

**The Wassermann and Noguchi complement-fixation test in leprosy / by Howard Fox.**

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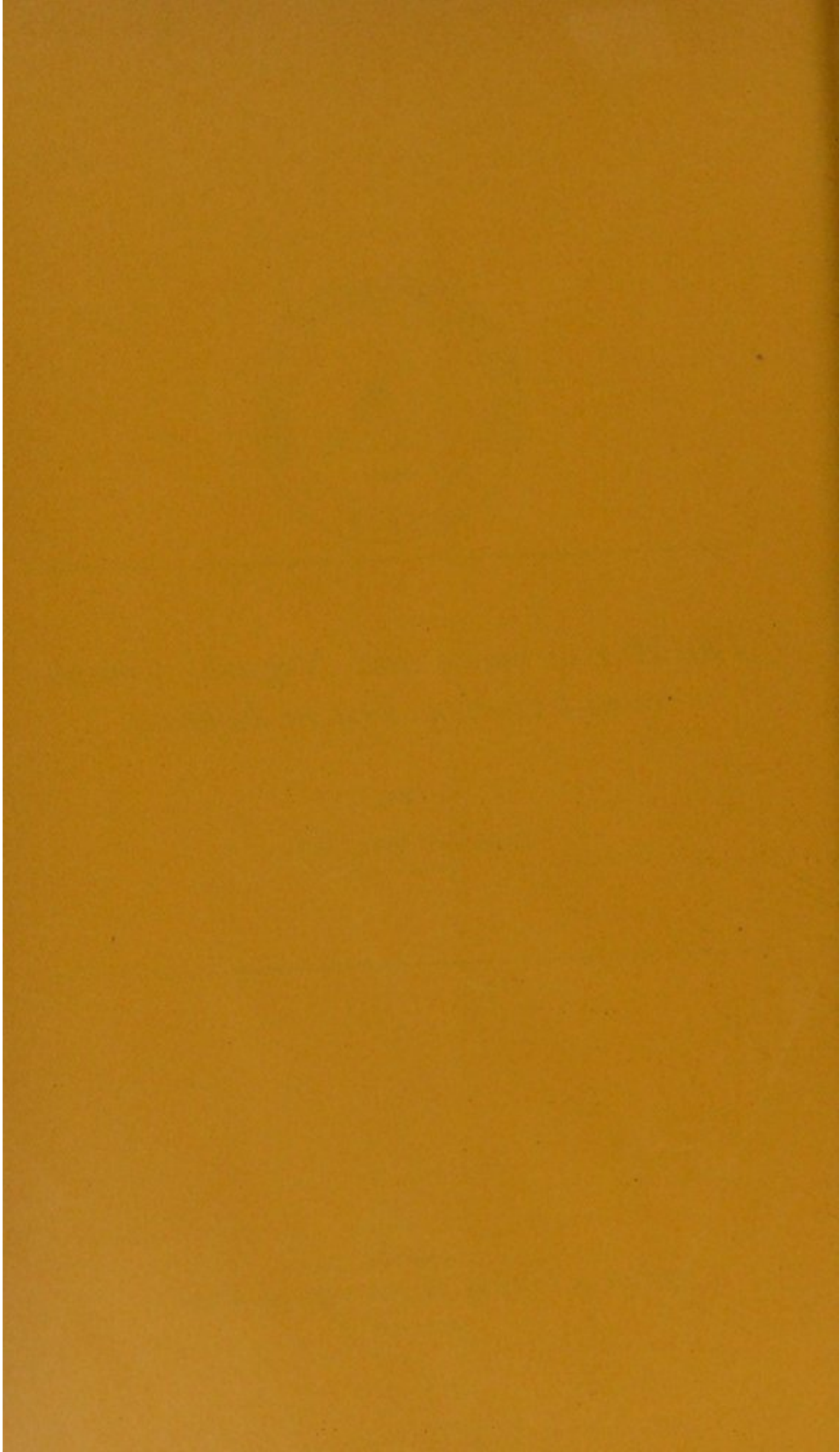
*The Wassermann and Noguchi Complement-Fixation Test in Leprosy.*

BY

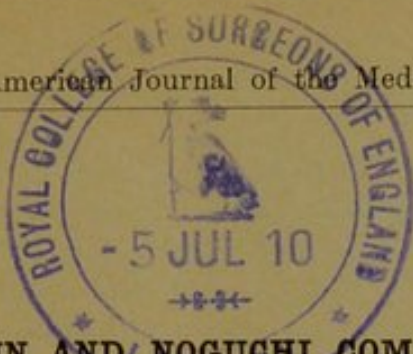
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OF NEW YORK

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## THE WASSERMANN AND NOGUCHI COMPLEMENT-FIXATION TEST IN LEPROSY.<sup>1</sup>

BY HOWARD FOX, M.D.,  
OF NEW YORK.

THE first to obtain a positive Wassermann reaction in a case of leprosy was Eitner<sup>2</sup> in 1906. A similar report was made by Weichselmann and Meier<sup>3</sup> nearly two years later. Since then it has been found by a number of observers that leprosy quite frequently gives a positive reaction. In testing 26 advanced cases of the disease, Slatineanu and Danielopolu<sup>4</sup> found 20 strongly positive, 4 moderately positive, and 2 weakly positive reactions. Jundell, Almkvist, and Sandman,<sup>5</sup> in a series of 26 cases obtained 4 strong and 4 moderately positive reactions. In 2 cases the result was unsatisfactory, while in the remaining 16 cases the reaction was negative. Of the positive cases, 5 were of the tubercular and 3 of the maculo-anesthetic type. From this Sandman concludes that the occurrence of the reaction does not depend upon the type of the disease, whether tubercular or anesthetic. Meier<sup>6</sup> on the other hand in a series of 28 cases, found positive reactions only in the tubercular type of leprosy. All of the anesthetic cases gave negative reactions. The number of cases of each type was unfortunately not stated. Similar results were obtained by Bruck and Gessner<sup>7</sup> who found positive reactions in 5 out of 7 tubercular cases and negative reactions in 3 anesthetic cases. Positive reactions have also been obtained by Gaucher and Abrami<sup>8</sup> in 8 cases and by Frugoni and Pisani<sup>9</sup> in 9 out of 11 cases of leprosy, the type of the disease, however, not being stated.

<sup>1</sup> Read at a meeting of the Medical Society, of the State of New York, January 24, 1910.

<sup>2</sup> Ueber den Nachweis von Antikörpern im Serum eines Leprakranken mittels Komplementablenkung, Wien, klin. Woch., 1906, No. 15, p. 1555.

<sup>3</sup> Wassermannsche Reaktion in einem Falle von Lepra, Deut. med. Woch., 1908, No. 31, p. 1340.

<sup>4</sup> Réaction de fixation avec le sérum et le liquide céphalo-rachidien des malades atteints de lèpre en présence de l'antigène syphilitique. Séances et mém. d. l. Soc. d. biol., 1908, xi, p. 347.

<sup>5</sup> Wassermann's Syphilisreaktion bei Lepra, Zentralbl. f. innere Med., 1908, No. 48, p. 1181.

<sup>6</sup> Zur Technik und klinischen Bedeutung der Wassermannschen Reaktion., Wien, klin. Woch., 1908, No. 51, p. 1765.

<sup>7</sup> Ueber Serumuntersuchungen bei Lepra, Berl. klin. Woch., 1909, No. 13, p. 589.

<sup>8</sup> Le séro-diagnostic des formes atypiques de la lèpre, 1909, viii, p. 152.

<sup>9</sup> Vielfache Bindingseigenenschaften des Komplements einiger Sera (Leprakranken) und ihre Bedeutung, Berl. klin. Woch., 1909, No. 33, p. 1530.



Eitner<sup>10</sup> was also the first to obtain complement-fixation in leprosy, using an extract of leprosy tissue as antigen. Similar results were later reported by Slatineanu and Danielopolu,<sup>11</sup> Gaucher and Abrami Sugai,<sup>12</sup> Pasini,<sup>13</sup> and by Frugoni and Pisani. It was also found by Slatineanu and Danielopolu<sup>14</sup> that complement could be fixed by leprosy serum employing tuberculin as antigen. Complement-fixation in leprosy was also obtained by Frugoni and Pisani by using tuberculin, tubercle bacilli, and extracts of sarcoma and carcinoma as antigen.

It has been my privilege during the past six months to have employed the Wassermann reaction in 60 cases of leprosy. Fifteen of these cases were seen in various clinics and hospitals in New York City. The remaining forty-five were seen during a recent visit to the Leper Home in Louisiana, an institution under the direction of Dr. Isadore Dyer of New Orleans. All of these 15 cases with one exception were tested by both the regular Wassermann and the Noguchi methods, the results in all cases being identical. The cases in Louisiana were tested alone by the more convenient method of Noguchi, owing to lack of time at my disposal. The technique used was the same as that described in some of my previous communications<sup>15</sup> and will be here omitted for the sake of brevity. It may, however be remarked that the antigen used in the Wassermann test was an alcoholic extract of syphilitic liver. The antigen used in the Noguchi<sup>16</sup> test consisted of acetone insoluble lipoids. The patient's serum in the Noguchi method was used in active condition. All of the cases examined were undoubted lepers, many of them having been under observation for years. No history of syphilis was obtainable in any case. Certainly no lesions were seen in any patient that could have been regarded as syphilitic.

To summarize the results, of the 38 cases of the tubercular and mixed type, the reaction was negative in 7, weakly positive in 3, positive in 21, and strongly positive in 7 cases. Of the 22 maculo-anesthetic and purely anesthetic cases, the reaction was negative in 19, strongly positive in 1, and positive in 2 cases.

It may be of interest to add that beside the 15 cases of leprosy

<sup>10</sup> Zur Frage der Anwendung der Komplementbindungsreaktion auf Lepra, Wien. klin. Woch., 1908, No. 20, p. 729.

<sup>11</sup> Sur la présence d'anticorps spécifiques dans le sérum des malades atteints de lèpre, Séances et mém. d. l. Soc. de biol., 1908, xi, p. 309.

<sup>12</sup> Zur klinisch-diagnostischen Verwertung der Komplementbindungs methode bei Lepra. Archiv. f. Dermatol. u. Syph., 1909, p. 313.

<sup>13</sup> Sulla reazione della deviazione del complemento nella lepra. Reviewed in Giorn. Ital. d. Malatt. Vener. e d. pelle, 1909, No. 111.

<sup>14</sup> Réaction de fixation dans la lèpre en employant la tuberculine comme antigène. Séances et mém. d. l. Sec. de Biol., 1908, lxxv, p. 530.

<sup>15</sup> The Principles and Technique of the Wassermann Reaction and its Modifications. Med. Record, 1909, p. 421; a Comparison of the Wassermann and Noguchi Complement Fixation Tests, Jour. Cutan. Dis., 1909, p. 338; The Wassermann Reaction (Noguchi Modification) in Pellagra, New York Med. Jour., 1909, p. 1206.

<sup>16</sup> On Non-specific Complement-fixation, Proceed. Soc. Exper. Biol. and Med., December, 1909.



examined in New York, I have also seen or personally known during the past six months, of 7 other cases (3 of Dr. J. McF. Winfield, and one each of Drs. Wm. B. Trimble, M. B. Parounagian, F. M. Dearborn, and G. H. Fox). It will doubtless seem surprising to some that there should have been so many cases of leprosy in New York City during such a short space of time.

CASES OF TUBERCULAR AND MIXED TYPE WITH POSITIVE REACTION.<sup>17</sup> CASE I.—Patient of Dr. S. Dana Hubbard, service of Dr. Jackson, Vanderbilt Clinic. I. W., West Indian negress, aged thirty-three years. Advanced case of tubercular type. Duration of disease two years. Reaction: strongly positive.

CASE II.—Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. S. V., man, aged forty years, born in Russia. Active fairly advanced case of mixed type. Duration, two years. Reaction: Strongly positive.

CASE III.—Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. P. N., man, aged forty-two years, Italian, Armenian. Advanced case of mixed type. Duration said to be two years. Reaction: Strongly positive.

CASE IV.—Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. S. V., man, aged twenty-seven years, Italian. Very marked active case of tubercular type. Duration, three years. Reaction: Positive.

CASE V.—Patient of Dr. L. Duncan Bulkley, New York Skin and Cancer Hospital. R. R., Russian woman, aged sixty years. Advanced case of mixed type. Duration, ten years. Reaction: Positive.

CASE VI.—Patient of Dr. J. McF. Winfield, Kings County Hospital. C. W., negro, aged twenty-six years, born in United States. Mixed type of moderate severity, of eight years' duration. Reaction: Positive.

CASE VII.—Patient of Dr. J. McF. Winfield, Kings County Hospital. L. M., man, aged about fifty years, Russian. Advanced case of mixed type. Duration, about twenty years. Reaction: Positive.

CASE VIII.—Patient of Dr. F. M. Dearborn, Metropolitan Hospital. P. L., Chinaman, aged thirty-nine years. Advanced active case of mixed type. Duration six years. Reaction: Positive.

CASE IX.—Patient of Dr. Wm. S. Gottheil, City Hospital. Chinaman, aged twenty-nine years. Moderate case of tubercular type, of four years' duration. Reaction: Weakly positive.

CASE X.—Patient of Dr. Wm. S. Gottheil, City Hospital. E. G., man, aged twenty-seven years, born in Russia. Mild case of tubercular type. Duration three and a half years. Reaction: Positive.

<sup>17</sup> Cases not designated by the name of physician and name of clinic where treated, were seen at the Louisiana Leper Home in the service of Dr. Isadore Dyer.



CASE XI.—Patient of Dr. L. Oulman, German Hospital. L. T., woman, aged twenty-four years, born in Russia. Case of mixed type of moderate severity. Duration, nine years. Reaction: Strongly positive.

CASE XII.—Colored woman, aged fifty-seven years, active tubercular case. Duration of disease four years. Reaction: Positive.

CASE XIII.—White woman, aged forty-eight years. Advanced case of mixed type. Duration fourteen years. Reaction: Positive.

CASE XIV.—White woman, aged twenty-seven years. Case of mixed type. Duration, seven years. Patient improving. Reaction: Weakly positive.

CASE XV.—White woman, aged fifty years. Mixed type of the disease in an advanced stage. Reaction: Positive.

CASE XVI.—White woman, aged forty years. Advanced and active case of mixed type. Reaction: Positive.

CASE XVII.—Colored woman, aged fifty years. Advanced case of tubercular type. Duration of disease, three years. Reaction: Positive.

CASE XVIII.—White boy, aged sixteen years. Case of tubercular type. Duration, nine years. Reaction: Positive.

CASE XIX.—White man, aged forty-eight years. Incipient type, in which the disease is active. Duration, five years. Reaction: Strongly positive.

CASE XX.—White man, aged forty-five years. Advanced case of mixed type. Duration, seventeen years. Reaction: Positive.

CASE XXI.—Colored man, aged forty-eight years. Advanced case of mixed type, in which process is stationary. Duration, four years. Reaction: Positive.

CASE XXII.—Colored man, aged thirty-seven years. Active case of tubercular type. Duration, five years. Reaction: Weakly positive.

CASE XXIII.—Colored man, aged fifty years. Advanced case of mixed type. Disease active. Duration, five years. Reaction: Strongly positive.

CASE XXIV.—White boy, aged eighteen years. Terminal case of tubercular type. With active lesions. Duration, twelve years. Reaction: Positive.

CASE XXV.—White boy, aged nineteen years. Advanced case of mixed type. Duration, five years. Reaction: Positive.

CASE XXVI.—White boy, aged sixteen years. Advanced case of mixed type. Duration, four years. Reaction: Positive.

CASE XXVII.—White boy, aged twenty years. Incipient case of mixed type, relapsing after apparent cure. Duration, nine years. Reaction: Strongly positive.

CASE XXVIII.—Colored man, aged forty-two years. Terminal stage of mixed type. Duration, three years. Reaction: Positive.



CASE XXIX.—White woman, aged thirty-five years. Advanced active case of mixed type. Duration, fourteen years. Reaction: Positive.

CASE XXX.—White woman, aged fifty-seven years. Advanced case of mixed type, tubercles having disappeared. Duration, twenty years. Reaction: Positive.

CASE XXXI.—White man, aged forty years. Terminal stage of mixed type. Duration, eight years. Reaction: Positive.

CASES OF TUBERCULAR AND MIXED TYPE WITH NEGATIVE REACTION. CASE XXXII.—Patient of Dr. Wm. S. Gottheil, City Hospital. H. S., man, aged thirty-three years, born in the United States. Case of mixed type of moderate severity. Duration, ten years. Reaction: Negative.

CASE XXXIII.—Patient of Dr. F. M. Dearborn, Metropolitan Hospital. J. M., man, aged fifty years, born in Russian Poland. Case of mixed type. Very few lesions at present, though formerly well marked. Duration of disease not known. Has been in leper ward for the past six years. Reaction: Negative.

CASE XXXIV.—White man, aged twenty-eight years. Mixed type. Patient improving. Duration of disease, eighteen years. Reaction: Negative.

CASE XXXV.—White man, aged twenty-one years. Incipient case of mixed type, which is improving. Duration, six years. Reaction: Negative.

CASE XXXVI.—White man, aged twenty-four years. Advanced case of mixed type. Disease active. Duration, eighteen years. Reaction: Negative.

CASE XXXVII.—Colored man, aged twenty-six years. Terminal case of mixed type. Duration, probably five years. Reaction Negative.

CASE XXXVIII.—White woman, aged forty-three years. Case of mixed type, improving, tubercles having disappeared. Duration, twenty years. Reaction: Negative.

CASES OF MACULO-ANESTHETIC TYPE WITH POSITIVE REACTION. CASE XXXIX.—Patient of Dr. G. H. Fox, New York Skin and Cancer Hospital. T. D., girl, born in Key West, Florida. Maculo-anesthetic case of one year's duration. Reaction: Positive.

CASE XL.—Colored woman, aged sixty-four years. Incipient anesthetic case. Duration three years. Reaction: Strongly positive.

CASE XLI.—Colored woman, aged fifty-nine years. Muculo-anesthetic case, improving. Duration, two years. Reaction: Positive.

CASES OF MACULO-ANESTHETIC TYPE WITH NEGATIVE REACTION. CASE XLII.—Patient of Dr. J. McF. Winfield, Kings County Hospital. J. D., West Indian negro, aged twenty-nine years. Maculo-anesthetic type. Duration, about twenty-three years. Reaction: Negative.



CASE XLIII.—White girl, aged seventeen years. Incipient case of maculo-anesthetic type. Duration, fourteen years. Reaction: Negative.

CASE XLIV.—White woman, aged about sixty years. Anesthetic type in advanced stage. Duration of the disease, unknown. Reaction: Negative.

CASE XLV.—White woman about fifty years of age. Advanced case of anesthetic type. Duration of the disease, unknown. Reaction: Negative.

CASE XLVI.—White woman, aged about fifty years. Incipient maculo-anesthetic case. Duration unknown. Reaction: Negative.

CASE XLVII.—White woman, aged eighty-seven years. Incipient case of maculo-anesthetic type. Duration, five years. Reaction: Negative.

CASE XLVIII.—Colored woman, aged fifty-three years. Advanced anesthetic case. Duration, twenty-seven years. Disease checked. Reaction: Negative.

CASE XLIX.—Colored woman, aged about sixty years. Advanced anesthetic case, the disease being stationary. Duration, fifteen years. Reaction: Negative.

CASE L.—White woman, aged thirty-four years. Maculo-anesthetic case. Former tubercles have disappeared. Duration, eight years. Reaction: Negative.

CASE LI.—White boy, aged nineteen years. Advanced case of anesthetic type. Duration, nine years. Reaction: Negative.

CASE LII.—White man, aged forty years. Maculo-anesthetic type, improving. Duration, fourteen years. Reaction: Negative.

CASE LIII.—White girl, aged twelve years. Incipient case of maculo-anesthetic type. Duration, four years. Reaction: Negative.

CASE LIV.—Colored boy, aged nine years. Incipient case of maculo-anesthetic type. Duration, four years. Reaction: Negative.

CASE LV.—White man, aged forty-three years. Advanced case of anesthetic type. Duration, thirty years. Disease arrested. Reaction: Negative.

CASE LVI.—White man, aged fifty-four years. Incipient case of anesthetic type. Duration ten years. Reaction: Negative.

CASE LVII.—White man, aged fifty-eight years. Terminal case of anesthetic type. Duration, thirty years. Reaction: Negative.

CASE LVIII.—White man, aged fifty-six years. Terminal stage of anesthetic type. Duration, thirty years. Reaction: Negative.

CASE LIX.—Chinaman, aged seventy-five years. Anesthetic case of thirteen years' duration. Reaction: Negative.

CASE LX.—White man, aged forty-six years. Advanced anesthetic case. Patient claims to have been discharged cured from a Norwegian hospital twenty years ago. Duration, twenty-five years. Reaction: Negative.



CONCLUSIONS. 1. A positive Wassermann reaction is frequently obtained in cases of leprosy giving no history or symptoms whatever of syphilis.

2. The reaction is at times very strong, inhibition of hemolysis being complete.

3. The reaction occurs chiefly in the tubercular and mixed forms of the disease, especially in advanced and active cases.

4. In the cases of the maculo-anesthetic and purely trophic type the reaction is generally negative.

5. The value of the test is not affected in the slightest by the results found in leprosy.

In closing, I desire to express my thanks to Dr. Isadore Dyer for kindly putting at my disposal the splendid material of the Louisiana Leper Home. I also wish to thank Dr. Ralph Hopkins, the attending physician to the Leper Home for aid in obtaining case histories. For the material in New York I am indebted to the physicians whose names have been mentioned in the text.



