anterior staphyloma and one each of iridocyclitis and conjunctivitis.

Laryngitis of marked degree was observed in one case of neural and in four cases of advanced cutaneous or mixed type. One patient who had suffered from the neural type for forty years had been deaf for the past three years, though no diagnosis as to the nature of the deafness had been made.

Leprotic ulcers were observed in 18 cases of cutaneous or mixed type, trophic ulcers in 5 of cutaneous and 17 of neural type and ulcers classed as traumatic in 4 cases of cutaneous and 5 of neural type.

Other diseases which were observed in these patients included 3 cases of elephantiasis, 4 of hydrocele, and numerous cases of marked enlargement of the femoral glands, all of which conditions were possibly due to filarial infestation. There were also three patients with clinical evidence of syphilis, 3 with extensive ringworm of the axillae and groins, 2 with extensive alopecia (women), and one with marked general hyperhidrosis.

The general health of the lepers at the asylum was good, and their mental attitude was extraordinarily cheerful. In fact, I have never seen a group of lepers in an institution who were more approachable, which condition speaks well for the physicians in charge and for the faithful nurse who has devoted herself to this work for years. I had no difficulty in examining every one of the patients stripped, and in taking numerous photographs as well as a few biopsies.

Treatment had not been particularly successful, because of change in methods and outside interference at one time on the part of a native who preached against all manner of treatment. Progress had been made recently by giving intramuscular injections of ethyl esters

of chaulmoogra oil, and the number of patients submitting to this treatment was constantly increasing.

Since my visit to St. Croix one more patient has been admitted to the asylum, a negro boy of nine years, born in St. Croix. He was suffering from the C-1 type of the disease. There were also four patients on parole, information concerning whom has been given me by Dr. Knott. One was a negress, 45 years old, born in St. Kitts, with C-1 type of leprosy. The second was a negress, 30 years old, born in Barbados, also with C-1 type. The third case was a negro boy of 18, born in St. Croix, who had been admitted to the asylum at the age of seven suffering from N-1 type. The disease appeared to have been arrested in all of these cases, none of them at present showing any signs of leprosy. The fourth case was a white woman 34 years old, born in St. Croix, who was classed as one of secondary neural type. She was the only one of these cases which had at first shown marked evidence of the disease. Nodules had disappeared leaving wrinkled and atrophic skin. Areas of anesthesia were still present. She had received a long course of treatment by chaulmoogra oil given both orally and intramuscularly. As has been said, a number of patients at the asylum were candidates for parole.

While the leprosy material at St. Croix is not abundant it is varied and interesting, and the cooperation given by both patients and authorities is all that could be desired. As the climate is also delightful St. Croix, I think, would be an excellent place in which to undertake an intensive laboratory and clinical study of the disease.

#### REFERENCES

- (1) MEMORIAL CONFERENCE. Report of the Leonard Wood Memorial Conference on Leprosy. *Philippine Jour. Sc.* 44 (1931) 449.
- (2) EVANS (CAPT.) W., *The Virgin Islands of the United States*. Navy Dept. Washington, D. C., 1928.
- (3) EHLERS, EDVARD. Report of leprosy survey. Proceedings of the Colonial Council of St. Croix, 1902.

#### DESCRIPTION OF PLATE

##### PLATE 1.

Examples of advanced cases of leprosy among the inmates of the St. Croix Leper Asylum.

Fig. 1. Cutaneous type (C-3), showing nodules about the nipples.

Fig. 2. Neural type (N-3), with staphyloma of the right eye.

Fig. 3. Two advanced cases of cutaneous type and one of neural type. On the chest and abdomen of the last-mentioned raised, marginate lesions apparently of tuberculoid type.



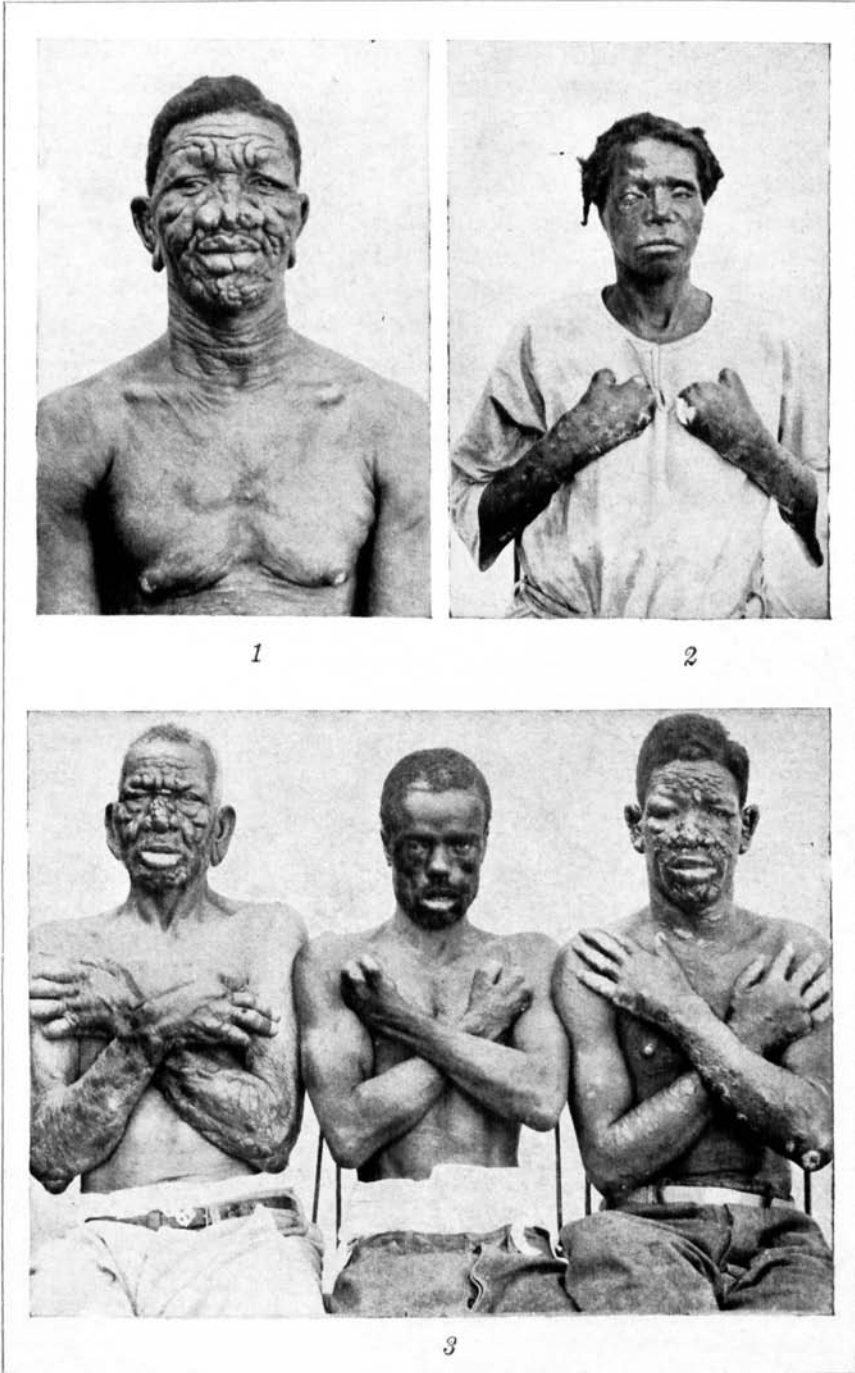


PLATE 1.