

## LEPROSY CONTROL IN BRAZIL

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The campaign against leprosy in Brazil is led by the Federal Government, in cooperation with those of the states, following well-established general rules. Since the decision of the government, in 1935, to give the campaign a national character, the work has been developed by the federal authorities with large financial expenditures. It is believed that the definite solution of such an important problem should remain, at least in its greatest part, in the hands of the Federal Government in order to obtain uniformity of direction and continuity of action, since the campaign must cover the entire territory of the country and should be carried on without interruption for many years.

For these purposes, and as a preliminary step, the accomplishment and revision of a leprosy census had to be undertaken. Physicians were appointed who had graduated from the course given by the International Center of Leprology, and they were sent to the regions where a census was most needed—Pará, Ceará, Pernambuco, Bahia, Mato Grosso, Rio Grande do Sul and Goiás. The available data as of June 1st, 1938, are given in Table 1, with the reservation that they are still incomplete and for certain states represent only reasonable estimates.

On the basis of these statistics the regional incidence of leprosy may be given provisionally as follows:

*North:* Acre, Amazonas, Pará and Maranhão, 2.05 per 1,000.

*Northeast:* Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia, 0.20 per 1,000.

*Center:* Espírito Santo, Estado do Rio, Federal District, Minas Gerais, Goiás, São Paulo, and Mato Grosso, 1.13 per 1,000.

*South:* Paraná, Santa Catarina and Rio Grande do Sul, 0.49 per 1,000.

A conference held at Rio de Janeiro in 1935, for the purpose of unifying the campaign against the disease, recognized that under the particular conditions existing in Brazil isolation is "most important in conjunction with hygienic measures for the prophylaxis of the disease." In July, 1935, the writer, with

the collaboration of Drs. Ernani Agricola and Joaquim Motta, studied a general plan for the campaign which emphasized the need for the construction of new leprosaria of the agricultural colony type, best suited to the conditions of the country, and also for the enlargement, adaptation and improvement of the establishments already existent.

TABLE 1. *Number of cases of leprosy in Brazil, by census and estimates.*

<i>States</i>	<i>Cases</i>
Acre .....	400
Amazonas .....	1,250
Pará.....	4,000
Maranhão .....	1,130
Piauí.....	200
Ceará.....	764
Rio Grande do Norte.....	168
Paraíba.....	200
Pernambuco .....	1,000
Alagoas.....	100
Sergipe.....	89
Baía .....	300
Espirito Santo .....	527
Estado do Rio.....	557
Federal District.....	1,084
Minas Gerais .....	8,700
São Paulo.....	10,545
Paraná.....	1,069
Santa Catarina.....	654
Rio Grande do Sul.....	800
Mato Grosso.....	500
Goíaz .....	1,104
TOTAL.....	35,241

In these establishments must be isolated (a) patients of the lepromatous and mixed forms, which are responsible for more than 95 percent of new infections, and particularly (b) persons of small resources or indigents who cannot have efficient isolation in their homes. Of the persons with pure neural leprosy, the mutilated and the beggars ought also to be isolated. It is certain that this class of sick people represents a large proportion of the total, for in Brazil as in every other country it happens that the disease attacks especially the poor; but even so, the new orientation of hospital isolation only for open cases lessens for the government the cost of the greater part of the program. It is impossible to obtain accurate statistics regarding the distribution of the clinical forms, but the

number of patients to be isolated has been computed to be 65 percent of the approximate total.

As a part of the same plan, the obligation was placed on the individual states to: (a) provide the land necessary for the establishment of agricultural colonies, (b) to operate the leprosaria when constructed and also to provide a sufficient number of dispensaries, (c) to contribute one-half of the expenses of the maintenance of the patients, and (d) to adopt the federal leprosy legislation.

In Table 2 are shown the number of establishments in function, in construction or planned, and the approximate number of patients to be isolated.

TABLE 2. *Leprosy institutions functioning, under construction or planned.*

States	Already existent		Leprosaria under construction	Leprosaria planned	Number of beds
	Leprosaria	Asylums and hospitals			
Acre .....	-	1	-	2	306
Amazonas.....	1 <sup>a</sup>	-	1	-	837
Pará.....	1 <sup>a</sup>	1	1	2	2,660
Maranhão .....	1 <sup>b</sup>	-	-	-	678
Piauí.....	1 <sup>a</sup>	-	-	-	130
Ceará.....	1 <sup>a</sup>	-	1	-	496
Rio Grande Norte....	1 <sup>a</sup>	-	-	-	110
Paraná.....	-	-	1	1	130
Pernambuco.....	-	1	1	-	870
Alagoas.....	-	1	1	-	65
Sergipe.....	-	-	1	-	65
Bahia .....	-	1 <sup>a</sup>	-	1	206
Espirito Santo.....	1 <sup>b</sup>	-	-	-	380
Rio de Janeiro.....	1 <sup>b</sup>	-	-	-	362
Federal District.....	1 <sup>a</sup>	1	-	-	900
Minas Gerais .....	1 <sup>a</sup>	1	3	1	6,938
São Paulo.....	5 <sup>a(2)</sup>	-	-	-	6,855
Paraná.....	1 <sup>a</sup>	-	-	-	900
Santa Catarina.....	-	-	1	-	425
Rio Grande Sul.....	-	1	1	-	532
Goiás .....	-	3	1	1	718
Mato Grosso.....	-	1	1	1	325
TOTALS.....	16	12	14	9	24,888

<sup>a</sup> Indicating establishments in function before 1935 and improved or enlarged by the Federal Government after that year.

<sup>b</sup> Indicating establishments inaugurated after 1935.

With regard to the planned colonies, care has been taken in the choice of sufficient areas of land, in regions of good climate.

located near towns and even large cities, accessible by train or automobile, offering favorable conditions for construction and facilities for agriculture and raising of live-stock, good water, light and electric supplies. Every effort has been made to assure comfort and assistance to the patients and also to minimize their contact with healthy people who work in the establishments. In the general plan of the institutions three zones are distinguished. One is for the healthy people, 500 meters from the intermediate section. The latter is reserved for the administration and its dependencies (pharmacy, laboratory, dwellings for nurses and charity sisters), and also for the observation pavilion. At a distance of at least 100 meters from this latter zone is the patients' section, which comprises, besides the admission building, the residential part (pavilions each for approximately 30 patients, small houses for 4 to 8 patients with resources of their own, and the kitchen and refectory), the medical center (dispensaries of polyclinic type and a small hospital for intercurrent diseases), the recreation area (club, cinema, gymnasium, sports fields) and the work area (shops, laundry and land for agricultural and livestock raising).

Three new colonies have already been inaugurated, Bomfim (Maranhão), Itanhenga (Espírito Santo) and Iguá (Estado do Rio). Within a few months from the time of writing we expect to open 11 of the 14 that are under construction: Marituba (Pará, 22 kilometers from the capital); S. Bento (Ceará, 24 kilometers from the capital); Rio do Meio (Paraíba, 6 kilometers from the capital); Mirueira (Pernambuco, 14 kilometers from the capital); Macció (Alagoas, 6 kilometers from the capital); Aracajú (Sergipe, 21 kilometers from the capital); Santa Tereza (Sta. Catarina, 14 kilometers from the capital); Itapoan (Rio Grande do Sul, 50 kilometers from the capital); São Francisco Assis (Minas, 6 kilometers from the city of Bambuí in the west part of the State); Santa Fé (Minas Gerais, 8 kilometers from the city of Tres Corações in the south of the same State); and Campo Grande, (Mato Grosso, 11.5 kilometers from the city of the same name). At the same time will be completed the improvements made by the Federal Government in the establishments of the states of Rio Grande do Norte (São Francisco de Assis colony), Distrito Federal (Curupaity hospital-colony), and São Paulo (Cocais colony). Improvements have already been completed in four other establishments of the states of Ceará, Baía, São Paulo and Minas Gerais.

In 1940 the entire plan will be realized with the completion of: (a) Three other leprosaria still in construction: one in Manaus (Amazonas, 20 kilometers from the capital); Padre Damião (Minas, 12 kilometers from the city of Ubá, in the eastern part of the state); and Goiânia (Goiás, 12 kilometers from the capital). (b) Eight more leprosaria already planned: Acre (2) Pará (2), Minas, Baía, Mato Grosso and Goiás. (c) Five leprosaria which are being improved or enlarged: Acre, Amazonas, Pará, Piauí and Paraná. The expenses with this program were estimated in about 33.430 contos, 22 625:-\$30\$000 of which were in the national budgets for 1936-38, distributed as shown in Table 3.<sup>1</sup>

TABLE 3. Federal appropriations, 1936 to 1940, for construction or improvement of leprosy institutions.

States	1936	1937	1938	1939-1940
Acre .....	-	-	100:000\$	980:000\$
Amazonas .....	-	815:000\$000	524:000\$	888:000\$
Pará .....	300:000\$000	942:200\$000	750:000\$	2.795:000\$
Maranhão .....	200:000\$000	495:000\$000	230:000\$	270:000\$
Piauí .....	-	40:000\$000	155:000\$	155:000\$
Ceará .....	200:000\$000	370:000\$000	537:000\$	218:000\$
Rio Grande Norte .....	-	200:000\$000	65:000\$	-
Paraíba .....	1:135\$750	398:864\$250	110:000\$	-
Pernambuco .....	530:000\$000	570:000\$000	440:000\$	305:000\$
Alagoas .....	-	40:000\$000	250:000\$	-
Sergipe .....	-	234:400\$000	100:000\$	-
Baía .....	200:000\$000	-	320:000\$	580:000\$
Espirito Santo .....	200:000\$000	200:000\$000	-	-
Estado Rio .....	580:000\$000	330:000\$000	175:000\$	70:000\$
Federal District .....	135:000\$000	771:000\$000	200:000\$	-
Minas Gerais .....	1.200:000\$000	2.400:000\$000	2.200:000\$	2.477:000\$
São Paulo .....	-	400:000\$000	260:000\$	-
Paraná .....	110:000\$000	150:000\$000	200:000\$	420:000\$
Santa Catarina .....	393:490\$000	360:000\$000	390:000\$	-
Rio Grande Sul .....	310:000\$000	370:000\$000	585:000\$	-
Mato Grosso .....	-	309:740\$000	673:000\$	939:000\$
Goiás .....	-	80:000\$000	526:000\$	1.723:000\$
TOTALS .....	4.359:625\$750	9.476:204\$250	8.790:000\$	11.820:000\$

It must be made clear that practically all of the states have contributed to the realization of the construction plan, especially Minas, Rio Grande do Sul, Santa Catarina and Es-

<sup>1</sup>It may be said 250\$000 is the ordinary monthly salary of a man working in the fields, at such work as opening and cleaning ditches.

pirito Santo. In the State of São Paulo, as a rule, all of the work has been done on the initiative of its own government, and only since 1937 has the Federal Government contributed certain sums for the enlargement of three of the five established institutions. These are: the São Angelo colony, inaugurated in 1938; the Sanatorio Padre Bento and the Pirapitingui colony, both inaugurated in 1931; the Cocais colony, inaugurated in 1932; and the Aimoré colony, inaugurated in 1933.

Some of the states could not pay their part of expenses for the installation needed in buildings erected. For this reason, since 1936, the Federal Government has been giving money also for this purpose.

For the maintenance of the patients in the new colonies the Federal Government has appropriated, since 1938, progressively increasing sums of money. To share in this aid it is demanded that a state shall have a well organized service for leprosy prophylaxis, comprising the establishment of dispensaries, good census work, and complete and permanent medical assistance to the patients, as well as perfect cooperation with the federal authorities in charge of the campaign.

The per capita expense in a large leprosarium was fixed, in 1937, at a little more than 3\$000 in the colony of Santa Izabel, in Minas Gerais, where 1,500 patients were isolated, and something above 3\$800 in the leprosaria of São Paulo. In a smaller leprosarium, as the one of the Federal District, the per capita cost amounts to 9\$700.

When the chain of leprosaria is completed care will be taken, in the patients' interest, that they shall be located in their own states, except when they have lived in another one for three years before admission.

Concerning dispensaries that have been established, the actual situation is shown in Table 4. This important side of the campaign is most intensively carried on in the Federal District and in São Paulo and Espírito Santo. In the Federal District there are 12 health centers, each of which has a dispensary for "diseases of the skin"; all of them are active. It must be emphasized that the 634 leprous persons living at their own homes in the District are watched over by a special nursing staff of the public health service. In Minas Gerais, where the necessity of this service is most important, it will be realized especially through the installation of travelling dispensaries.

Concerning leprosy treatment, a considerable amount of work was done by the chemistry section, headed by Dr. H. I. Cole, of the International Center of Leprology of Rio de Janeiro, in which there were also sections of epidemiology, bacteriology and immunology, all of them active until the institution was closed very recently. The Center had the cooperation of the medical school of Rio de Janeiro, the Instituto Oswaldo Cruz, and the National Health Department. It maintained with good results a postgraduate course of leprology.

TABLE 4. Leprosy dispensaries in existence.

State	Dispensaries
Acre.....	-
Amazonas.....	1
Pará.....	1
Maranhão.....	1
Piauí.....	-
Ceará.....	1
Rio Grande do Norte.....	-
Paraíba.....	1
Pernambuco.....	4
Alagoas.....	1
Sergipe.....	-
Baía.....	-
Espírito Santo.....	8
Rio de Janeiro.....	1
Federal District.....	12
Minas Gerais.....	1
São Paulo.....	9
Paraná.....	-
Santa Catarina.....	-
Rio Grande do Sul.....	-
Goiás.....	-
Mato Grosso.....	-
TOTAL.....	41

In the section of chemistry mentioned there has been produced an ester of chaulmoogra oil whose activity and reduced irritating effect permits doubling and even tripling the usual therapeutic dose. Children support this intensive treatment very well. At the same time a good product has been made which does not cause pigmentation on intradermal injection, an important point for that method of treatment of skin lesions. Another interesting point is that the section has been trying to obtain from *Carpotroche brasiliensis* (sapucainha oil) a product with therapeutic effects at least similar to those of *Hydnocarpus wightiana*.

The results of leprosy treatment in Brazil are encouraging and extensive work has been done, especially in Rio de Janeiro (D.F.) at the Curupaity colony and the health centers, and in São Paulo. In the establishments of that state, where treatment is the central basis of the colony life, the beneficial results of the chaulmoogra medication are unquestionable, and a large percentage of cases have become quiescent or the disease has been apparently cured.

In a large number of cases isolated in Curupaity the use of the chaulmoogra esters (10 cc. three times per week, and almost double the usual dose for children) has given very satisfactory local and general results. Bacteriological negativity has been attained in 56 percent of the adults and 82 percent of the children treated (Henrique de Moura Costa). Original methods that are being employed with good results are those of oxygen under pressure (A. Ozorio de Almeida and E. Rabello) and oxygen under pressure combined with methylene blue (A. Ozorio de Almeida and H. Moura Costa).

Social assistance to the families of the patients has been developed in Brazil by the beneficent efforts of private associations, helped by public authorities. There are 72 organizations of this kind, affiliated in a general association, which have done a great deal of good work in the recent years. From 1935 to 1937, 54 cities of 14 states were visited by women who lead this association, and through an educational campaign they have enlisted many enthusiastic members. As a result of this campaign recreation buildings for the patients have been erected in some of the leprosaria and very extensive material and moral assistance has been given to the families of patients.

Nine preventoria for children of patients already exist in activity in the States of Amazonas, Pará, Espírito Santo, Minas Gerais, São Paulo (two), and the Federal District; there are 1,000 children in these institutions. Two more are in construction, in Paraíba and Espírito Santo, and many others are projected.

#### DESCRIPTION OF PLATES

##### PLATE 7

FIG. 1. A partial view of the Curupaity hospital-colony in the Federal District, Rio de Janeiro. At the left the recently constructed administration and clinic building. At the right two two-story pavilions of sanatorium type for patients.

FIG. 2. A view in the recently completed Santa Tereza colony, near Florianópolis, in the State of Santa Catarina.



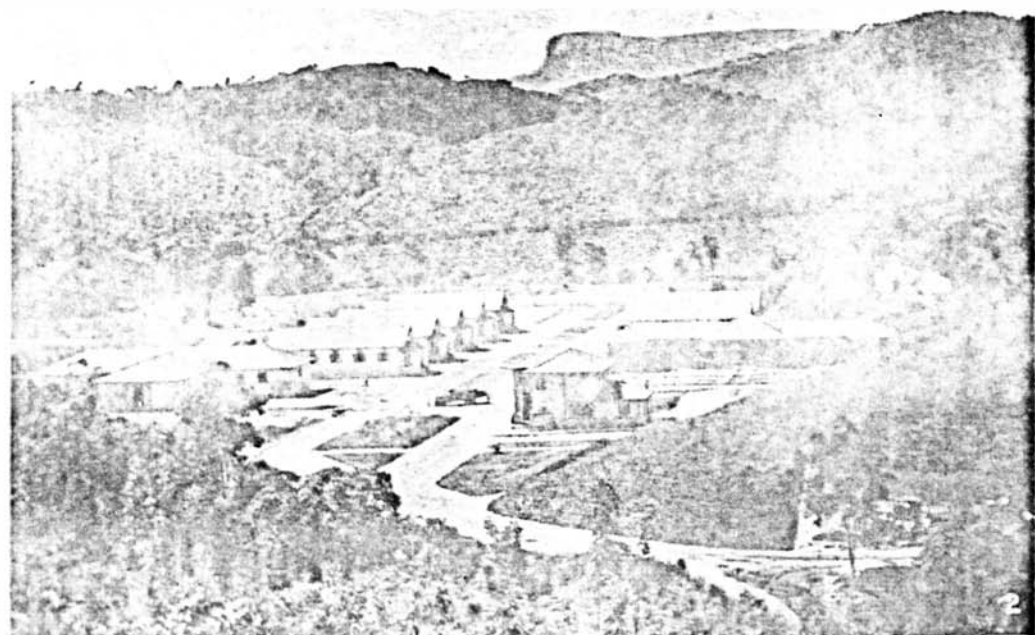
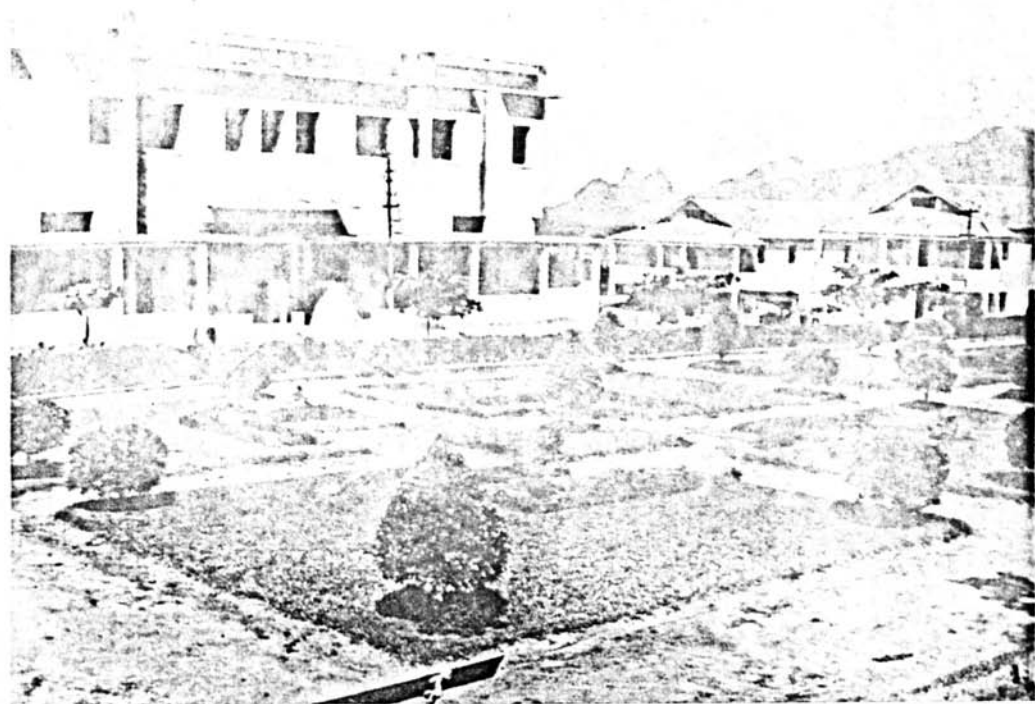


PLATE 7

PLATE 8

FIG. 3. The main street of the new Marituba colony at Belém, State of Para. Zone B in the foreground, with at the left three houses for healthy nurses and at the right the administration building. Zone C, for the inmates, in the distance.

FIG. 4. Construction in the Aleixo colony, near Manaus, in the State of Amazonas. In Zone C, three pavilions of the "Carville" type and the foundation of the refectory-kitchen building.

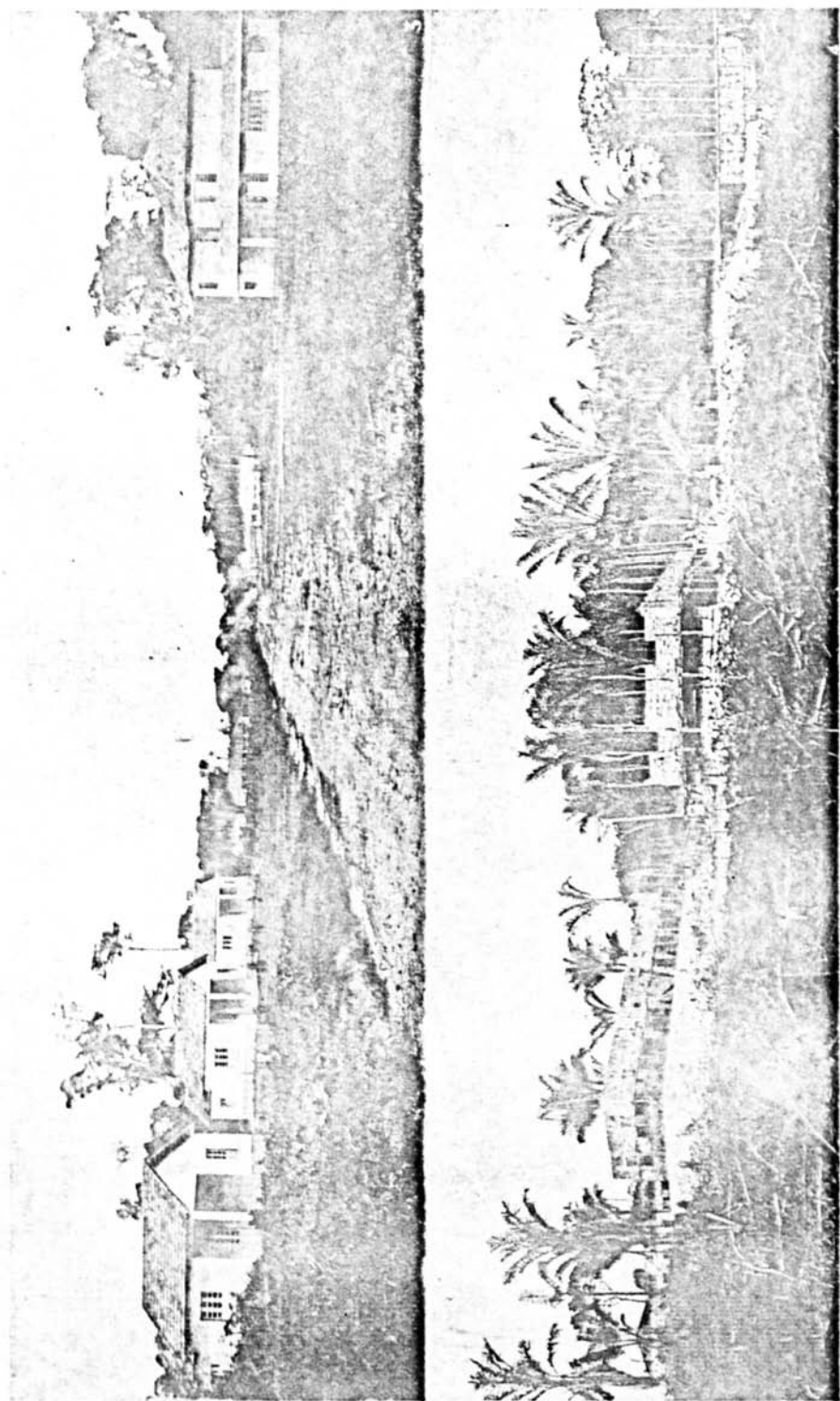


PLATE 8