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A FIELD STUDY OF LEPROSY

II. REEXAMINATION OF CASES OF LEPROSY AT CORDOVA CEBU PROVINCE, PHILIPPINE ISLANDS¹

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INTRODUCTION

In 1933, Doull, Rodriguez, Guinto and Plantilla (2) examined for leprosy 5,957 persons of an enumerated population of 6,063 living in the municipality of Cordova, Island of Mactan, Cebu. Of the 106 persons that were not examined (less than two percent of the whole), 18 had died during the course of the work. Among the remaining 88, according to the records, there were five paroled lepers and two who had been classified as "incipients" when seen at the Cebu Skin Dispensary several years previously.

The incidence of leprosy, including patients in institutions, was found to be 17.2 per thousand. Some minor adjustments have been necessary in the numbers and classification of patients given in the original report; these are as shown in Table 1.

TABLE 1. *Lepers regarded as residents of Cordova, 1933.*

Classification	Original report	Corrected
Open cases		
In segregation.....	43	44 ^a
At home, newly discovered.....	3	3
Paroled cases, previously open.....	16	15 ^b
Closed cases.....	42	45 ^c
TOTAL.....	104	107

^a One patient at Culion was classed later as nonresident; two Culion cases were omitted in 1933.

^b A patient of the old Cebu Detention Hospital was found never to have been paroled; probably he was never positive.

^c Includes one from the original paroled list and two regarded as "suspected," later classed as tuberculoid, following biopsy.

In 1935, two years after the first survey, the present writers returned to Cordova to continue the field work there. In this second phase of the survey the following work was undertaken:

(a) The histories of 304 persons in Cordova who are known to have had leprosy from 1878 to 1935 were investigated on the ground. Their former residences if still standing were visited, details in their histories were checked, and their possible relationships with one another were carefully traced.

(b) All persons known to have lived in the same house as a leper in Cordova were examined again, whether they were still residents of this town or had moved elsewhere.

(c) The cases of leprosy recorded in the 1933 survey were all reexamined.

(d) Many residents coming for consultation to the clinic established in Cordova in connection with the survey were also examined for leprosy.

(e) New cases of leprosy that had developed after 1933 or that had been missed during the first survey were examined and included in the records.

The present paper, covering only the clinical part of the report of this further study, gives the results of the reexamination of the cases found in 1933 as well as the findings in the newly discovered cases developing in the interval. The main body of the report referred to, which contains statistical data regarding the intrafamilial as well as the extrafamilial spread of leprosy in Cordova and epidemiological information regarding the house contacts examined, will appear as a separate article.

Definitions.—Definitions of terms used throughout this report are as follows:

(a) Open case: One that is, or has been, bacteriologically positive, standard methods of examination being used.

(b) Closed case: One that is negative bacteriologically, on repeated examinations. If macules are present it is classed as "macular," whether there is anesthesia or not. If there are anesthetic areas on apparently normal skin, or characteristic muscular atrophy or contractures, the case is classed as "neural" (polyneuritic).

(c) Activity: A macular case is "active" if the border or any portion of the macule is above the level of the surrounding skin, or if any portion of it is reddened, or if there is papulation in or beyond its border, or if there has been any increase in the number or size of the macules in the previous six months. A neural case is active if there have been any progressive changes in the site or extent of anesthesia, or in the character of the atrophies or contractures, in the previous six months; or if any involved nerve is found to be still thickened and tender.

(d) Quiescence: A macular or neural case showing no activity for from six months to two years is classed as "quiescent."

(e) Arrest: A macular or neural case showing no activity for two years or more is classed as "arrested."

EXAMINATION OF PERSONS OMITTED IN 1933

In the second survey efforts were made to reach all persons omitted in 1933. Of the 88 in this class, 62 were seen. Four had died. Of the 22 that could not be examined, 2 were stated by former neighbors to be "lepers in hiding." No reason for suspecting leprosy in any of the others was learned; 18 of them were living elsewhere. The total examined up to December 31, 1935, reached 6,019, or 99.6 percent of the enumerated population.

TABLE 2. *Clinical classification of Cordova lepers, 1933 and 1935.*

Classification as of December 31, 1935										
	Open				Closed				Dead	
	In segre- gation	At home		Active		Quiescent		Arrested		
		Not segre- gated	Pa- roled	Ma- cular	Neural	Ma- cular	Neural	Ma- cular		Neural
Classification as of September 1, 1933										
OPEN (62 cases)										
(a) In segregation.....	44	—	2	—	—	—	—	—	—	3
(b) At home, paroled.....	15	2	9	—	—	—	—	—	—	2
(c) At home, new.....	3	1	—	—	—	—	—	—	—	—
CLOSED (45 cases)										
Active										
(a) Macular.....	18	—	—	11	—	6	—	1	—	—
(b) Neural.....	2	—	—	—	1	—	1	—	—	—
Quiescent										
(a) Macular.....	8	1	—	—	—	5	—	2	—	—
(b) Neural.....	0	—	—	—	—	—	—	—	—	—
Arrested										
(a) Macular.....	8	—	—	—	—	—	—	6	—	2
(b) Neural.....	9	—	—	—	—	—	—	—	9	—
TOTAL.....	107	44	11	11	1	11	1	9	9	7

EXAMINATION OF CASES OF 1933

The importance of prognosis in leprosy, to both the individual and the community, can hardly be over-estimated. The general trend, whether progressive or retrogressive, of any group of cases, and the similarly important questions of parole and relapse rates, can be estimated only by statistical studies based upon periodical reexaminations over a long period of years. However, it is of great interest in itself that only one of the closed cases found in 1933 had become open by 1935. This Cordova series, in spite of its small numbers, offers an exceptional opportunity to study the subsequent course of all types of leprosy.

Of the 45 closed cases seen in 1933, all were reexamined in 1935, most of them twice (42 in May and 43 in November); 13 of them had been examined in the intervening year. All the paroled patients were examined in December, 1935. A summary of the clinical classification of the cases as compared to that in 1935 is given in Table 2.

OPEN CASES OF 1933

Of the 44 open cases that were in segregation in 1933, three had died before the end of 1935. Three were paroled in the interval, but one of them remained on parole only for about a year. The others were still either in the Eversley Childs Treatment Station or the Culion colony.

CLOSED CASES OF 1933

Clinically active cases.—Of the twenty macular and neural cases that in 1933 were classed as clinically active, seven had apparently become quiescent and one was considered arrested. Several of the others showed some changes, progressive or retrogressive, but none was found to have become bacteriologically positive by ordinary methods of examination, though a biopsy specimen from one patient with tuberculoid leprosy had revealed a few bacilli in 1933.

Clinically quiescent cases.—Of the eight patients who had had quiescent macular lesions, one had become an open case, five were regarded as still quiescent and two as arrested. The history of the open case (F.T.) will be given later.

Clinically arrested cases.—Of the 17 cases in this class two had died before 1935. None of the remainder was found to show any sign of activity.

Considering all closed cases as a group, it is seen from Table 2 that, whereas 20 of 45 were active in 1933, only 13 of 43 were active in 1935, including one that was found bacteriologically positive and is therefore tabulated as an open case. It is of interest that there seemed to be a greater tendency toward retrogression of lesions in females than in males. Of the 18 active macular patients of 1933, nine were males and nine females. Of the former, two were classed as quiescent or arrested in 1935, while of the latter five were quiescent. Further data of this character are necessary to determine whether the greater tendency to recovery among early cases exhibited by the females of this group is the rule or a chance occurrence.

PAROLED PATIENTS OF 1933

Of the fifteen lepers on parole in 1933, only ten were examined at that time. Of that group two had died by 1935; of the eight remaining, three were found to have relapsed. Of the five not examined in 1933, one had relapsed. Excluding the deaths and assuming that the paroled who were not examined in 1933 were negative at that time, four of thirteen had relapsed in two and one-fourth years.

SUSPICIOUS CASES OF 1933

In the 1933 survey there were found nine persons who were suspected of leprosy. One was discovered on biopsy to be a tuberculoid case. On reexamination in 1935, one of the remaining eight was diagnosed as "macular, quiescent," and one as "neural, quiescent." Three were left in the "suspect" class and three were eliminated as nonleprous. Summarized case histories follow:

CASE 1. Agbo, S. (No. 659-5126) female, 70 years old. On September 15, 1933, there was on the postero-lateral surface of the left arm an irregular, ill-defined macule, about 1 inch across at its widest portion, with faintly elevated borders. Anesthesia was difficult to determine because of dullness of the patient. On April 4, 1935, the lesion had disappeared completely; there was no anesthesia. Final diagnosis; nonleper.

CASE 2. Baguio, T. (No. 533-3182) male, 10 years old. A small hypopigmented macule, about the size of a grain of corn, was present on the left buttock on August 22, 1933. The entire macule was removed at biopsy. Findings: Slight infiltration about some of the vessels of the papillary layer, with proliferation of the epidermis.² Impression: not leprotic. The boy was again examined on May 6, 1935, and no sign of leprosy was discovered. Final diagnosis: nonleper.

²The histological examination of this specimen, and of those from Cases 3, 5 and 9, were made by Dr. H. W. Wade at the Cullen Leper Colony.

CASE 3. Bontulan, D. (No. 431-3096) female, 22 years old. The suspected lesion, August 21, 1933, consisted of a hypopigmented area about 2 inches wide on the lateral portion of the right leg below the knee. At the center was an irregular scar, the entire picture suggesting that an effort had been made to burn out a macular lesion. Neurological examination unsatisfactory, patient uncooperative. Biopsy specimen removed from the area of depigmentation outside the scar. Findings: Slight round-cell accumulation in the superficial (papillary) layer of the dermis, with tendency to thickening of connective tissue around the deeper hair follicles and the coil glands. On June 1 and November 9, 1935, the appearance of the lesion was about as before except that at the border of depigmented zone there were irregular groups of pin-point papules. There was definite anesthesia to pain and temperature around the biopsy scar, and the corresponding peroneal nerve was definitely thickened and tender. Final diagnosis: leprosy, neural, quiescent.

CASE 4. Casquejo, S. (No. 304-4996) male, 3 years old. On September 13, 1933, a whitish macule about one-half inch in diameter was found on the antero-lateral surface of the left thigh. The upper border showed exaggeration of the skin furrows and ridges and was slightly pink in color. Anesthesia could not be determined on account of the youth of the patient. On April 7, 1935, the skin at the site of the lesion described was shiny and wrinkled—atrophic looking. This was considered an indication that the condition was not due to an ordinary superficial skin infection. The left peroneal nerve was distinctly thicker than the right. Anesthesia could not be determined. Diagnosis: still suspicious.

CASE 5. Inoc, L. (No. 110-4412) male, 30 years old. There were three macules of various sizes, the largest measuring 3 by 1½ inches, on the right buttock. All were shiny and of granular appearance due to exaggeration of the grain of the skin; only segments of the borders were distinct. Definitely no anesthesia. The upper border of the largest macule was biopsied. Findings: The deeper layer of the dermis normal. Superficially there is only round-cell infiltration, slight at one end of the section and moderate at the other end. On May 6, 1935, none of the macules could be seen. Around the biopsy scar were pin-head sized papular elevations, apparently limited to the hair follicles. On the opposite buttock and on both forearms were itchy circinate lesions probably due to ringworm. Smears taken from both sides of the septum and from the circinate patches were all negative. Neither fungi or yeast-like organisms were found. Diagnosis: still suspicious.

CASE 6. Jumao-as, C. (No. 670-1268) female, 17 years old. On August 5, 1933, on the left buttock was a wrinkled and atrophic-looking area of the shape and size of an ordinary pear. The center seemed to be anesthetic, but the patient was dull and uncooperative. All over the body there were numerous large scars due to yaws. The lesion on the buttock was said also to be due to yaws. On April 6, 1935, the lesion had not increased appreciably in size. However, there were several irregular projections at the upper border, where the skin was also wrinkled, unchanged in color but palpably thickened, in contrast with the rest of the lesion which was even thinner than the surrounding skin. The center was definitely anesthetic. Diagnosis: leprosy, macular, quiescent (?).

CASE 7. Pelloche, J. (No. 940-908) female, 58 years. On July 31, 1933, there was on the right elbow region a pinkish-brown raised macule

which had a papulated, slightly rolled edge. Patient claimed that this lesion appeared together with sores of yaws some years previously. No anesthesia. Reexamined on April 4, 1935, the lesion had disappeared and there was nothing suspicious of leprosy. Diagnosis: nonleper.

CASE 8. Sumagang, J. (No. 811-28) female, 9 years old. The suspected lesion on October 8, 1933, consisted of a pinkish, penny-sized, irregular patch in the left suprascapular region, said to be of 2 years duration. No anesthesia or scaling. On April 13, 1935, the spot was still present but no longer pinkish. No anesthesia elicited. Slight ichthyosis was present on the legs. Diagnosis: still suspicious.

CASE 9. Tura, R. (No. 818-3945) male, 18 years old. The suspicious lesion found on the right lumbar region on October 8, 1933, consisted of a very distinctly outlined, kidney-shaped pinkish macule the size of a lima bean. Not raised; sensibility normal. Duration unknown. At biopsy the greater part of it was removed. Findings: Slight to moderate superficial round-cell infiltration, with two very small, very superficial tuberculoid foci, one almost minimal, the other less definite, immediately subepidermal. Some ten months later (August 3, 1934) the lesion had extended one-quarter inch beyond both sides of the scar. Lateral to the scar it was raised, red, and presented a granular surface; medial to the scar it had the same characteristics except that it was less red. At the last examination, April 4, 1935, the appearance was about the same except that the medial side of the scar now looked more active than the lateral side. Diagnosis: leprosy, tuberculoid.

The circumstances which prevented the determination of a definite diagnosis in the "suspicious" cases were: (a) The lesions were not typical, being either ill-defined, hazy, scar-like, or too small. (b) The results of the neurological tests were not definite, due to age (too young or too old), or to dullness or lack of cooperation on the part of the patient.

Biopsy specimens were taken from four patients; only in one instance did the specimen itself permit the diagnosis to be arrived at definitely. This was Case 9, with a single flat lesion no larger than a lima bean which proved to be tuberculoid. In the three other cases biopsied the sections revealed only slight to moderate round-cell infiltration in addition to other changes similar to those found in superficial scars, all of which can be found in many conditions other than leprosy.

The best aid in arriving at a diagnosis in suspicious cases consists in periodic clinical examinations repeated at frequent intervals. At these examinations the condition of sensibility in the suspected lesions is carefully explored, while the progress of the lesions and the effects on them of antiparasitic treatment are observed until a definite diagnosis can be arrived at.

NEW CASES DISCOVERED AFTER 1933

NEW OPEN CASES

In the two and one-quarter years from the close of the survey in 1933 to December 31, 1935, six open cases were discovered among residents of Cordova. All of them had been examined in 1933 but only one had been diagnosed as leprosy at that time; another one had been marked for reexamination but was not placed on the list of suspects. The remaining four patients had been regarded as free from leprosy.

The population groups from which these open patients were derived were as follows:

- (a) From 45 closed cases of 1933: one case.
- (b) From 9 suspects of 1933: none.
- (c) From 902 house contacts, apparently free from leprosy in 1933: one case.
- (d) From the remaining resident population (not house contacts; approximately 5,216 persons): four cases.

It may be objected, and rightly, that there may have been other open cases in the general population at the end of 1935. Only a complete resurvey of the population could determine whether that was so or not. However, the conclusion was reached in 1933 that open cases do not remain long unsegregated. It is of interest that four out of the five cases occurring in persons not considered as lepers in 1933 were not in the groups reexamined in 1935; they either presented themselves voluntarily at the Cebu Skin Dispensary or came to us at the Cordova clinic.

Brief case histories of the new open cases are given:

CASE 1. Pinote, J. (No. 653-4814) male, 38 years, was first examined on September 10, 1933 (R.G.). The principal findings were ringworm of the toes, seborrheic eczema of the face, papular dermatitis on thighs probably due to maguay, and a nonanesthetic depigmented macule with faintly raised borders surrounding the right nipple. The inguinal glands were moderately enlarged on both sides, while the peroneal nerves were slightly thickened bilaterally. There was also ichthyosis on the front of the legs. Patient complained of numbness of the fingers and toes. The knee jerks were sluggish, particularly on the right side. He was marked for reexamination, but as he was a sailor and away most of the time the examination was not repeated.

The patient was not seen again until he presented himself at the Cebu Skin Dispensary on July 8, 1934, believing that he had leprosy. At that time the pinna of the left ear and the lobe of the right ear were infiltrated. Numerous penny-sized coppery macules were present all over the body, and large circinate patches on the buttocks and thighs. Smears from the right earlobe, back, buttocks, thighs, and right septum were all positive for *M. leprae*. According to his history, the macule on the chest was of about one

year's duration at the time of the examination in 1933. Two years previously the sole of the left foot had been punctured with a nail but he had felt no pain. In February, 1934, the left earlobe became infiltrated and numerous lesions appeared on different parts of the body.

CASE 2. Siton, M. (No. 207-3373), male, 10 years, was first examined on August 24, 1933 (J.R.). The only findings were a few scabies sores on the legs and hands, numerous small itchy papules on the extensor surfaces of the arms and forearms (diagnosed as prurigo), and ichthyosis of the legs. The boy stated later that he had discovered an anesthetic area about the size of a penny on the lateral surface of the right heel only two weeks before this examination, but he did not mention the fact to the examiner at the time.

He was found to be a clinically and bacteriologically positive leper 13 months later, September 21, 1934. There was a small, bright red papule on the right earlobe, and a few reddish areas of infiltration on the arms, buttocks, and backs of both thighs. The patient stated that about a month previously the red nodule appeared on the right earlobe and itched severely for three days, after which the part became numb and insensible. There was no fever. At the same time the areas of infiltration appeared, first in the buttocks, followed within a few days by those found elsewhere.

CASE 3. Nuñez, M. (No. 339A-2730), male, 11 years old, was examined on August, 19, 1933. (J.A.D.). The findings were ichthyosis on arms and legs, healing ulcers on the legs, and thickened scars on the right elbow, said to be due to an injury.

On November 22, 1934, patient presented himself at the Cebu Skin Dispensary and was found to be a positive leper. The face, including the ears, was covered with a uniform, diffuse red infiltration. Extensive circinate patches of infiltration were present on the trunk, both front and back, and on the buttocks and thighs. Trophic ulcers of both planter surfaces. For about six months after the first examination nothing unusual was observed by the patient until the sole of his left foot was pierced by a piece of sharp coral, without pain. Shortly afterward the other foot was similarly wounded, with the same result. The cutaneous lesions were, the patient claimed, noticed only within a month before the second examination. This case indicates how rapidly leprosy can develop to a fairly advanced mixed stage within the space of a few months.

CASE 4. Tiro, F. (No. 214-486), male, 19 years old, was examined on October 10, 1933 (F.P.). At that time there were two small distinct leprotic macules at the left buttock, and a large one with a clearing center covering the entire right buttock; there were also a few small ones at the right nate and back of the right thigh. A biopsy specimen was taken from the clearing center of the extensive macule on the right buttock. Findings (Dr. Wade): Changes similar to those found in an ordinary superficial scar, in addition to slight to moderate round-cell infiltration about some of the vessels in the papillary layer; coil and sebaceous glands normal; no acid-fast bacilli found. Smears taken from the different macules and from the nasal septum also negative.

Reexamined on July 31, 1934, nearly ten months later, there was severe scabies involving the buttocks, so that the macules could not be examined very well. However, segments of the upper border of the large macule

covering the right buttock were distinct and flushed, while the larger of the two on the opposite side had increased in size.

When the patient was next examined (March 16, 1935, some 8 months later), the condition had become a typical, moderately advanced cutaneous case, with marked infiltration of both ears and extensive infiltrations all over the body. The sites of the two macules on the left buttock were covered by red, irregular plaques of infiltration. The upper border of the large macule on the right buttock was also infiltrated but its center, in which was the scar of the biopsy, remained clear and atrophic. According to the history, about one month after the examination in July, 1934, itchy red patches appeared on the ears and at the back of the right thigh, accompanied by occasional fever and a feeling of extreme weakness.

CASE 5. Jumao-as, B. (545-5664), female, 72 years old, was examined on September 28, 1933 (F.P.). The only findings recorded consisted of a papular eruption (supposedly maguey dermatitis) on the upper portion of the abdomen, the breast, back, and the cubital and popliteal spaces, together with contractures of the small and middle fingers of the left hand, said to be due to injury. However, this old woman had been suspected by her neighbors of being a leper for many years, and later (in 1935) she stated that her skin had been "different" since her youth.

At the second examination, on June 12, 1935, the earlobes were found to be slightly edematous and reddish. The skin over the malar eminences and the lower lids were also reddish and thickened. The alae nasi were pigmented and wrinkled. There was a generalized fine, branny scaling on the face. Partial constriction of the fourth and fifth fingers of the right hand, and of the third and fifth fingers of the left hand, the last two said to be due to injury. Smears taken from the right helix, right malar region, right and left alae nasi were positive.

CASE 6. Inting, P. (No. 535-4175), male, 27 years old, was first examined on September 2, 1933 (J.R.). The interesting condition found then was an erysipelas-like lesion on the right forearm, extending from the wrist up to and involving the right elbow region; peculiarly, it had remained stationary for about three weeks, rather unusual for erysipelas. The inflamed area, which felt hot, had been previously painted with black ink by the patient, a recognized treatment for erysipelas on the island. The condition was diagnosed as erysipelas.

This man was next examined on November 23, 1935. It was rumored that he had had definite symptoms of leprosy for several months. The ears were both markedly infiltrated and numerous infiltrated patches were present all over the glabrous portion of the body. Numerous bacilli were found in the lesions and also the nasal septum.

Of these six persons who became positive or open cases after the 1933 examination, only one presented at that time lesions which were definitely diagnosed as leprotic. One more case (a sailor, always away) would undoubtedly have been so diagnosed had it been possible to reexamine him. A third presented an erysipeloid lesion which probably was leprotic in nature. Another had no distinct stigmata of leprosy at the

time of examination, although she had been long suspected as being a leper. One claims to have had a small localized area of anesthesia on one heel at that time, and the last one might have had anesthesia of the plantar surfaces, but as these conditions were not reported to the examiners they were unavoidably missed. In the necessarily rapid examination of the entire population of a community such changes cannot be detected unless attention is called to them.

In short, only two of the six cases had shown in 1933 lesions which were diagnosed or should have been diagnosed as being leprotic; the rest presented signs and symptoms which either were not typical or could not have been expected to have been discovered under the circumstances. This confirms our experience in the Cebu Skin Dispensary and at the Everley Childs Treatment Station that the usual mode of onset of the cutaneous type of leprosy, at least in the Philippines, is still little understood. If one were to judge from the Cebu cases which have become positive lepers among persons who had been examined previously, the earliest lesions of this type are difficult to recognize, possibly frequently evanescent, variable, and of rapid development compared with the relatively well defined and slowly evolving lesions which characterize the onset of the macular and neural types. The Cordova material should furnish an excellent opportunity to make further studies along these lines, inasmuch as almost the entire population (only 22 individuals excepted) have been examined, 912 of them at least twice.

The point in question is decidedly of more than mere academic interest. Since the macular and neural cases can usually be diagnosed early, as already stated, and since the incipient cutaneous cases cannot be definitely recognized unless the leprosy bacillus is found, it is reasonable to suppose that many of those being treated in the skin dispensaries as "incipients" at the present time belong to the former kinds. Since these are essentially different from those which eventually have to be segregated, it may later turn out that, in spite of the fact that almost all the closed cases treated in such dispensaries are getting "cured," the number of open cases remains the same or may continue to increase.

Another point of interest may be mentioned. Since these closed macular and neural cases tend towards spontaneous arrest, claims of high percentages of "cures" among patients belonging

chiefly to these types must naturally be received with caution.

Status of open cases.—Of the 60 open Cordova cases living at the end of the survey, 36 were at the Culion Leper Colony, 19 were at the Eversley Childs Treatment Station, and 5 were unsegregated. Three of the latter voluntarily sought admission to the treatment station shortly after the survey was completed. In addition, there were at Cordova, 13 paroled cases, previously bacteriologically positive. Therefore, out of 73 living open or previously open cases from this municipality, 13, or 18 percent, had been paroled.

NEW CLOSED CASES

During the period in question 18 additional closed cases were added to our records. Twelve of them occurred among residents and the other six were found among nonresidents. The population groups from which they were derived were as follows:

Residents (12 cases):

From 9 cases classed as suspicious in 1933, 2 cases (not house contacts).

From 793 resident house contacts, 8 cases.

From approximately 5,216 resident nonhouse contacts, 2 cases (excluding two listed above as being found among suspicious cases in 1933).

Nonresidents (6 cases):

From 109 nonresident house contacts, 3 cases.

From approximately 350 nonresident nonhouse contacts, 3 cases.

Of the six nonresident closed cases, all of the three giving histories of house contact were new cases found among persons examined for the first time in 1935. Only one of the three found among those who had not been exposed as house contacts was a new case; the other two were known to us in 1933 but had not been included in the list of clinical cases because we were then dealing exclusively with resident cases.

Of the twelve new closed cases found among residents, one was a person who was not examined in 1933; two were considered suspicious cases, as already mentioned; in five the lesions seemed very recent, and it is held very likely that they had appeared after 1933. The remaining four cases are of some interest and will be discussed in more detail.

CASE 1. Baguio, S. (No. 525-4695) male, 13 years, presented circinate patches at the left axilla and low on the left thigh which were diagnosed as ringworm on September 8, 1933. On May 6, 1935, leprotic macules were discovered posteriorly on the left thigh and on the left elbow region. It

was then impossible to determine whether the macule on the thigh was the one originally diagnosed as a ringworm lesion or is an entirely different thing.

CASE 2. Inoc, E. (No. 587-5413) female, 41 years. Nothing of interest was noticed on examination on September 17, 1933, except for slight ichthyosis on the front of the legs. On May 26, 1935, there was a swelling as large as a hen's egg on the dorsum of the right foot, close to the base of the distorted middle toe. There was a typical leprotic trophic ulcer on the plantar surface, and anesthesia of the foot and leg. Had the swelling mentioned (due to infection of the plantar ulcer) not been present at this last examination, the presence of the trophic ulcer might have been missed again. Distortion of the toes among the Cordova people is frequent, due to injuries by the coral rock that covers the greater part of the island. It is very probable that the condition was present in 1933 but was overlooked.

CASE 3. Angco, C. (No. 550-1470) female, 24 years. On August 7, 1933, the only observation of interest was the presence of whitish irregular patches on the left leg, which however were not considered even suspicious of leprosy. On July 22 and November 9, 1935, a faint anesthetic macule was present just below the left knee, and there was also anesthesia over the antero-lateral surface of the leg. The peroneal nerve was as thick as a lead pencil, cord-like and tender throughout its palpable portion. The patient stated that the macule had been noticed in 1925; naturally it was present at the time of the first examination.

CASE 4. Pagobo, E. (No. 768-2997) male, 67 years. The only findings of interest at the August 20, 1933, examination were slight thickening of the great auricular nerves, and also slight contracture of the small finger of the right hand, said to have been due to injury. The corresponding ulnar nerve was recorded as not palpable. On April 26, 1935, the right ulnar nerve was found to have a fusiform enlargement about the thickness of a pencil above the elbow, and anesthesia was present on the ulnar side of the dorsum of the hand and over the bent fifth finger.

NEW PAROLED CASES

As already stated, three patients were paroled between 1933 and 1935. One of them, paroled on March 5, 1934, was found on December 12, 1934, to have relapsed and was re-segregated four months later.

NEW SUSPICIOUS CASES

Five new suspicious cases were found during the 1935 survey, all among resident house contacts who in 1933 showed no suspected lesions.

LIVING CORDOVA LEPERS, 1935

The total numbers of known lepers living in or deriving from Cordova on December 31, 1935, are 117 residents and 17 nonresidents. The total resident population at that time was 6,275. Details concerning these cases are given in Table 3.

Since, as has been said, the entire population of Cordova was not reexamined in 1935, the above figures do not represent the actual total number of cases in the town. There are, however, reasons to believe that there remain undetected few open or easily recognizable closed cases. In addition to the special groups that were particularly examined, we were also able to examine many resident and nonresident people of Cordova coming for consultation to either the Cordova clinic during the survey or the Cebu Skin Dispensary in the interval between the surveys. In fact, it will be recalled that four of the six new open cases came from the group of nonhouse-contacts which was not examined in 1935. Also, two out of twelve new closed cases found among the residents came from this incompletely examined group. Many people of Cordova came voluntarily for consultation, or were brought by their relatives and friends because they were believed to have had skin lesions suspicious of leprosy. For these reasons it is believed that not very many active cases were missed in 1935.

TABLE 3. *Numbers of living Cordova lepers as of December 31, 1935.*

Class and location	Residents	Nonresidents
<i>Positive for Mycobacterium leprae</i>		
(a) At the Culsion Leper Colony.....	32	4
(b) At the Eversley Childs Treatment Station, Cebu.....	15	4
(c) At home.....	5	0
Total, positive cases.....	52	8
<i>Negative for Mycobacterium leprae</i>		
(a) At home paroled (formerly positive).....	11	2
(b) At home incipient.....	54	7
Total, negative cases.....	65	9
TOTAL.....	117	17
Resident population.....	6,275	

Nevertheless, statistically considered, the numbers of cases here recorded cannot be used in determining the true incidence of leprosy for Cordova for the year 1935, and the data are given here merely for record purposes. It is hoped that it will be possible to reexamine the entire population in a few years, so that a real picture of any changes in the incidence of leprosy in the town may be accurately determined.

In the report of Doull, Rodriguez, Guinto, and Plantilla, the proportion of open or previously open (paroled) cases to the closed cases was as 62 to 42. In the present report, the rate stands as 63 to 54 among the residents. It will be noted that the open cases exceeded the closed cases. In contrast, Muir (4) reports that the proportion between the two types in recent surveys in North India averaged 2 bacteriologically positive to 3 negative cases, while Lowe (3) states that the corresponding ratio in areas surveyed under his direction stand as 1 to 3 or 4. The proportion of open to closed cases at Nauru, where the entire native population is examined for leprosy at regular intervals, seems to approach the Cordova ratio more than that for India. According to Clouston (1), up to June, 1936, there were registered 284 infective or open cases and 193 closed ones, although many of the latter are known not to have been registered. It would be interesting to speculate on the possible significance of this ratio; it may be found to have some epidemiological value.

EXAMINATION OF HOUSE CONTACTS

There were examined during the 1935 survey 902 persons who were definitely known to have lived in the same house as a leper in Cordova and who had been considered as being free from leprosy. Of this number, 793 were residents and 109 were nonresidents. This total represents the number of presumably healthy persons who had been exposed to both the primary and the secondary cases in the household. It will be brought out in a subsequent report, however, that only 797 of them had been in contact with the primary cases; 105 of them joined or were born into the exposed families after the primary cases either had been segregated or had died, but they were exposed to secondary cases.

Among the 793 resident contacts reexamined one new open case, eight new closed cases, and five suspects had developed since the 1933 survey, while among the 109 nonresidents examined three closed cases and no positive or suspicious lepers were found.

As already stated, the statistical data regarding these house contacts will be presented in a separate report.

SUMMARY

Doull, Rodriguez, Guinto, and Plantilla, in 1933, carefully examined for leprosy 98.3 percent of the enumerated population of Cordova, a highly infected town of 6,063 inhabitants in the

Province of Cebu, Philippines. They found the incidence to be 17.2 per 1,000 inhabitants, which is high, although many of the cases found were arrested early macular and neural cases.

Two years later the present writers extended the field work thus started. On this occasion the histories of 304 cases of leprosy which had occurred in Cordova from 1878 to 1935 inclusive were carefully investigated. Living house-contacts to these cases were reexamined for leprosy. The lepers of all types found in the first survey were also reexamined and any changes in their condition were noted. Several new cases were found to have developed during the interval of two years elapsing between the two surveys, though it was not possible to reexamine the entire population. The present article covers only the clinical features of the second survey; the epidemiological portion will be given in a separate article.

Whereas 20 of the 45 closed cases recorded in 1933 were clinically active at that time, only 13 of them showed signs of activity in 1935, including one that became bacteriologically positive. There seemed to be a greater tendency to improvement of "closed" lesions among females than among males. Of 18 patients with macular lesions in 1933, nine were males and nine females; of the males, only one was classed as quiescent and one as arrested in 1935, while five of the females had become quiescent.

Of 15 previously positive cases on parole in 1933, two were found to have died and four had relapsed since the first survey.

There were 9 suspicious cases in which a definite diagnosis could not be arrived at in 1933. One was found to be tuberculoid leprosy on biopsy. Of the others, two were classified as "closed" lepers at the 1935 reexamination, three were definitely eliminated as nonlepers, and three were still considered as suspicious.

There were 793 resident house contacts reexamined, and 105 other house contacts, no longer residents, who were examined for the first time. The data relating to these individuals is primarily of epidemiological interest and will be dealt with in a later report.

Six new open cases had developed during the period between the two surveys. Only one came from the group of house contacts; the rest developed among individuals who were not known to have lived in the same house as a leper. One of

the latter had been classified as a quiescent macular case in 1933; the rest either showed no lesions at all or at most only vague manifestations not characteristic of leprosy.

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