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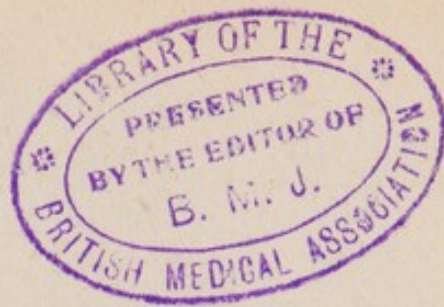


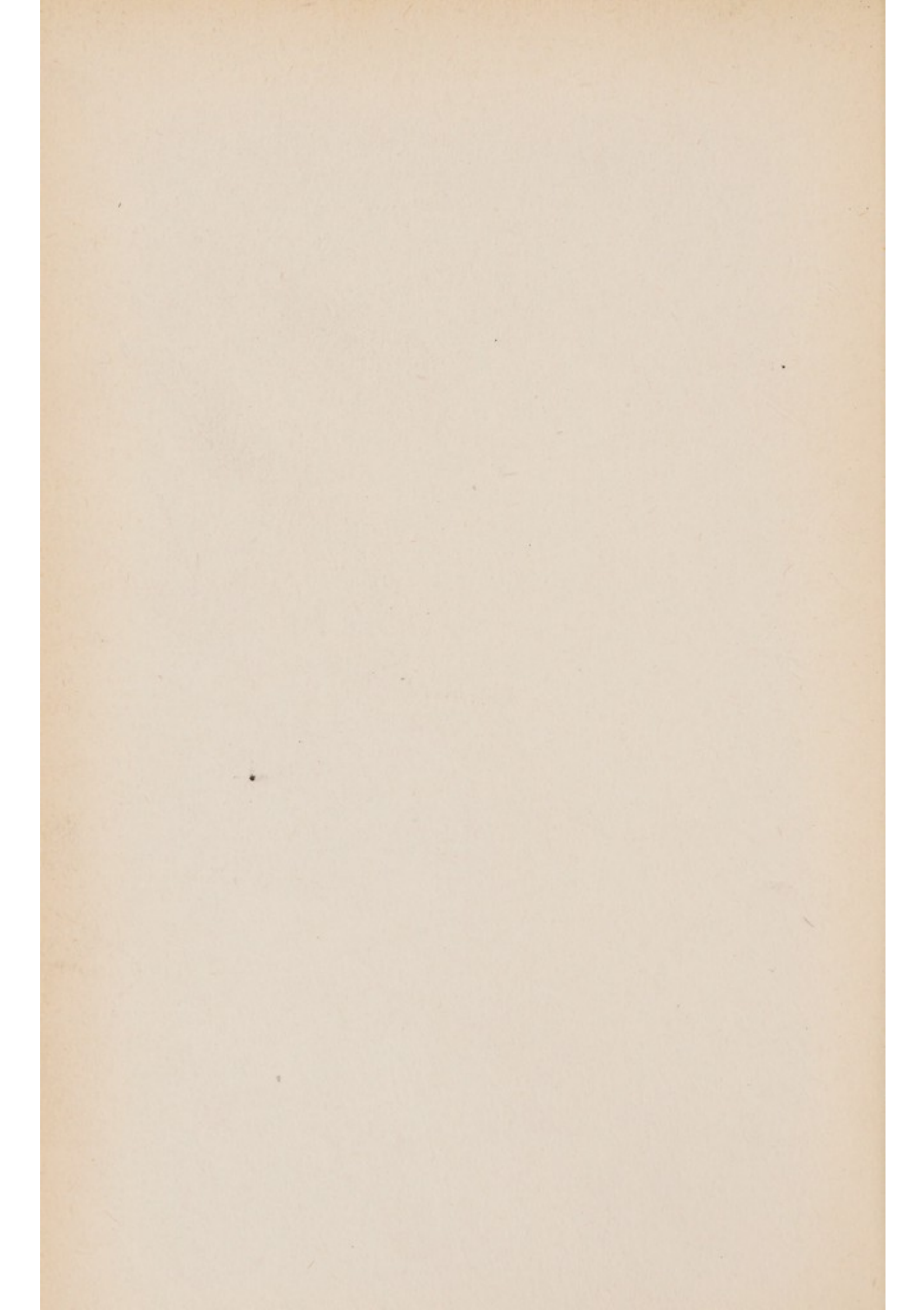
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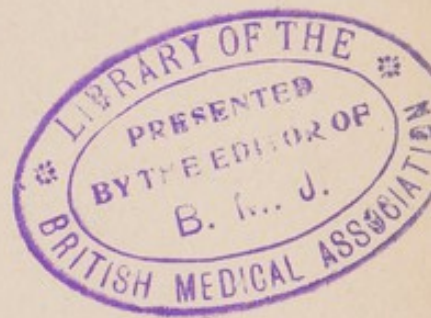






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SYPHILIS AND PUBLIC HEALTH



BY

EDWARD B. VEDDER, A.M., M.D.

LIEUTENANT-COLONEL, MEDICAL CORPS, UNITED STATES ARMY

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UNITED STATES ARMY*



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SYPHILIS AND PUBLIC HEALTH.

INTRODUCTION.

THE importance of this subject cannot be too highly emphasized. Syphilis is one of the most prevalent of all infectious diseases, causes an incalculable amount of suffering and economic loss, and because it has so far eluded sanitary control is a constant menace not only to the licentious but to the clean-living public as well.

Because of the secrecy which has always shrouded the disease we do not know and perhaps never shall know the exact incidence of syphilis, but sufficient is known with regard to its prevalence to justify the above statement. For several years past syphilis has been made a reportable disease by the city of New York. During the fourteen weeks from July 4 to October 3, 1914, 25,633 infectious and contagious diseases were reported. Of these, syphilis stood first on the list, with 6432 cases, or 28 per cent.; tuberculosis second, with 5525 cases, or 21 per cent.; diphtheria third, with 3370 cases, or 13 per cent.; measles fourth, with 2750 cases, or 11 per cent.; scarlet fever fifth, with 1064 cases, or 4 per cent. From this and many other statistics which will be quoted later it would appear that with the exception of gonorrhoea syphilis is the most prevalent of all serious infectious diseases.

If statistics as to the incidence of syphilis are somewhat vague, figures as to the amount of morbidity and mortality caused by syphilis are still more vague. Syphilis appears seldom in death certificates, for the family physician always seeks a more euphonious title to cover the demise. However, if it be remembered that syphilis is the real cause of

death in all cases of paresis, locomotor ataxia and aortic aneurysm, in many cases of cerebral hemorrhage and apoplexy, organic diseases of the heart, liver and kidneys, and that it is a contributory cause of death in a host of other conditions, including, perhaps, one-fifth of all cases of pulmonary tuberculosis, the real influence of syphilis on the mortality rate begins to be suspected.

Osler some time ago made the statement that "of the killing diseases, syphilis comes third or fourth." In a more recent article¹ Osler analyzes the statistics of the Registrar-General for 1915 as follows:

	Total.	Number of syphilitics.
Diseases of the nervous system	58,000	
General paralysis	2,263	2,263
Locomotor ataxia	735	735
Other diseases of the cord	2,846	1,500
Cerebral hemorrhage (apoplexy)	25,423	3,000
Softening of the brain	1,472	500
Paralyses without specified cause	2,983	500
Other diseases of nervous system	15,000	2,000
Diseases of the vascular system:		
Aneurysm and aortitis	1,141	1,000
Organic disease of heart	56,000	5,000
Diseases of arteries	10,000	3,000
Total		19,498

Including stillbirths, deaths of infants under one month and other syphilitic conditions, Osler estimated that the actual deaths from syphilis were above 60,000, a number which moves syphilis from the tenth place in the Registrar-General's report to the place at which it belongs, *at the top*, an easy first among the infections.

Downing² illustrates this fact with the vital statistics for Massachusetts for 1912. According to the records the *Treponema pallidum* is only responsible for 113 deaths; but of the 3188 stillbirths, half may be accredited to syphilis; 231 died of general paralysis and 87 of tabes. One-half of the 372 cases called paralysis without cause may be accredited to syphilis and nearly all of the 56 recorded as softening of the brain. One-tenth of the 3496 who died of cerebral hemorrhage were probably syphilitic, for nearly 500 of these cases

were between the ages of twenty and fifty. It may also be estimated that one-tenth of the 1979 cases under the heading of diseases of the arteries, not to mention some of the 4610 organic diseases of the heart, a few of the 388 cirrhoses and other diseases of the liver and a few of the 478 suicides may be accredited to syphilis. In round numbers and counting the stillbirths, Downing estimates the mortality from syphilis at 3000, or about 1 in every 18 deaths, making its record of fatality fall behind only tuberculosis, pneumonia and cancer. This estimate is none too high. Salmon finds that general paralysis in New York State stands eighth in the mortality tables and that 1 out of every 9 male deaths between forty and sixty is from general paralysis. According to Lenz,³ in the large cities 25 per cent. of syphilitics die as the result of aortitis (angina pectoris, aortic insufficiency, aneurysm), while 3 or 4 per cent. die from general paralysis, 1 or 2 per cent. from tabes and at least 10 per cent. more as the result of syphilitic diseases of the brain, liver and kidneys. Almost half of all syphilitics eventually succumb as the result of their infection. Syphilis is therefore the greatest cause of death of men in the large cities.

Brooks⁴ states that 66 per cent. of his luetic diseases die from or with serious circulatory diseases apparently of syphilitic origin. Stengel and Austin⁵ discuss syphilis as the etiological factor in certain cases of nephritis. Out of 84 cases of nephritis there were 66 in which possible etiological factors such as lead, alcohol, excessive work, exposure, senility, etc., could be recognized. But in 18 cases no such factors could be determined. Of these 18 cases there existed in 8 either an unquestionable history of syphilis or a positive Wassermann, or both. In 6 of the remainder no Wassermann was secured while in only 4 was syphilis definitely excluded. The nephritis occurring in early secondary syphilis is well known. It seems probable that syphilis, together with mercurial treatment, may be responsible for a considerable number of the cases of nephritis of unknown causation, and that here again the influence of syphilis on the death-rate must be taken into consideration. An estimate of the annual mortality caused by syphilis in Paris is given in the following

table compiled, by Leredde,⁶ from the mortality statistics for the year 1910.

	Men.	Women.	Total.	Syphilis.
Syphilis	70	41	111	111
Cancer and malignant tumors of the buccal cavity	93	13	106	80
Affections of the nervous system:				
General paralysis	133	55	188	188
Ataxia	40	26	66	66
Encephalitis	28	15	43	4
Meningitis (except tuberculous)	439	350	789	78
Paralysis without a determined cause	240	323	563	138
Diseases of the spinal cord (ataxia excepted)	49	52	101	33
Epilepsy	31	30	61	6
Cerebral hemorrhage (apoplexy)	1142	1161	2303	768
Softening of the brain	109	134	243	81
Different diseases of the nervous system	39	37	76	25
Diseases of the circulatory apparatus:				
Organic maladies of the heart	1526	1807	3333	1111
Angina pectoris	87	39	126	96
Arterial disease, aneurysm, atheroma, etc.	173	72	245	122
Diseases of the digestive apparatus:				
Cirrhoses of the liver	374	225	629	125
Diseases of the urinary apparatus:				
Nephritis, acute	26	22	48	4
Bright's disease	858	642	1500	300
Diseases of the bones (tuberculosis excepted)	26	18	44	4
Sudden death	139	107	246	24
Total deaths attributable to syphilis				3364

Further, Leredde estimates that syphilis probably kills 25,000 persons each year in France.

An idea as to the amount of morbidity and mortality caused by syphilis may also be obtained by observing known syphilitics for a number of years. This has been done by Mattauschek and Pilcz,⁷ who found that of 4134 officers of the Austrian army who contracted syphilis between the years 1800–1900, on January 1, 1912:

- 198 have general paralysis.
- 113 have locomotor ataxia.
- 132 have cerebrospinal syphilis.

80 suffer from different psychoses.

17 died of aneurysm.

147 died of tuberculosis.

20 died with syphilis designated as the cause.

101 developed myocarditis and arteriosclerosis and all but 15 died from this condition.

Thus if we count general paralysis, tabes, cerebrospinal syphilis, malignant and inveterate syphilis, aortic aneurysm and arteriosclerotic conditions which are undoubtedly dependent on syphilis we find that 12 per cent. of these luetics died as the direct result of their infection. In addition there are 2.64 per cent. who apparently die as the result of syphilis if we count the cases in which the relation between syphilis and the arteriosclerosis was probable. Finally, if we consider the large number of cases of tuberculosis that are secondary to syphilis we are then able to consider the importance of syphilis to society. The actuaries of a German life insurance company estimate that the mortality of luetics is 130 to 100 for normal individuals, and in the 36- to 50-year period the average mortality in syphilitics is doubled.

Finally, we have the life insurance statistics compiled in the United States. Schroeder⁸ states that the Medico-Actuarial Mortality Investigation has recently completed a study of the experience of the companies represented, the expected deaths being calculated by the medico-actuarial table based on standard lives during the years 1885-1908 inclusive. These cases are divided into three groups and only include those in which the attack occurred at least three years prior to the date of the application except group three.

SYPHILIS, SURELY, THOROUGHLY TREATED, TWO YEARS'
CONTINUOUS TREATMENT AND ONE YEAR FREEDOM
FROM SYMPTOMS.

	Actual deaths.	Expected deaths.	Ratio of actual to expected deaths, per cent.
Between 2 and 5 years of application	13	9.32	139
Between 5 and 10 years of application	34	19.56	174
More than 10 years prior to applica- tion	53	24.42	217
	100	53.30	188

SYPHILIS, SURELY, NOT THOROUGHLY TREATED OR NO DETAILS
OF TREATMENT GIVEN.

	Actual deaths.	Expected deaths.	Ratio of actual to expected deaths, per cent.
Between 2 and 5 years of application	44	15.52	284
Between 5 and 10 years of application	54	25.52	212
More than 10 years prior to applica- tion	76	59.09	129
	<hr/> 174	<hr/> 100.13	<hr/> 174

SYPHILIS, DOUBTFUL.

	Actual deaths.	Expected deaths.	Ratio of actual to expected deaths, per cent.
More than 2 years prior to application	67	48.81	137

Hamill⁹ also says that syphilitics as a class are a poor risk. Thirty-four American companies have issued policies on cases that were believed to be cured. That is, they were only insured after great care had been exercised to eliminate all doubtful cures in so far as such elimination was possible and after the lapse of sufficient time to warrant the belief that cures had been effectual. This class has been under observation for thirty years. The result is unsatisfactory, for the mortality was 133 per cent. That is, where 100 deaths were expected 133 occurred.

It must be remembered in considering insurance figures that the possibility of an antecedent syphilitic infection cannot be excluded, and indeed undoubtedly occurs often among the presumably normal class on whom the expectancy is based. This fact emphasizes the increased mortality observed among known syphilitics and the potentialities of syphilis as a killing disease. More and more syphilis has come to be recognized as a very fatal disease, and this fact adds greatly to its importance from a public health standpoint. A disease would not become a sanitary menace, even if it were very prevalent, if only it were innocuous, but when it is both very prevalent and very fatal, its influence on the mortality becomes of the greatest importance to the sanitarian. Fisk¹⁰ has pointed out that while the death-rate

from the usual infectious diseases has steadily declined during the past three decades the death-rates for apoplexy, kidney diseases and heart and circulatory disturbances have steadily increased. This increase has been so marked that in 1912 the death-rate for organic heart disease exceeded the rate for all forms of tuberculosis. The death-rate during the early years of life is being decreased, but it is increasing during the period beyond forty years of age. Is not the influence of the syphilitic infection that pervades society observable here?

The danger of syphilis to the general public has been investigated by Blaisdell¹¹ who selected 60 cases in the early stages of the disease as they presented themselves in the skin department of the Boston dispensary. Blaisdell found that between the time of their infection to the time of their first appearance in the clinic for treatment these 60 cases exposed 34 people to the disease by coitus, 442 through family or boarding-house life and 651 by occupational association, or 1227 people in all. Of the 476 people so exposed by coitus or family life, 5 were definitely ascertained to have become infected, 4 through intercourse and 1 by being kissed by the mother, while of the remaining exposed persons no definite information was obtainable. It may be assumed that these 60 cases of fresh, untreated syphilis are the direct result of 60 other definitely active foci of infection in the community. Of these 60 foci only 2 were brought under medical control as the result of investigation of the source of infection.

The danger of syphilis to the community or individual is increased in proportion to the inadequacy of the treatment received by those suffering with the disease. A careful investigation of this portion of the clinic was made in order to find out how effectively patients follow their doctor's advice. Seventy per cent. of the patients made less than five visits, a number insufficient in most cases to relieve even the symptoms for which they entered the clinic. Only 9 per cent. came more than eight times. The menace to the public in this situation is sufficiently clear.

Facts such as these indicate that a careful consideration of syphilis in its relation to public health should be of value.

In considering the sanitary measures to be taken against a disease such as syphilis, whose immediate cause is known, the important factors to be discussed are (1) the incidence of the disease; (2) accurate information as to the various methods of transmission; (3) the practicability of the various methods that may be suggested for preventing this transmission.

An endeavor has therefore been made in this work to collect as much information as possible with regard to the prevalence of syphilis, more particularly in the United States, both by searching the literature and by original investigation.

The methods by which syphilis is transmitted are pretty thoroughly understood, and it has therefore been possible to collect a considerable amount of information on this point, including the proportion of genital and extragenital syphilis and the method of transmission in syphilis insontium.

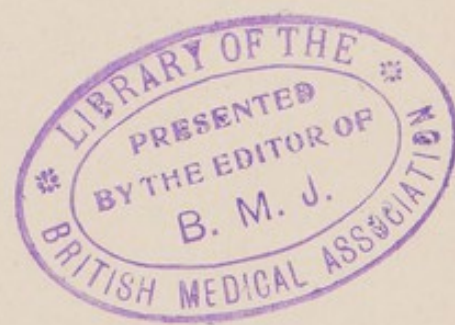
The methods that may be taken to reduce the prevalence of syphilis have been considered under the heads of personal prophylaxis, or those measures that any individual may take on his own initiative, and public health measures or sanitary regulations that can only be enforced by the community by statute or through the activity of the public health officer. The latter has necessitated a partial discussion of the old subject of prostitution. It would at first hardly seem as if anything new could be said on a theme that has been worn almost threadbare, but the Wassermann reaction and the use of salvarsan throw a new light on all phases of the subject of syphilis. The possibility of controlling the amount of syphilis acquired, whether by prostitution or general immorality, by means of enforced systematic treatment, has not yet been given the serious consideration that the subject merits.

The importance of the subject justifies its discussion. The writer has never had experience in public health work in civil communities, but has had opportunities for studying the subject in the army, which may fairly be called exceptional, in that they include a long period of actual service with troops both in the field and in garrison, followed by four years of continuous experience with the laboratory side of the problem, during which time the facilities afforded by the library of the Surgeon-General have been readily accessible.

Hence, while the results of this investigation are presented with, it is hoped, due modesty the writer has the temerity to believe that they may have some value.

REFERENCES.

1. Osler: The Campaign Against Syphilis, *Lancet*, 1917, i, 789.
2. Downing: Syphilis and Lung Disease, *Boston Med. and Surg. Jour.*, 1915, clxxii, 898.
3. Lenz: Ueber die Häufigkeit der Syphilitischen Sklerose der Aorta relativ zur gewöhnlichen Athero-sklerose und zur Syphilis überhaupt, *Med. Klinik*, 1913, ix, 955.
4. Brooks: The Heart in Syphilis, *Am. Jour. Med. Sc.*, 1913, cxlvi, 513.
5. Stengel and Austin: Syphilitic Nephritis, *Am. Jour. Med. Sc.*, 1915, cxlix, 12.
6. Leredde: Étude sur la Mortalité due à la Syphilis, *Revue générale de clin. et de thérapeutique*, 1913, xxvii, 611.
7. Mattauschek and Pilcz: Ueber die Weiteren Schicksale 4134 Katamenisch verfolgter Fälle luetischer Infection, *Med. Klinik*, 1913, ix, 1544. See also Waldvogel and Süssenguth: Die Folgen der Lues, *Berl. klin. Wchnschr.*, 1908, xlv, 1213.
8. Schroeder: Syphilis in Relation to Life Insurance, *Med. Record*, 1914, lxxxv, 691. See also Solomonson: Syphilis Mortality, *Med. Exam. and Practitioner*, 1905, xv, 605.
9. Hamill: Syphilis from a Life Insurance Stand-point, *Am. Jour. Dermat. and Gen.-urin. Dis.*, 1909, xiii, 144.
10. Fisk: Increasing Mortality in the United States, *New York Med. Jour.*, 1916, ciii, 97.
11. Blaisdell: The Menace of Syphilis to the Clean-living Public, *Boston Med. and Surg. Jour.*, 1915, clxxii, 476.



CHAPTER I.

THE PREVALENCE OF SYPHILIS.

It is specially important to obtain accurate knowledge with regard to the prevalence and distribution of syphilis if any attempt is to be made to control the disease. Such information is necessary not only to enable public health officials to adopt appropriate measures, but especially to enlist the support of public opinion, without which no measures can be effective. McIlroy¹ in referring to the recent investigation of the British Royal Commission into the prevalence of venereal diseases in Great Britain, said: "One could almost have wished that the Royal Commission had not been appointed until some time later, when, as the result of further investigation, the evidence of the prevalence of venereal diseases more especially among the poorer classes, would have been so overwhelming that the public itself would have awakened to a sense of the dangers and the necessity for some measures of reform." It will be the object of this chapter to make some attempt toward supplying this need.

A great many estimates or guesses have been made as to the prevalence of syphilis in different countries. Most of these are of little present value for several reasons. Many estimates have been based entirely upon the number of known cases appearing for treatment, and are therefore undoubtedly underestimates. There is no certainty that the figures obtained in another country will apply to our own, and, finally, in most cases an attempt has been made to estimate the prevalence of syphilis in the community as a whole. Now, society is not homogeneous, but consists of numerous strata or classes, and each class is composed of males and females of all different ages. The incidence of disease is

known to vary considerably in different classes, and because of its peculiar manner of spread, syphilis varies more in the different classes, races, sexes and ages than most other diseases. If 20 per cent. of the males and 1 per cent. of the females of a certain class are infected with syphilis we obviously create an erroneous impression when we state that 11 per cent. of the community are syphilitic, for this rate is ten times too high for the women and only about half the incidence among the men, and, moreover, the figures for another class of the population would be totally different.

Incidence in Different Groups of the Population. — Dr. Stevenson (synopsis of the final report of the Royal Commission on Venereal Diseases) has tabulated all deaths from syphilis and sequential diseases in eight groups as follows:

Class.	Social status.	Death-rate.	Order.
1	Upper and middle	302	III
2	Between 1 and 3	280	IV
3	Skilled labor	264	V
4	Between 3 and 5	304	II
5	Unskilled labor	429	I
6	Textile workers	186	VI
7	Miners	177	VII
8	Agricultural laborers	108	VIII

In this classification the chief points shown are: (a) the high incidence in classes 5, 4, 1 and the lower incidence in 8, 7, 6; (b) unskilled labor was highest on all counts except locomotor ataxia, in which it was the second highest. The upper classes were second in general paralysis of the insane and aneurysm, the highest in locomotor ataxia and the third in total deaths from syphilis. If these figures are correct it follows that syphilis is the most frequent in the highest and lowest social classes while agricultural laborers are relatively free. Such statistics, which are based on deaths alone, however suggestive, cannot be accepted without reservation. The poor naturally tend to die in institutions where the diagnosis is more apt to be correct, and in any case the deaths are only one index of the prevalence of syphilis, though other things being equal it should be a correct index.

Such figures, however, bear out the statement that a detailed study of the various social groups must be made before we will have accurate information as to the distribution of syphilis in the community.

While it is obviously impossible at present to obtain satisfactory evidence with regard to the incidence of syphilis in all these various component parts of the population of the United States, an attempt has been made to present such data as are obtainable in the literature, and in addition the writer has been engaged for the past four years in making a series of Wassermann surveys of certain groups of the population.

There may be a question in the minds of some as to the value of such surveys. A single positive Wassermann reaction in the absence of clinical evidence does not prove that the patient is syphilitic, and if the same examination is applied to thousands instead of to individuals, will not the error be multiplied? I do not think so. The error in this reaction as I have used it is apparently less than 1 per cent.: that is, of all double plus reactions that could be investigated less than 1 per cent. were presumably non-syphilitic. While it is most important to consider this error from the standpoint of the individual patient, it is not a matter of importance in estimating the percentage of syphilis in a certain group by means of this test. However, throughout the discussion, a distinction is maintained between estimates made by various authorities and the actual facts as obtained by statistical or scientific investigation. It is important to note that in forming conclusions as to the prevalence of syphilis both the reliability of the investigator and the thoroughness of the examination must be taken into account.* The percentage is always higher the more thorough the examination is made. A clinical examination combined with a Wassermann test always shows a greater number of syphilitics than is detected by either test alone. This fact indicates that the estimates based on the Wassermann reaction alone are probably conservative. The highest and probably the

* The Wassermann reaction used by the writer in his investigations is described in the appendix, p. 265.

most accurate figures have been obtained as the result of certain postmortem observations, of which, unfortunately, there are only too few.

STATISTICS FROM OTHER COUNTRIES.

While the main purpose is to deal with the prevalence of syphilis in the United States a few observations from other countries may be of value as a basis of comparison.

Russia.—According to Scheuer,² syphilis is widespread in Russia, where from 50 to 60 per cent. of the cases are due to extragenital infection, and the disease has practically lost its characteristics as a sexual disease and has become a contagious family disease. Sandberg³ has described remote villages in the District of Koslow where almost the whole population, old and young, were infected with syphilis, and where hardly a house could be found in which there was not some person infected. The peasants live herded together in great poverty and filth, of which some conception may be obtained by the statement that from twenty to thirty men may live in a house hardly 18 feet square. Sandberg concludes that 20.6 per cent. of all ambulatory patients were treated for syphilis, but that the actual percentage of syphilis must be much higher than this which represents only those in the active stages of the disease. In some villages the syphilization of the entire population has been accomplished, and the disease is equally distributed among men, women and children, most of the infections being extragenital. Scheuer also states that Generopitorozeff* described the epidemic of syphilis in the Parafiew District of the Government of Tschernigow. This consisted of six villages, with a population of 9500, in which, according to accurate lists, only about 5 per cent. of the people are not syphilitic; 66.1 per cent. of the cases were hereditary, 17.3 per cent. were infected by close contact, 11.9 per cent. in unknown ways and only 4.7 per cent. were infected by sexual contact. In such places syphilis ruins the people physically

* Wratch, 1901, No. 38.

and mentally, and is the greatest hygienic problem of the Russian peasant life.

Naturally, these are "horrible examples," and the incidence of syphilis in Russia as a whole can be nothing like so high. Accurate figures as to the prevalence cannot be obtained, but that it is a great sanitary problem throughout Russia may be gathered from the following statistics published by Rabinowitsch.⁴ These figures are claimed to give the number of syphilitic patients treated in hospitals and dispensaries, and can therefore represent only a small proportion of the actual number of infections. Thus in the United States army we have found that an admission rate of 3 per cent. usually indicates a percentage of infection ranging between 15 and 20.

Year.	Number of cases of syphilis.	Percentage from cities.	Percentage from country.
1900	936,985	?	?
1901	961,628	?	?
1902	1,007,429	?	?
1903	1,054,387	29.1	70.9
1904	999,869	31.8	68.2
1905	998,965	31.0	69.0
1906	1,098,366	32.0	68.0
1907	1,100,944	33.0	67.0
1908	1,181,647	34.0	66.0
1909	1,199,148	33.0	67.0
1910	1,214,915	33.0	67.0

Feldhusen⁵ has translated the paper of Tschlenoff, who conducted a questionnaire with regard to the sexual life of the students in Moskow. According to the answers received, 67 per cent. had had sexual relations before their entrance in the university; 7 per cent. were married. Of the total number of answers received from 2150 students, 69 per cent. acknowledged sexual intercourse outside the marriage relation. Half of these commenced between the ages of fourteen and seventeen years, the majority or 22 per cent. having had their first intercourse in the sixteenth year; 41 per cent. of the first exposures were with prostitutes, 39 per cent. with servant girls and 10 per cent. with married women.

In regard to venereal diseases, 523, or 25.3 per cent., acknowledged infection. 19.6 per cent. of the students had

had gonorrhoea; 3 per cent. had had chancroid, and 2.7 per cent. acknowledged syphilis.

Favre⁶ also sent a questionnaire to the students of the University and higher technical schools at Charkow. The replies were anonymous and 1298 answers were received. These indicated that 67 per cent. of these students had had sexual intercourse before entering the University. In the majority of cases the first step was taken at seventeen years and more or less regular sexual indulgence began about two years later. The incidence of venereal diseases was high, 47.2 per cent. suffering from gonorrhoea; 10.8 per cent. from chancroid, and 6.9 per cent. from syphilis.

Such figures can make little pretence toward scientific accuracy, but at least give some indication of the extent of venereal infections, including syphilis, and throw some light on the early age at which many such infections are acquired. The evidence indicates that the majority of infections in the United States are acquired somewhat later in life, namely, from twenty to twenty-five years of age.

Serbia.—Syphilis has been demonstrated throughout the whole of Serbia. Statistics completed in the years 1898 and 1899 show a proportion of 2.6 cases per thousand during the first year and 2.43 during the second year. The incidence is higher among the women, namely, 2.93 per thousand. These actual cases of the disease probably indicate an incidence of the disease of from 5 to 10 per cent. of the population, since only clinical cases were recorded. It is stated that infection by the genital route is comparatively infrequent and that extragenital infection is common.⁷

Asia Minor.—An article by von Düring-Pascha⁸ indicates that conditions in Turkey and Asia Minor are very similar to those already described in Russia. Hereditary syphilis is much more widespread than the sexually acquired type, and in all places except the cities, prostitution is of minor importance. The disease is spread largely through close association and uncleanness combined with ignorance of the danger of extragenital infection. The natives drink from vessels with a sharp spout and pass the water pipe and cigarettes from mouth to mouth with sublime carelessness. In one village

that was investigated, out of 2500 inhabitants, 495, or 19.8 per cent., were found to suffer with obvious lesions of syphilis. A Wassermann reaction would probably have shown the entire population to be syphilitic. The general distribution of the actual cases is shown in the following table:

OVER TWELVE YEARS OF AGE.			
	Men.	Women.	Total.
Early symptoms	47	52	99
Late symptoms	109	135	244
	—	—	—
Total	156	187	343

UNDER TWELVE YEARS OF AGE.			
	Boys.	Girls.	Total.
Early symptoms	66	61	127
Late symptoms	16	9	25
	—	—	—
Total	82	70	152
	—	—	—
Grand total			495

The same conditions may very possibly occur throughout a large part of Asia.⁹ Jefferys and Maxwell¹⁰ state that "syphilis is met with from one end of China to the other, though mild in type." This mildness may be an illusion owing to the fact that many of the more serious conditions may never be seen by a foreign practitioner. The authors state, however, that late lesions are most commonly seen. No attempt to determine the prevalence of the disease by Wassermann surveys or intensive observation appears to have been made.

The Tropics.—According to Scheube¹¹ syphilis is widespread over almost all tropical regions, and there are only a very few places in the heart of Africa, New Guinea and the interior of a few islands where the disease has not penetrated. He states that it is undeniable that the bearers of civilization have also always introduced syphilis. After its introduction the disease often spreads through extragenital methods of transmission, owing to the lack of clothes and close and insanitary contact; and as the disease is almost never treated, it is probable that whole races become thoroughly syphilized much faster than they become civilized.

It is unfortunate that no systematic investigation into the prevalence of syphilis among the natives of the Philippines has been made. It is known, however, that the disease is exceedingly common, and the rates for syphilis among soldiers have always been much higher in the Philippines than in the United States. This is undoubtedly partly due to the relaxation of morals that follows when men are shipped "east of the Suez where there aint no ten commandments;" but this is not the entire explanation. Outside of some of the larger cities there are no regular prostitutes, but all the native women are free and easy with the whites. It follows, therefore, that syphilis is very common.

Baermann¹² used the Wassermann reaction in order to determine the prevalence of syphilis among the laborers in Sumatra. The laboring colony consists of about 8000 (1000 Chinese, 4000 Javanese men and 3000 Javanese women). The laborers are given an examination twice yearly to detect syphilis, and the average hospital admissions for this disease, following three different examinations, was 4.5 per cent., 3.7 per cent., and 2.5 per cent. The falling rate is explained as the result of consistent treatment. The Wassermann reaction was performed on 900 sera from contract laborers who appeared healthy and had no manifest syphilis or yaws, with the following result:

	Positives in percentage.	
	Men.	Women.
Javanese laborers who had been in Sumatra several years	17	22
Laborers recently arrived from Java	16	20
Chinese	25	

Since the Wassermann reaction is only positive in about 50 per cent. of latent syphilis, Baermann suggests that to ascertain the prevalence of syphilis in this group the figures should be multiplied by two. According to this estimate, 34 per cent. of the older Javanese laborers suffer from syphilis, while 44 per cent. of the women are infected; and among recently arrived Javanese laborers the males suffer from syphilis in 32 per cent. and the females in 40 per cent. The Chinese males were estimated at from 50 to 60 per cent. These estimates may be taken for what they are worth, but

the results of the Wassermann reaction on this group of 900 apparently healthy natives are certainly below the actual prevalence of the disease. At least the 4.5 per cent. of those known to be infected must be added to obtain a correct idea of the incidence of the disease.

Conditions are probably not much better in the tropical regions of America. Rothschild¹³ stated, in 1901, that he was well within the limits of safety when he estimated that 70 per cent. of the male population of Nicaragua were syphilitic, while about 50 per cent. of the women were infected.

Africa.—Schroedter¹⁴ observed syphilis among the natives of Southwest Africa. He states that Livingstone found a tribe in the interior of Africa that was entirely free from syphilis. Along the coast where contact with whites has occurred, syphilis is universal. No exact statistics as to prevalence are given, but the statement is made that the relative prevalence between the men and the women is 1 to 10. The reason is that the women, whether married or single, practically all have intercourse with the whites. It is a noteworthy fact that whenever women are promiscuous, they suffer from syphilis to a greater extent than the males who may not be much more virtuous. This is undoubtedly because a promiscuous woman will have intercourse with a number of males much greater than the number of women with whom a promiscuous man has relations, so that the female is much more liable to infection. This fact explains the higher incidence of syphilis among the negro women in the United States.

Broc¹⁶ made some observations concerning syphilis among the inhabitants of Tunis, and says that it is excessively prevalent, certain physicians believing that it attacks more than two-thirds of the population. Of 8000 new cases presenting themselves in his clinic for all conditions, he saw only 9 chancres but more than 500 cases of clear secondary or tertiary lesions. Thus, 6.3 per cent. of all his cases had clinical manifestations of the disease. He comments on the mild course of the disease among the natives.

Brock¹⁵ made a clinical examination of 7660 consecutive natives in Basutoland and comes to the conclusion that

nearly 80 per cent. of these natives have detectable manifestations of syphilis; 68 per cent. of the natives have an indurated enlargement of the epitrochlear glands.

Sicard and Levy-Valesi¹⁷ say that it is a matter of general knowledge that syphilis is exceedingly common among the Arabs and that it is usually benign in its manifestations. They performed a Wassermann reaction on 30 wounded Arabs in a military hospital. These men were between twenty and thirty-five years of age and none of them suffered from manifest lesions of the disease. Of these 30 cases, 6, or 20 per cent., were positive; 2 gave a partial reaction and 22 were negative.

Ringebach and Guyomarch¹⁸ examined some 4000 people in the French Congo, and found 4 per cent. of obvious tertiary lesions. As this is necessarily only a small amount of the actual syphilitic infection that must be present, they come to the conclusion that the disease is widespread and common.

Turning now to countries where conditions are more nearly like those in the United States a few references may be presented from each of the following countries:

Germany.—Blaschko,¹⁹ in 1892, estimated that for the previous fifteen years there was a yearly incidence of 5000 fresh cases of syphilis to an average population of 1,270,000, or about 4 per cent., and concluded that at least 10 to 12 per cent. of the adult population either have or have had syphilis. If there were 4 per cent. of fresh cases annually this is evidently a very conservative estimate. Blaschko also gives the following figures for the troops of the Berlin garrison:

Year.	All venereal diseases, per cent.	Syphilis, per cent.
73 to 78	56.3	11.3
78 to 83	51.8	9.8
83 to 88	36.8	7.8

Lenz²⁰ stated in 1910 that of all the men who died in Berlin in the year 1900 hardly 10 per cent. were free from syphilis, and that in the whole of Prussia at least 22 per cent. of the adult males contract syphilis at some time during their life.

Pinkus²¹ wrote in 1912 that, "Roughly speaking, one may say that most German men have had gonorrhoea and about 1 in 5 syphilis." Erb found that out of 10,000 cases of all varieties of disease in his practice, 21 per cent. had syphilis, and he believed that 12 per cent. of the adult population of Berlin were infected. These are all estimates of more or less significance. The following studies may also be quoted:

Heller,²² in 1909, presented collected statistics as to the prevalence of hereditary syphilis in Berlin. Thus he quotes Neumann and Oberwarth, who investigated 62,221 children treated during fifteen years and found 1.4 per cent. of hereditary syphilis among the legitimate and 2.53 per cent. among the illegitimate. Taking only nursing children during 1904, 2.81 per cent. of legitimate and 3.43 per cent. of illegitimate babies were syphilitic. The figures from the Children's Polyklinik were lower. From 1872 to 1882, of 28,000 children, 254, or 0.9 per cent., were syphilitic. Von Cassel in another series of 17,448 nursing children found 207, or 1.18 per cent., to be syphilitic. When one considers that the Wassermann reaction was not yet in use and that this represents merely the obvious syphilis, some idea may be formed not only as to the amount of hereditary syphilis in Berlin, but also as to the amount of syphilis among the adult population which must have been many times higher. Epstein,²³ in 1913, examined 236 nursing children in an institution during the first weeks of their life. The Wassermann reaction was used in all cases, and 8, or 3.3 per cent., were shown to be luetic.

Kürner²⁴ applied the Wassermann reaction to the weak-minded, with the intention of obtaining some information as to the prevalence of syphilis in the community at large. The investigation was limited to inmates under forty years of age in the Institution for the Weak-minded in Würtemberg; 1244 patients were investigated, of whom 119, or 9.6 per cent., gave a positive reaction; 88 of the positives gave a history, and it was found that 63 of them came from cities while 25 came from the country. This indicates the greater incidence of the disease in the cities. In this series about 15 per cent. of idiots and 5 to 6 per cent. of epileptics had a positive Wassermann.

Lippmann²⁵ investigated the relation between idiocy and syphilis and gave references to the previous literature on this subject, among which may be mentioned the work of Piper, who performed the Wassermann on 316 idiots, of whom 16, or 5 per cent., were positive. Lippmann examined 136 epileptics, of whom 5, or 3.6 per cent., were positive. He then examined 121 idiots, of whom 78 were less than fourteen years of age, and all were under twenty years of age; 16, or 13.2 per cent., gave a positive Wassermann. Lippmann quotes the results of Plaut, who investigated a series of 52 children of luetic descent and found only 44 per cent. positive by the Wassermann reaction. Lippmann therefore estimates that of his 121 idiots the percentage actually infected with syphilis is 13.2 by $\frac{100}{44}$, or 30 per cent. The cases were also studied for evidence of hereditary syphilis, and as the result of these findings combined with the Wassermann reaction, Lippmann estimated that over 40 per cent. of these idiots were syphilitic.

Dean²⁶ examined and performed the Wassermann reaction on 330 cases of idiocy at the Potsdam asylum. Of these, 51, or 15.4 per cent., gave a positive reaction.

Hubert²⁷ studied the prevalence of syphilis among the patients at the medical clinic of Dr. Romberg at Munich. The investigation lasted from October, 1912, to July, 1915, and included a complete clinical study. The Wassermann reaction was used, but not on all patients. Out of 8562 patients so studied, 759, or 8.8 per cent., were luetic. Among the 4739 males, 405, or 8.5 per cent., were luetic, while among the 3903 females, 354, or 9 per cent., were luetic. Undoubtedly the percentages would have been higher had the Wassermann reaction been used on all patients.

At various times²⁸ efforts have been made to take a census of the venereal patients in various cities, but these attempts give little information as to the amount of syphilis actually present, as there is no proof that the physicians all reported their cases; and, moreover, such figures include only cases which appeared of their own volition for treatment, and the much greater number of latent cases is not shown by such figures.

Budapest.—Török²⁹ made an estimate of the prevalence of syphilis in Budapest, based upon the proportion of fresh cases of syphilis acquired by the members of certain workmen's associations for whom special hospital facilities were provided. Thus, in 1892 these associations contained 30,000 members (23,500 men and 6500 women). Of these, 124 men and 5 women were treated for fresh infections with syphilis. In 1893, of 44,700 members (36,000 men and 8700 women) 138 men and 10 women acquired syphilis. As these cases, coming to the hospital, represent only a small number of the total number of infections, Török estimates that from 2.5 to 2.9 per cent. of the total adult population and from 4.5 to 5.3 per cent. of the adult males acquire syphilis annually.

Belgium.—Bayet³⁰ estimated in 1908, as the result of his four years of observation of syphilis in Brussels, that 26 per cent. of the men of the working classes of Brussels acquired syphilis and that most of them transmitted it to their wives and sometimes to their children.

France.—Fournier estimated that 15 per cent. of the adult population of Paris were infected with syphilis. While this estimate is subject to the same criticism applying to other estimates it is but fair to add that it is based on what is probably the largest clinical experience of any one man in France, and, for that matter, probably in any part of the world. An estimate of the annual mortality caused by syphilis in Paris has already been presented in the introduction.

Raviart, Breton and Petit,³¹ in 1908, published the results of the Wassermann reaction applied to the spinal fluids of 400 inmates of the insane asylum at Armentieres; 76 were cases of general paralysis, of whom 71 gave a positive reaction. The remainder of the cases comprised the various forms of dementia, idiocy and imbecility. Of these 400 cases, 165, or 41.25 per cent., gave a positive reaction. Only 21 of these cases had clinical evidences of syphilis. Excluding the cases of general paralysis and 5 cases associated with tabes, 26.7 per cent. of the remainder were syphilitic. The intake of an insane asylum cannot have a very much higher percentage of syphilis than the general population if the

insanity specifically caused by syphilis is deducted. The sex and age of these insane was not stated.

Calmette, Breton and Couvreur³² examined blood from the cord in the case of 103 consecutive women confined at the Maternity Hospital of Seclin. There were 16 positive reactions, or 15.5 per cent. Most of these were respectable married women, but in a few cases the father was unknown.

D'Astros and Teissonniere³³ performed the Wassermann reaction on 500 foundling infants; 321 of these infants were from four to fifteen days old, 109 were from fifteen days to one month, 42 were between two and three months, 4 were from six months to one year of age, and 3 were from one year to fifteen months of age. An alcoholic extract of syphilitic liver was used as antigen; 477 of these infants gave a negative reaction and 18, or 3.6 per cent. gave a positive reaction. The authors conclude that approximately 4 per cent. of these foundlings have a positive Wassermann reaction and are presumably syphilitic.

Leduc³⁴ stated that of 1213 women admitted for pregnancy to the maternity hospital at Tenon, 94, or 7.7 per cent., presented certain clinical signs of syphilis. The Wassermann reaction was not performed.

Bubendorf³⁵ investigated the prevalence of syphilis among the laborers in the mines of Briey and Longwy. The Wassermann reaction was apparently not used and the estimate was based on clinical cases and was evidently a very sketchy affair. The prevalence of the disease varied considerably in different districts, but was considered to be increasing. The following table gives the population in some of the districts, with the estimated incidence of syphilis:

Industrial center.	Population, 1912.	Estimated syphilis, per cent.
Homecourt	10,192	4.5
Joeuf	10,100	4.8
Landres	2,800	25.0
Pienne	3,700	25.0
Auboue	4,600	6.7
Moutiers	1,820	2.4
Tucquegnieux	2,265	6 to 8
Valleroy	1,500	16.0
Sancy	860	6 to 8

Letulle and Bergeron³⁶ performed the Wassermann reaction on a large number of cases at the hospital Boucicaut. They found that:

Of 253 chronic nervous diseases, 136, or 53.7 per cent., gave a positive Wassermann.

Of 168 vascular lesions, 90, or 59.5 per cent., gave a positive Wassermann.

Of 116 kidney cases, 34, or 29.3 per cent., gave a positive Wassermann.

Of 75 cases of cirrhosis, 34, or 45.3 per cent., gave a positive Wassermann.

Thus of a total of 608 chronic diseases 296, or 48.6 per cent., gave a positive Wassermann. While such figures give very little basis for deductions as to prevalence of syphilis, we may conclude that as the percentage in these cases is rather higher than that expected in the same type of cases in this country, it is a fair deduction that syphilis must be rather more common in that part of France than in most sections of the United States.

Australia.—According to Barrett³⁷ for twelve months syphilis was made a notifiable disease in an area of ten miles radius from the general Post Office of Melbourne. No names were given, but the age, sex and clinical condition were certified and the information accompanied by a specimen of blood for the Wassermann reaction. At the end of the year about 5500 cases had been reported and tested, and 3157 were proved to be syphilitic. This was about 5 per cent. of the population. It does not follow that this is the correct percentage of syphilis in that part of Australia, but it does follow that at least 5 per cent. is definitely known to be infected. There was no information as to the relative prevalence among the sexes.

The percentage is naturally higher among patients in hospital, and there are several observations bearing on this point. Barrett³⁸ states that of 550 patients at various clinics, 44, or 8 per cent., gave a positive Wassermann, and 31, or 5.6 per cent., gave a partial Wassermann. This makes a total of 13.6 per cent. that may be estimated to be syphilitic among this class of patients. Barrett assumes that for

public health purposes six positive Wassermanns indicate the existence of 10 cases of syphilis. Piper³⁹ made a Wassermann survey on 100 women taken in the order of admission to the women's hospital at Melbourne. There were 10 positive, 6 partial and 84 negatives. "Thus there is a result of 16 per cent. of syphilis definitely present in a sample of 100 cases taken at random from the class of female patients admitted to a public hospital. Furthermore, as a negative Wassermann does not disprove syphilis, no estimate can be formed of the number of probable specifics among the 84 whose reaction was negative." Of these, 11 gave a history which could be regarded as indicating the possibility of syphilis.

Bennie⁴⁰ believed that in hospital practice in Melbourne 30 per cent. of the children show signs of syphilitic infection, and that 20 per cent. of the children in private practice are infected; so that he estimates that 25 per cent. of the sick children in Melbourne are tainted with syphilis. From his knowledge of the families whom he has often treated for many years he believed that fully 14 per cent. of these families are infected.

Allen⁴¹ published 100 consecutive postmortems from hospital practice in which 34 showed clear signs of syphilis, 19 others doubtful signs of syphilis and 1 was open to suspicion. A second 100 consecutive postmortems showed 32 clear cases and 30 others more or less doubtful. While warning against applying this percentage to the entire population, Allen writes: "After all cautions and reservations I am compelled to hold that in the hospital population syphilis is widespread, a frequent cause of death and a potent factor of physical deterioration, adding largely to the mortality from many other diseases."

England.—The prevalence of venereal diseases in Great Britain has been a very live issue in recent years. Such a mass of evidence has been presented to the Royal Commission on Venereal Diseases that it would be hopeless to attempt to analyze it, and much of it is hardly worth analyzing. In testifying before this Commission, Dr. French stated that in the British army the average number of cases con-

stantly on the syphilis register for two or three years and undergoing treatment was probably 3 or 4 per cent. This is about the same percentage that obtains in our own army, and we know that the number thus undergoing treatment is only a fraction of the number actually infected. A very fair estimate was presented to the Royal Commission by Dr. Douglas White.⁴² From a consideration of available statistics in regard to venereal disease and making an attempt to allow for differences in conditions, Dr. White arrived at the conclusion that there were every year 122,500 fresh cases of venereal disease in London and 800,000 fresh cases in the United Kingdom. He estimated that of the 800,000 fresh cases, 114,000 would be syphilis. From these figures he deduced that there must be in the United Kingdom some 3,000,000 syphilitics, which would be something under 7 per cent. for the total population. Dr. White compared the results obtained by this statistical inquiry with the estimate obtained by assuming that a certain percentage of cases of syphilis terminate in general paralysis or locomotor ataxia. The figures obtained from notification in Denmark led to the conclusion that in that country rather less than 2.5 per cent. of syphilitics died of general paralysis. In the United Kingdom there were about 2600 deaths annually from general paralysis and about 700 deaths from locomotor ataxia. If it might be assumed that 3 per cent. of cases of syphilis resulted in death from these diseases the conclusion was reached that there were about 111,000 syphilitic infections annually.

Without going further into the testimony offered it should be noted that the conclusion of the Royal Commission⁴³ in regard to the prevalence of venereal diseases in England was expressed in the following sentence: "While we have been unable to arrive at any positive figures, the evidence we have received leads us to the conclusion that the number of persons that have been infected with syphilis, acquired or congenital, cannot fall below 10 per cent. of the whole population in the large cities and the percentage infected with gonorrhoea must greatly exceed this proportion."

Some results of systematic examination by means of the

Wassermann reaction, either alone or in conjunction with the clinical examination, are available and are of interest. McIlroy, Watson and McIlroy⁴⁴ performed the Wassermann reaction on 100 women in a Scotch clinic in order to determine the prevalence of syphilis among gynecological patients. All suffered from a definite gynecological complaint, but only six patients gave a history pointing to syphilitic infection in the past. All of these six had a positive Wassermann. The patients attending the clinic are drawn from the respectable working classes, all cases of obvious syphilis being excluded and sent elsewhere for treatment. The results obtained were very remarkable, for out of the 100 cases examined, 43 (34 married and 9 unmarried) gave a positive Wassermann; 48, all married, were negative; and 9 also married gave a partial reaction. The method used was that described by Browning, Cruikshank and Mackenzie. This investigation is only a small series, but so far as it goes it indicates an amazing prevalence of latent syphilis among the gynecological patients of the working classes.

Dr. Ivy Mackenzie⁴⁵ examined the blood of 786 insane patients in Scotland. Of that number 234 were supposed from the clinical examination to be general paralytics, and of these 221 gave a positive Wassermann reaction. Altogether, of the 786 cases 347, or 44.1 per cent., gave a positive reaction. A systematic examination of the patients admitted to his wards at the Victoria Infirmary showed that 15 per cent. gave evidence of syphilis.

Manson and Smith⁴⁶ investigated the prevalence of syphilis in ocular diseases. Using the Wassermann reaction they studied 250 cases, including a great variety of clinical conditions of the eye: 125, or 50 per cent., were positive, 3 were doubtful and 122 were negative. Excluding such conditions as ocular injuries, conjunctivitis, cataract and the ordinary errors of refraction, much more than 50 per cent. were associated with a positive reaction.

Elliott⁴⁷ performed a Wassermann reaction on 130 children of the city of Glasgow, selected because of their unhealthiness or because they belonged to the poorer classes; 14, or 10.8 per cent., had a definitely positive Wassermann; 4 of these

cases had definite signs of congenital syphilis. If these cases were excluded the percentage of positive reactions becomes approximately 8.5. Elliott concludes that about 8 per cent. of all children of the poorer classes in Glasgow are syphilitic.

Browning⁴⁸ investigated over 3000 cases from different groups in the community by clinical and serological methods. Some of his findings are as follows:

Children.—Among 331 cases representative of the general conditions which lead to the appearance of children at the outdoor department of a hospital, 10 per cent. are syphilitic both on clinical evidence and as a result of the Wassermann test; 22 per cent. have a syphilitic association on clinical grounds, with confirmatory evidence from a doubtful result of the Wassermann test in 4 per cent. This gives practically conclusive evidence of syphilis in 14 per cent. of the children studied. Of 204 cases of mental deficiency and epilepsy in young subjects, 95, or 46 per cent., had a positive Wassermann. Of 25 cases of heart disease in children, 17, or 64 per cent., were positive. Of 52 cases of ozena that showed no clinical signs of syphilis, and in which no syphilitic history was obtainable, 16, or 30 per cent., gave a positive Wassermann. Of 46 cases of aortic disease examined, 64 per cent. had a positive Wassermann. Of 122 cases of nervous disease from a general hospital, 41 per cent. were positive. Of 104 prostitutes examined ranging in age from fourteen to eighteen years, all, or 100 per cent., were positive. Browning made no attempt to gauge the prevalence of syphilis in the general population, but states that it is impossible to avoid the conclusion that syphilis is very largely associated with the hospitalized portion of the community, and also with certain classes peculiarly liable to spread the disease.

Assinder⁴⁹ performed the Wassermann reaction on 500 patients admitted to the Infirmary, Dudley Road, Birmingham. Of the 500 patients tested, 120, or 24 per cent., gave a positive reaction: 67 of these cases were obviously luetic, and if this number be subtracted from the total number of patients, it will be seen that of 433 cases, 63, or 14.5 per cent., gave a positive reaction. In regard to sex, 272 were males and 80, or 29.4 per cent., gave a positive reaction; 288 were

females, of whom 40, or 17.5 per cent., gave a positive reaction. These were all cases belonging to the poorer classes.

Dr. Fildes reported the results of 1002 Wassermann reactions made at the London Hospital. The patients tested were nineteen years of age and upward and had come to the hospital for reasons wholly unconnected with syphilis. Cases of obvious or probable syphilis were excluded. Of 616 males thus tested, 64, or 10.3 per cent., were positive, while of 386 females, 20, or 5.1 per cent., proved syphilitic. "This implies that in a typical working-class population of London at least 8 to 12 per cent. of adult males and at least 3 to 7 per cent. of adult females have acquired syphilis. If congenital syphilis were included, or if the total number of patients attending had been tested, the proportion would certainly have been higher."

Sir John Collie carried out an investigation among employees referred for a medical examination. The persons examined fell into three classes:

1. 1119 disabled by accident or illness.
2. 557 apparently in perfect health but requiring examination before appointment.
3. 500 of the same who submitted to the Wassermann test.

The first two classes only underwent a clinical examination; they showed 56 cases of syphilis, or 3.3 per cent. Among the last group who had a Wassermann, 46, or 9.36 per cent., proved to be syphilitic.*

Darling⁵⁰ examined the blood of 171 women admitted to the Belfast Maternity Hospital for pregnancy at term. The women were almost all married, of the artisan class, and were examined in the order of admission, making no selection in cases; 12.8 per cent. gave a positive Wassermann.

She also quotes the series of Dr. Mott on 1483 patients admitted to the infirmaries of Shoreditch, Westminster and Paddington, which gave practically 20 per cent. of positive reactions. Mott also examined 71 mothers in the Shoreditch Infirmary and obtained 14.3 per cent. of positives among

* Synopsis Final Report of Royal Commission on Venereal Diseases.

the married and 27.6 per cent. of positive reactions among the unmarried.

Canada.—Dr. Charles K. Clarke,⁵¹ superintendent of the Toronto General Hospital, has stated that since October 6, 1916, routine Wassermann tests have been done in the wards of the Toronto General Hospital, and out of 971 tests, 125 were positive, a percentage of 12.8. Dr. Clarke concludes that more than 12 per cent. of the patients admitted to the public wards of that hospital for various conditions, both medical and surgical, have syphilis, and that this disease must be considered a greater menace than tuberculosis.

Graham,⁵² in a discussion before the Toronto Academy of Medicine stated that of 412 medical cases admitted to the Toronto General Hospital the Wassermann reaction was positive in 180, or 43.6 per cent. These were consecutive cases admitted between August 11 and December 13, 1913. Among the professional class, however, the percentage of positive reactions was only 7, and among the business class it was 23 per cent.

STATISTICS FROM DIFFERENT GROUPS IN THE UNITED STATES.

A few random quotations indicating various opinions in regard to the prevalence of syphilis may be of some interest as a prelude to more serious investigations.

Gerrish⁵³ is of the opinion that syphilis is one of the commonest diseases. While its prevalence cannot be precisely determined, those best able to judge declare their belief that 10 per cent. of the community are affected by it. Fischer⁵⁴ estimates that 18 per cent. of the population suffers from syphilis and that 250,000 deaths occur each year as the result of venereal diseases. Cunningham⁵⁵ wrote, in point of prevalence, that syphilis and gonorrhoea vastly overshadow all other infectious diseases, both acute and chronic. It is a conservative estimate that fully one-eighth of all human diseases and suffering comes from this source. It is a fact worthy of consideration that every year in this country 770,000 males reach the age of early maturity. It

may be affirmed that under existing conditions at least 60 per cent., or over 450,000, of these young men will some time during life become infected with venereal disease: 20 per cent. will occur before the twenty-second year, 50 per cent. before the twenty-fifth year and 80 per cent. before the thirtieth year. This is the venereal morbidity of the male product of a single year.

It has already been pointed out that accurate figures in regard to the prevalence of syphilis in the general population are not only unobtainable, but that much more definite information is obtained by studying the prevalence of the disease in certain groups. In presenting the evidence with regard to the prevalence of syphilis in the United States, the plan will therefore be to select certain definite groups with regard to which more or less accurate information is available.

Prostitutes.—The percentage of syphilis among prostitutes might be expected to be very high. Obviously the exact percentage found would depend upon the length of time those examined have followed their calling, and upon other factors. It may be supposed that after several years of this life every woman would become infected, and that such is not far from the case is indicated by the findings of Browning, already quoted. Among the older women, however, the disease often becomes latent, especially if a certain amount of treatment has been received. As a matter of fact, therefore, percentages are apt to be higher among the younger women, since the old latent cases may escape both clinical and serological methods of examination. Average figures are probably given by Kneeland,⁵⁶ who says that the records of the Bedford Reformatory for girls show that 20.56 per cent. of the 647 inmates have clinical manifestations of venereal disease. With the Wassermann test, 224, or 48 per cent., have positive reactions, and 30, or 6.4 per cent., gave doubtful reactions. The same sera were tested by the complement-fixation test for gonorrhoea, with the result that 306, or 65 per cent., gave positive reactions, 101, or 21.7 per cent., gave doubtful reactions, and 59, or 12 per cent., gave negative reactions. The value of the complement-fixation test for gonorrhoea is not yet thoroughly established. But,

accepting the results as indicating gonorrhoea and syphilis, the full significance of these results is apparent. Of the 466 girls tested only 50, or 10.7 per cent., were found to be free from venereal infection: 54.4 per cent. had a positive or doubtful Wassermann and were probably syphilitic, 86.7 per cent. probably suffered from gonorrhoea and 170, or 36.4 per cent., gave positive reactions for both syphilis and gonorrhoea. The complement-fixation tests in these cases were made by Dr. McNeil, of the Research Laboratory, Department of Health, New York.

In a later statement, Davis⁵⁷ says that 51 per cent. of the inmates of this reformatory are syphilitic. Walker,⁸⁸ in an examination of 327 prostitutes in Baltimore, found that 67 per cent. gave a positive Wassermann reaction.

Sullivan and Spaulding⁵⁸ find that among 63 women arrested for alcoholism only, syphilis was found in 42.8 per cent., while 9.6 per cent. more show a doubtful Wassermann. Among 94 women arrested for alcoholism and other offences, syphilis was found in 46.8 per cent., with 14.9 per cent. more showing a doubtful Wassermann. Among 243 prostitutes syphilis was found in 65.5 per cent., with 9.5 per cent. more showing a doubtful Wassermann. Among the entire 500 consecutive cases who were all regular or irregular prostitutes, 75.7 per cent. had gonorrhoea, and 44.7 per cent. were undoubtedly syphilitic, while 9.5 per cent. more had a doubtful Wassermann.

For the purpose of comparison the following figures obtained in foreign cities may be quoted. Meirovsky⁵⁹ examined 100 prostitutes in Cologne, using the Wassermann reaction in conjunction with the clinical findings: 74 per cent. were found to be syphilitic, although 43 cases were clinically negative; 26 of these gave a positive Wassermann. Hecht⁶⁰ examined 260 prostitutes, also using the Wassermann reaction. Of these cases 191, or 73 per cent., had clinical signs of syphilis, and 49 of these had received treatment for the disease. Of the total 260, 102, or 39.2 per cent., gave a positive Wassermann, while 195, or 75 per cent., were positive either clinically or by the Wassermann, or both. Hecht observes that these findings strongly indicate that almost

all prostitutes that have followed their occupation for several years must be infected. While many of these cases were hospital cases, yet they were examined in rotation without regard to the cause of admission, and 69 of the 260 had no clinical evidences of syphilis. Somewhat lower figures have been obtained by Swedish investigators. According to Johansson 69 per cent. of the inscribed women examined were syphilitic, but only 31 per cent. showed clinical signs of the disease. Other observers are quoted who found from 32 to 36 per cent., and Almkvist⁶¹ out of 32 prostitutes obtained a positive Wassermann in 8, or 25 per cent.

Pinkus⁶² stated in 1912 that non-syphilitic prostitutes must be extraordinarily rare in Berlin and that the majority acquire syphilis during their first year. Pinkus examined by the Wassermann reaction 230 of the older girls that had no history of syphilis and no physical signs of the disease, and 180, or 78.2 per cent., were positive, while among the 50 that were negative some of them later had symptoms of syphilis. Of 177 women who had remained for ten years without history or symptoms of infection the Wassermann reaction showed 101, or 81.2 per cent., to be positive.

Excluding the occupation of prostitution which necessarily renders those engaged in it especially liable to infection with syphilis, some classification of the population must be used to divide it into groups that can be studied. Whites and negroes should, of course, be considered separately. It then becomes more or less natural to classify both races into those who are well and those who are sick and defective. Not only do patients who suffer from manifestations of syphilis naturally gravitate to hospitals and dispensaries, but these institutions have also many other patients suffering from conditions that are aggravated even if not caused by a pre-existing syphilitic infection. Under these circumstances it is natural to expect that the percentage of infections among the hospitalized portion of the community will be higher than among those individuals that are presumably well. One of the first classes of the sick to invite attention is the insane.

The Insane.—Matson,⁶³ who applied the Wassermann reaction in the study of the insane in 1910, says: "The

importance of syphilis in the psychic infirmities is indicated by our examination of 470 inmates of the Oregon State Insane Asylum. Nearly 20 per cent. gave positive reactions while only 5 per cent. gave specific histories, and none presented visible or clinical manifestations. . . . Nearly 15 per cent. of 51 cases of dementia precox were positive, while none gave a syphilitic history: 16 per cent. of 151 cases of paranoia were positive. Twenty-five per cent. of 40 cases of chronic mania were positive, 20 per cent. of 26 cases of chronic melancholia were positive and 20 per cent. of 62 cases of dementia were positive."

Paine,⁶⁴ in 1912, examined 200 consecutive admissions to the Danvers State Hospital in Massachusetts. The Wassermann was done in every case, and when a positive or doubtful report was received a spinal puncture was also performed: 49 of these cases, or 24.5 per cent. of the admissions, showed a positive Wassermann in the blood; 146 of these cases were from cities, of whom 36, or 24.7 per cent., were positive and 54 cases were from small towns, of whom 13, or 24.07 per cent., were positive; 82 cases were females, of whom 19, or 23.1 per cent., were positive. The seacoast cities gave a percentage of 32, the inland towns a percentage of 17, the mill cities a percentage of 28 and other cities a percentage of 19. While these figures are very suggestive as to the distribution of syphilis in the different portions of the State, the number of cases studied is too small to form the basis of serious conclusions.

Darling and Newcomb⁶⁵ obtained a Wassermann reaction on 849 cases at the Warren State Hospital, of which 43 cases were positive, a percentage of 5.06. They also state: "In the seventeen months elapsing since September, 1912, there were made as a routine procedure upon admissions 452 Wassermann reactions, of which 92 were positive, giving a percentage of 20.4." The low rate of 5.06 was for long resident chronic insane cases and contained very few cases of paresis, which are usually well advanced when committed to this institution, and their hospital residence is brief. Among the new admissions the high rate (20.4 per cent.) was due to cases of paresis and cerebral lues.

Mitchell⁶⁶ states in regard to this same survey that 18.5 per cent. of the female admissions showed a positive serum, while 22.3 per cent. of the males gave the same result.

Southard⁶⁷ gives figures for Massachusetts. In the Psychopathic Hospital 1671 random tests were made on different cases, of which 264 gave a positive Wassermann. This is a percentage of 15.8 for the psychopathic intake, and Southard says: "I consider that there is no better set of data available for Massachusetts."

Vedder and Hough⁶⁸ made a study of 1283 inmates of the Government Hospital for the Insane, Washington, D. C. The results of this examination are shown in the following tables:

RESULTS OF WASSERMANN'S IN SIX HUNDRED AND SIXTEEN CONSECUTIVE CASES.

	Number examined.	Double plus.	Plus.	Plus-minus.	Negative Wassermann.				Total syphilitic, counting all but ≠ Wassermanns.	
					Paresis.	Cerebral luces.	Increased cell count.	Undoubted history.	No.	Per cent.
White males . . .	374	42	4	3	11	4	5*	7	73	19.51
White females . . .	83	0	0	0	0	0	0	0	0	0
Colored males . . .	93	11	2	4	1	1	0	7	22	23.65
Colored females . . .	65	6	1	1	0	1	0	0	8	12.30
Total	616†	59	7	8	12	6	5	14	103	16.72

RESULTS OF WASSERMANN'S IN SIX HUNDRED AND SIXTY-SEVEN RANDOM CASES.

		Double plus.		Plus.		Plus-minus.		Minus.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Hough . . .	235	17	7.23	5	2.12	5	2.12	208	88.51
Vedder . . .	432	30	6.94	58	13.42	96	22.22	248	57.40
Total . . .	667	47	7.04	63	9.44	101	15.14	456	68.36

* All of these cases had a positive Noguchi test for protein; the cell counts were respectively 9, 20, 120, 88, 160.

† One Indian is included in this total.

The authors concluded that among the white males the presence of syphilis was demonstrated in 20 per cent. of the cases, that at least 30 per cent. are probably syphilitic and that at least 10 per cent. of the insanity in this institution is directly attributable to syphilis. No syphilis was detected among the 83 white females studied, but this number is so small that no deductions can be safely drawn from it except that the prevalence of syphilis among this group of insane females is less than among insane males. The statistics obtained for the colored race should be compared with those given later by Ivey under the figures given for the negro race.

More than one-eighth of the cases of insanity annually admitted to Michigan State hospitals for the insane are directly caused by syphilis. In the year 1913-1914, insanity resulting from syphilis constituted 12.9 per cent. of all cases admitted to these hospitals. Syphilis was the direct cause of insanity in 17.5 per cent. of all males and in 6.65 per cent. of all females admitted. In order to ascertain the general prevalence of syphilis among the insane in the Michigan State hospitals for the insane the Wassermann test was made on 1546 patients admitted during the year 1913-1914. In 21.6 per cent. of the 940 males tested positive reactions were obtained, and 3.6 per cent. more were strongly suggestive of syphilis. Among the 606 females who were tested, positive reactions were obtained in 12.7 per cent. Of all admissions 18.1 per cent. gave positive reactions, 4.17 per cent. were questionable and 77.2 per cent. were negative.⁶⁹

Holbrook⁷⁰ reported 2000 Wassermann reactions on the 1600 inmates of the East Louisiana Hospital for the Insane. Of 637 white males, 50, or 8 per cent., gave positive reactions; 516 white females, 20, or 4 per cent., gave positive reactions; 212 colored males, 15, or 7 per cent., gave positive reactions; 235 colored females, 25, or 11 per cent., gave positive reactions.

Thus of 1153 white patients 6 per cent. gave a positive reaction, while of 447 negroes 9 per cent. gave a positive reaction. These figures appear very low, but the majority were chronic cases, and the acetone-insoluble antigen was used. A study of the 515 cases received during the biennium

ending March, 1916, showed that 11.07 per cent. were paretic and 17.4 per cent. were syphilitic. These figures are probably much closer to the facts regarding the psychopathic intake of the State of Louisiana, but even here it must be remembered that higher figures would undoubtedly have been obtained had the cholesterinized antigen been used.

Fell⁷¹ examined 1700 consecutive admissions to the Elgin State Hospital of Illinois and found that 16 per cent. of the admissions were syphilitic, or about 22 per cent. of the males and 9.5 per cent. of the females. Paresis formed about 12 per cent. of the admission rate, being 19 per cent. for males and 5.5 per cent. for the females. The Wassermann reaction was used in this work in conjunction with the clinical findings.

Percentages of Syphilis among Patients in Hospitals and Dispensaries.—Most of the hospitals and dispensaries from which information of this character can be obtained are located in the cities. Evidence from cities in various parts of the United States will be presented.

New York.—Kneeland⁵⁶ states that during the year 1911, 522,722 cases of all kinds were treated in 17 dispensaries in New York, of whom 15,781 were venereally affected. Of 5380 cases treated in 13 hospitals, 6.33 per cent. were venereally affected. These figures are far from showing the actual extent of syphilitic infection. As soon as the Wassermann reaction is applied the percentages increase. Thus of 308 adults admitted to the medical wards of a New York hospital during three months in 1913 the Wassermann was applied in 166 cases, of which 38, or 23 per cent., gave positive results. This is equivalent to 12.3 per cent. of the entire 308, but had the test been applied to all admissions the figures would undoubtedly have been higher.

Greeley⁷² reports that fully 20 per cent. of the general patrons of hospitals during the past few years and over 8 per cent. of the peddlers recently examined in New York City by the Department of Health gave positive Wassermann tests, and for other reasons, fully 10 per cent. of the general population can be conservatively regarded as having at some time or other suffered from syphilis.

Dr. Haven Emerson very kindly sent me the following

additional data from the New York Department of Health: In 1915 routine tests were made on 110 masseurs and 12 were found to give a positive Wassermann reaction. During 1915 and 1916 the physicians attached to the occupational clinic examined a total of 70,714 persons, and the Wassermann test was used in 2982 of these cases. In about 20 per cent. of the cases the Wassermann was used because of some suspicious circumstance in the history or clinical examination, but in the remainder of the cases the Wassermann was taken as a routine measure, for the most part in persons who denied all history of syphilis. Of the 2982 cases in which the reaction was performed there were 657, or 22 per cent., of positive reactions. The persons so examined were bakers, peddlers, food-handlers and certain other special trade groups. It is difficult to form any conclusions as to the prevalence of syphilis among these workers from these figures. One-fifth of these examinations were made in selected cases suspected of syphilis. If we assume that because of this selection these figures are a fifth too high, then the actual prevalence of syphilis among this group would be four-fifths of the above figures, or 525 cases, 17.6 per cent. of the 2982 cases examined. This figure is not very different from the estimate made by Vedder in regard to the prevalence of syphilis among the class from which the army is recruited (20 per cent.).

Bulkley⁷³ in 20,000 of his personal dermatological cases found syphilis in over 12 per cent., while in 300,000 cases compiled by members of the American Dermatological Association, syphilis was found as a causative factor in about 11 per cent. of the cases.

Symmers⁷⁴ wrote that the Wassermann reaction in Bellevue Hospital has yielded strongly positive results in over 25 per cent. of the enormous number of serums examined. Many, though not all of these, were consecutive random examinations. On the other hand, among 4880 necropsies performed at Bellevue Hospital in the past ten years, anatomical confirmation of the existence of syphilis was found in only 314 cases, or 6.5 per cent.

Through the kindness of Dr. William F. Snow I have been

able to secure a tabulation of the Wassermann reactions performed at Bellevue. The results for the year 1915 were selected because it was the year when routine tests were very largely made. The Wassermann reactions here recorded were performed by Dr. Cyrus W. Field. Fixation of the complement was on an 18-unit basis, and in the following tabulation fixation of 0 to 3 units was considered negative, 3 to 8 units a partial reaction and 8 to 18 units a positive reaction.

The work of tabulating these results was performed by Miss Sarah Greenspan at the request of Dr. Snow. I wish to express my indebtedness to both Dr. Snow and Miss Greenspan both for obtaining these results and for permitting me to use them.

Service.	Cases.	Positive.		Partial.		Negative.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.
Men's medical	3012	861	28.5	170	6.57	1981	65.7
Men's surgical	1073	245	22.8	56	5.2	772	71.9
Total males	4085	1106	27.0	226	5.5	2753	67.4
Women's medical	1178	341	28.9	91	7.7	746	63.3
Women's surgical	574	134	23.3	35	6.1	405	70.5
Women, pregnancy	699	97	13.8	46	6.5	556	79.5
Total women	2451	572	23.3	172	7.0	1707	69.3
Children, male	116	22	18.9	13	11.2	81	69.8
Children, female	75	20	26.6	5	6.6	50	66.6
Total children	191	42	21.9	18	9.4	131	68.5
Syphilis, male	2156	885	41.0	145	6.7	1126	52.2
Syphilis, female	888	378	42.5	61	6.9	449	50.5
Syphilis, children, male	73	23	31.5	7	9.6	43	58.8
Syphilis, children, female	47	17	36.2	4	8.5	26	55.3
Total syphilis	3164	1303	41.1	217	6.8	1644	51.9
Total all cases	9891	3023	30.5	633	6.4	6235	62.8

In interpreting these results it should be noted that the cases listed in the men's and women's medical and surgical wards were taken as a routine. In the case of women admitted for pregnancy, specimens were not taken as a routine in all cases, but were partly routine and partly on women who were suspected of being syphilitic or whose infants had suspicious symptoms. It must also be noted that all the cases listed under the heading "Syphilis" are not necessarily actual cases of syphilis but are those cases in whom a preliminary diagnosis of syphilis was made, sometimes on very slight grounds. These cases are tabulated under the heading "Syphilis" because it would be obviously unfair to include these cases among the routine cases from the medical and surgical wards, and yet the percentage of positive Wassermann reactions in these cases is so low (41.1) that it is obvious that many of them were not syphilitic. If all these cases be included, then out of 9891 cases, 3023, or 30.5 per cent., were positive. If we exclude the cases suspected of being syphilitic, then out of a total of 6535 routine tests on both men and women there were 1678, or 25.6 per cent., of positive reactions. Of 4085 males in the medical and surgical wards, 1106, or 27 per cent., were positive, while among 1752 females in the medical and surgical wards, 475, or 27.1 per cent., were positive. It is therefore apparent that among the sick women admitted to this hospital the percentage of syphilis is no lower than among the sick men. It is believed that these percentages are very conservative, because they do not include the results of the physical examination or the partial Wassermann reactions, but are based solely on the positive Wassermann reaction; and also because so many cases of syphilis have been excluded among the cases in whom a diagnosis of probable or possible syphilis was made. It seems quite probable that the actual percentage of syphilis among the admissions to this hospital is at least 30 and may very well be higher.

On the other hand, among women admitted for pregnancy, and who are presumably healthy women, the percentage is much lower, namely, 13.8 per cent. This figure is higher than that obtained for pregnant women else-

where, which is to be explained because the examinations here were not routine, but partly on suspected cases, and also because the women admitted here probably belong to a poorer and more ignorant class than the admissions to some of the other maternity hospitals from which figures are presented.

The higher percentage of positive reactions obtained among the children in this hospital is also worthy of note, but inasmuch as these groups are so small, no conclusions will be drawn from them.

Dr. F. C. Costen has very kindly sent me the results of the Wassermann reaction as used in the Post-Graduate Hospital of New York for the calendar year 1916. Only white patients are included and no selection of cases was made. The Wassermann reactions were performed in the laboratory of Dr. Ward J. MacNeal and the reactions are on a four-plus basis. I have interpreted the four-plus and three-plus reactions as positive and the two-plus and one-plus reactions as partial reactions:

	Male.					Female.				
	Total.	Nega- tive.	+ and ++	+++ and ++++	Per cent. posi- tive.	Total.	Nega- tive.	+ and ++	+++ and ++++	Per cent. posi- tive.
0-10..	111	76	15	20	18.0	74	46	12	16	21.6
11-20..	140	97	13	30	21.4	99	54	8	37	37.3
21-30..	262	158	29	75	28.6	202	120	23	59	29.2
31-40..	269	145	24	100	37.1	182	104	26	52	28.6
41-50..	221	133	11	77	34.8	105	67	8	30	28.5
Over 50	165	119	16	30	18.1	84	65	8	11	13.1
Total..	1168	728	108	332	28.4	746	456	85	205	27.4

Of a total of 1168 white male patients, 332, or 28.4 per cent., gave a positive Wassermann, while of 746 female white patients, 205, or 27.4 per cent., gave a positive Wassermann. From these figures we may conclude that approximately 30 per cent. of the patients of this hospital are syphilitic, and, further, that the percentage is not materially

lower among the females than among the males. The figures also indicate that the percentage of those infected steadily increases with advancing years at least up to the age of forty. The sudden decline after forty is equally interesting. It is known that the death-rate among syphilitics over forty is approximately twice as high as among normal individuals, so that this affords the most probable explanation for the diminishing morbidity rate after forty. Many of the syphilitics have already died.

Chicago.—Gatewood⁷⁵ reported the results of 1400 Wassermann reactions performed in the Michael Reese Hospital on all classes of patients. A test may be ordered for any patient in the hospital, and some of the physicians order the Wassermann almost as a routine. Many of the patients showed no symptoms or gave no history of syphilitic infection. Of this series of 1400 tests, 400, or 28.5 per cent., were positive. Since tests were not performed on all admissions this percentage does not represent the percentage of syphilis in all admissions. But if the cases diagnosed as syphilis are deducted the remainder of the tests constitute practically a random series. Among the 400 positive reactions there were 11 cases of primary syphilis, 90 of secondary syphilis, 43 of tertiary syphilis, 22 parasyphilitics and 10 cases of hereditary syphilis, or a total of 176 cases in which the clinical diagnosis of syphilis was made. Deducting these cases we find that in a series of 1224 random tests, 224, or 18.3 per cent., were positive. As the Wassermann reaction does not detect all cases of syphilis, and as the clinical cases of syphilis are deducted from these figures, the percentage of syphilis among patients admitted to the Michael Reese Hospital must be more than 18 per cent., and may be conservatively estimated at 20 per cent. Moreover a considerable majority of the patients are Jews, among whom the incidence of syphilis is generally believed to be lower than is the case in the gentile population.

Moore⁷⁶ wrote in 1915: "The general medical dispensary affords a medium by which we come in contact with a certain class of persons in whom through poverty, deficient education and mental instability we might expect a higher percentage

of syphilis than in the average of the community." During several months Wassermann reactions were made as a routine test on nearly all persons attending clinics of the University of Illinois College of Medicine. Of 418 patients, 56, or 13.4 per cent., reacted positively. Omitting those who gave a weak reaction and had no history or symptoms of syphilis, and adding those who reacted negatively but who were known to have had the disease, there were 78, or 18.6 per cent., of the group who were syphilitic. Of the 89 women tested, 16, or 18 per cent., had a positive Wassermann; while of the 329 males tested, 40, or 12.2 per cent., had a positive Wassermann. The number of women tested was too small to afford a basis for drawing a comparison between the males and females, but at least it can be said that the percentage of syphilitic infections is probably quite as high among this class of female patients as among the male patients.

Fell⁷¹ examined 1700 consecutive admissions to the Elgin State Hospital, using the Wassermann reaction in conjunction with a physical examination. This is a hospital for the insane, but it draws its inmates from the State as a whole, so that both urban and rural districts are about equally represented. Sixteen per cent. of admissions were syphilitic: 22 per cent. of males and 9.5 per cent. of females. Paresis formed about 12 per cent. of the admission rate: 19 per cent. of males and 5.5 per cent. of females. Fell states that after deducting the strictly syphilitic psychoses there is no reason why the percentage of syphilitics among the admissions to the State hospital should differ materially from that of the adult population at large, and estimates on this basis that about 5 per cent. of the population of Illinois is syphilitic, with men affected somewhat more frequently than women.

Michigan.—Peterson⁷⁷ reported the results of a study of 2000 cases admitted to the hospital of the University of Michigan, and excluding patients admitted to the department of dermatology and syphilology in accordance with the purpose of the investigation which was to determine the prevalence of syphilis among the average hospital patients.

In 2000 patients there were 110 positive Wassermann reactions in which the diagnosis was confirmed by the

department of syphilology. Among patients giving a doubtful reaction there were eight who were subsequently proved to be syphilitic. This indicates that at least 6 per cent. of the general run of hospital patients in this institution are syphilitic. When considering this low figure it must be remembered that the obviously syphilitic are excluded from these figures by the exclusion of the department of syphilis. But even making this allowance, these figures seem very low in view of the findings of Warthin⁷⁸ in the same institution. Warthin found the *Treponema pallidum* together with the pathological lesions of syphilis in one-third of the adult necropsies from the University Hospital. It should be stated that this is a State hospital whose patients represent the average middle-class population of the State of Michigan. The greater part of the cases gave no history of syphilis and were ignorant of the fact that they had contracted the disease. While the Wassermann reaction may be open to some criticism as an indication of syphilitic infection, no such objection can be brought against Warthin's findings. The actual finding of the causal organism by a master of technic cannot be criticised, and Warthin's 33 per cent. must be regarded as much nearer the real truth with regard to the prevalence of this disease than the evidence obtained by Wassermann surveys. It is interesting, however, to note that Peterson found the percentage of syphilis in 381 cases in the maternity department to be 4.7 per cent. as shown by the Wassermann reactions and physical examinations.

Boston.—Walker and Haller,⁷⁹ in 1916, investigated the prevalence of unsuspected syphilis among patients in a general hospital by performing the Wassermann reaction on 4000 cases from the Peter Bent Brigham Hospital: 1800 of these patients were in the medical wards, 350 in the neurological division of the surgical service and 1850 were in the outdoor department or in the general surgical service. The original Wassermann technic, with the substitution of a 0.4 per cent. cholesterinized alcoholic human heart extract for antigen, was used. Among the 4000 cases, 600, or 15 per cent., gave complete fixation. Only 48 of these 600 patients were in any early stage of the disease, *i. e.*, 13 had a chancre

and 35 had an early rash. The remainder were the class of patients that may be found in any general hospital. It may be assumed that had the partial reactions been carefully studied in connection with the history and clinical condition the percentage of syphilitics would have been even higher.

Hornon⁸⁰ applied the Wassermann reaction to unselected medical cases of the Boston City Hospital. Of 500 cases so tested, 87, or 17.4 per cent., had a positive test, and in only 18 of these cases was a probable diagnosis of syphilis made before the Wassermann reaction was received.

Of 312 Wassermann reactions from consecutive admissions at the Boston Marine Hospital from February to October, 1916, excluding readmissions and faulty specimens, and considering doubtful reactions as negative, 77, or 24.7 per cent., were positive. Including 11 cases giving a negative reaction on account of recent treatment the total incidence was 28.2 per cent.⁸¹

The following table presents a resumé of the 4218 Wassermann tests made by the laboratory of the Massachusetts State Department of Health during 1915 upon various institutional groups:

Classification of patients examined.	Number.	Number, positive.	Percentage, positive.
Psychopathic patients	1997	298	14.8
Feeble-minded and delinquent	679	61	9.0
Criminal subjects	185	74	40.0
Tuberculous subjects	432	39	9.0
Cancer	21	1	4.8
Pregnant women	172	8	4.7
Infants and children	136	24	18.5
Acute general hospital group	419	68	16.2
Chronic diseases	177	48	26.1
Total	4218	621	15.0

San Francisco.—Whitney⁸² classified 7885 case histories from the out-patient department of the University of California Hospital from July 1, 1912, to May 1, 1914. The Wassermann reaction was used in part of these cases, some departments requiring a routine Wassermann reaction and some only calling for it in selected cases. It will be seen from the following table that 6.9 per cent. of the entire 7885

cases were syphilitic, while of the 363 cases from the nerve clinic 82, or 22.6 per cent., were syphilitic, and in the medical clinic of 1695 cases, 370, or 21.8 per cent., were syphilitic. It may fairly be assumed that had the Wassermann reaction been universally employed the percentages would have been higher, and it is not improbable that a survey of the patients in the hospital would have furnished figures higher still.

CASES OF SYPHILIS IN VARIOUS DEPARTMENTS OF THE OUT-PATIENT DEPARTMENT.

Department.	Cases of syphilis.	Total new cases.	Percentage of syphilis.
Whole O. P. D.	544	7885	6.9
Nerve	82	363	22.6
Medical	370	1695	21.8
Skin	134	892	15.0
Orthopedic	90	652	13.8
Genito-urinary	57	434	12.9
Eye	121	1421	8.5
Throat, nose, ear	53	1597	3.3
Children	26	890	2.9
Women's clinic	21	915	2.3
Surgical	28	1262	2.2

As the children's department is stated to have required a routine Wassermann in every case for several years the percentage found (2.9) may be assumed to be very close to the actual prevalence of the disease. The nerve department also demanded the reaction in almost every case and the medical department for over half the cases. Nothing was said as to the surgical department, and it is a fair assumption that the Wassermann reaction was not used to any great extent by this department. Had it been used as a routine test there is every reason to believe that the figures would have been more like those obtained by the medical department. The general average of 6.9 per cent. for the entire number of cases must therefore be taken to represent the amount of syphilis actually found, but cannot be taken as an estimate of the amount of syphilis present in this class of cases.

Knapp¹⁴² reported the results of an examination of 400 cases studied in St. Luke's Hospital, San Francisco. No

selection was made of the cases and the Wassermann reaction was used as an aid in diagnosis. Of 177 male patients, 41, or 23 per cent., were syphilitic, while of 223 female patients, 10, or 4.4 per cent., were syphilitic. The work appeared to be carefully done, and while this is a small series, it is believed that such a series gives a more accurate idea of the prevalence of syphilis in the hospitalized portion of the community than many larger series in which the examination has not been so thorough.

New Jersey.—Hammond⁸³ examined all the inmates of the New Jersey State Hospital at Trenton, which is an institution whose intake is representative of the rural type of the general population of the State. In all 1583 individuals were tested by the Wassermann reaction: 70 of these were cases of general paralysis and 1513 cases were otherwise diagnosed. Of the cases not general paralysis, 1472 gave negative reactions, and 41, or 2.7 per cent., gave positive reactions.

Including cases of general paralysis about 7 per cent. of all individuals of both sexes examined and about 10 per cent. of all males were found to be syphilitic. Hammond believed that this percentage is representative of the entire general adult population of the rural parts of the State, because a careful analysis of the data obtained led to the conclusion that syphilis among the insane is no more frequent in occurrence than in the general community. He concluded that the prevalence of lues in the entire general adult population of the State of New Jersey is 7 per cent.

It is not believed that this estimate can be accepted unreservedly. In the first place the incidence of syphilis in an asylum is higher than that in the general community because of the tendency of paretics and cases of cerebral lues to gravitate to the asylum. On the other hand, if these cases be excluded the incidence of 2.7 per cent. is believed to be too low even for rural sections of the country. Hammond believed that his data indicated that the prevalence of syphilis in city and country is in general exactly two to one. Excluding paretics this would mean that the incidence of syphilis in cities of New Jersey would be 5.4 per cent. We have already indicated the danger of making estimates of this

character, and although the work was evidently done with care the percentage of positive cases is very low as compared with the results obtained by workers in other similar asylums.

Richmond, Va.—Van der Hoof⁸⁴ reports that of 2449 patients including white and colored from the out-patient and in-patient clinics of the Medical College of Virginia, 44 per cent. showed complete fixation, with an additional 12 per cent., giving partial or incomplete reactions. In the psychopathic clinic of that college 42 per cent. of incorrigible or backward children have a positive Wassermann. The high percentages here given may be assumed to be due to the inclusion of negroes in these statistics.

Birmingham.—McLester⁸⁵ reports 300 consecutive private patients seen in his practice and in consultation with other physicians. The original Wassermann reaction was performed by a competent technician using the original technic and a beef-heart antigen. Of the 300 cases, 56, or 18.8 per cent., gave a positive reaction. Of the positive cases, 22, or 39 per cent., gave a history of syphilis, while 34, or 61 per cent., gave no such history.

Baltimore.—Major⁸⁶ reported the reactions performed at the Johns Hopkins Hospital from September 1, 1911, to August 1, 1912. The reaction was performed on the sera of 1200 patients, the great majority of whom were medical cases, and included a great variety of diseases from outspoken syphilis to neurasthenia and similar cases in whom the reaction was performed to exclude syphilis. The series includes functional and organic nervous diseases, cardiac diseases, nephritis, diabetes, pneumonia, typhoid fever, gastro-intestinal diseases—practically every medical condition seen in an active clinic. Therefore, although no attempt was made to take every admission, the results cannot be greatly above the average of the intake of this medical clinic. Of the 1200 cases, 239, or 20 per cent., gave positive reactions, while 961, or 80 per cent., were negative. The series included 185 negroes, the majority being cardiorenal cases, and of this number 61, or about 34 per cent., gave positive reactions. According to Janeway,⁸⁷ of 1272 consecutive white patients of this same medical clinic from September 21, 1914, to

April 2, 1916, 106, or 13 per cent., had a positive Wassermann reaction, while of 288 colored individuals examined during the same period, 124, or 43 per cent., had a positive Wassermann. As this series consists of consecutive cases it gives an excellent picture of the prevalence of syphilis among medical patients attending hospitals and dispensaries in Baltimore.

Walker⁸⁷ reported in 1916 that in a recent examination of 1080 patients, regardless of the disease for which they sought treatment, 10.8 per cent. gave a positive Wassermann.

Philadelphia.—According to Krumbhaar and Montgomery,⁸⁹ of 1000 consecutive new cases at the Pennsylvania Hospital Dispensary, 34 were diagnosed as luetic and 30 of these gave positive Wassermann reactions. They state that this 3 per cent. of all dispensary cases is probably below half of the actual proportion of syphilitic patients attending the clinic and indicate only those patients having conditions obviously syphilitic. A routine Wassermann reaction on the entire number would have given much higher figures.

The following figures are given by Rosenberger,⁹⁰ comprising the Wassermann reactions performed during 1916 at the Philadelphia General Hospital. It is not claimed that all patients are included, so that it must be assumed that the Wassermann reaction is only performed on selected cases.

Ward.	Positive.	Negative.	Total.
Men's medical	259	838	1097
Psychopathic	198	708	906
Insane	154	407	561
Men's and women's nervous	103	329	432
Men's and women's surgical	92	181	273
Women's medical	103	170	273
Men's and women's tuberculosis	98	193	291
Maternity	10	126	136
Women's venereal	127	151	278
Gynecological	20	49	69
Children's	8	48	56
Men's venereal	45	13	58
Total	1217	or 27.4 per cent. of	4430

Dr. John H. Musser, Jr., reports that in an examination of cases at the University Hospital, Philadelphia, 14 per cent. gave a positive Wassermann.⁹¹

Williams and Kolmer⁹² performed the Wassermann reaction on 300 gynecological cases such as might be met with in the average gynecological dispensary and ward service in Philadelphia, no selection being made as to the type of lesion present. Three antigens were used, including a cholesterinized alcoholic extract of human heart. Of 208 white cases, 35, or 20.2 per cent., gave positive reactions, while of 92 negroes, 33, or 35.8 per cent., gave positive reactions. This, however, included partial reactions. Of the total series of 300, 36, or 12 per cent., gave strongly positive reactions. The percentage of syphilis among these cases may therefore be placed at not less than 12 per cent. and as probably 22 per cent.

Washington.—Ladd⁹³ reported statistics compiled on the basis of 1000 Wassermann reactions performed at the Casualty, Washington Asylum and George Washington Hospitals. Of 425 dispensary patients at the Casualty and Washington Asylum, 25.5 per cent. gave double-plus reactions, 21.7 per cent. were partial reactions and 52.8 per cent. were negative. Of these patients, 68.8 per cent. were white and 31.2 per cent. were colored, and of the double-plus reactions, 10.9 per cent. were in the white race and 14.6 per cent. in the colored race. Of 449 white patients in the wards of the George Washington Hospital, 10.4 per cent. were double plus, 18.4 gave partial reactions and 71.2 per cent. were negative. Of these patients 43 per cent. were females furnishing 3.6 per cent. of the positive results, while 57 per cent. were males, furnishing 6.8 per cent. of the positive reactions. Of 126 private cases, 14.1 per cent. were double plus, 23.4 per cent. had partial reactions and 62.5 per cent. were negative. There were more partial reactions among the white than the colored population, and Ladd thought this was due to the fact that the white race has pursued treatment more faithfully. He concluded from these figures that the percentage of positive reactions in the general population might be estimated at 17 per cent. We have already pointed out the danger of applying one set of statistics to the entire population.

I have also made an endeavor to study the prevalence of

syphilis by applying the Wassermann reaction to several institutions in Washington, and also to private patients. A special effort was made to obtain female patients because there is very little evidence obtainable covering the prevalence of syphilis among women. The Women's Clinic and the Columbia Hospital for Women very kindly sent me specimens. While I have not obtained all admissions from these institutions the specimens have been random, and at various periods certain physicians have sent all admissions to their wards. All varieties of diseases are included, but especially gynecological conditions. The private patients were obtained from several physicians in Washington who have made a practice of sending me all their new cases for a Wassermann reaction. The results of this work are shown in the following table:

WHITE WOMEN.

Place.	Total.	Positive.		Plus.		Plus minus.		Negative.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Women's Clinic . . .	150	13	8.66	16	10.66	14	9.33	107	71.33
Columbia Hospital . . .	188	21	11.17	27	14.36	16	8.51	124	65.95
Private cases . . .	417	17	4.07	24	5.75	36	8.63	340	81.53
Total	755	51	6.75	67	8.87	66	8.74	571	75.62

WHITE MEN.

Soldiers' Home* . . .	621	97	15.6	85	13.6	93	14.9	346	55.7
Private cases	430	23	5.34	15	3.49	29	6.74	363	84.41
Total	1051	120	11.41	100	9.51	122	11.60	709	67.46

As the hospital cases all come from the poorer classes, while the private cases come from the better classes, these figures are believed to represent a fair average of the percentage to be expected among the sick of these classes in Washington, so far as the facts may be determined by the

* Published in Bulletin No. 8, W. D., Office of the Surgeon-General.

use of the Wassermann reaction. It is to be expected that these figures would be considerably higher if the serological evidence could have been combined with the clinical findings. Unfortunately this was impossible.

Tuberculous Patients.—Syphilis has long been suspected as a predisposing cause of tuberculosis, a fact that has been exemplified in the expression "Syphilis makes the bed for tuberculosis." Brock,¹⁶ as a result of an investigation of 7660 consecutive South African natives, among whom tuberculosis in any form was practically unknown at that time, comes to the following interesting conclusions:

1. Thirty-five per cent. of natives have a fibroid condition of the lungs.

2. Sixty-eight per cent. have indurated enlargement of the epitrochlear gland.

3. Both conditions result from syphilis, and nearly 80 per cent. of the natives have one or both conditions present.

4. Syphilis prepares the way for tuberculosis and is in all probability the *chief* cause for the great prevalence of, and the high mortality from, the latter disease in the natives engaged in mine work on the Rand.

5. Syphilis plays a role in the production of lung diseases in the youth and adult, the great importance of which has not been recognized.

In accordance with such considerations it would be expected that syphilis would be found to be more prevalent among the tuberculous than among those ill from other causes. That such is the fact is indicated by some of the following investigations:

Letulle, Bergeron and Lepine⁹⁴ investigated the prevalence of syphilis among this class of patients in Paris, and for more than a year performed the Wassermann reaction on all patients male or female admitted for tuberculosis. Thus of 346 tuberculous patients 64 gave positive reactions and 8 were doubtful. At least 19 per cent. are therefore shown to be infected with syphilis on the basis of the Wassermann reaction alone. The authors state that "In Paris among the patients in hospital for pulmonary tuberculosis, one-fifth at least suffer from syphilis more or less latent but which

is still in full activity. This is shown by the Wassermann and confirmed at all points by our pathological investigations." Vedder⁹⁵ investigated the prevalence of syphilis among soldiers discharged from the army for tuberculosis. All patients at Fort Bayard at the time were included except those having a history of syphilis, and a Wassermann reaction was performed on all of them. Of the 211 patients so examined, 36, or 17 per cent., gave a double-plus reaction, while 17 per cent. more gave a plus reaction. There were 17 patients known to be syphilitic, and if those known to be infected are added to those giving a double-plus Wassermann reaction, of a total of 229 patients, 53, or 23.2 per cent., were syphilitic. Snow and Cooper⁹⁶ repeated this work at Fort Bayard, also using the Wassermann reaction on all cases, but with a somewhat different technic than that used by Vedder. Of 290 patients examined, these authors found 44, or 14.8 per cent., to be surely syphilitic, and 58, or 20 per cent., who were surely or probably syphilitic. Lyons⁹⁷ reports 29, or 6.2 per cent., positive out of 471 tuberculous patients, while 12, or 3 per cent. more, gave partial reactions. Jones⁹⁸ reported 73, or 29 per cent., positive out of 251 patients coming to the public clinics, but many of these were partial reactions. Out of 189 patients from a sanatorium who were undoubtedly tuberculous there were 11 per cent. of three-plus reactions, 17 per cent. of two-plus reactions and 25 per cent. of plus reactions. The original Wassermann technic was used with a three-plus reading. Of the patients 70 per cent. were males and 30 per cent. females, and the percentage of positive reactions was about the same for both sexes. Petroff,⁹⁹ using a cholesterinized heart extract for antigen, found that of 376 cases, 82, or 21.8 per cent., gave a positive Wassermann reaction. Ford¹⁰⁰ examined 328 patients at the Loomis Sanitarium, of whom 302, or 92 per cent., were negative, and only 2 per cent. showed a persistently positive reaction, and the remainder gave partial reactions. A cholesterinized antigen was used, but nothing is said as to the social status of the patients, which it is thought may explain the remarkably low percentage found in this series. The statement is made¹⁰¹ that Wassermann

tests were made on 175 tuberculous patients at the Corlears Tuberculosis Clinic. Of these, 154, or 88 per cent., were negative, 14, or 8 per cent., were positive and 9, or 5.1 per cent., gave partial reactions. Subsequent findings confirmed the diagnosis of syphilis in all cases that gave a strongly positive reaction, and in some that were reported weakly positive. Through the kindness of Dr. H. J. Corper I am able to quote the results which he has obtained from routine examinations of patients at the Chicago Tuberculosis Sanitarium for the last three years (1915-1917). The Wassermann reaction was performed on all admissions, using the Noguchi hemolytic system and a non-cholesterinized beef-heart antigen. Only those cases giving complete fixation of complement were considered positive. The results may be tabulated as follows:

Age in years.	Male.			Female.		
	Total.	Positive.	Positive, per cent.	Total.	Positive.	Positive, per cent.
0 to 5	43	1	2.3	31	1	3.2
6 to 15	207	16	7.7	265	14	5.2
16 to 25	341	14	4.1	443	17	3.8
26 to 40	551	50	9.0	531	37	6.9
41 to 60	212	19	8.9	111	11	9.9
Over 61	14	1	7.1	5	0	0.0
Unknown	27	0	0.0	13	0	0.0
Total	1395	101	7.2	1399	80	5.7

From the above table it will be seen that of a total of 2794 cases of both sexes and all ages a positive Wassermann was obtained in 181, or 6.5 per cent. This is believed to be an absolute minimum, for it must be remembered that partial reactions are not given, that a cholesterinized antigen was not used, and that many cases known to be syphilitic were probably excluded and treated elsewhere. Many are thus treated at the County Hospital. Among males of twenty-six to forty years of age the percentage is at least 9, and may be estimated at a considerably higher figure.

Criminals.—Criminals can hardly be included with the sick, nor can they be classed with the normal population.

According to Boudreau¹⁰² the Wassermann reaction has been performed on all admissions to the prison at Auburn, N. Y., except those sent from Sing Sing. This rule has been in force since December, 1915. During the following five months there were 279 admissions, of which 47, or 16.8 per cent., had positive reactions. In addition the test was made on all inmates of the women's prison, and out of 127 specimens, 43, or 33.8 per cent., were positive.

Kramer¹⁰³ examined 1583 out of the 1800 inmates in the Ohio penitentiary on July 1, 1915: 288, or 18.1 per cent., gave either positive or partial reactions as follows: 18 were four plus, 35 were three plus, 149 were two plus and 86 were plus. Of these 288, 43, or 14.9 per cent., gave a clinical history of some sort. Of the colored population, 58, or 13.4 per cent., were positive; while 108, or 20.9 per cent., of the American-born population were positive. This low finding among the colored prisoners is remarkable and unexplained.

Vedder⁹⁵ investigated the prevalence of syphilis among the military prisoners confined at Fort Leavenworth and Fort Jay. While these men are not criminals they include a certain number of defective and abnormal individuals. Of 1145 prisoners examined, 82 were under treatment for syphilis, 101 more had a double-plus Wassermann; so that 183, or 15.98 per cent., may be regarded as undoubtedly syphilitic. In addition to this there were 65, or 5.67 per cent., who had a plus Wassermann.

Thomas¹⁰⁴ reported that for a year a Wassermann reaction was made on every prisoner admitted to the Naval Prison at Portsmouth. Of the 280 tested, 59 gave a history of a chancre, and of these 49 had a positive Wassermann. None of the 221 cases denying a history of infection had a positive Wassermann. While these figures are almost too good to be true, and it can hardly be believed that not a single case out of 221 denying infection should have a positive Wassermann if accepted at their face value; this indicates that 21 per cent. of the prisoners at Portsmouth are syphilitic.

The statistics of the New York Health Department quoted by Pollitzer¹⁰⁵ are of great interest. He states that 35 per cent. of the 3809 cases from the criminal, degenerate and

derelict class have syphilis, the distribution being shown by the following table:

SYPHILIS IN THE DERELICT CLASS.

	Number of tests.	Positive.	Positive, per cent.
Tombs prison men awaiting trial . . .	391	45	11.5
Hart's Island Reformatory—boys . . .	544	37	6.8
Penitentiary, Blackwell's—both sexes . . .	253	62	24.5
Workhouse—both sexes	2621	1209	45.7

Sick Children.—The prevalence of syphilis among children depends almost entirely upon the prevalence of inherited or congenital syphilis. Such children naturally tend to be found in hospitals and institutions. While the percentage found in general hospitals for children is not large the percentage of syphilitic children in institutions for the feeble-minded may be quite high. Much work has been done along this line, and it cannot all be quoted.

Churchill¹⁰⁶ tested a series of 101 hospital children by the Wassermann reaction. None of these children were admitted for syphilis, yet 38 per cent. of the cases gave a positive reaction. Some of these were undoubtedly partial reactions, yet in investigating the clinical condition and history, Churchill came to the conclusion that there were 29 cases, or 28 per cent. of syphilitic children in this series.

Blackfan, Nicholson and White¹⁰⁷ also examined 101 infants, 68 of whom were from a foundling hospital and 33 from the wards and out-patient department of the St. Louis Children's Hospital. In the first 68 children the Wassermann was negative in 66, doubtful in 1 and positive in 1. In the second group the Wassermann was negative in 32 and positive in 1. Holt¹⁰⁸ reported 178 tests made on hospitalized children showing no definite signs of syphilis. Positive reactions were obtained in 11 cases, and of these 5 were proved to be syphilitic by the subsequent findings and 2 were probably syphilitic. If the whole 11 are counted as syphilitic this gives a percentage of 6.1.

Churchill and Austin¹⁰⁹ made an analysis of the literature and an intensive study of 695 patients in the Children's Memorial Hospital, Chicago. They conclude that, according

to the literature, the incidence of hereditary syphilis must vary considerably, it being variously estimated at from 2 to 14 per cent. in both Europe and America. Intensive study of their own series of 695 patients during the winter of 1915-1916, including both clinical and laboratory methods, indicated an incidence of 3.3 per cent. of hereditary syphilis. The amount among hospital infants and children in four large cities of the United States, New York, St. Louis, Chicago and San Francisco, appears to range from 2 to 6 per cent. Whitney's figures⁸² indicated that of 890 children in the out-patient department of the University of California, 26, or 2.9 per cent., were syphilitic. Walker⁸⁸ examined 480 inmates of an institution for the feeble-minded in Baltimore, boys and girls, representing State charges, and found that less than 3 per cent. had a positive Wassermann.

As showing the higher incidence of syphilis in certain institutions, we may quote several investigators.

Johnson¹¹⁰ performed a Wassermann reaction on 224 children from the open-air schools of St. Louis. These schools are maintained for children suffering from anemia and malnutrition of apparently unknown origin. Of these children, 37, or 16.5 per cent., gave a four-plus reaction, 39, or 17.4 per cent., gave a three-plus reaction, 22, or 9.8 per cent., gave a two-plus reaction, 28, or 12.5 per cent., gave a plus reaction and only 98, or 43.8 per cent., gave a clean negative. If the four- and three-plus reactions are counted as indicating syphilis, 76, or 33.9 per cent., of these children were luetic.

Lucas¹¹¹ found that out of 111 children from two to nineteen years of age the Wassermann reaction was positive in 35, or 31.5 per cent. These were all abnormal children, mentally backward, epileptic and suffering from various nervous conditions.

Anderson¹¹² performed the Wassermann reaction on a series of 225 cases intensively studied by exact mental tests: 41 were adults and 184 were children and adolescents; 41 per cent. of the adults and 42.5 per cent. of the children were mental defectives. Of the 41 adults, 24.6 per cent. had a positive Wassermann, and of the 184 children and ado-

lescents, 17 per cent. had a positive Wassermann. Anderson states that in every instance the Wassermann reaction was negative in those individuals classified as normal by exact mental tests, so that the percentage of positives for the mentally deficient must have been much higher than indicated by the above percentages and higher than the figures obtained by other investigators.

Haines¹¹³ found that of 68 feeble-minded children at the psychopathic hospital about 30 per cent. were syphilitic, while the incidence of syphilis among all patients tested at this hospital was 14.7 per cent. These results agree closely with those of Dean²⁶ and Lippmann²⁵ who studied the incidence of syphilis among idiots in Germany by means of the Wassermann reaction and the clinical findings.

On the other hand, quite different results are recorded as the result of an investigation of weak-minded in Denmark,¹¹⁴ in which out of 2061 weak-minded patients of all ages only 31, or 1.5 per cent., gave a positive reaction. However, such figures are altogether too good to be true. It will probably be admitted that the percentage of syphilis in the general population in Denmark must be higher than this, and there is no reason to suppose that the percentage among weak-minded is lower than that among the surrounding population, but rather the reverse. It would seem therefore that this particular Wassermann technic must have been inefficient in spite of the fact that Boas was one of the collaborators.

Haines¹¹⁵ also studied the incidence of syphilis among juvenile delinquents and found undoubted evidence of syphilitic infection among delinquent boys and girls in from 15 to 20 per cent. of the cases. His figures are as follows:

	Boys.	Girls.	Total.
Total tested	147	218	365
Positive Wassermann	34	42	76
Per cent. positive	23.1	19.2	20.8

In such studies of congenital syphilis by means of the Wassermann reaction, higher percentages are obtained the younger the children studied, because the Wassermann reac-

tion is always more strongly positive in early syphilis than in tertiary and so-called latent syphilis. This fact is brought out by Dean's figures on idiots, which were as follows:

	Number examined.	Positive.	Positive, per cent.
Patients ten years and less	94	20	21.27
Patients eleven to fifteen years	142	24	16.9
Patients sixteen to twenty years	66	4	6.06

However, it should be noted that under one year of age this rule appears to be reversed. Rabinowitsch⁴ examined infants at a creche in Charkow, Russia. He made a total of 1108 Wassermann examinations, of which 153 were positive. But 732 of these made on the first examination gave only 83, or 11.33 per cent., positive; 308 who were examined the second time at a later age resulted in 16.2 per cent. of positives, while on the third examination there were 29.4 per cent. of positives.

Dr. Sessions, superintendent of the Indiana Girls' School, an institution for delinquent girls, reported an examination of 243 girls in that school in May, 1915: 55, or 22.6 per cent., gave positive reactions, and Dr. Sessions thought that in 45 of these girls the disease was congenital, and that not one of these 45 had a well-balanced, dependable mind.¹¹⁶

McKay¹¹⁷ performed the Wassermann reaction on 1550 inmates in the institution for the feeble-minded at Columbus, Ohio. The patients tested ranged in age from six to sixty-one years of age: 134, or 8.6 per cent., gave positive reactions. In only 2 of these cases was there a history of syphilitic infection, so that in 132, or 8.5 per cent., the infection was presumably congenital. The youngest patient having a positive reaction was seven years old and the oldest was sixty-one.

Moulton¹¹⁸ tested 600 boys at the Minnesota School for the Feeble-minded. Noguchi's modification with the acetone-insoluble fraction for antigen was used: 523, or 87.1 per cent., were negative, while the remainder gave complete or partial reactions; 16, or 2.6 per cent., gave complete inhibition, and 61, or 10.1 per cent., gave partial reactions. Had a stronger

antigen been used, undoubtedly some of these partial reactions would have been completely positive.

Dawson¹¹⁹ reports the results of an examination of 1113 inmates of the Sonoma State Home at Eldridge, California, using the Noguchi technic. Positive tests were obtained in 30 males and 23 females, a total of 53, or about 5 per cent. Ages were from nine to sixty-five years.

Individuals Who are Presumably Healthy.—While it is comparatively easy to obtain information in regard to the existence of syphilitic infection among those individuals who are sick and have presented themselves for treatment, it is a matter of great difficulty to obtain any evidence in regard to the prevalence of syphilis among individuals who are healthy and therefore do not come under observation, and it is due to this fact chiefly that our information in regard to the prevalence of syphilis in the community as a whole is so meager. It occurred to the writer that such information could be readily obtained with regard to the young adult males of the community by making surveys of the men in the army and also of the recruits accepted for the army. This work was accordingly carried out and the results have been published.⁹⁵ So far as healthy white males are concerned, these results may be summarized as follows:*

Survey.	Total examined.	Known syphilitics.	++ Wassermann.	Undoubted syphilitics.	+ Wassermann.	Estimate of total probable syphilitics.
Recruits . . .	1019	0	7.75	7.75	9.02	16.77
Cadets . . .	621	0	2.57	2.57	2.89	5.46
White enlisted men . . .	1577	3.44	4.77	8.21	7.87	16.08

The cadets were from seventeen to twenty-seven years old and may be taken as representative of the better class of young men that are found in our colleges. The enlisted men ranged from eighteen to forty years of age, but the majority

* Foucar made a Wassermann survey of 500 white soldiers at Honolulu, of whom 8.25 per cent. gave a double-plus reaction. Report of Surgeon-General, 1916, p. 193.

were between twenty to twenty-five years of age and may be taken as representing the great middle class of mechanics, artisans and untrained laborers. The evidence indicated that the percentage of syphilitic infections increased with age.

Of 25 men of eighteen years of age, 1, or 4 per cent., was positive.

Of 64 men of nineteen years of age, 2, or 3.12 per cent., were positive.

Of 86 men of twenty years of age, 7, or 8.14 per cent., were positive.

The average percentage for five-year periods was as follows:

18 to 22	10.35
23 to 27	16.58
28 to 32	20.85
33 to 37	24.22
37 to 41	28.82

The recruits constituted an especially interesting class because they were not yet a part of the army and therefore represented conditions as found in civil life, except for the fact that as these men had already passed two physical examinations, and evident syphilitics had been rejected, it may be assumed that there was a higher percentage of syphilitic infections among the men of this class in civil life than among the picked recruits.

From this study the writer drew the conclusions:

1. We may estimate that about 20 per cent. of the young adult male population of the class from which the army is recruited are infected with syphilis.

2. We may estimate that about 5 per cent. of the young men in our colleges are syphilitic.

These results were sufficiently interesting to warrant further study, and accordingly, arrangements were made by the Surgeon-General and the Adjutant-General to have a Wassermann reaction performed on each recruit accepted for the army. Each recruit depot was equipped to perform this reaction, and a medical officer was detailed at each depot to perform this work. The same technic was used by all of these officers, and was that used in the previous work.*⁹⁵

* See Appendix, p. 265.

THE PREVALENCE OF SYPHILIS

Place.	Medical officer.	Total.	Double plus.		Plus.		Plus-minus.		Negative.	
			No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Fort Logan, Col. . . .	Craig	1,136	103	9.06	51	4.48	20	1.76	962	84.68
Jefferson Barracks, Mo. . .	Jones	5,315	280	5.26	563	10.59	971	18.26	3,501	65.87
Fort Slocum, N. Y. . . .	Offut	3,788	117	3.08	268	7.07	729	19.24	2,674	70.59
Columbus Barracks, O. . .	Chunn	3,495	193	5.52	154	4.40	286	8.18	2,862	81.88
Fort McDowell, Cal. . . .	Nichols	2,310	213	9.22	94	4.07	68	2.94	1,934	83.72
Total . . . . .	. . . . .	16,044	906	5.64	1,130	7.04	2,074	12.92	11,933	74.37

The work was commenced about October, 1915, and the results for the first year are tabulated on the opposite page.

At this time the above-named officers were relieved from this duty. The work was continued but was performed by a personnel unknown to the writer, and part of the time at least by enlisted men of the Hospital Corps who had received a certain amount of training under the previous medical officers performing the work. The results of the work carried on under these conditions during 1916-1917 may be tabulated as follows:

Place.	Double plus.		Plus.		Plus-minus.		Negative.		Total.
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	
Fort Logan, Col.	143	5.68	55	2.18	37	1.46	2,281	90.66	2,516
Jefferson Barracks, Mo.	461	5.66	322	3.95	351	4.31	7,001	86.06	8,135
Fort Slocum, N. Y.	101	1.40	234	3.26	1298	18.10	5,536	77.22	7,169
Columbus Barracks, Ohio	84	2.95	158	5.56	380	13.37	2,219	78.10	2,841
Fort McDowell, Cal.	99	4.10	27	1.12	41	1.70	2,244	93.07	2,411
Total	888	3.84	796	3.45	2107	9.13	19,281	83.56	23,072

It is very difficult to pass judgment on these figures. The percentage of positive reactions obtained during the second year (3.84 + + and 3.45 +) are much lower than those obtained during the first year (5.64 + + and 7.04 +).

Since the qualifications of the workers who performed the test during the second year are unknown it is only natural to believe that the results obtained during the first year are the more accurate and give a better idea as to the prevalence of syphilis among accepted recruits for the army.

But there is some variation in the figures obtained by different workers even during the first year, and it is a remarkable coincidence that the figures obtained by Craig and Nichols were constantly higher than the figures obtained by other workers. The results obtained by these two workers

are almost identical and only slightly below those obtained by the writer, as may be seen from the following tabulation:

	Total number.	Double plus.	Plus.	Per cent. positive.
Vedder	1019	7.75	9.02	16.77
Craig	1139	9.06	4.48	13.54
Nichols	2310	9.22	4.07	13.29

The difference between the results obtained by Craig and Nichols and the other three workers during the first year consists in the higher percentage of double-plus reactions obtained by Craig and Nichols and the higher percentage of plus reactions obtained by the other three workers. If all double-plus and plus reactions be added together there is substantial uniformity of result. Thus 12.68 per cent. of positive reactions were obtained in a total of 11,933 cases. On this basis we may estimate that about 13 per cent. of accepted recruits for that year were syphilitic.

Since these figures agree so closely with my own the possibility that the low figures for the second year when only 7.29 per cent. of positive reactions were obtained were due to imperfections in technic must be considered. It is also possible that at least a part of the decrease in positive reactions during the second year of the work was due to the fact that, owing to the possibility of active service, a younger and better class of recruits were secured during the last year. It has been the policy of the War Department to discourage reënlistments except in the case of non-commissioned officers, and especially valuable men, and during this year the percentage of reënlistments was very low. This would cut down the percentage of men over thirty years of age very materially. In former years approximately 16 per cent. of the total number of recruits were over thirty years of age, and in all the groups studied by Vedder the percentage of positive reactions increased steadily with increasing age. The fact that the percentage of syphilis among accepted recruits is materially lower as the age decreases is also shown by a survey made by Munger,¹²⁰ who made a Wassermann survey of 500 accepted recruits for the navy. Of these men, 5, or 1 per cent., were double plus, and 3, or 0.6 per cent.,

were plus. It is not to be supposed that there is any essential difference between the class of men secured for the navy and that secured for the army; but there is an important difference in the age, as the average age of these 500 naval recruits was only nineteen. The age seventeen furnished the largest number of any one year and 73 per cent. were under twenty-one. All of the men giving double-plus reactions were over twenty-one. The recruits surveyed by Vedder were from eighteen to forty years of age, but 61 per cent. were between twenty-one and twenty-four years of age, and 16 per cent. were over thirty years of age.

As these are all men who have been selected by passing one rather severe physical examination in the course of which all cases of obvious syphilis were rejected, it should be safe to estimate that in the civil community, men of the corresponding groups may run from 1 to 5 per cent. higher; so that the original estimate by Vedder of 20 per cent. for the young adult male population of the class from which the army is recruited is approximately correct for men from twenty-five to thirty years of age, but is probably too high for men from seventeen to twenty-five years of age.

Through the kindness of Dr. Huron W. Lawson, of Washington, D. C., the writer has been able to perform a Wassermann survey on 856 consecutive candidates for the police force, the results of which are as follows:

Total examined.	Double plus.		Plus.		Plus-minus.		Negative.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
856	54	6.30	77	8.99	91	10.63	634	74.06

From this we see that 15.29 per cent. of these candidates gave either a double-plus or a plus reaction, so that we may estimate that at least from 15 to 16 per cent. of these men are syphilitic. These men are almost all robust, apparently healthy men, but they are, as a class, more intelligent than

the average recruit for the army. Since only a few men present themselves at a time for this examination, in order to obtain this number of men the work was continued over about three years. It is believed therefore that this represents a fair average of the material presenting for the police force of the city of Washington, and these figures obtained in strong and apparently healthy males in civil life are an additional confirmation of the correctness of the writer's original estimate of the prevalence of syphilis among the young adult males of the community, and indicate that there is no reason to suppose that the incidence of the disease is any higher among those men who present themselves as candidates for the army than among other young males of the general community belonging to the same social scale.

Candidates for a Commission in the Army.—The writer has also had an opportunity to make a Wassermann survey of a large number of young men who have been candidates for a commission in several training camps in the Eastern Department. Many of these were college men, a fair proportion were non-commissioned officers of the regular army, and young men in business and various professions were all included. Taken as a whole, they may fairly be considered as representative of a more highly educated class than the class applying for enlistment. Some of them have come from the best of homes, and probably no better group of men could have been selected to represent the great middle class. While there were a few men over forty, the great majority of this group were young men under thirty. In all, 3203 candidates for commissions were examined, with the following results: 79, or 2.46 per cent., gave a double-plus reaction; 109, or 3.4 per cent., gave a plus reaction; 116, or 3.61 per cent., gave a plus-minus reaction; 2899, or 90.5 per cent., gave a negative reaction. A history of physical signs of syphilis was obtained in many of the positive cases and in a few of the partial reactions, so that the incidence of syphilis in this group may be regarded as falling between 2 and 5 per cent.

These figures are much lower than the percentages obtained

from surveys of enlisted men or candidates for enlistment, and are about the same as those obtained in the survey of cadets at West Point. In the latter case, however, as there were no clinical evidences of syphilis among any of the cadets, it is probable that the incidence of syphilis among these cadets is nearer 2 than 5 per cent., while among the present group of candidates for a commission it is probable that the percentage is nearer 5 than 2.

Healthy Women.—While information as to the prevalence of syphilis may be obtained in regard to women who have entered the hospital for some illness, it is very difficult, for obvious reasons, to obtain information in regard to the prevalence of this disease among presumably healthy women. Such information can, however, be obtained from maternity hospitals, for there is no reason why women who are admitted only for pregnancy should not be considered as normal. Williams¹²¹ found that of 10,000 consecutive admissions to the obstetrical department of the Johns Hopkins Hospital, of which 4600 were colored, a total of 350 syphilitic children were born, a percentage of 3.5. This does not indicate the total number of syphilitic women, but only those who gave birth to obviously syphilitic children. Of 705 fetal deaths occurring in this series, 273 were in the white race and 35 of these, or 12.3 per cent., were due to syphilis; 432 deaths occurred in the colored race, of which 151, or 34.9 per cent., were due to syphilis. Williams concludes that syphilis is the greatest single cause of fetal death.

Commisky¹²² in a series of 1822 routine Wassermann tests on pregnant women found 145, or 8 per cent., positive; 26, or 1.4 per cent., doubtful; while 11 negatives, or 0.6 per cent., had infants whose reactions were positive or doubtful. Of those positive, 82 per cent. gave no history or clinical signs of the disease.

Falls and Moore¹²³ examined 160 pregnant women from fifteen to forty-three years of age, over 90 per cent. being from eighteen to twenty-two years of age. Of 118 married women 10.6 per cent. were positive, while among 44 single women 13.6 per cent. were positive. Of 146 white women,

9.5 per cent. were positive; while of 14 colored women, 28.5 per cent. were positive. In the discussion following this paper Dr. Losee* stated that routine Wassermann tests had been made during the past two years at the New York Lying-in Hospital on 2000 antepartum women, of whom 3.05 per cent. were positive, and that Fildes in the East End of London had observed 3.9 per cent. in 677 women.

Dr. Reuben Ottenberg has been so kind as to send me the results of the routine Wassermann reactions performed by him on cases of pregnancy admitted to the Sloane Hospital for Women, New York, from July, 1916, to December, 1917. A non-cholesterinized antigen was used. The results are as follows:

Negative reactions	2183	87.7 per cent. of the whole
Plus-minus or plus	38	} 2.4 per cent. of the whole
Double plus	40	
Positive 3+ or 4+	227	9.9 per cent. of the whole

In 252 cases tests were performed also with a cholesterinized antigen prepared after the method of Walker and Swift. Of these,

Five listed as negative were four plus with the cholesterinized antigen.

Five listed as negative were three plus with the cholesterinized antigen.

Ten listed as negative were two plus with the cholesterinized antigen.

It will thus be seen that the cases reported by Dr. Ottenberg are the result of a very conservative reaction and must be considered as the minimum number of positive cases at the Sloane Hospital.

For several years I have made routine Wassermann tests for the Columbia Hospital for Women, Washington, D. C. During certain times I have also made this test as a routine for Dr. Lawson's obstetrical clinic. The following tabula-

* See Syphilis in Mother and Infant, Bulletin of the Lying-in Hospital of New York, June, 1916.

tion which includes only women admitted for pregnancy, shows the results obtained:

WHITE WOMEN.

	Number examined.	Double plus.		Plus.		Plus-minus.		Negative.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Lawson .	20	3	15.0	4	20.0	2	10.0	11	55.0
Columbia	181	14	7.73	15	8.28	22	12.15	130	71.82
Total .	201	17	8.01	19	9.05	24	11.94	141	70.01

COLORED WOMEN.

Lawson .	165	31	18.78	25	15.15	15	9.09	94	56.97
Columbia	497	94	18.91	56	11.26	55	11.06	292	58.75
Total .	662	125	18.88	81	12.23	70	10.57	386	58.3

Counting double-plus and plus cases we may estimate that 17 per cent. of these white women are syphilitic, and it is not believed that this estimate is much too high, for it is undoubtedly true that these patients are for the most part from the poor and ignorant classes and include a fair sprinkling of single women. Probably among the better classes the percentage would be nearer the 3 per cent. found in the New York Lying-in Hospital. These figures may be compared to the 31.1 per cent. of positive reactions found among pregnant negro women.

The Prevalence of Syphilis among Negroes.—All who have had any extensive experience with the negro race have felt assured that the incidence of venereal diseases is much higher among them than among the white race. These impressions have been based partly upon the observations of those physicians who have been brought in professional contact with negroes, and partly on *a priori* deductions from the generally admitted sexual promiscuity of the majority of this race. Murrell, of Richmond, Va., was one of the first to call attention to the prevalence of syphilis among the

negroes of the South. Among other things Murrell¹²⁴ said: "Morality among these people is almost a joke and is only assumed as a matter of convenience, or when there is a lack of desire and opportunity for indulgence, and venereal diseases are well-nigh universal. As an illustration of this, in clinic and private practice I have never seen a negro virgin over eighteen years of age. In an investigation among negroes of all classes the average age of defloration was found to be about fifteen, and these estimates are not unfair to the race as a whole, for they are gained from experience with a part of the negro population that enjoys exceptional advantages for education and improvement. It is my honest belief that another fifty years will find an unsyphilitic negro a freak unless some such procedure as vaccination comes to the relief of the race, and that in the hands of a compelling law. Tuberculosis is often spoken of as the scourge of the negro, but there must be twenty syphilitics to the one consumptive, and hundreds of the negro consumptives have syphilis to combat as well. This may sound exaggerated, but it is near the pitiless truth."

Similar evidence as to the sexual habits of negroes has been given by Quillian,¹²⁵ McHatton¹²⁶ and others. Quillian states: "In a practice of sixteen years in the South I have never examined a negro virgin over fourteen years of age. From personal observation I believe that from 60 to 70 per cent. of the blacks in the South have either hereditary or acquired syphilis."

Such statements, while based on ample clinical experience, are obviously guesses, and while such estimations may not exceed the facts as to the prevalence of syphilis in the negro race they cannot obviously be given the same value as accurate statistical investigations.

Until very recently no such accurate statistics have been available. Several investigators have compared the admission rates for syphilis at various clinics for whites and negroes. Thus, Matas,¹²⁷ in 1896, found from statistics of the Charity Hospital of New Orleans that for the ten years from 1884-1893 the ratio of the prevalence of syphilis was 2.84 per cent., or 28 cases in 1000 for the whites, and 5.06 per cent., or 51

cases in 1000 among the colored. That is, syphilis was nearly twice as frequent among the negroes, and the deaths caused by syphilis were exactly three times greater in the colored than in the white hospital population. Fox,¹²⁶ in 1908, analyzed statistics based on Central Dispensary reports for nine years, and including all cases of syphilis that were treated in clinics for medicine, surgery, children, gynecology, throat, chest, skin and genito-urinary and nervous diseases. In a total of 15,000 whites included there were 621 cases of syphilis, while in a total of 32,000 blacks there were roughly 1900 cases of syphilis; that is, that syphilis in blacks was only 1.46 times as frequent as in whites. According to Hazen,¹²⁹ Dr. Warfield, superintendent of the Freedmen's Hospital, Washington, D. C., has personally tabulated all cases of syphilis in the service of that hospital from 1901-1912. The total negro patients were 90,172, having 4913 cases of syphilis, or 5.37 per cent. In a study of syphilis published by the Committee on Social Betterment it was found that in the hospitals of Washington 3.46 per cent. of all patients applied for treatment because of syphilis. A comparison of these figures shows that admissions for syphilis in Washington are about one and a half times as frequent among negroes as among whites. These figures agree closely with those of Fox.

Hazen¹³⁰ has also reported 5 cases of syphilis in the contagious stage among negro children attending school, and between the years of twelve and fifteen. One of these, a boy, aged fourteen years, gave the interesting information that three boys and three girls of his school had formed a "social club" and had had intercourse nearly every night, it being the custom to change the partners frequently. Hazen quotes Pollock as stating that each year in Baltimore at least 800 cases of venereal disease are acquired by children under fifteen years of age. In general, under six years of age more cases of venereal infection occur among the white children; but that after six years of age, when sex begins to assert itself, there are more cases among the colored.

Baetz¹³¹ states that at Ancon Hospital, in the Canal Zone, 500 cases of syphilis were observed among 8226 colored

admissions during a period of twenty-three months, making 6 per cent. of colored admissions that are known to be syphilitic. Of these 500 cases, 366, or 4.4 per cent., came to the hospital solely because of syphilis. Such figures, which might be multiplied indefinitely, all indicate that syphilis is more frequent among the colored race than among whites. They all fail, however, to give any adequate idea as to the actual prevalence of syphilis among negroes for the reason that they are based solely on admission rates, and, as all the writers quoted have observed, the negro often fails to present himself for treatment for syphilis which he considers a trifling disorder, and when he does consult a physician will only remain under treatment for a few days or weeks until the immediate symptoms have passed off. Hazen presents a number of other circumstances and figures which indicate that syphilis must be more prevalent among negroes than the admissions show. Thus the health reports of the District of Columbia for ten years ending 1903 show that during this period there were 27,893 legitimate and 907 illegitimate births among whites and 13,909 legitimate and 4786 illegitimate births among the colored. Practically one-third of the population was negro. In a study of 2000 cases of skin diseases in negroes and a similar number in whites, Hazen found over three times as much secondary and tertiary syphilis in the negro, nearly six times as many gummas and over four times as much hereditary syphilis in the negro. The average age of infection in 500 consecutive cases was twenty-one years, but 9 cases were in school children, 4 of whom were under fifteen years of age.

Lee¹³² says: "Syphilis has as much to do with the high death-rate in the negro as any other single factor. It does not show on the death certificate, but as a complication of bronchitis, pneumonia and tuberculosis it reduces the chance of a successful fight against those diseases, and as a cause of arteriosclerosis, endocarditis, cerebral hemorrhage, nephritis and stillbirths it seems to be ever present. As city physician during three years I treated 1426 negroes, 486 of whom had syphilis in some evident form, to say nothing of those who came to me with minor ailments who only paid one or two

visits but in whom the disease was latent and in whom I did not make the diagnosis. I personally believe that more than 50 per cent. of the colored race suffer with this disease, either inherited or acquired."

We may now pass to certain investigations that have been undertaken with the definite purpose of determining the amount of syphilis in negroes. In 1914 Murrell¹³³ stated: "In our dispensary work in Richmond we make the Wassermann test in negroes as a routine measure, and it is almost invariably positive. Of all specimens taken probably 75 per cent. show a positive Wassermann."

Ivey¹³⁴ reported the results of a Wassermann test among the negro insane at Alabama. The test was performed on every case in the asylum, with the following results: 357 males were examined, of whom 90, or 25 per cent., were positive, and of these 90 males, 48 showed clinical signs of syphilis; 349 females were examined, of whom 102, or 29 per cent., were positive, and 49 showed clinical signs of syphilis.

Hindman¹³⁵ performed a routine Wassermann reaction on all patients admitted to the Georgia State Sanitarium from January to November, 1915; 1194 patients were admitted, of whom 420 white males gave over 6 per cent. positive reactions, 351 white females gave over 5 per cent. positive reactions, 255 negro males gave over 16 per cent. positive reactions and 218 negro females gave over 16 per cent. positive reactions. All positive reactions recorded were clear-cut complete inhibition of hemolysis. Hindman also states that Dr. Lynch, Professor of Pathology in the Medical College of South Carolina, permits the use of the following conclusions arrived at by a comparative study of a large number of negroes with the aid of the Wassermann reaction:

1. Syphilis occurs in from 50 to 60 per cent. of the major class of our Southern negroes.

2. It is more frequent in the women than in the men.

Vedder and Hough,⁶⁸ in a Wassermann survey of the insane at the Government Hospital for the Insane, Washington, D. C., studied 93 colored males, of whom 22, or 23 per cent., were syphilitic, and 63 colored females, of whom 8, or 12

per cent., were syphilitic. This lower percentage in the females is not to be taken seriously, owing to the fact that only a small number of colored females were in the asylum at the time of the examination. Wender¹³⁶ in a later study in the same institution found that of 106 colored male patients admitted between July 1, 1914, and June 30, 1915, 53, or one-half, were infected with syphilis. In 21 cases the relation between the psychosis and the syphilitic infection could not be determined, but 32, or 30.1 per cent., suffered from syphilitic disease of the central nervous system; 11 suffered from cerebrospinal syphilis, while 21 cases, or 18.86 per cent., suffered from general paralysis. Wender concludes that these findings justify the conclusion that syphilis is prevalent to a marked degree in the colored race.

McNeil¹³⁷ investigated the prevalence of syphilis among the negroes of the city of Galveston. The majority of the negroes studied were of the working class and the wives and children were also included in the study. Of 1200 adult negroes fifteen years of age or over applying at clinics, 34 per cent. gave definitely positive reactions. In order to determine the prevalence of the disease among average healthy negroes 200 such cases were examined, of whom 24 per cent. gave a positive Wassermann. McNeil's conclusions were as follows:

1. The incidence of syphilitic infection among apparently healthy adult negroes in this community varies between 25 and 30 per cent.

2. The infection is largely acquired, since it is much lower in incidence among children under the age of puberty.

3. The incidence of syphilitic infection among sick negroes is considerably higher than among the well, averaging between 40 and 50 per cent.

4. The occurrence of syphilis among white people of the same social class as negroes would seem to be about the same as among the negroes. In the better class of white people the occurrence is much less, while in the best classes it is almost *nil*.

5. Syphilis is undoubtedly one of the chief causes of death and disease among the negroes, ranking as high or higher

than tuberculosis, Bright's disease and pellagra which are the three other chief causes of death and disability among that race in this community.

Wilson¹³⁸ made an examination of young colored girls in a reformatory institution. They were of an average age of sixteen years, the youngest being eleven and the oldest twenty-one. The Wassermann was positive in 6 out of 76 of these girls, or 8 per cent., while several others had had syphilis and had been treated. There was a discharge from the vagina in 20 cases, with a positive finding for gonococci on a single examination in 8 cases. A marital vagina was found in all cases. The lower percentage of syphilis detected in these cases is probably due to the youth of these girls, but the findings bear out the statements of others as to the average age of defloration among colored girls.

Jamison¹³⁹ examined 1000 consecutive negro females who were medical cases seen at the clinics of the Charity Hospital at New Orleans. Of these, 166, or 16.6 per cent., were diagnosed as syphilis. Syphilis headed the list of diagnoses, tuberculosis coming next and malaria third; but there were twenty times as many cases of syphilis as of malaria. The Wassermann reaction was performed on about half of the cases diagnosed as syphilis and was positive in about 80 per cent. of these cases, but no attempt was made to perform a routine Wassermann on all patients. Had this been done it may be assumed that the number of cases detected would have been very greatly increased. Investigations in the United States army indicate that when about 3 per cent. of clinical syphilis is present in a group, if the Wassermann reaction is applied, from 18 to 20 per cent. may be detected. In other words, in a given group there is at least five times as much syphilis as is indicated by the number of cases presenting obvious lesions alone. On this basis we may estimate that at least 80 per cent. of these negro women were infected. It must be emphasized that this is a mere estimate, but Boas¹⁴⁰ estimates on the basis of army statistics that syphilis is about two and a half times as frequent in negroes as in whites.

Moore¹⁴¹ gives some figures in regard to the incidence of

hereditary syphilis among negro children applying at a clinic for treatment. The clinical records of 807 consecutive admissions showed that of 582 negro infants and children, 52, or 8.9 per cent., were clinically suffering from hereditary syphilis, while out of 225 white infants and children, 7, or 3.1 per cent., were syphilitic. The clinically evident cases of hereditary syphilis were 2.9 times as frequent among the negroes as among the whites. The Wassermann reaction was not applied, and Moore states that "Our figures should be accepted as an underestimate of the frequency of hereditary syphilis." Between 1900 and 1910 the increase in population among the whites was 15 per cent. while among the negroes it was only 11.2 per cent.

Canal Zone.—Qualls¹⁴³ reported routine Wassermann tests on 981 white males in the surgical wards of Ancon Hospital. Of these 136, or 13.8 per cent., gave a double-plus reaction while 12 more gave a plus reaction, so that it may be concluded that at least 15 per cent. of these patients were syphilitic.

A routine test was also made on 1198 colored male surgical cases: 297 of these patients showed active symptoms or gave a history of previous syphilitic infection, and of these 104 gave a double-plus reaction. Of the 901 cases showing no clinical evidence of syphilis 197 gave a double-plus Wassermann. Counting the double-plus reactions alone, 25 per cent. of these negroes were syphilitic, but if the Wassermann reaction be considered in conjunction with the clinical findings, 27 per cent. are demonstrated to be syphilitic, with a probability that 40 per cent. are syphilitic.

My own investigations confirm the results obtained by others indicating the great prevalence of syphilis among negroes. This work has been carried on continuously from 1913 to 1917 as opportunity afforded.

Sick and Delinquent Negroes.—A study was made of the negroes at the Washington Asylum, which includes a jail to which vagrants and petty thieves are sent, and a free hospital maintained by the District of Columbia. A Wassermann survey was made, including all negroes in the institution at the time and all admissions during the period of the examina-

tion, no selection of cases being made. The results of this survey of 598 negroes may be seen in the following table:

	Total examined.	Double plus.		Plus.		Plus-minus.		Minus.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Hospital, male	267	106	39.70	39	14.60	36	13.48	86	32.21
Hospital, female	105	45	42.85	22	20.95	14	13.33	24	22.85
Jail	226	71	31.40	33	14.60	46	20.30	76	33.60
Total	598	222	37.12	94	15.72	96	16.05	186	31.10

At the time the specimens of blood were taken a brief history was also obtained. By combining the results of this examination with the Wassermann reaction the following results were obtained:

	Total examined.	Undoubted syphilitics.		Doubtful.		Negative.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.
Hospital, male	267	150	56.18	65	24.35	52	19.47
Hospital, female	105	66	62.85	19	18.09	20	19.04
Jail	226	97	42.90	69	30.50	60	26.50
Total	598	313	52.34	153	25.58	132	22.08

It is evident from this series that at least 52 per cent. of all the 598 inmates of this institution are undoubtedly syphilitic, and further, that the percentage of infections was higher among the women than among the men.

Of interest in this connection is the fact that in this series there was one girl of fourteen years of age with a diagnosis of condylomata and a double-plus Wassermann, and another girl of twelve years of age was diagnosed chancre and had a double-plus Wassermann. This undoubtedly proves that in a certain percentage of cases, sexual irregularities occur at a very early age in the negro race, as has already been affirmed. It would be exceedingly difficult to match these cases in children from the white race. On the basis of all the facts it is estimated that from 60 to 70 per cent. of the negroes in the Washington Asylum were infected with syphilis.

A routine Wassermann reaction was also performed on

420 colored women from the gynecological service of the Columbia Hospital for Women. The results of this examination are as follows:

Total examined.	Double plus.		Plus.		Plus-minus.		Negative.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
420	105	25	52	12.38	46	10.95	217	51.66

Healthy Negroes.—A survey was made⁹⁵ on 1472 negro soldiers from two regiments stationed at four different posts. Of these men, sixteen were on the sick report for syphilis, and a Wassermann test was made on the remaining 1456 men, with the result that 321, or 22.04 per cent., gave a double-plus reaction; 193, or 13.26 per cent., gave a plus reaction; 162, or 11.12 per cent., gave a plus-minus reaction, 780, or 53.57 per cent., were negative. Including the double-plus cases and those under treatment for syphilis, 22.21 per cent. were found to be syphilitic; and if the plus cases be added, the estimated number of probable syphilitics may be placed at 36 per cent. This is to be compared with the 8.21 per cent. of undoubted syphilitics found among white soldiers by the same examination and the 16.08 per cent. of estimated probable syphilitics among white soldiers.

TABULATION OF RESULTS OBTAINED BY THE WRITER FROM SURVEYS IN THE ARMY AND PREVIOUSLY PUBLISHED.⁹⁵

Survey.	Total examined.	Known syphilitics, per cent.	+ Wassermann, per cent.	Undoubted syphilitics, per cent.	+ Wassermann, per cent.	Estimate of total number probably syphilitic, per cent.
Recruits	1019	0	7.75	7.75	9.02	16.77
Cadets	621	0	2.57	2.57	2.89	5.46
White enlisted men	1577	3.44	4.77	8.21	7.87	16.08
Colored enlisted men	1472	1.08	21.8	22.21	13.11	36.00
Porto Rico regiment	531	13.55	28.58	42.37	13.55	55.93
Military convicts	1145	6.48	9.50	15.98	5.67	21.65
Insane soldiers	567	3.51	8.29	11.80	7.41	19.21
Tuberculous soldiers	229	7.56	15.72	23.28	15.72	39.00
Soldiers' Home	1171	11.62	13.40	25.02	9.73	34.75
Total	8332					

Healthy Colored Women.—These figures have already been given but may be recapitulated here. Of a total of 662 such women examined, 125, or 18.88 per cent., gave a double-plus reaction; 81, or 12.23 per cent., gave a plus reaction; 70, or 10.57 per cent., gave a plus-minus reaction; 368, or 58.30 per cent., gave a negative reaction.

From this statement it will be seen that the writer has personally performed over 15,000 Wassermann reactions in systematic surveys on various groups of the army and of the population of Washington, D. C. Similar surveys have also been performed on 39,116 consecutive recruits for the army by other medical officers. The recent literature has also been studied in an attempt to obtain all the statistics that would be of value in determining the prevalence of syphilis in the various groups of the population. This work may now be summarized as follows:

SUMMARY.

1. **Prostitutes.**—The percentage of syphilis among prostitutes as indicated by a physical examination or a positive Wassermann reaction, or both, is as follows: 51 per cent. (Davis); 54.4 per cent. (Kneeland); 65.5 per cent. (Sullivan and Spaulding); 67 per cent. (Walker). European figures are even higher: 75 per cent. (Meirowsky); 73 per cent. (Hecht); 78 to 81 per cent. (Pinkus); 100 per cent. (Browning). As no one would claim that all cases of syphilis are detected by this examination, these must be regarded as minimal figures, and we may therefore estimate that among prostitutes in the United States syphilis occurs in from 50 to 100 per cent., depending upon circumstances, particularly upon the length of time they have been prostitutes.

2. **The Insane.**—The percentage of syphilis among insane, as a general class, as indicated by a physical examination or a positive Wassermann, or both, is 15.8 per cent. in Massachusetts (Southard); 18.1 per cent. in Michigan; 20 per cent. in Oregon (Matson); 20.4 per cent. in Pennsylvania (Darling and Newcomb); 24.5 per cent. in Massachusetts (Paine).

For male insane the following figures are given: Louisiana, 8 per cent. (Holbrook); Washington, D. C., 20 per cent. (Vedder and Hough); Michigan State Hospital, 21.6 per cent.; Illinois, 22 per cent. (Fell); Pennsylvania, 22.3 per cent. (Mitchell); Massachusetts, 25.4 per cent. (Paine). As the figures given by Holbrook are obviously too low they may be disregarded, and we may conclude that among male white insane syphilis is demonstrable in from 20 to 25 per cent.; and that it is probably present in from 25 to 35 per cent. of white male insane.

For female white insane the following figures are given: Louisiana 4 per cent. (Holbrook); Illinois, 9.5 per cent. (Fell); Michigan, 12.7 per cent.; Pennsylvania, 18.5 per cent. (Mitchell); Massachusetts, 23.1 per cent. (Paine). We may therefore conclude that syphilis is demonstrable in from 10 to 23 per cent. of female white insane, depending upon the locality and the circumstances; and we may estimate that syphilis is probable among from 15 to 30 per cent. of this class of patients.

3. Adult Admissions to Hospitals and Dispensaries for Medical and Surgical Conditions.—The percentage of syphilis among such adult admissions has been indicated variously as follows:

New York: Greeley estimated 20 per cent. The Wassermann reaction on 6536 male and female admissions at Bellevue gave 25.6 per cent. positives.

Chicago: 20 per cent. (Gatewood); 18.6 per cent. (Moore).

Michigan: 6 per cent. (Peterson; Wassermann alone); 30 per cent. (Warthin; treponemata found at necropsy).

Boston: 15 per cent. (Walker and Haller; Wassermann); 17.4 per cent. (Hornon; Wassermann); 28.2 per cent. (Bryan and Hooker; Wassermann and clinical examination).

San Francisco: 6.9 per cent. (Whitney; clinical examination with partial Wassermann).

Baltimore: 20 per cent. (Major; Wassermann); 10.8 per cent. (Walker; Wassermann); 13 per cent. (Janeway; Wassermann).

Philadelphia: 27.4 per cent. (Rosenberger; Wassermann);

14 per cent. (Musser; Wassermann); 12 to 20 per cent. (Williams and Kolmer; Wassermann).

Washington: 10 to 25 per cent. (Ladd; Wassermann).

The percentage to be found in a given hospital depends upon two factors: the class of patients admitted and the thoroughness of the examination. As showing the influence of the class of patient, we may take the Philadelphia General Hospital, where most of the admissions come from the poorer classes, and where the Wassermann indicates 27.4 per cent. as compared with the admissions to the hospital of the University of Pennsylvania, where the admissions come from a better class and where the Wassermann shows 14 per cent. In regard to thoroughness of examination: in Michigan Peterson found but 6 per cent. on a Wassermann examination alone, but Warthin, after a careful search for treponemata, found 30 per cent. in a hospital where the admissions come from a very good class of the population. With the exception of Warthin's figures all statistics presented are minimal. In consideration of the fact that the lower figures quoted would have been very greatly increased had a complete examination been made, it is believed that it is fair to estimate that between 20 and 30 per cent. of the clientele of the average hospital are infected with syphilis.

In the cases admitted to the general medical and surgical wards there is no indication that the proportion of syphilis is lower among the women than among the men. Thus the figures from the Philadelphia General Hospital furnished by Rosenberger show 23.6 per cent. positives among the men and 35.9 per cent. positives among the women. The figures from Bellevue show that out of 4085 males admitted to the medical or surgical wards, 1106, or 27 per cent., gave a positive reaction; while among 1752 females admitted to the medical or surgical wards, 475, or 27.1 per cent., gave a positive reaction. Thus while the percentage of syphilis among the women of the community as a whole is undoubtedly lower than among the men, it is as high or higher among the sick women as among sick men.

4. **Private Patients.**—Comparatively little information is obtainable in regard to private patients. Ladd stated that

he found 14.1 per cent. of positive reactions among his patients in Washington, D. C., while McLester, in Birmingham, Ala., found 18.8 per cent. among his private patients. In neither case was the proportion between men and women given. Among the better class of private patients in Washington, Vedder found 5.3 per cent. of positive Wassermann reactions among the males and 4 per cent. among the females. We may therefore conclude that since these figures are all based on Wassermann surveys, and would be higher with a complete examination, that it is a conservative estimate that from 10 to 20 per cent. of private patients are infected with syphilis, the exact percentage depending largely upon the class from which such patients are drawn.

5. **Tuberculosis.**—The prevalence of syphilis among the tuberculous in this country has been variously placed by different investigators on the basis of a clinical examination or a positive Wassermann, or both. Some of these are as follows: Vedder, 23.2 per cent.; Snow and Cooper, 20 per cent.; Petroff, 21.8 per cent.; Lyons, 9.2 per cent.; Jones, 29 per cent. The figures given by Lyons were based upon a Wassermann examination alone, and are so low as to throw some doubt upon the efficiency of the reaction used, or else the investigation must have been made upon an exceptionally good class of patients. On the basis of such figures it is fair to estimate that from 20 to 30 per cent. of the ordinary class of consumptives met with in institutions have syphilis as well as tuberculosis to contend with. The importance of syphilis as a predisposing cause of tuberculosis must be given serious consideration, and sanatoria should make provision for the diagnosis and treatment of syphilis if they wish to give their tuberculous patients a reasonable chance for recovery.

6. **Sick Children.**—Churchill and Austin estimate that the percentage of syphilis among children sick in hospital may range from 2 to 14 per cent. In their own series it was 3.3 per cent. Whitney gives 2.9 per cent. in San Francisco. Holt found 6.1 per cent. In the large cities it may fairly be estimated that the percentage among sick children ranges between 3 and 10 per cent., depending upon circumstances.

At the same time among certain groups it may be much higher, as Johnson found 33.9 per cent. among the open-air schools of St. Louis. These schools were provided for anemic children who were not sick enough to be in hospital, and Churchill found 38 per cent. in another series. Among institutions for mentally backward children and delinquent children the percentages are also very high. Lucas found 31.5 per cent.; Anderson, 17 per cent.; Haines, 14.5 per cent. Here again we have minimal figures, so that we may estimate that among the mentally backward and idiots the percentage of syphilitic infection will fluctuate between 20 and 40. It seems probable therefore that syphilis is one of the important causes in the production of feeble-mindedness and idiocy.

7. **Criminals.**—Vedder found 15.9 per cent. of military prisoners definitely syphilitic, with 5.6 per cent. more probably infected. Boudreau gives figures for Auburn as 16.8 per cent. for male and 33.8 per cent. for female. Kramer found 18.1 per cent. positive in the Ohio Penitentiary. Thomas found 21 per cent. among naval prisoners and Pollitzer reported 35 per cent. positive among the criminal degenerate and derelict class of New York. From these figures, which are all minimal, we may estimate that among this class the amount of syphilis may range from 20 to 40 per cent., depending upon circumstances.

8. **Presumably Healthy Men of the Class that Enlist in the Army.**—Munger found between 1 and 2 per cent. of syphilitic infections among men of this class, 73 per cent. of whom were under twenty-one years of age, and the majority of whom were seventeen years of age. Vedder found that the percentage of infections increases steadily, with advancing years, as follows: eighteen to twenty-two, 10 per cent.; twenty-three to twenty-seven, 16 per cent.; twenty-eight to thirty-two, 20 per cent.; thirty-three to thirty-seven, 24 per cent.; thirty-eight to forty-one, 28 per cent. It is believed that these figures indicate approximately the prevalence of syphilis among the unmarried men of this class. The younger men will average below 20 per cent. but the older men will average more than 20 per cent., so that as a group

it is probably fair to estimate a prevalence of 20 per cent. This group includes unskilled labor and a certain percentage of the trades.

9. Among men from better families or who have received a better education the percentage of infections is much lower, probably varying between 2 and 10 per cent., depending upon age, marital condition and other factors.

10. **Presumably Healthy Women.**—Surveys of pregnant women who were presumably healthy have been collected from various maternity hospitals, and may be summarized as follows: Losee found 3 per cent. infected, while in Bellevue nearly 14 per cent. had a positive Wassermann. Falls and Moore found 9.5 per cent., while 8 per cent. of my cases gave a double-plus reaction and 17 per cent. a double-plus or a plus reaction. We may therefore estimate that among young women in the community the percentage of syphilitic infections fluctuates between 3 and 20 per cent., depending upon age, marital condition, education and social status. The infection is rare among the unmarried girls of good character, but is only too common among married women whose virtue is beyond challenge. The deduction is obvious. As among men the proportion of infections increases as we descend in the social scale.

11. **The Prevalence of Syphilis among Negroes.**—All the evidence indicates that syphilis is far more common among negroes than among whites, and that it is even more frequent among negro women than among negro men. We may estimate that the rates for the colored race are at least double those for the white race. Syphilis is undoubtedly the greatest cause of death and disability in the negro race.

In conclusion it may be stated that the writer is fully aware of the dangers and fallacies inherent in statistics of this type. It has been necessary to present imperfect statistics because no perfect statistics are available. While I have not hesitated to draw conclusions from statistics that are obviously fragmentary, I shall have no quarrel with anyone who chooses to differ with these conclusions. They are offered for what they may be worth.

If the figures presented fail to satisfy the scientific critic

this should indicate the necessity for securing more complete statistics by means of improved diagnoses on death certificates and especially by means of a more general application of the Wassermann reaction. When this work was planned it was hoped that many institutions would coöperate, but experience has shown that even an offer to perform a Wassermann reaction free of charge, provided it is made on all admissions, does not appeal to many institutions. All are willing to send occasional cases, but few hospitals will take the trouble to send a routine blood specimen in all cases, and probably the patients themselves object in many instances. Yet the test has proved of great value to those institutions that have adopted it as a matter of routine; and it is probable that information as to the prevalence of syphilis can be obtained in no other way. It is believed that well-conducted hospitals should perform a routine Wassermann on all cases admitted. Many hospitals have for years made a routine urinary examination an essential in the examination of the patient. Positive findings with a routine Wassermann would be much more frequent and more important in diagnosis, for syphilis is the great masquerader.

City and State Boards of Health should also take up this work. Syphilis is one of the largest, if not the largest, problem in public health work today, and public health officials should not be content to use the laboratory facilities which they possess merely to perform the Wassermann reaction as a diagnostic measure in selected cases only, but by instituting large surveys should make a real endeavor to determine the prevalence of the disease in their respective communities.

REFERENCES.

1. McIlroy: Some Problems in the Treatment of Venereal Diseases, *British Medical Journal*, 1914, i, 579.
2. Scheuer: *Die Syphilis der Unschuldigen*, Berlin, 1910, Urban and Schwarzenberg.
3. Sandberg: Syphilis im Russischen Dorfe, *Arch. f. Derm. u. Syph.*, 1895, xxxi, 389. See also Tarnowsky: *La Syphilis en Russie*, *Comptes rendus du XII Congrès internationale de médecine*, 1897, iv, 7. Also Truhart-Dorpat: *Ueber die Verbreitung der Lues in Livland*, *St. Petersburger med. Wehnschr.*, 1895, xx, 98.

4. Rabinowitsch: Syphilis und Wassermannsche Reaktion bei den Findelsäuglingen, *Centralbl. f. Bakt. u. Parasitenkunde, Orig.*, 1913-1914, Abt. 1, lxxii, 344.
5. Feldhusen: Die Sexualenquete unter der Moskauer Studentenschaft, *Ztschr. f. Bekämpfung der Geschlechtskrankheiten*, 1908-1909, viii, 245.
6. Favre: Ueber den Geschlechtsverkehr, Venerische Krankheiten und Onanie unter der Studierenden Jugend, *Russische Ztschr. f. Haut und Geschlechtskrankheiten*, 1910, xix, No. 4. See also abstract in *Archiv f. Physikalischdiätetische Therapie in der Aertzlichen Praxis*, 1910, xii, 379.
7. Perichitch: La Syphilis en Serbia, *Dissertations de la Faculté de Médecine de Nancy*, 1901-1902.
8. Von Düring-Pascha: Studien über Endemische und Hereditäre Syphilis, *Archiv f. Dermatologie und Syphilis*, 1902, lxi, 1.
9. Jeanselme: La Syphilis dans la Peninsule Indo-Chinoise, *Ann. de dermat. et de syph.*, 1901, 4 series, ii, 817.
10. Jefferys and Maxwell: *Diseases of China*, 1910, P. Blakiston's Son & Co., Philadelphia.
11. Scheube: Die Krankheiten der Warmen Länder, 1910, Gustav Fischer, Jena.
12. Baermann: Die Wassermann-Neisser-Brucksche Reaktion in den Tropen, *München. med. Wehnschr.*, 1910, lvii, 2131.
13. Rothsuh: Die Syphilis in Nicaragua, *Arch. f. Schiffs-u. Tropen-Hygiene*, 1901, v, 75.
14. Schroedter: Die Syphilis bei den Eingeborenen Südwestafrikas, *Inaug. Dissertation, Leipzig*, 1908, Bruno Georgi. See also Mense: La Syphilis et les Maladies Vénériennes dans les Pays Nouvellement ouverts à la Civilisation, surtout en Afrique, *Proc. Conference Internationale pour la Prophylaxie de la Syphilis et des Maladies Vénériennes*, Brussels, 1899, i-ii, 167. Also Quennec: Notice sur la Syphilis dans l'Afrique Tropicale, *Archiv f. Schiffs-u. Tropen-Hygiene*, 1902, vi, 127. Also Syphilis in Cape Colony, *Polyclinic*, 1902, vi, 271.
15. Broc: La Syphilis chez les Indigènes Musulmans de Tunis, *Ann. des mal. vénériennes*, 1909, iv, 483.
16. Brock: Report on an Inquiry into the Prevalence of Syphilis in the South African Native and its Influence in Aiding the Spread of Tuberculosis, *Lancet*, 1912, i, 1270.
17. Sicard et Levy-Valensi: Syphilis latente des Arabes, *Bull. et mém. Soc. méd. de hôp. de Paris*, July 7, 1916, xxxii, 1087.
18. Ringenbach et Guyomarch: Notes de Géographie Médical de la section Française de la mission de delimitation Afrique équatoriale Française Cameroun, *Bull. Soc. Path. Exot.*, 1915, viii, 199.
19. Blaschko: Die Verbreitung der Syphilis in Berlin, 1892, S. Karger.
20. Lenz: Ueber die Verbreitung der Lues, Speciell in Berlin und ihre Bedeutung als Faktor des Rassentodes, *Arch. f. Rassen. u. Gesellsch. Bio.*, 1910, vii, 306.
21. Pinkus: Die Verhütung der Geschlechtskrankheiten, Freiburg, 1912, p. 21.
22. Heller: Die Häufigkeit der Hereditären Syphilis in Berlin, *Berl. klin. Wehnschr.*, 1909, xlvi, 1315.
23. Epstein: Ueber die Bedeutung der Wassermannschen Reaktion in der Säuglingsfürsorge, *Prager med. Wehnschr.*, 1913, xxxviii, 621.

24. Kürner: Ueber die Verbreitung der Syphilis in den Schwachsinnigenanstalten Württembergs auf Grund von Blutuntersuchungen mittels der Wassermannschen Methode, *Med. Klinik*, 1910, vi, 1445.
25. Lippmann: Ueber die Beziehung der Idiotie zur Syphilis, *Deutsch. Ztschr. f. Nervenhe.*, 1910, xxxix, 81. See also Lippmann: Ueber den Zusammenhang von Idiotie und Syphilis, *München. med. Wehnschr.*, 1909, lvi, 2417.
26. Dean: An Examination of the Blood Serum of Idiots by the Wassermann Reaction, *Lancet*, 1910, ii, 227.
27. Hubert: Die Bedeutung der Vorgeschichte, des Befundes und der Wassermannschen Reaktion für die Erkennung der Syphilitischen Ansteckung in den breiteren Volksschichten, *München. med. Wehnschr.*, 1915, lxii, 1314.
28. Aerztlicher Verein in Frankfurt, München. med. Wehnschr., 1910, lvii, 2371. Also note in *Jour. Am. Med. Assn., Venereal Diseases in Germany*, 1914, lxiii, 497.
29. Török: Die Verbreitung der Syphilis in Budapest und ihre Prophylaxe, *Archiv f. Dermat. und Syph.*, 1895, xxxi, 409.
30. Bayet: Die Verbreitung der Geschlechtskrankheiten in Brüssel, *Ztschr. f. Bekämpfung der Geschlechtskrankheiten*, 1908-1909, viii, 393.
31. Raviart, Breton et Petit: Recherches sur la Reaction de Wassermann chez Quatre Cents Aliénés, *Comptes rendus des séances et mémoires de la Société de Biologie*, 1908, i, 358.
32. Calmette, Breton et Couvreur: Application pratique de la Reaction de Wassermann diagnostic de la Syphilis chez les Nouveau-nés, *Comptes rendus des séances et mémoires de la Société de Biologie*, 1911, i, 238.
33. D'Astros et Teissonniere: La Reaction de Wassermann chez le Nouveau-né et le Nourisson, *Marseille médical*, 1912, xlix, 713.
34. Leduc: La Syphilis à la Maternité de l'Hôpital Ténon, 1905-1906, Thèse de Paris, 1906, A. Michalon, Paris.
35. Bubendorf: La Syphilis dans les Agglomerations Ouvrières du Bassin de Briey, Thèse de Nancy, 1913, Imprimerie Centrale, Reims.
36. Letulle et Bergeron: Wassermann Reaction in Chronic Diseases, *Bull. de l'Acad. de méd.*, 1916, lxxv, 204.
37. Barrett: The Suppression of Venereal Diseases, *West Canada Med. Jour.*, 1913, vii, 164.
38. Barrett: Notes on Some Wassermann Reactions, *Australian Med. Jour.*, 1910, xv, 245. See also *The Wassermann Reaction Results in the Victorian Eye and Ear Hospital for a Year*, *Australasian Med. Gaz.*, 1911, xxx, 711.
39. Piper: Results of the Wassermann as Applied to a Random Series of Patients admitted to Hospital, *Australian Med. Jour.*, 1912-1913, n. s. xi, 916.
40. Bennie: The Frequency and Intensity of Congenital Syphilitic Infection in Children, *Intercolonial Med. Jour. of Australia*, 1909, xiv, 119.
41. Allen: Prevalence of Syphilis in Hospital Postmortem Practice, *Tr. Australasian Medical Congress, Victoria*, 1908, ii, 238.
42. White: *Proc. Royal Commission on Venereal Diseases*. Also *British Med. Jour.*, 1914, i, 770.
43. *Report of the Royal Commission on Venereal Diseases*. See also *British Med. Jour.*, 1916, ii, 591.
44. McIlroy, Watson and McIlroy: The Significance of the Wassermann Reaction in Gynecological Diagnosis, with Special Reference to Uterine Hemorrhage, *British Med. Jour.*, 1913, ii, 1002.

45. Mackenzie: Syphilis in the Causation of Insanity, from the Fourth Annual Report of the Scottish Western Asylums Research Institute, *British Med. Jour.*, 1914, i, 434.
46. Manson and Smith: The Wassermann Reaction in Ophthalmic Practice, *British Med. Jour.*, 1915, i, 324.
47. Elliott: Some Observations on the Occurrence of the Wassermann Reaction in the Serum of Children of the Poorer Classes, *Glasgow Med. Jour.*, 1914, lxxxi, 339.
48. Browning: Investigations on Syphilis as Affecting the Health of the Community, *British Med. Jour.*, 1914, i, 77.
49. Assinder: Syphilis in the Poorer Classes: its Diagnosis by the Wassermann Test and its Incidence as Demonstrated Thereby, *Birmingham Med. Rev.*, 1914, lxxvi, 137.
50. Darling: *Dublin Jour. Med. Sc.*, September, 1917, third series, No. 549, p. 147.
51. See Note in *Jour. Am. Med. Assn.*, 1917, lxxviii, 296; and also Note on Prevalence of Venereal Disease in Canada, *Am. Jour. Pub. Health*, 1917, vii, 209.
52. Graham: *Lancet*, 1914, i, 1074.
53. Gerrish: A Crusade against Syphilis and Gonorrhoea, *Proc. Massachusetts Med. Soc.*, 1908-1910, xxi, 727.
54. Fischer: Municipal Control of Venereal Diseases, *Public Health*, 1913, viii, 51.
55. Cunningham: Importance of Venereal Disease, *Boston Med. and Surg. Jour.*, 1913, clxviii, 77.
56. Kneeland: Commercialized Prostitution in New York, 1913, *The Century Co.*, p. 188.
57. Davis: *Proc. Annual Congress of American Prison Association*, Indianapolis, 1913.
58. Sullivan and Spaulding: The Extent and Significance of Gonorrhoea in a Reformatory for Women, *Jour. Am. Med. Assn.*, 1916, lxvi, 95.
59. Meirovsky: Serodiagnostische Untersuchung bei Prostituirten, *Deutsch. med. Wehnschr.*, 1909, xxxv, 1698.
60. Hecht: Die Serodiagnose in Rahmen der Prostituirten-Kontrolle, *Deutsch. med. Wehnschr.*, 1910, xxxvi, 317.
61. Jundell, Almkvist and Sandman: Nagsa erfarenheter med Wassermanns serum-reaktion vid Syfilis, *Hygiea*, 1910, lxxi, 214.
62. Pinkus: Beiträge zur Kenntnis der Berliner Prostitution; die Syphilis der Prostituirten, *Archiv f. Dermat. und Syphil.*, 1912, cxiii, 805.
63. Matson: On the Application of the Wassermann Reaction in General Medicine, Based upon 968 Examinations, with Special Reference to the blood of the Insane, *South California Practitioner*, 1910, xxv, 49.
64. Paine: Results of the Wassermann in 200 Consecutive Admissions to the Danvers State Hospital, *Boston Med. and Surg. Jour.*, 1913, clxviii, 501.
65. Darling and Newcomb: A Comparison of the Wassermann Reaction among the Acute and Chronic Insane, *Jour. Nerv. and Ment. Dis.*, 1914, xli, 575.
66. Mitchell: General Paralysis of the Insane, *New York Med. Jour.*, 1914, c, 605.
67. Southard: Statistical Notes on a Series of 6000 Wassermann Tests for Syphilis Performed in the Harvard Neuropathological Testing Laboratory, *Boston Med. and Surg. Jour.*, 1914, clxx, 947.

68. Vedder and Hough: Prevalence of Syphilis among the Inmates of the Government Hospital for the Insane, *Jour. Am. Med. Assn.*, 1915, lxiv, 972.
69. Influence of Syphilis upon Insanity and Marriage: Note and Comment in *Social Hygiene*, 1915, i, 485. From the Report of the Commission to Investigate the Extent of Feeble-mindedness, Epilepsy and Insanity and other Conditions of Mental Defectiveness in Michigan.
70. Holbrook: Syphilis in the East Louisiana Hospital for the Insane, *American Jour. of Insanity*, 1916, lxxiii, 261.
71. Fell: Syphilis among Admissions to the Elgin State Hospital, Illinois *Med. Jour.*, 1917, xxxii, 267.
72. Greeley: The Public Health as Affected by Chronic Diseases of the Heart, Kidneys and Arteries, *Am. Jour. Pub. Health*, 1915, v, 705.
73. Bulkley: Some Plain Truths about Syphilis, *Med. Record*, 1907, lxxii, 213.
74. Symmers: Anatomical Lesions in Late Acquired Syphilis, *Jour. Am. Med. Assn.*, 1916, lxvi, 1457.
75. Gatewood: Results of 1400 Wassermann Reactions in the Michael Reese Hospital, *Illinois Med. Jour.*, 1912, xxii, 725.
76. Moore: The Wassermann Test in the Medical Dispensary, *Jour. Am. Med. Assn.*, 1915, lxxv, 1980.
77. Peterson: Observations on the Occurrence of Syphilis in the University of Michigan Obstetric and Gynecologic Clinic, *Surg., Gynec. and Obstet.*, 1916, xxiii, 280.
78. Warthin: Persistence of Active Lesions and Spirochetes in the Tissues of Clinically Inactive or "Cured Syphilis," *Am. Jour. Med. Sc.*, 1916, clii, 508.
79. Walker and Haller: Routine Wassermann Examinations of 4000 Hospital Patients, *Jour. Am. Med. Assn.*, 1916, lxvi, 488.
80. Hornon: The Occurrence of the Wassermann Reaction among Hospital Patients, *Boston Med. and Surg. Jour.*, 1916, clxxiv, 194.
81. Bryan and Hooker: Prevalence of Syphilis as Indicated by the Routine Use of the Wassermann Reaction, *Public Health Reports*, November 24, 1916, xxxi, 3230.
82. Whitney: A Statistical Study of Syphilis, *Jour. Am. Med. Assn.*, 1915, lxxv, 1986.
83. Hammond: Statistical Studies in Syphilis with the Wassermann Reaction, etc., *Am. Jour. of Insanity*, 1913-1914, lxx, 107.
84. Van der Hoof: Syphilis as a Factor in the Production of Cardiovascular-renal Disease, *Southern Med. Jour.*, 1917, x, 100.
85. McLester: The Frequency of Unsuspected Syphilis, *Jour. Am. Med. Assn.*, 1916, lxvi, 2063.
86. Major: The Wassermann Reaction in the Johns Hopkins Hospital, *Johns Hopkins Hosp. Bull.*, 1913, xxiv, 175.
87. Janeway: Shattuck Lecture, The Etiology of the Diseases of the Circulatory System, *Boston Med. and Surg. Jour.*, 1916, clxxiv, 925.
88. Walker: Symposium on Syphilis, Congress of American Physicians and Surgeons, 1916, *Jour. Am. Med. Assn.*, 1916, lxvi, 1740.
89. Krumbhaar and Montgomery: Syphilis in the Medical Dispensary, *Jour. Am. Med. Assn.*, 1914, lxii, 290.
90. Rosenberger: Summary of the Wassermann Tests Done during 1916 in the Philadelphia General Hospital, *New York Medical Journal*, 1917, cv, 1233.
91. Osler: The Campaign against Syphilis, *Lancet*, 1917, i, 790.

92. Williams and Kolmer: The Wassermann Reaction in Gynecology, *Am. Jour. Obstet.*, 1916, lxxiv, 639.
93. Ladd: One Thousand Wassermann Reactions, *New York Med. Jour.*, 1916, civ, 952.
94. Letulle, Bergeron and Lepine: The Wassermann Reaction in Pulmonary Tuberculosis, *Bull. de l'Acad. de méd. de Paris*, 1914, lxxi, 596.
95. Vedder: The Prevalence of Syphilis in the Army, *Bulletin No. 8*, W. D., Office of the Surgeon-General, p. 60.
96. Snow and Cooper: The Wassermann Reaction in its Relation to Tuberculosis, *Am. Jour. Med. Sc.*, 1916, clii, 185.
97. Lyons: Contact Points between Tuberculosis and Syphilis, *Boston Med. and Surg. Jour.*, 1916, clxxv, 285.
98. Jones, W. R.: The Wassermann Reaction in 251 Tuberculous Dispensary Cases, *Med. Record*, 1916, xc, 418.
99. Petroff: Serological Studies in Tuberculosis, *Am. Rev. Tub.*, 1917, i, 49.
100. Ford: The Wassermann Reaction and Pulmonary Tuberculosis, *Med. Record*, 1917, xcii, 678.
101. Note in the *New York Med. Jour.*, under *Collectanea*, July 14, 1917, vol. cvi.
102. Boudreau: The Syphilis Problem among Confined Criminals, *Med. Record*, 1916, xc, 981.
103. Kramer: The Prevalence of Syphilis in a Penal Institution, *Illinois Med. Jour.*, 1915, xxviii, 279.
104. Thomas: Results of Wassermann and Luetin Tests at the Naval Prison, Portsmouth, N. H., *Med. Record*, 1915, lxxxvii, 523.
105. Pollitzer: Syphilis in Relation to Some Social Problems, *Am. Jour. Obstet.*, 1916, lxxiii, 857.
106. Churchill: The Wassermann Reaction in Infants and Children, *Tr. Am. Pediat. Soc.*, 1912, xxiv, 149.
107. Blackfan, Nicholson and White: A Study of the Wassermann Reaction in 100 Infants, *Am. Jour. Dis. Children*, 1913, vi, 162.
108. Holt: The Wassermann Reaction in Hereditary Syphilis in Congenital Deformities and in Various other Conditions in Infancy, *Am. Jour. Dis. Children*, 1913, vi, 166.
109. Churchill and Austin: Frequency of Hereditary Syphilis, *Am. Jour. Dis. Children*, 1916, xii, 355.
110. Johnson: Serological Examination of over 200 Children from the Open-air Schools of St. Louis, *Am. Jour. Syphilis*, 1917, i, 606.
111. Lucas: The Incidence of Syphilis in 111 Consecutive Children Examined in the Out-patient Department of the Psychopathic Hospital, *Boston Med. and Surg. Jour.*, 1913, clxix, 423.
112. Anderson: On Certain Irregularities in Mental Defect Demonstrable by Mental Tests and Suggesting Special Educative Measures, *Boston Med. and Surg. Jour.*, 1913, clxix, 421.
113. Haines, T. H.: High-grade Defectives at the Psychopathic Hospital during 1913, *Boston Med. and Surg. Jour.*, 1914, clxxi, 854.
114. Thomsen, Boas, Hjort and Leschly: Eine Untersuchung der Schwachsinnigen, Epileptiker, Blinden und Taubstummen Dänemarks mit Wassermann's Reaktion, *Berl. klin. Wehnschr.*, 1911, xlvi, 891.
115. Haines, T. H.: Incidence of Syphilis among Juvenile Delinquents, *Jour. Am. Med. Assn.*, 1916, lxvi, 102.
116. Note on the report presented by Dr. Sessions at the Conference on the Education of Delinquent, Truant, Backward and Dependent Children, at Baltimore, May, 1915, *Social Hygiene*, 1916, ii, 476.

117. McKay: Inherited Syphilis in Feeble-mindedness, *Illinois Med. Jour.*, 1915, xxviii, 281.
118. Moulton: Wassermann Test on 600 Cases of Feeble-minded at the Minnesota School for Feeble-minded and Colony for Epileptics, *Jour. Psychoasthenics*, 1914, xviii, 222.
119. Dawson: Additional Report of Wassermann Tests, *Jour. Psychoasthenics*, 1914, xviii, 227.
120. Munger: A Wassermann Survey on 500 Apprentice Seamen, *Naval Med. Bull.*, October, 1916, x, 642.
121. Williams: The Limitations and Possibilities of Prenatal Care, *Jour. Am. Med. Assn.*, 1915, lxiv, 95.
122. Commisky: A Preliminary Report of the Routine Wassermann Reaction in Hospital Obstetrics, *Am. Jour. Obstet.*, 1916, lxxiii, 676.
123. Falls and Moore: The Value of the Wassermann Test in Pregnancy, *Jour. Am. Med. Assn.*, 1916, lxvii, 574.
124. Murrell: Syphilis and the American Negro, *Jour. Am. Med. Assn.*, 1910, liv, 846.
125. Quillian: Racial Peculiarities as a Cause of the Prevalence of Syphilis in Negroes, *Am. Jour. Dermat. and Genito-urinary Dis.*, 1906, x, 277.
126. McHatton: The Sexual Status of the Negro, Past and Present, *Am. Jour. Dermat. and Genito-urinary Dis.*, 1906, x, 6.
127. Matas: The Surgical Peculiarities of the Negro, *Tr. Am. Surg. Assn.*, 1896, xiv, 483.
128. Fox: Skin Diseases in the Negro, *Jour. Cutan. Dis.*, 1908, xxvi, 67, 109.
129. Hazen: Syphilis in the American Negro, *Jour. Am. Med. Assn.*, 1914, lxiii, 463.
130. Hazen: Syphilis among School Children, *Washington Med. Ann.*, 1913, xii, 223.
131. Baetz: Syphilis in Colored Canal Laborers, *New York Med. Jour.*, 1914, c, 820.
132. Lee: The Negro as a Problem in Public Health Charity, *Am. Jour. Public Health*, 1915, v, 207.
133. Murrell: Discussion on Syphilis, *Jour. Am. Med. Assn.*, 1914, lxiii, 565.
134. Ivey: The Wassermann Reaction among the Negro Insane of Alabama, *Med. Record*, 1913, lxxxiv, 712.
135. Hindman: Syphilis among Insane Negroes, *Am. Jour. Public Health*, 1915, v, 218.
136. Wender: The Role of Syphilis in the Insane Negro, *New York Med. Journal*, 1916, civ, 1286.
137. McNeil: Syphilis in the Southern Negro, *Jour. Am. Med. Assn.*, 1916, lxvii, 1001.
138. Wilson: Disease in Apparently Healthy Colored Girls, *New York Medical Journal*, 1916, ciii, 585.
139. Jamison: Certain Phases of Syphilis in the Negro Female from the Stand-point of Medical Diagnosis, *New Orleans Med. and Surg. Jour.*, 1916, lxix, 96.
140. Boas: The Relative Prevalence of Syphilis among Negroes and Whites, *Social Hygiene*, 1915, i, 610.
141. Moore: Hereditary Syphilis in the Negro Race, *Southern Med. Jour.*, 1915, viii, 946.
142. Knapp: The Wassermann Reaction in Four Hundred Cases Investigated by Group Study Methods, *Am. Jour. Syph.*, 1917, 1, 772.
143. Qualls: Some Observations on Latent or Clinically Inactive Syphilis in the Canal Zone, *Am. Jour. Syph.*, 1917, i, 712.

CHAPTER II.

THE SOURCES OF INFECTION AND TRANSMISSION OF SYPHILIS.

INASMUCH as the *Treponema pallidum* (*Spirocheta pallida*)* is now universally accepted as the cause of syphilis,† the etiology of the disease need not be discussed here. From the public health stand-point, however, it is most important to be fully informed in regard to the various methods whereby this organism is transmitted from patient to patient, since the only way in which we can hope to prevent the disease is to close these various avenues of infection.

Fortunately the methods whereby syphilis is transmitted are well known, owing to the fact that they have been carefully observed by physicians of experience who have continued to study this important point ever since the disease was first clearly recognized. The literature on this subject is therefore enormous and no attempt will be made here to treat it exhaustively, but merely to indicate the sources of infection and the various methods of transmission briefly but clearly enough to form a sound basis for the recommendation of appropriate sanitary measures, with sufficient references to literature to enable the reader to verify the accuracy of the statements made.

* Pusey has recently suggested (*Jour. Am. Med. Assn.*, November 25, 1916, lxxvii, 162) that as the great majority of writers have designated this organism by the name of *Spirocheta pallida*, this name should be generally adopted. This argument loses sight of the fact that zoölogical nomenclature is not determined by usage but by certain definite rules. A discussion of this point in terminology by Charles Wardell Stiles will be found in the *Jour. Am. Med. Assn.*, January 6, 1917, lxxviii, 57. While admitting that there may be a difference of opinion on the subject, Stiles favored the use of the term *Treponema pallidum*, which is accordingly used throughout this work.

† An exception may be made in the case of McDonagh (*Biology and Treatment of Venereal Diseases*, Harrison & Sons, London, 1915), who claims that the *Treponema pallidum* is only one phase in the life-cycle of the *Leukocytozoön syphilidis*, the organism which he claims is the cause of syphilis.

This subject may be considered from two different viewpoints, namely, (1) the sources of infection, or an investigation of the infectiousness of the various lesions or bodily fluids with which direct or indirect contact is possible, and (2) the methods of transmission, or a practical study and classification of the exact methods whereby actual cases of syphilis have received their infection.

THE SOURCES OF INFECTION.

Syphilis cannot be transmitted as are many other infectious diseases by means of infected water, food or air. The *Treponema pallidum* is conveyed from patient to patient, either by direct bodily contact or by contact with some material object, upon which infectious secretions have been deposited, and, so far as known, *syphilis cannot be transmitted in any other way*. Since an actual transference of the infecting organism from one individual to another is necessary, the most important evidence bearing on the sources of infection may be considered under the following heads:

A. Immediate Bodily Contact.—The transmission of syphilis by bodily contact depends upon the infectiousness of the various specific lesions with which bodily contact is possible. This infectiousness depends mainly upon whether treponemata are present in the lesion in question, and if so, in what numbers.

B. Mediate Infection.—So far as mediate infection by various objects is concerned, it is necessary to determine:

1. The infectiousness of the various bodily fluids which may become deposited on these objects.

2. The viability of the *Treponema pallidum* outside the body or its ability to live and retain its infectious properties when deposited on these objects under various conditions.

C. The Methods Whereby the *Treponema Pallidum* Gains Access to the Healthy Body:

1. Penetrative powers of the *Treponema pallidum*. Can this organism penetrate sound skin or mucous membrane, or is it forced to gain entrance to the body through fissures?

2. Genitotropic tendency of the *Treponema pallidum*.

3. Infection d'emblee; cryptogenic infection.

In the following discussion we will endeavor to follow this analysis.

A. The Infectiousness of the Various Syphilitic Lesions with which Bodily Contact is Possible.—1. *The Primary Lesion or Chancre.*—It is amply demonstrated that the chancre is highly infectious from its first appearance until it is completely healed. It is extraordinarily rich in its treponema content and the chancre juice or serum obtained by pressure from the chancre teems with living organisms. Treponemata have been demonstrated by a dark field examination in chancres of only two or three days' duration* long before the sore had taken on the clinical appearance of a chancre, and while it resembled a simple abrasion. From this it will be seen that not only is the chancre highly infectious, but from the nature of the case it is one of the lesions of syphilis most frequently responsible for the transmission of the disease. The chancre is usually painless, is frequently atypical and apparently a trifling lesion, and only appears from four to six weeks after the infection was received, or a period so long that the average person has ceased to consider the probability of infection.

From all of these circumstances it follows that in the absence of a careful daily inspection a chancre may exist for many days before it is detected. It is comparatively rare to obtain the history of a primary sore from women, by whom the chancre is not noticed, owing to the fact that an inspection is seldom made, and in addition it is frequently located internally.

Taking all of these facts into consideration it will be seen that sexual intercourse frequently occurs while one of the parties suffers from a highly infectious chancre. Usually the existence of the chancre is unknown, but many men of the lower classes pay no attention to such small matters. I have several times questioned patients, particularly negroes, who admitted intercourse many times after they knew of the appearance of a sore, and I have examined a young woman who was only able to walk with difficulty because of inguinal

* Bulletin No. 8, War Department, Office of the Surgeon-General, p. 10.

adenitis, and who had a large chancre, yet was continuing her usual sexual relations. Every physician has undoubtedly had similar experiences. In the case of the woman it is certain that she is seldom conscious of the existence of a chancre, but in any case prostitutes are almost certain to continue their vocation during the entire primary stage of the disease, and thus many men are infected.

2. *The Secondary Lesions.*—Ricord¹ denied that secondary lesions were contagious, and his authority was so great that about twenty years elapsed before the infectiousness of secondary lesions was accepted. Ricord finally became convinced upon this point² and the infectiousness of secondary lesions was generally admitted, but the period during which the disease might be transmitted was believed to be about six months. This period was gradually lengthened first to one year and soon to two, and a little later to three and four years by the work of Langlebert, Diday and Fournier. The general opinion immediately prior to 1889 was that syphilis was infectious during all the secondary period, which was placed at from three to four years, but that tertiary lesions were not infectious.

We now know that all secondary lesions are potentially infectious because treponemata have been demonstrated in all of them. The mucous patch is the secondary lesion most commonly responsible for the transmission of the disease. Like the chancre it fairly teems with treponemata, it is comparatively painless, and occurring in the mouth or genitalia it occupies the two regions of the body most commonly brought into close and intimate contact with persons of the opposite sex.

Since the lesions of the secondary stage are responsible for most of the infections with syphilis it is important to determine how long this stage may last.

Duration of the Secondary Stage.—We have already mentioned the earlier views on this subject. Hutchinson stated in 1896 that the contagiousness of syphilis did not as a rule last more than two years. This statement is altogether too optimistic.

The ability of a given patient to transmit infection only

depends upon the length of time he has suffered from the disease in so far as the duration of the infection influences the type of lesions. Time plays no part when it is a question of the infectiousness of a mucous patch, for example, which is just as infectious when it occurs ten years after the chancre as when it appears two months after the primary lesion. The point to determine, therefore, is the possible duration of the secondary lesions, or the period of inflammatory vascular phenomena. So long as exudative papules are present infection is possible. Buba³ has reviewed the literature on this subject, which may be condensed as follows: Buba quotes a case from the clinic of Dr. Max Joseph, in which a man who had had a chancre eight years previously married and infected his wife. The man had mucous patches at the time. Finger⁴ relates the case of a man who acquired lues in 1888 and married in June, 1896. He had had specific treatment. His wife developed a chancre on October 5, followed by secondaries, and when examined the man was found to have papules on the glans and skin of the penis.

Barthelemy⁵ found that of 531 prostitutes at St. Lazare whose infection dated from four to twelve years back, 20 had papulomucous syphilides. All had had irregular or no treatment. Feulard⁶ published 20 cases at the London Congress, in which infection with syphilis had been transmitted sixteen times from four and a half to ten years after the original infection and four times, fourteen, seventeen, eighteen and twenty years after. Infection in these cases for the most part was caused by erosions in the mouth or genitalia, but 2 of these cases were caused by ulcerating tertiary syphilides. Newman⁷ reports a case in which secondary symptoms occurred from ten to twenty years after the primary infection, and states that in 41 cases the secondary period lasted from a few months to fourteen years. Tarasewitch⁸ claims that the secondary stage with its endless lesions may last from twenty-three to twenty-nine years. Kromayer⁹ relates a case in which a man infected in 1867 married in 1878 and had three healthy children, but infected his wife in 1896, practically thirty years after receiving his infection. Tschistjakow¹⁰ has published valuable statistics concerning

the length of the condylomatous secondary period. He collected 1000 cases from the clientele of Tarnowski that were observed on the average for ten years. In these cases the last condylomatous lesions developed:

Within the first five years in 802 persons.

Within the second five years in 167 persons.

Within the third five years in 26 persons.

Within the fourth five years in 5 persons.

From these facts we conclude that, as a general rule, the older the infection the less frequent are the secondary manifestations of the disease. But there are so many exceptions to this rule that in the individual uncured case it is practically impossible to place any time limit on the appearance of secondary lesions. And as not only these late secondary lesions but also the tertiary lesions may transmit infection, we must regard any uncured syphilitic as a possible source of infection, although it is probable that the majority of infections are acquired from syphilitics in the primary or early secondary stages of the disease. These apparently dry facts become of interest in the discussion of the time limit at which it is safe to permit syphilitics to marry.

3. *The Tertiary Lesions.*—It was thought for many years that the tertiary lesions of syphilis were not infectious. In 1889, at the first International Congress on Dermatology and Syphilis, at Paris, the question of the infectiousness of tertiary lesions was raised by Landouzy.¹¹ In this paper Landouzy quoted a case of conjugal syphilis in which the husband infected the wife from an undoubted tertiary lesion of the penis occurring twenty years after the original infection. Fournier,¹² at the same Congress, related a case of a husband having a tertiary glossitis fifteen years after his chancre, and infecting his wife, who suffered from a labial chancre. The question was raised again at a later meeting of the same society in 1896, at which Feulard presented the case of a man who infected his wife by means of a gumma of the penis occurring fourteen years after the primary lesion. Lassar¹³ also related several such instances. Zedlewski (quoted by Buba) has collected 5 similar cases in his inaugural dissertation. In all of these cases infection was transmitted from

gummata on the penis that developed from eight to twenty years after the chancre. The infectiousness of tertiary lesions are summed up so far as clinical evidence is concerned by Tarassewitch⁸ in 1897, who concludes that the numerous cases in which husbands have infected their wives from undoubted tertiary lesions dating from fourteen to twenty-one years after the chancre, and under conditions that eliminate other modes of infection, force us to believe that tertiary lesions may prove infective. It has therefore been demonstrated by clinical experience that tertiary lesions may prove infectious. When the *Treponema pallidum* was discovered and search for this organism was instituted by many investigators the earlier observers failed to find the parasite in tertiary lesions. However, later and more careful observations have demonstrated beyond cavil that practically all tertiary lesions contain treponemata, though usually in such small numbers that they can only be detected after a most thorough search. Doutrelepont and Grouven¹⁴ and Tomaszewski¹⁵ succeeded in finding the typical forms of the pallida in gummas and other tertiary lesions, but today the finding of the offending organism in tertiary lesions is so common that it excites no comment.

Moreover, the presence of treponemata in these lesions was demonstrated by animal inoculation. Finger¹⁶ succeeded twice in infecting apes from gummata. With all clinical and experimental evidence in accord on this point, infection from any superficial tertiary lesion must be considered as a possibility.

Practically the cases of infection from tertiary lesions are comparatively rare, though by no means exceptional. There are two obvious reasons why transmission of syphilis from tertiary lesions is comparatively infrequent: one is the relative rarity of treponemata in such lesions, and the second is the pronounced tendency for such tertiary lesions to become localized in the internal organs. There is obviously no opportunity for transmission of treponemata from such internal lesions except under the most unusual circumstances. But tertiary eruptions of the skin and superficial gummatous ulcerations are by no means uncommon, and from the sanitary point of view must be regarded as potential sources of infection.

B. Mediate Infection.—1. *The Infectiousness of the Various Bodily Fluids.*—*Blood.*—Investigation of the circulating blood by direct microscopic examination is generally attended with negative results, and numerous observers have failed to find treponemata under these circumstances. On the other hand, a few observers have reported that they have found the organism by microscopic examination of blood taken from a vein by puncture through sound skin (Neisser,¹⁷ p. 71). It is evident that in examinations of such a character, and granting the reliability of the investigator, a positive finding outweighs many negative findings and indicates that the organisms are undoubtedly present in the blood stream. Even the successful observers, however, have only succeeded in finding perhaps a single treponema in a small number of the cases investigated.

Inoculation experiments have been more successful, though there were many failures among the earlier experiments. Thus Neisser¹⁷ and Finger and Landsteiner¹⁶ both failed, but Hoffman¹⁸ succeeded three times in producing syphilis in animals by the inoculation of blood taken from cases of syphilis of a duration of six weeks, three months and six months respectively. Uhlenhuth and Mulzer¹⁹ have made a long series of inoculations of blood from patients in all stages of syphilis, and their work may be briefly summarized as follows: The blood was collected from a vein, defibrinated, and from 1 to 2 c.c. were injected into the testicles of rabbits within ten minutes after withdrawal from the patient. The blood from 23 cases having a chancre with or without the characteristic inguinal adenitis was tested. Of these 23 cases 4 are excluded because the rabbits died within the incubation period of the chancre. Among the 19 cases in which at least one rabbit lived longer than four months a positive result was obtained in 16 cases, or 84.2 per cent. A positive result means the development of a syphilitic lesion in the testicle of the rabbit in which living treponemata could be demonstrated. The blood of 38 patients having different clinical manifestations of secondary syphilis (exanthemata, polyadenitis, lesions of the mucous membranes and a positive Wassermann) were examined in a similar manner. Of the 36 cases in which

the experiment was satisfactory a positive inoculation was obtained in 27 cases, or 75 per cent. From this it will be seen that of 55 cases in the primary or secondary stage of syphilis, treponemata were demonstrated by inoculation in 78.1 per cent. The bloods of only 4 cases of tertiary syphilis were tested. A positive result was obtained in 1 case, the patient having a gumma of the tongue and a positive Wassermann. The bloods of 4 cases of so-called latent syphilis were tested and a successful inoculation in the rabbit was obtained once.

From the above experiments it will be seen that the infectiousness of the blood has been demonstrated in all stages of syphilis. The blood of syphilitics must therefore be regarded as capable of transmitting the disease, although the degree of infectiousness is evidently much higher in the case of blood from the primary and secondary stages than in the tertiary and latent cases. The blood is never so highly infectious as are the secretions from the chancre or mucous patches. These latter fairly teem with treponemata while the number in the blood even of active secondary syphilis must be comparatively small as indicated by the difficulty in detecting them by direct microscopic examination and by the fact that comparatively large amounts of blood, 1 or 2 c.c., are necessary in order to produce successful inoculations in animals.

While in practice blood must undoubtedly be considered infectious, particularly in recent cases, it is not highly infectious. Moreover, contact with fresh blood is comparatively infrequent, so that the danger of infection from this source is slight. An exception to this statement is to be noted in the case of surgeons, physicians, nurses, dentists and midwives. Infections from syphilitic blood are known to have occurred often enough among attendants on the sick to make it a matter of importance that such persons should be particularly careful to protect themselves from this possible source of infection.

Milk.—In 1876 Voss²⁰ noted several cases in which a wet-nurse, who had no symptoms of syphilis at the time, nevertheless infected a healthy child. This led him to test the infectiousness of milk. He obtained milk from the breast of a

woman suffering from secondary syphilis and injected this milk into three young prostitutes with their consent. The first girl injected had had syphilis and the result, of course, was negative. The other two were believed never to have had syphilis because they had been under observation for several years. Of these two experiments one was negative but in the second girl the area surrounding the injection became indurated and the neighboring lymphatic glands were also greatly enlarged and indurated, and she developed secondary syphilis forty days after the inoculation. While in all probability this resulted from the inoculation of the milk, this experiment cannot be accepted unreservedly because of the possibility that the woman may have contracted syphilis in some other way.

Animal experiments are not open to this objection. Finger and Landsteiner¹⁶ failed in one case to produce syphilis in animals by inoculating milk from a syphilitic woman, but Uhlenhuth and Mulzer¹⁹ have succeeded twice out of eight attempts. In one case the woman had no clinical symptoms of syphilis herself but had given birth to a congenitally syphilitic child and had had a positive Wassermann. It may be noted in passing that it is such cases that have caused the downfall of the so-called laws of Colles and Profeta. The second case was a woman having the clinical manifestations of fresh secondary syphilis.

As a result of these experiments the milk of a syphilitic woman must be regarded as infectious, and this is borne out by clinical experience, since it is well known that a syphilitic wet-nurse will almost surely infect a healthy child, and in the absence of syphilitic lesions the disease would appear to be transmitted through the milk.

Sputum, Sweat and Urine.—Comparatively little is known concerning these secretions, and they are not generally regarded as infectious. Uhlenhuth and Mulzer have inoculated the urine once and the sputum once into rabbits, with negative results. On the other hand, Dreyer and Toepfel²¹ demonstrated the presence of *Treponema pallidum* on several occasions in the urine from a case of secondary syphilitic nephritis. In one of these instances the urine was withdrawn

by a catheter and the identification of the treponema was confirmed by Schaudinn. Pasini²² investigated the organs of children suffering from congenital syphilis and found *Treponema pallidum* in the lungs, spleen, liver and kidneys. This finding was not new, as Levaditi in France, Buschke and Fischer in Germany and Berterelli, Volpino and Rodaeli in Italy had already demonstrated this parasite in the lungs and kidneys of children having congenital syphilis.

But Pasini claimed to have found numerous treponemata in the epithelial cells of the pulmonary alveoli, the bronchi, sweat glands and the tubules of the kidney. From this observation he concluded that the *Treponema pallidum* is eliminated in the sputum, sweat and urine, and that therefore these secretions from individuals having congenital syphilis must be regarded as possibly infectious. Hoffman²³ states: "Inside the tissues the *Treponema pallidum* is ordinarily extracellular, being found in the lymph spaces and in the connective tissue. It is, however, found inside of parenchymatous cells, connective-tissue cells and leukocytes."

It seems clear that if this organism can penetrate into epithelial cells of such organs as the lungs, kidneys and sweat glands that it may be assumed *a priori* that it can also pass through these cells and enter the secretions from these organs. It is generally believed that these secretions are not infectious, but in view of the above findings it would appear that these secretions must be considered as possible, though certainly rare sources of infection.

It is, of course, understood that the saliva from an individual having mucous patches in the mouth is infectious to a high degree, but this has no bearing on the above argument. In the latter instance the source of infection is in reality the mucous patch and not the glandular secretion. In practice, however, owing to the frequent presence of mucous patches in the mouth, the saliva of syphilitics must always be regarded as a possible source of infection. The same may be said of the nasal secretion of syphilitics and particularly of children suffering from congenital syphilis.

The Spinal Fluid.—Much experimental work has been performed with this fluid, and it has been definitely proved

to be infectious in many cases in which the central nervous system is involved. But since there is practically no possibility for the transfer of this fluid from one individual to another it can play no part in the transmission of syphilis except in so far as doctors and nurses might become accidentally infected in careless handling of fluids removed by tapping from syphilitics. These fluids are used in the Wassermann reaction without inactivation, and several instances are known in which such fluids have been accidentally sucked into the mouth through a pipette; but so far as known no case of infection with spinal fluid has been recorded.

Spermatic Fluid.—Neisser¹⁷ has reviewed this subject up to 1911. Neisser himself failed to infect monkeys in seven trials with fresh seminal fluid from cases in various stages of the disease. Hoffmann failed in three trials with fluid from cases of two and a half months, eleven months and eighteen months' duration. Finger and Landsteiner¹⁵ succeeded twice in obtaining a positive result. One of these successful inoculations was performed with the spermatic fluid of a patient with florid secondary syphilis. The fluid was obtained by expression from the seminal vesicles, and microscopically was normal sperm without admixture of blood. The authors considered that any admixture of material from the syphilitic eruption was absolutely excluded. The second successful inoculation was performed with the spermatic fluid of a patient who had syphilis for three years and suffered from a bilateral interstitial orchitis. Uhlenhuth and Mulzer¹⁹ confirmed this observation in 1913. They obtained seminal fluid from an early case, with relapse after salvarsan, and successfully inoculated three rabbits. Seminal fluid from the same case after treatment failed to infect rabbits. Nichols²⁴ succeeded in finding a typical *Treponema pallidum* by means of dark-field illumination in the apparently normal prostatic fluid of a secondary case, a finding that I was fortunate enough to be able to observe.

Warthin²⁵ found lesions of syphilis in the testes in 31 out of 36 male syphilitics at autopsy. The lesion most often found is the so-called orchitis fibrosa syphilitica chronica. Warthin says: "Spirochetes are found in these areas, and

the close relationship of the spirochete to the seminiferous tubules makes the entrance of the organism into the tubule a very probable occurrence, and can be taken as a very strong argument for the possibility of seminal infection. In congenital syphilis and in early acquired syphilis I have found the testes swarming with spirochetes even when no histological changes can be recognized in the organ. In such cases great numbers of spirochetes must gain entrance to the tubules and pass out with the semen."

Such findings demonstrate that the seminal fluid from many secondary cases is infectious, and we may assume that the seminal fluid from tertiary cases may be infectious in the presence of a suitable lesion in the testicles.

Clinical experience indicates that some cases of syphilis appear to be transmitted through inoculation with seminal fluid. When we consider the great number of cases in which husbands have infected their wives, though they thought they were cured previous to marriage and apparently had suffered from no perceptible lesion for years, we are led to the conclusion that the infection has been transmitted by means of the spermatic fluid. Fournier and other great syphilologists have insisted that women were thus infected at the time of conception through the fetus and developed secondary symptoms without ever having had a chancre.

Theoretically it would be difficult to conceive of a more perfect mechanism for the transmission of the disease. For granted that treponemata are present only occasionally, and in small numbers in the spermatic fluid, yet a considerable quantity of this fluid is deposited at each act of intercourse and may remain in contact with the female genitalia for a prolonged period. With repeated inoculations of this character one would suppose that sooner or later infection would be sure to occur.

2. *The Viability of the Treponema Pallidum or its Ability to Live and Retain its Infectiousness Outside the Body.*—The *Treponema pallidum* may retain its life and infectious properties for long periods in tissues that are excised from the body and in various bodily fluids when kept in the laboratory under suitable conditions or in cultures. This, however,

is aside from our present purpose, which is to determine how long this organism is capable of retaining its infectiousness when deposited upon various objects with the secretions from a syphilitic, in order that we may determine the degree of danger incurred by those persons who later handle these objects.

The actual experimental evidence on this point is very satisfactory. Hertmanni²⁶ found that the treponema lost its motility as soon as drying occurred. The time of drying depends on physical laws, and experience showed that drops of serum of the size used dried in from fifteen to forty-five minutes while large drops of blood required from one to one and a half hours for complete drying. Thin smears of infectious material on absorbent fabrics would, of course, dry much more rapidly. Hertmanni undertook experiments to determine whether material that has dried upon razors, combs, eating and drinking utensils, closet-seats, etc., is still capable of conveying infection. The material used was obtained from syphilitics and mixed with the serum from the lesion, and a control preparation was always examined by the dark field and the presence of active, living treponemata established. This material was dried for varying lengths of time and then redissolved in physiological salt solution. Investigation of these dried smears showed that all motility was lost as soon as drying occurred, and that there was no return of motility, although the preparations were observed for over four hours.

Neisser¹⁷ also determined that virus from syphilitics that produced syphilis when inoculated into monkeys absolutely lost its power to transmit the infection as soon as the fluid which contained the treponemata was dried. Gastou and Comandon²⁷ have investigated the question of how long living treponemata would remain on drinking glasses. Individuals with mucous patches or chancres of the lip containing many treponemata were selected to drink from the glasses. The glasses were then cleaned after the method used in public houses, *i. e.*, some time after use the glasses were rinsed in water. It developed that the saliva or the slimy secretion in which the treponemata were

contained by its adhesion to the glass retained the organisms under almost as good conditions as the mucous patches themselves until the material had entirely dried. Living and active treponemata were recovered from these glasses up to a half-hour after they were deposited on the glass. Scheuer²⁸ experimented with sponges contaminated with syphilitic secretions and found living treponemata after one and a half hours.

We may therefore regard it as demonstrated that any material that has dried has lost its power to transmit the infection. This is a matter of the greatest practical importance, since it is evident that most infected objects will only remain infected for a short time if they are of such a nature as to permit of the drying of the material deposited upon them.

Neisser also determined that infectious material lost its power to transmit infection after being exposed to unfavorable temperatures as follows: (1) after three hours at a temperature of 10° C.; (2) after twenty hours in an ice-chest; (3) after heating to 48° C. for half an hour. Mucha and Landsteiner²⁹ and Eitner³⁰ obtained similar results and found that treponemata that lived several days at room temperature died in from five to six hours at 20° to 27° C., and only lived fifteen minutes at 45° C. Bronfenbrenner and Noguchi³¹ found that *Treponema pallidum* suspended in physiological salt solution is killed by the temperature of 45° C. in from seven to ten minutes, and that they are killed by solutions of mercuric chloride, tricresol, phenol, etc., in dilutions from twenty to one hundred times higher than are required to kill the colon bacillus.

Zinsser and Hopkins,³² however, showed that the *Treponema pallidum* may live eleven and a half hours on wet towels exposed to room temperature and daylight. We have therefore an organism that cannot survive drying, extremes of temperature or light, and is also easily killed by disinfectant. It seems quite certain therefore that treponemata seldom live for any long period of time after being deposited upon objects, and it is probably owing to this fact that cases of innocent syphilis are not more frequent than they are.

These facts are in accordance with clinical experience, which indicates that in almost all cases in which a chancre is believed to have been received from some intermediate object the victim has handled it very shortly after its use by the syphilitic person from whom the infection originated. Under other circumstances in which sufficient fluid is deposited upon the object for it to remain wet for a longer period the danger of the transmission of syphilis is proportionately increased; and as the experiment of Gastou and Comandon indicates, syphilis may be transmitted by a drinking glass at least half an hour after its use by a syphilitic. Probably the conditions in this experiment were exceptionally favorable, and the washing to which the glasses were subjected may have been sufficient to keep them moist and insufficient to remove the slimy secretion from around the edges. But we must conclude that any object recently soiled or still moist with infectious secretions from a syphilitic must be regarded as a possible source of infection.

C. The Methods Whereby the *Treponema Pallidum* Gains Access to the Body.—Certain other characteristics of the *Treponema pallidum* are worthy of consideration, since they bear upon the methods of transmission of syphilis. These embrace (1) the penetrative powers of the treponema or its ability to penetrate sound skin or mucous membrane, and (2) the tendency for these organisms to become localized in the genital organs.

1. *Penetrative Powers of the *Treponema Pallidum*.*—It has been very generally held that the *Treponema pallidum* is unable to penetrate unbroken skin or mucous membrane but that the organism must gain access to the body through fissures or abrasions. Indeed, this belief may almost be accorded the rank of a dogma, for statements to this effect may be found in almost any standard text-book or article on syphilis.* While it cannot be denied that the presence of

* Though as great an authority as Hutchinson,³⁷ on page 16 of his book, states that abrasions are not essential nor perhaps even frequent in syphilitic infections, and that there is nothing improbable in the suggestion that the virus can easily penetrate the unbroken but soft, moist, and very delicate mucous structures of the parts on which chancres are usually seen.

such fissures or abrasions favors the entrance of the virus, and that many or perhaps a majority of infections are so acquired, it is difficult to understand on what facts the statement that the treponema cannot penetrate the unbroken mucous membrane is based. In the first place it is a negative statement and is therefore insusceptible of proof; while, on the other hand, the known facts in regard to this infection appear to me to contradict this statement.

Consider first the organism itself. It may be briefly described as an animated corkscrew, and anyone who has seen the living organism in the dark field and observed its slender pointed ends, its rotary, lateral and progressive motility, will agree that it is admirably constructed for penetrating purposes. It has been found that boils and skin infections may be produced by rubbing cultures of virulent staphylococci on the unbroken skin. If this is true of a non-motile coccus, why should we deny the ability of an organism like the *Treponema pallidum* to penetrate the skin?

Next, consider the locations in which the organism is found in the tissues. It is found practically everywhere; but to cite one example, it is known that it is present in the brain tissue in paresis (Noguchi). These organisms could not have reached their final resting place without penetrating some tissues, even allowing for their original distribution through lymph channels and bloodvessels. I have already quoted the statements of Pasini and Hoffman to the effect that these organisms may be found within certain cells. Now, if this organism can penetrate certain cells, as it must to reach the locations in which it is found, why should we assume that it cannot penetrate the cells of the mucous membrane, which are certainly not very tough or resistant?

Finally, let us consider clinical observations. It is to my mind inconceivable that all of the innumerable chancres, located in all parts of the body, are predicated upon a pre-existent abrasion. Granting, for the sake of argument, that this is true of all chancres on the exterior of the body, how are we to account for the interurethral chancre for example? How was the fissure or abrasion acquired in the mucous membrane of the urethra? It seems improbable at least,

and far more probable, that the treponema was able to penetrate the unbroken membrane.

The kissing party reported by Shamberg³³ has become classic, and it may be remembered that eight individuals acquired chancres of the lip from kissing a young man who also had a chancre of the lip. Now, is it reasonable to suppose that all of these girls had abrasions or fissures on their lips and that the organisms were carefully deposited on these solutions of continuity? The percentage of infections here was so high (eight were infected and five or six escaped) that to explain them in this manner would require us to believe that practically no one has an unbroken mucous membrane. Shamberg states that of those that developed chancres, 4 had no knowledge of any abrasion on the lips prior to infection, though 1 had a fissured lip and 1 was in the habit of biting the lips.

Such arguments might be adduced *ad infinitum* and perhaps *ad nauseam*, but may be omitted, since there is a practical experiment bearing on this point. Reasoner has performed experiments at the Army Medical School to test this point. Eight rabbits were inoculated with an emulsion of treponemata obtained from two chancres on rabbits' testicles. This emulsion was placed in the eyes, mouth and nose; in the vagina in two instances; on the penis of one rabbit; and on the skin of the scrotum and groin several times. Six of these experiments were negative, but the two rabbits inoculated in the vagina both developed syphilis. In 1 case there was generalized syphilis, with the treponemata demonstrated in the lesions of the nose, but no chancre; and in the other case a vaginal ulcer developed one month and eighteen days after the inoculation, in which many organisms were demonstrated; and this rabbit subsequently developed generalized syphilis, lesions being found in many organs, including the brain. It may, of course, be objected that in these two cases an abrasion was present. It is impossible to meet such an argument, and no experiment can be devised which will positively guarantee an absolutely intact integument. It can only be stated that in this experiment the utmost care was used to avoid breaking the skin or mucous membrane,

and that the rabbits were kept separately and all due care exercised to avoid this possibility. Personally, I regard this experiment as a demonstration of my long-standing belief that the *Treponema pallidum* can and often does penetrate unbroken mucous membranes and possibly unbroken skin.

2. *Genitotropic Tendency of the Treponema Pallidum.*—There are several circumstances that appear to indicate that the *Treponema pallidum* has a selective affinity for the genital organs. Attempts to transmit syphilis to rabbits were made in many instances in earlier years, but were generally unsuccessful until it was determined that the sexual organs afforded the best place for the multiplications of the parasites. Injections of syphilitic material into the scrotum or testicle of rabbits almost never fail to produce a syphilitic lesion in the rabbit; although, as stated, failure was frequent when other locations were used for the inoculation. Further, intravenous injections of syphilitic blood in the rabbit may result first, and sometimes only, in lesions of the scrotum and testicle (Nichols). In regard to monkeys, Neisser¹⁷ states that the testicles of infected animals always proved to be infectious even when inoculations with the spleen and bone marrow failed, and that "it appeared that the testicles acted particularly well and long as a depot of the virus." Conversely, when inoculating monkeys it was found that the best results were obtained when the virus was injected into the testicle.

In man the chancre is located on the genitalia in something over 90 per cent. of the cases, but we must exclude this fact from consideration, because these organs are the parts upon which the virus is commonly deposited. But the great liability of the testicle to tertiary lesions is well known, and treponemata may be demonstrated often in testicles presenting no gross lesions, as has been shown by Warthin.²⁵

Again, in the case of dourine, which is a trypanosome infection of the horse transmitted solely by sexual intercourse, and therefore analogous to syphilis in man, the parasites are said to multiply best in the testicle in experimental inoculations of the rabbit, either direct or intravenous.

All of these observations seem to indicate that the *Treponema pallidum* has an actual affinity for the tissues of the

genital organs, and that we may be dealing with a characteristic of the organism that has been acquired in the course of its evolution in the effort to perpetuate itself. If true the importance of this circumstance is obvious. The reason why such an overwhelming number of chancres are located on the genital organs may be due partly to this fact as well as to the reasons usually assigned, and the special affinity of the organism for the testicle becomes important because of the possibility already mentioned that syphilis may be often transmitted by the spermatic fluid. If the treponemata remain in a virulent condition in the testicle, even though no lesion may be present, and may at any time be emitted in the spermatic fluid, this fact must be taken into consideration when permitting syphilitics to marry. And, finally, if the parasite favors the sexual organs as a habitat the sexual nature of the disease is emphasized, and any endeavor to deny the essentially venereal nature of syphilis and to regard it simply as a contagious disease, however well intentioned, will necessarily fail, since this endeavor is founded upon what is at best but a half-truth.

3. *Syphilis d'Emblee*.—This is a term used to define cases of generalized syphilis in which there has never been a chancre or primary lesion. For many years it has been maintained by a few syphilologists that generalized syphilis can develop without the previous appearance of a chancre if the virus gains access directly to the bloodvessels or lymphatics. Other authors, including most of the orthodox, have opposed this conception, and state that a chancre must always appear at the port of entry of the virus and that generalized syphilis without a chancre is not possible. The question is of considerable scientific interest, and is also of importance in any study of the public health aspects of the disease.

It is a common experience to have a syphilitic patient deny all history of a chancre or sore of any kind. Physicians commonly pay no attention to such denials on the ground that all venereal patients are liars who prefer to tell an untruth when the truth would serve better. No doubt this is often the case, but there are numerous exceptions to this rule. We often have, for example, the educated and intelli-

gent men who say, "It is true that I was exposed at various times, but I always watched myself very carefully, and I am positive that I have never had any sore of any kind." This is usually not a falsehood. The patient has admitted his breach of morals, has consulted his physician in good faith and there is no reason to suppose that he is lying. But it is well known that the chancre is often atypical, indeed, that it may be so slight as to entirely escape attention, a mere fissure or erosion. Most syphilologists explain such cases in this way, and apparently are completely satisfied with this explanation.

But there is still another class of patients in whom this explanation becomes fraught with difficulties. These are the cases of fresh secondary syphilis in which, perhaps, all knowledge of the manner by which the infection was acquired is denied and in which the most careful and painstaking physical examination fails to detect any sign or trace of a chancre. Such cases are often called cryptogenic syphilis, and while naturally somewhat unusual, are not at all rare. Most of these cases are never reported, for obvious reasons, and yet there are a good many in the literature. Almkvist^{*34} has collected 23 such cases; Lane³⁵ has recorded 6 more; and there are undoubtedly others. The 2 cases reported by Mueller³⁶ are particularly interesting, because these patients were under continuous observation from the time of exposure to the development of secondaries. Briefly, these cases are as follows:

CASE I.—On November 6, 1896, two patients applied for treatment who had had intercourse with the same girl four days before, but had had no other intercourse for months.

Patient No. 1 had gonorrhoea, and after ten days developed a small ulcer on the glans that became indurated November 22. The inguinal glands enlarged and treatment with mercury was started, but in March, 1897, the patient

* Havas, 1894, 1 case; Cardier, 1894, 2 cases; Verchere, 1894, 3 cases; Mueller, 1898, 2 cases; Marshall, 1899, 1 case; Heuss, 1901, 1 case; Reiss, 1901, 1 case; Cozanet, 1903, 1 case; Blaschko, 1904, 1 case; Jakowlew, 1905, 2 cases; Emery, 1906, 1 case; Waelsch, 1909, 3 cases; Magian, 1909, 1 case; Bettman, 1910, 1 case; Covisa, 1910, 1 case; Papee, 1911, 1 case.

developed generalized secondary syphilis. This case serves as a control.

Patient No. 2 had no gonorrhoea and was under careful observation all the time. At the end of January the left inguinal glands became painful, but the lymph vessels on the dorsum of the penis were normal. Eight days later the right inguinal glands enlarged and a general adenitis developed. At no time was there the slightest trace of a primary lesion. Early in February generalized syphilis developed, with a macular eruption, condylomata and angina.

CASE II.—An intelligent man, aged twenty-seven years, who had had gonorrhoea years before, but otherwise no venereal disease. Consultation August 30, 1895. Had intercourse six days before, the only one in the last half-year; but found out the day before the consultation that the girl with whom he had had relations had contracted syphilis six months previously. On examination nothing could be found—not an erosion, not a herpes nor any injury to the genitalia. As the patient was engaged he reported every two days in order that a chancre could be excised at once should it appear. Not the slightest lesion appeared, although the entire body was investigated, and the urethra was also examined with the endoscope. For six weeks the investigation was entirely negative. In the seventh week, right and left inguinal adenitis; eighth week, polyadenitis; tenth week, generalized secondary syphilis, with macular eruption and nocturnal headaches. He was then placed on mercurial treatment, but had a relapse March, 1896.

Mueller concludes that in these 2 cases all errors are excluded and that they prove the existence of syphilis without a primary lesion. Almkvist³⁴ does not accept this reasoning, and quotes a case of his own, of a similar nature, in which no chancre could be found, but who developed a slight secretion from the urethra in which treponemata were demonstrated, and subsequently a small erosion was found in the urethra behind the fossa navicularis. Almkvist concludes because of the great ease with which such a small erosion may escape observation, that it is not possible to prove that a case of infection without a demonstrable primary lesion is a

true case of syphilis d'emblee and not a case of concealed chancre.

This is a conclusion with which most syphilologists have always agreed. However, it must be accepted with some caution, for the reason that the existence of undoubted and undeniable syphilis d'emblee has been demonstrated in a very few cases. These are the cases in which a physician or his assistant were accidentally infected by a needle or other instrument while operating on a syphilitic. There are at least 9 such cases in the literature as follows: Hutchinson,³⁷ 2 cases; Jullien,³⁸ 2 cases; Waelsch,³⁹ 1 case; Bettman,⁴⁰ 1 case; Fordyce,⁴¹ 1 case; Hazen,⁴² 1 case; Nonne,⁴³ 1 case.

Some of these cases will bear repetition. Jullien's 2 cases are as follows:

A surgeon and his assistant operated on a woman, aged thirty-two years, for a swelling of the sternum, and after excision and scraping they sewed up the wound. The needle, however, was blunt, and in trying to force it through the skin the surgeon wounded himself deeply in his right index finger. Subsequently the assistant met with a similar mishap and wounded himself on the same finger. In both instances the puncture healed in three or four days. On dressing the patient's wound eight days later they observed phenomena in the wound, which suggested the possibility of syphilis; and on the following day a general macular eruption appeared on the patient. On examining her genital organs a healing chancre was discovered, and also enlarged inguinal glands. Twenty-six days after the inoculation the surgeon developed fever, shivering and malaise, and remained in bed one day. At the same time the site of the needle wound became sensitive and a slight ulcer appeared. This was followed on the thirtieth day by a macular eruption and a week later by mucous patches on the scrotum and tongue. The assistant showed no signs of infection before the thirtieth day; when he also had an attack of fever, and though no changes appeared at the site of inoculation, a macular syphilide appeared on the thirty-third day.

Waelsch's case: A physician operated on a case of paraphimosis in an individual known to him as a syphilitic.

During the operation he broke a flask of soap while his hands were covered with blood and a glass splinter made a deep wound in his right forefinger. He cleaned and dressed the wound and continued the operation. The wound healed at once, and the physician watched it for weeks, but no induration or infiltration appeared. The general eruption appeared about two and a half months after, and the diagnosis of syphilis was made by Waelsch, who remarks that this observation had almost the exactitude of an experiment.

Fordyce says: "I have had a number of cases in which by the most painstaking search it was not possible to find any evidence of an initial sore, but such cases were shown to be definitely syphilitic by secondary symptoms and a positive Wassermann. I have under observation at the present time a male nurse who pricked himself with a needle used for taking blood for the Wassermann, directly after he had withdrawn the blood in a very florid case of syphilis. There was absolutely no lesion at the site of the puncture, and though the patient was watched for secondaries, nothing appeared for several months, when a few papules developed between his toes. His Wassermann was strongly positive.

To these cases I am now able to add another case of my own. Dr. X took an examination for admission to the service, in the course of which a slight macular eruption was noticed and a Wassermann reaction was made and was strongly positive. Dr. X then gave the following history:

Three months before he had operated on a patient with a very sore throat and greatly enlarged tonsils. It was later found that this patient had a four-plus Wassermann and was in the active stage of secondary syphilis. Dr. X removed the tonsils with a snare, and during the operation the wire broke and cut the left forefinger almost to the bone. He continued the operation and then cauterized the wound with pure carbolic. The wound healed readily and hardly left a scar, and although watched for two months no sore of any kind appeared. A careful physical examination of Dr. X was made and showed that he had a very sore throat in addition to the macular eruption already noticed. He did not, however, have any enlarged glands, although the epitrochlear

inguinal and axillary regions were carefully palpated, nor was there any trace of a sore or scar on the penis or any other part of his body. He stated that he had had no intercourse for seven years and had never had a sore on the penis. He also offered the following evidence to prove that he was free from syphilis before the date of the operation described above. Several weeks before the operation he had served as a donor for a blood transfusion, and at that time a routine Wassermann was made and was negative. Dr. X was sent to the hospital, where he received several injections of salvarsan as a result of which he had a pronounced Herxheimer reaction, and the eruption became bright red, but after the fourth injection the Wassermann reaction became negative. This indicates that previous to the operation in which he cut his finger he was free from syphilis, and the positive reaction and response to salvarsan shows that three months after the operation he was in the active secondary stage of syphilis. No other port of entry of the virus could be found, and in so recent a case the chancre or at least the scar should be found if it existed.

It has been shown by experiment that if a rabbit be given an injection of syphilitic virus intravenously it will usually develop generalized syphilis without the appearance of a chancre at the site of inoculation. This fact and the above clinical cases demonstrate conclusively that generalized syphilis may occur without a primary lesion.

Indeed, it is difficult to understand why syphilologists have objected so strenuously to acknowledging this possibility. It has been generally admitted that syphilis does not always run a classical course. The secondaries are often omitted in mild cases or in malignant syphilis in which tertiary lesions may follow shortly after the primary infection. The tertiary lesions are often omitted entirely, and it is not at all uncommon in cases of tabes dorsalis to find that both secondary and tertiary symptoms have been absent, although no treatment was received. It is generally recognized that there is no disease in which any particular symptom or lesion must be invariably present to establish a diagnosis. Why should the chancre be the only sacred symptom without

which there can be no syphilis? It has already been noted that the chancre may be small and trifling, and it has been shown in some cases that small erosions or perhaps only a herpes is all that can be demonstrated as the lesion caused by the entrance of the virus. Whoever goes so far as to accept such trifling lesions as the initial lesion of syphilis must logically admit that the lesion may be absent altogether and accept the possibility of syphilis d'emblee. Idiopathic tetanus and cryptogenic septicemias are well known in which, even at autopsy, no portal of infection can be recognized. Why should syphilis be the only disease in which exception to the general rule cannot occur?

The subject has been emphasized at this length because of its importance in the public health aspects of the disease. If syphilis d'emblee is a rare condition it is of no importance, but it is believed that, on the contrary, it is rather common. The fact that only a few cases can be found in the literature does not militate against this belief for the reason that few such cases can be proved with sufficient scientific accuracy to warrant recording them. But many of the so-called cases of cryptogenic infection were probably truly cases of syphilis d'emblee, and indeed were so considered by their sponsors, although perhaps the proof offered is not unassailable.

If we consider the fact that tears of the mucous membrane, fissures and erosions are rather common sequences of sexual intercourse, and that in their production the small blood-vessels and lymphatics are necessarily opened, and that the treponema is an actively motile organism that can easily gain access to these opened vessels, it seems most probable that many infections are acquired in this manner.

If true this explains the fact that so many of our undeniably syphilitic patients deny all history of a primary lesion. More important it points to the fact that there are many individuals in the community who are entirely ignorant of the fact that they have acquired syphilis. They have been exposed, but have observed themselves; no chancre has appeared and they consequently think that they have escaped infection. Perhaps the development of paresis or

locomotor ataxia in later years will be the first indication of the disease. Some such explanation must be forthcoming to explain the great prevalence of syphilis as shown by Wassermann surveys, and particularly by Warthin's finding of treponemata in a third of his adult necropsies, among individuals who strenuously denied the possibility of syphilitic infection. All men are not liars, and it is believed that many of our patients are telling the truth when they deny the existence of a primary lesion.

THE METHODS OF TRANSMISSION.

Although the various methods whereby syphilis is transmitted are extraordinarily multiplex in detail, and involve to a greater or less degree almost every relation of family and social life, yet fortunately these multifarious methods may be resolved into a simple classification; thus clarifying greatly their consideration from a public health stand-point. Thus, syphilis may be divided into two main categories: syphilis of the innocent, or syphilis insontium; and syphilis resulting from illicit intercourse, or syphilis pravorum. Syphilis insontium is usually further subdivided, in accordance with its method of transmission. For our present purpose the following classification will be used:

A. Syphilis insontium, or syphilis of the innocent:

1. Marital syphilis, or syphilis e coitu legitima.
2. Hereditary syphilis.
3. Syphilis sine coitu, manifested by extragenital chancres.

B. Syphilis pravorum:

1. Adulterous relations.
2. Clandestine prostitution.
3. Open prostitution.

1. **Marital Syphilis.**—This includes all syphilis transmitted from husband to wife, or *vice versa*, whether through coitus, kissing or other methods. The subject is of great interest and importance because marital syphilis is so frequent, and because the individual so infected is invariably an innocent victim of the disease, and usually remains ignorant of the

infection, and therefore receives either no treatment or insufficient treatment.

Syphilis may be acquired by either husband or wife before or after marriage. When acquired after marriage the second party is almost invariably infected, while in the case of syphilis contracted before marriage, although the probability that the infection will be transmitted is great, the innocent party frequently escapes.

Transmission from Wife to Husband.—This is comparatively rare. The great majority of women have no sexual relations before marriage, and after marriage are faithful to their husbands. While there are numerous exceptions to this general rule, and syphilis is undoubtedly transmitted from wife to husband on occasion, it is impossible to obtain any figures on the frequency with which this occurs, owing to the great difficulty in obtaining the exact facts in each case. Married men who contract syphilis occasionally claim to have had no extramarital relations; but such statements must be regarded with suspicion in the absence of definite proof, which is almost never forthcoming. Transmission from wife to husband is sufficiently rare to render its discussion unprofitable from a public health point of view, and in any case the methods of transmission are similar to those by which the disease is transmitted from husband to wife.

Transmission from Husband to Wife.—Here the facts are reversed. Syphilis is exceedingly rare among single women of the better classes, and more or less uncommon among any single women, except clandestine and regular prostitutes. It is, on the other hand, fairly common among married women who have almost always been infected by their husbands. Approximate figures as to the frequency of this form of marital syphilis are obtainable. Fournier⁴⁴ states that the facts in his clinic have shown that of 100 syphilitic women, 80 per cent. are of irregular life and 20 per cent. are respectable married women. In other words, one syphilitic woman out of five is infected by her husband and the other four are all immoral. Among the married women in Fournier's private practice in 75 per cent. of the cases the disease was unmistakably traced to the husband. Bulkley states⁴⁵ that

in his own private practice fully 50 per cent. of the females with syphilis acquired it in a perfectly innocent manner, while among the married women the percentage would be 85 or more. Fournier⁴⁶ remarks that "the contagion in effect is rendered so easy by the intimate and incessant contact that results from marriage that it is almost fatal, and it is rare that the wife is not infected. As M. Dechambre says, 'Syphilis is divided among husband and wife like the daily bread.'" Still worse, in a large percentage of cases the disease is transmitted almost immediately after marriage. Thus, Fournier⁴⁶ states that of a total of 572 syphilitic women no less than 81 contracted syphilis from their husbands during the first days of their marriage. To be sure this was written in 1880; but who can be sure that with the prevailing ignorance concerning this disease conditions are much better now?

Methods of Transmission of Syphilis from Husband to Wife.—According to Fournier⁴⁴ out of 312 syphilitic women 218 were infected by a husband who acquired his syphilis before marriage and 94 were infected by a husband who became syphilitic after marriage.

The Delayed Chancre.—This method of transmission is probably comparatively rare in this country, but according to French authors it is not infrequent in France and some other countries where young men celebrate the close of their bachelor days by an orgy with former mistresses. Since the primary lesion of syphilis does not develop for some time after the infection is received, under the circumstances described above, it is not unusual for the chancre to appear some days or weeks after marriage and for the wife to become infected before the small and painless lesion is noticed. Clinical authorities have placed the incubation period of syphilis at fifteen days for the minimum and forty-two days for the maximum; and this corresponds closely to the results obtained in experimental inoculation of animals. In a series of 100 rabbits inoculated with syphilis by Nichols and Reasoner in the laboratory of the Army Medical School the average incubation period has been thirty-eight days and the longest sixty days. From this it is evident that the pos-

sibility of transmission of syphilis to the wife by a chancre developing after marriage is ever present in any case in which illicit intercourse has occurred within two months of approaching marriage.

Secondary Lesions that Escape Notice.—Mucous patches are particularly prone to occur in the mouth even after the disease has lasted several years and has been well treated in accordance with past standards. If the wife has escaped a genital infection, either by good luck or good management on the part of the husband, she may, and not infrequently does, develop a chancre of the lip as the result of kissing at some time when one of these highly infectious lesions has developed unnoticed in the husband's mouth. Diday⁴⁷ observes that secondary lesions in a man are relatively infrequent on the genital organs and very common in the mouth, and that when a man has a chancre of the penis he knows it is infectious; but, on the other hand, he is frequently ignorant not only of the danger of mucous patches in the mouth but of their presence. For these reasons Diday thought on theoretical grounds marital syphilis in women should usually originate in the mouth. He points out, however, that practice does not bear this out and that there are ten vulvar chancres to one chancre of the lip. Fournier⁴⁶ states that in the vast majority of cases syphilis is transmitted to the wife as a result of secondary lesions. The disease is infinitely more dangerous at this stage because of the great variety, wide dissemination and infectiousness of the lesions. The mildest and slightest lesions of this period are the most dangerous because they are most apt to escape the attention of the husband. We may conclude that in the majority of cases syphilis is transmitted to the wife when the husband is in the late secondary period of the disease; and having been well treated, thinks he is healthy, but really suffers from some small, and perhaps almost imperceptible lesion of the genitals or mouth. Fournier⁴⁴ has collected statistics on this point that are well worth quoting:

Of 142 men who contracted syphilis prior to marriage and infected their wives:

- 6 were in the incubation stage, the chancre having incompletely developed.
- 1 had a chancre less than six weeks.
- 4 had a chancre less than a year previously.
- 6 were known to have been syphilitic for three months.
- 7 were known to have been syphilitic for four or five months.
- 5 were known to have been syphilitic for six months.
- 4 were known to have been syphilitic for eight months.
- 4 were known to have been syphilitic for a few months: not more definite.
- 18 were known to have been syphilitic for one year.
- 1 was known to have been syphilitic for thirteen months.
- 12 were known to have been syphilitic for fifteen to eighteen months.
- 16 were known to have been syphilitic for two years.
- 5 were known to have been syphilitic for two and a half years.
- 9 were known to have been syphilitic for three years.
- 1 was known to have been syphilitic for three and a half years.
- 8 were known to have been syphilitic for four years.
- 1 was known to have been syphilitic for four and a half years.
- 6 were known to have been syphilitic for five years.
- 2 were known to have been syphilitic for five and a half years.
- 5 were known to have been syphilitic for six years.
- 5 were known to have been syphilitic for seven to seven and a half years.
- 5 were known to have been syphilitic for eight years.
- 1 was known to have been syphilitic for nine years.
- 2 were known to have been syphilitic for ten years.
- 1 was known to have been syphilitic for eleven years.
- 2 were known to have been syphilitic for twelve years.
- 2 were known to have been syphilitic for thirteen years.
- 1 was known to have been syphilitic for fifteen years.
- 1 was known to have been syphilitic for seventeen years.
- 1 was known to have been syphilitic for eighteen years.

Thirty-seven had had syphilis less than one year; 31 had had syphilis from one to two years; thirty had had syphilis from two to three years, so that 98 had had syphilis less than three years.

Of 154 women who were infected by their husbands the time of infection was:

First months after marriage, 10 cases.

Second month, 26 cases.

Third month, 20 cases.

Fourth and fifth months, 7 cases.

Sixth month, 1 case.

First month of marriage, without greater accuracy, 53 cases.

Second half of first year, 13 cases.

Second year, 9 cases.

Third year, 3 cases.

Fourth year, 3 cases.

Fifth year, 2 cases.

Sixth year, 3 cases.

Seventh year, 2 cases.

Eighth year, 1 case.

Ninth year, 1 case.

From this it will be seen that 130, or 84 per cent., of these women were infected during the first year of married life, although a few infections occurred as late as the ninth year after marriage.

Syphilis Transmitted to the Wife by Conception.—Concerning this Fournier⁴⁶ writes:

“A pure girl is married to a syphilitic and soon develops symptoms of secondary syphilis. Examination shows no trace of a primary lesion. The objection may be raised that a chancre in a woman is often a small fugitive lesion which may escape detection. But there is no bubo, which is not only the faithful companion of the chancre, but according to M. Ricord is also a posthumous witness, since it survives the chancre for a long time. No trace of a scar; no adenopathy; in a word, syphilis d’emblem without a chancre. Examination of the husband fails to show any infectious lesions whatever. The woman has become syphilitic at the contact of her syphilitic husband, who has not the least

external symptom capable of conveying the contagion. Facts of this kind are common; are frequent. What then is the key to the mystery? It is that the wife is *pregnant* and has become syphilitized by conception. In such a situation pregnancy is always present. The woman who appears to have received syphilis from her husband has in reality received syphilis from her child, who in turn received it from the father."

Diday⁴⁷ also insists that this method of infection is common and mentions the following case:

"A young girl, aged sixteen years, had a single coitus with a young man who had had syphilis for six months, but who had been treated regularly and who had shown no symptoms after a month of treatment. The morning after the coitus the man was examined, and no lesion could be discovered on his genital organs or on the rest of his body. The girl became pregnant and in three months developed generalized secondary syphilis, but without a chancre or inguinal adenopathy. She was treated, but gave birth to a syphilitic child.

Diday mentions a number of such cases among married women, and states that in 1 case the infection with syphilis dated eight months after marriage; one eighteen months; once three years; twice from four and a half to six years, after marriage; and remarks: "During all these years infection did not occur even during the excesses of the honeymoon. It was only later when both love and syphilis had lost their first ardor that infection attacked the poor woman, spared until then. What happened? Almost nothing, only the husband became a father. Transmission in this manner is therefore certain."

At the present day it is generally believed that paternal transmission to the fetus direct is impossible, but this conclusion should be accepted with some reservation in view of the above well-authenticated observations. We have already seen that treponemata have been demonstrated in the seminal fluid of syphilitics. It seems most probable that in cases such as those quoted by Fournier and Diday the infection was transmitted by means of the spermatic fluid which contained treponemata at the time of the intercourse that led to con-

ception; that the ovum was thereby infected; and that the mother was not infected directly, but only secondarily from the fetus.

However, it is an academic question whether the mother was infected directly or only secondarily. The plain fact is that numerous innocent marital infections have been transmitted by means of infected spermatic fluid by husbands who thought they were healthy. This leads directly to a discussion of the standard of cure of syphilis, and the conditions under which a syphilitic may be permitted to marry and become a father. This subject will be discussed in the following chapter.

Accidental Extragenital Infection of the Wife.—This differs in no respect from the extragenital chancres accidentally received in other social relations, except that because of the very close contact between members of the same household extragenital infection is especially apt to occur between husband and wife.

2. **Hereditary Syphilis.**—The methods of transmission may be briefly summarized as follows:

(a) The husband has syphilis. He infects his wife; and she infects the embryo. Experience indicates that this is the usual method of transmission, and that the wife is often infected soon after marriage. The treponemata circulating in the blood stream of the mother during the secondary period of the disease apparently penetrate the placenta with ease, and enter the blood stream of the child. The child naturally has no trace of a chancre, so that it may be noticed that we have here another indication of the possibility of syphilis d'emblee.

(b) The husband has syphilis and infects the ovum at the time of conception; the wife later becoming infected.

(c) The wife alone has syphilis, and infects the child in the same manner as in (a). It is fairly obvious that in any case of hereditary syphilis the mother is certainly infected, and the father is usually, but not necessarily, infected.

The Results of Hereditary Syphilis.—The results following the syphilization of the embryo may also be summarized as follows: The earlier the fetus is infected the more rapidly

the syphilis advances, so that it may lead to the death of the fetus within six weeks. When the infection is received later the child may be born with the symptoms of the disease, and if the infection occurs shortly before birth, the child may be born apparently healthy, and even the Wassermann reaction may be negative, since there may not have been sufficient time to permit the development of this phenomenon. These are the children formerly considered immune. Some of them may show symptoms soon after birth, and some in later years; and possibly some never show symptoms that lead to a diagnosis.

We have therefore the following possibilities:

1. The infection causes a cessation of development and abortion.
2. The fetus grows, but is born before the normal expiration of intra-uterine life (premature births).
3. The fetus goes to term, but is born dead (stillbirths).
4. The child is born at term living, but with unmistakable signs of syphilis, and dies shortly.
5. The child may show no symptoms of syphilis at birth, but a few weeks later typical symptoms develop. It may die or, as the result of treatment, may live.
6. The child shows no symptoms of syphilis for weeks, months or possibly years; the disease being latent, and becoming manifest in some cases as late as twenty-eight years in the tertiary form (so-called syphilis hereditaria tarda).

It is possible that the child of syphilitics is not invariably infected. Such parents may apparently have a healthy child that remains so, and this child may be followed by one infected with syphilis. No rule whatever is observed in such cases, which apparently occur when the parents are in the later stages of syphilis and are capable of transmitting *treponemata* only at times. It is clear, however, that the greatest care must be exercised in deciding that such apparently healthy children are in reality free from the disease. Many of these apparently healthy children have a positive Wassermann reaction, and even a negative reaction will not exclude the existence of syphilis with absolute accuracy, in spite of the fact that the Wassermann reaction is

positive in a very high percentage of cases in hereditary syphilis.

Some authorities have also held that since syphilitic parents are constitutionally affected by the disease their germ cells may also become affected or deteriorated, so that the embryo resulting from their union, though not actually infected, is subjected to this unfavorable influence. As a result the child may be puny, weak and show various abnormalities, though not actually syphilitic. The claim is made that in this respect the poison of syphilis acts like alcohol or lead. There are many observations indicating that the children of alcoholics are inferior,⁴⁸ but such observations must, for the present, be accepted with a certain amount of caution.

The Comparative Frequency of the Results of Hereditary Syphilis.—Information as to the comparative frequency of the various results of syphilization of the embryo enumerated above has been obtained by observing the histories of all pregnancies and the resulting children in a large number of families in which one or both parents were syphilitic. Fournier (quoted by Haberman) counted 161 pregnancies in 18 families, of which 137, or 85 per cent., died before or at birth; and he found that in purely maternal syphilis 84 per cent. of the offspring were affected, while in paternal syphilis only 37 per cent. were infected. Fournier⁴⁶ also gives the following figures: of 85 pregnancies observed in syphilitic women in his private practice, 58 died before or at birth, and there were 27 live births. Of 167 pregnancies observed in syphilitic women in hospital, 145 died before or at birth; and in 22 cases the infant survived. Fournier also quotes the records of other physicians, including the following:

Dr. Coffin observed 28 pregnancies in syphilitic women in which there was only one living birth, all others dying at birth or before.

Dr. Pileur, observing the pregnancies of syphilitic women for ten years, found that of 414 such pregnancies, 154 were terminated by abortion or stillbirths, while of the 260 children born alive at term, 141 died after a short delay (only 22 lived more than one month), making a total of 295 deaths in 414 pregnancies, or approximately 71 per cent.

M. Durac observed 43 pregnancies in syphilitic women, in which 36 resulted in the death of the infant, a mortality of 83.7 per cent.

Diday⁴⁷ records 212 observations of syphilitic women, the total of whose pregnancies resulted in 225 deaths by abortion, premature birth, death at birth or shortly after. Forty-nine infants survived. He pessimistically remarks that when both father and mother are syphilitic the infant has no chance at all to escape infection. On the other hand, if only the father is syphilitic the chances are much better, as he may succeed in avoiding infecting his wife.

According to Haberman⁴⁹ a study of Nonne's cases showed the following: 90 syphilitic families were examined, of whom 8 remained sterile. In the remaining 82 families, 350 pregnancies occurred; 91, or 26 per cent., ended in abortion; 10, or 2.9 per cent., in stillbirths; 65, or 18.8 per cent., died young; 183, or 52.3 per cent., remained alive. Of the latter only 119 were examined; 36 were found normal and 83 were infected. Expressed in other words, 47.7 per cent. of the offspring of syphilitic parents died before term; only 52.3 per cent. remained alive, and of these 35.8 per cent. were syphilitic. If one parent was diseased there was a child mortality of only 37 per cent., while if both were diseased between 47 and 53 per cent. died. Hochsinger (quoted by Haberman) speaks of 67 families in which there were 266 pregnancies, of which only 142 came to term and 76 more died within the first few days. This makes a total of 218 deaths, or more than 81 per cent., in this series.

It is apparent that mortality will depend upon the treatment received. Fournier⁵⁰ gives the percentages of hereditary syphilis as influenced by treatment as follows:

Treatment.	Inheritance.	
	Father.	Father and mother.
None	59	82
Short	36	85
Medium	21	30

In the light of our present knowledge such figures are inaccurate. The figures given for paternal infection are

very high, and we must assume that the mothers were also infected in these cases, although perhaps they showed no clinical manifestations of the disease. The Wassermann reaction was not available at this time. However, these figures do throw considerable light upon the influence of treatment on the transmission of hereditary syphilis, and that is all they are used for in this connection. Raven⁵¹ also points out that the prognosis for the child is much graver when the mother is diseased than when the father alone is syphilitic. Fifty-two syphilitic men occasioned 154 pregnancies, of which one-half lived. In 20 cases of maternal syphilis there were 74 pregnancies of which only a fifth came to term.

Veeder⁵² reports 331 pregnancies in 100 syphilitic families; 131, or 40 per cent., died before term; 51, or 15 per cent., died after birth, making a total mortality of 55 per cent.; 116, or 35 per cent., are living but syphilitic; and 33, or 10 per cent., are living and free of syphilis. So that we may say that in this series only 10 per cent. escaped infection. As this is a recent series the patients presumably received about the average amount of treatment, and the cases were studied in accordance with modern methods, including the use of the Wassermann reaction, we may conclude that this series typifies the results of syphilitic infection upon the children at the present day.

Enough has been said to indicate the terrible results of syphilis upon the unborn children and to indicate the necessity of considering the prevention of this great infant mortality. This can only be done by imposing the proper restrictions on syphilitics before marriage.

Colles and Profeta's So-called Laws.—In 1837 Colles stated that apparently normal women bearing syphilitic children do not contract syphilis when exposed to infection, and Profeta's law states that a child showing no taint but born of a woman suffering from syphilis will not become infected though suckled by its mother.

It has long been thought that this indicated that in bearing a syphilitic child the mother became immune to the disease. These so-called laws were inaccurate generalizations from

clinical experience alone, and the deduction that immunity to the disease was produced was entirely erroneous. The Wassermann reaction in these cases is almost invariably positive. Many studies of this peculiar phenomenon have been published since the introduction of the Wassermann reaction, but only one need be quoted here. Jeans⁵³ tested the blood of 85 mothers of syphilitic children. Of these 85 mothers, 74, or 87 per cent., denied all knowledge of infection, nor was there anything in the history that would indicate infection except a history of frequent abortions. Seventy-three of these 85 women gave a positive Wassermann test, and 5 of the others were tested after at least ten years had elapsed between the birth of the last syphilitic child and the time of the test. There has been a remarkable unanimity in the results obtained in all such studies, so that we are forced to conclude that such women do not develop any immunity to the disease, and that they do not become infected when exposed for the very simple reason that they are already infected and suffer from syphilis though usually without clinical manifestations other than a positive Wassermann.

3. **Syphilis Sine Coitu (Extragenital Chancres).**—Extragenital chancres are not necessarily acquired innocently but may be the result of improper practices. Chancres of the mouth, tonsil and rectum are not infrequent following such perversions. On the other hand, genital syphilis is not necessarily due to immorality, since it frequently results from marital relations, and has occasionally occurred following the rite of circumcision. But in this discussion, extragenital infection includes any infection in which the lesion is acquired accidentally and is not the result of sexual intercourse. The vast majority of the chancres so acquired are extragenital. It is particularly desirable to make this distinction from the public health stand-point, as the measures taken to prevent syphilis resulting from immorality and syphilis acquired accidentally are naturally quite different.

The knowledge that syphilis could be contracted extragenitally was common at the close of the 15th century. In 1504 transmission between nurse and suckling was

established. Surgical instruments, and especially cupping-glasses, were incriminated by Seitz in 1509 and Renner in 1554. In 1870–1871 infection through vaccination was described (Scheuer). Since that time the literature of extragenital chancres has become very rich. Bulkley,⁴⁵ in 1894, wrote a monograph on *Syphilis in the Innocent*, and from his rich personal experience and a search of the literature up to 1892 collected 12,000 cases of extragenital chancres. The literature from 1892–1896 has been well covered by Münchheimer, who collected 1207 cases, and Fournier,⁵⁴ who added 1124 cases. Scheuer²⁸ has searched the literature from 1896–1909 and has collected 5679 cases of extragenital chancres during this period. The combined data obtained by all of these authors, comprising 20,000 cases of extragenital chancres, was analyzed by Scheuer to indicate the location of the chancre, the method of transmission, etc. From this very large number of cases the actual methods by which syphilis is transmitted extragenitally may be stated with great accuracy.

Frequency of Extragenital Infection.—It is impossible to give the exact proportion between extragenital and genital chancres, based on the literature, because the number of cases acquired sexually is not known, and the majority of the extragenital chancres are never reported. Almost every physician has seen a few without reporting them. Incidentally, I may say that I have seen 5: 1 in the inner canthus of the eye in an assistant to a laryngologist, who undoubtedly received the infection from rubbing his eye with a finger soiled by handling instruments that had just been used on a syphilitic case; 1 was on the abdomen, and the method of transmission was never discovered with certainty but probably originated as the result of scratching with an infected finger; and 3 were on the lips. I have known of, but not personally seen, a considerable number of such cases that have never been reported; and finally it frequently occurs that a patient with syphilis claims that the infection was acquired innocently by a chancre on the lip. Many of these patients are lying “to save their face,” and it is impossible to say what percentage of them are telling the truth.

The statistics of clinics where a very large number of cases of primary syphilis are seen form the best basis for estimating the proportion between innocent extragenital and genital chancres resulting from intercourse. Such statistics have been compiled by Bulkley⁴⁵ (page 25) from a number of European clinics. In a total of 7123 cases so analyzed, 6770 were genital and perigenital, and only 353, or approximately 5 per cent. of the entire number, were extragenital. But Bulkley thinks that extragenital chancres are really much more frequent than would be indicated by these figures because they are taken from venereal clinics, where most of the patients go for diseases acquired in sexual intercourse. The cases of extragenital infection occurring in special clinics, such as for the eye, throat, etc., would not enter into such statistics; and Bulkley thinks extragenital infections may form 10 per cent. of the whole. We may therefore conclude that innocent extragenital infections constitute from 5 to 10 per cent. of the total infections with syphilis.

All authorities and statistics agree that extragenital chancres are more frequent in women than in men. Hahn (quoted by Scheuer) and Bulkley give figures that indicate that women are so infected twice as often as men. Possible explanations of this fact are that more men are genitally infected than women because of the more frequent immoral relations of the former. And, consequently, more women than men are susceptible to an extragenital infection; and that women, as mothers, nurses, wet-nurses and midwives are more exposed to infection than men.

It is apparent from these statistics, and from the fact that 20,000 cases of extragenital infection have been recorded in the recent literature already quoted, that such accidental infection is by no means uncommon and that its incidence is quite sufficient to justify a careful study of the methods whereby the disease has been transmitted in these cases in order that proper hygienic precautions may be taken to avoid such infection. But the fact cannot be glossed over that the vast majority of all syphilitic infections are acquired from sexual intercourse.



Methods of Transmission.—The methods by which syphilis has been accidentally transmitted are so multifarious that it is impossible to discuss them systematically without using some kind of a classification. The following general classification is given by Bulkley:

- | | | |
|-----------------------|---|---|
| A. Syphilis pandemica | { | 1. Epidemica.
2. Endemica. |
| B. Syphilis sporadica | { | 1. Economica.
2. Brephotrophica.
3. Technica. |

Bulkley further subdivides each heading into a most elaborate classification that includes practically all possible methods whereby the disease may be transmitted *sine coitu*. Those especially interested in extragenital chancres should consult this classification (pages 17 to 20). For the present purpose, however, this classification is unsuitable. Some of the methods detailed are so rare as to be negligible to the sanitarian, who rather wants to know particularly the most frequent methods of transmission, and it may be pointed out that so far as epidemic and endemic syphilis insontium is concerned these epidemics are largely maintained by innocent marital intercourse; and that in so far as these epidemics are due to extragenital infection the methods of transmission differ in no respect from those obtaining in sporadic syphilis.

The location of a chancre provides an excellent clue as to the method of transmission in a given case. The location of all the extragenital chancres recorded in the literature has been given as a matter of course, and by analyzing these cases we are able to reach a definite conclusion as to which methods of transmission are most important. This is essential information for the sanitarian, for if the common and usual methods of transmission of extragenital syphilis can be avoided no great effort need be expended on the prevention of infection by methods of transmission that are rare or only occasional. Scheuer²⁸ has analyzed 14,590 cases of extragenital chancres in regard to their location as follows:

Lips	3880
Vaccination	2144
Breast	1569
Tonsils	1104
Fingers and hands	897
Mouth	824
Circumcision	753
Eyelids	632
Nostrils and throat	423
Perigenital	278
Tongue	273
Chin	252
Cheeks	228
Cupping	181
Arms	176
Nose, external	172
Trunk	168
Lower extremities	167
Tattooing	109
Gums	97
Forearm	79
Forehead and temples	69
Neck	63
Ears and head	52
Total	14,590

These figures furnished by Scheuer may be further analyzed to demonstrate the most frequent methods of transmission. The 278 perigenital chancres, including 176 anal chancres, are undoubtedly almost all contracted during sexual intercourse, and need not be considered in the present discussion. This leaves 14,212 extragenital chancres to be analyzed. These fall naturally into the following groups in the order of their importance:

TABLE I.

GROUP 1.—BUCCAL INFECTIONS.

Location.	Number.	Per cent.
Lips	3880	27.44
Tonsils	1104	7.80
Mouth	824	5.82
Tongue	273	1.93
Gums	97	0.68
Total	6178	43.70

GROUP 2.—MINOR OPERATIONS BY IGNORANT PERSONS.

Operation.	Number.	Per cent.
Vaccination	2144	15.16
Circumcision	753	5.32
Cupping	181	1.28
Tattooing	109	0.77
Total	3187	22.54

GROUP 3.—NURSING SYPHILITIC CHILDREN, BREAST-DRAWING, ETC.

	Number.	Per cent.
Breast and nipples	1568	11.09

GROUP 4.—PHYSICIANS, MIDWIVES, NURSES, ETC.

	Number.	Per cent.
Finger and hands	897	6.34

GROUP 5.—MISCELLANEOUS.

	Number.	Per cent.
Eyelids	632	
Nostrils and throat	423	
Chin	252	
Cheeks	228	
Nose	172	
Trunk	168	
Lower extremities	167	
Forearm	79	
Forehead and temple	69	
Neck	63	
Ears and head	52	
Total	2305	16.30

The essential facts brought out by this classification are that of all extragenital chancres, 43.7 per cent. are buccal; 66.24 per cent. belong to the first two groups, and 83.67 per cent. belong to the first four groups. Each of these four groups corresponds in the main with certain definite methods of transmission. It should therefore be possible to prevent the vast majority of extragenital infections by the adoption of comparatively simple sanitary measures.

GROUP 1.—*Buccal Infections*.—A certain percentage of buccal infections are acquired as the result of sexual perversions. The vast majority of such chancres are acquired

from kissing, and in accordance with this is the fact that 27.44 per cent. of the total number of extragenital chancres are located on the lips. The remaining cases are caused by introducing in the mouth some object that has been used recently by a syphilitic.

GROUP 2.—*Minor Operations Performed by Ignorant Persons.*—It will be seen that under this heading by far the greater number of infections have been transmitted by vaccination. The importance of vaccinal syphilis *in the past* is indicated by the following table from Scheuer, in which Münchheimer combines the figures given by Berliner and Bulkley up to the end of 1896:

Country.	Number of extragenital infections, total.	Number through vaccination.	Per cent.
United States	1339	887	66.2
Great Britain, Ireland and Colonies	590	204	34.6
Italy	1003	209	20.8
Austria-Hungary	902	121	13.4
France, Belgium and Colonies	2778	370	13.3
Germany, Switzerland, and Holland	1082	59	5.4

The vast majority of these cases occurred in the days when arm-to-arm vaccination was practised. Since the introduction of bovine lymph, vaccinal syphilis has become relatively unimportant, as will be seen from the classification of the methods of transmission given later for the cases occurring after 1896. It is important to note, however, that vaccinal syphilis may still occur through carelessness when vaccinating *en masse* by using the same needle or knife on all persons.

The next method of transmission in this group in point of frequency is circumcision. Many extragenital infections (5.32 of the total) have been transmitted by the performance of this rite by ignorant persons who have sucked the wound. The operator may become infected in the mouth from a syphilitic child and may then spread the infection to many other children; or the operator may already be infected. Although this practice of sucking the wound is being gradually supplanted by a better surgical technic, it is still common in certain localities.

Cupping, which was formerly responsible for many infec-

tions, and for some epidemics of syphilis, is now no longer of importance because cupping is seldom practised, except in occasional cases in hospitals or under the care of physicians. Tattooing is responsible for a certain percentage of infections, and though relatively unimportant, should be mentioned because the practice of tattooing is still common, and many operators use their own saliva in mixing the pigment or put the needles in their mouths.

GROUP 3.—*Syphilis of the Breast and Nipples*.—This is an important heading since it comprises 11.09 per cent. of the total number of extragenital chancres. In the vast majority of such cases the infection has been transmitted to wet-nurses by suckling syphilitic infants. A healthy wet-nurse is almost certain to be infected by a syphilitic infant. Wet-nurses are not so common in this country as in Europe, where a large proportion of these cases of extragenital chancres occurred. A certain percentage of chancres of the breast have been caused by emptying the breast by the mouth instead of by a breast pump. Midwives and poor, ignorant women often perform this service in some localities; and a number of cases of syphilis transmitted in this way are on record.

GROUP 4.—*Infection on the Fingers and Hands*.—This group comprises 6.34 per cent. of the total extragenital chancres, and the victims are almost wholly physicians, nurses, midwives and other persons who attend the sick. In the last thirteen years of this series 168 cases of extragenital syphilis in physicians have been published, so that it may almost be called an occupational disease of physicians. In 20 cases the victim was an obstetrician or gynecologist. Examination of female genitalia is often practised without inspection under the bedclothes, and hangnails and slight abrasions of the skin of the fingers are most common, so that the opportunities for infection in this way are legion. Surgeons are also often affected, particularly while excising buboes. Dentists frequently are infected.

Scheuer has also tabulated the method of transmission in 1450 extragenital chancres occurring from January 1, 1896, to January, 1909, including all cases in which the method

of transmission was known. I have subdivided this table into groups as follows:

TABLE II.

GROUP 1.—BUCCAL CONTACT.

	Number.	Per cent.
Kissing	192	13.24
Instruments used in certain callings, such as glass-blowers, musicians, and chemists	37	
Smokers' articles	28	
Drinking glasses	26	
Eating utensils	22	
Toothpicks	5	
Artificial feeding of children	10	
Total	320	22.07

GROUP 2.—PATIENTS INFECTED BY PHYSICIANS.

	Number.	Per cent.
Vaccination	272	
Infected instruments	46	
Total	318	21.93

GROUP 3.—ACQUIRED THROUGH MEDICAL ATTENTION TO PATIENTS.

	Number.	Per cent.
Physicians	168	
Midwives	64	
Nurses	17	
Unlicensed physicians	8	
Volunteer nurses	6	
Total	263	18.13

GROUP 4.—ACQUIRED THROUGH CARE OF SYPHILITIC CHILDREN.

	Number.	Per cent.
Nursing	169	
General care and handling	91	
Total	260	17.93

GROUP 5.—TRANSMITTED TO OTHER MEMBERS OF FAMILY BY CLOSE FAMILY ASSOCIATION.

	Number.	Per cent.
Personal contact	36	
Common use of toilet articles, medicines, etc.	32	
Handling of clothing, wash, etc.	17	
Sleeping with a syphilitic	11	
Play, games, etc.	5	
Total	101	6.96

GROUP 6.—MINOR OPERATIONS PERFORMED BY NON-MEDICAL MEN.

	Number.	Per cent.
Barbers and shaving utensils	44	
Tattooing	18	
Circumcision	7	
	—	
Total	69	4.75

GROUP 7.—MISCELLANEOUS.

	Number.	Per cent.
Contact with finger	45	
Biting	41	
Insect bites (?)	1	
	—	
Total	87	6.00

GROUP 8.—UNNATURAL SEXUAL PRACTICES.

	Number.	Per cent.
Total	32	2.20

Consideration of this table and comparison with Table I shows that immediate or mediate buccal contact with syphilitics is the most frequent method of extragenital transmission. The percentage (22.07) is considerably lower than that given for buccal infection in Table I (43.7). But in Table II the classification is by method of transmission without regard to location of the chancre, and in many of the cases included under unnatural sexual practices, family association and care of syphilitic children the situation of the chancre was buccal. The great danger of kissing is again emphasized by the fact that 192 infections, or 13.24 per cent. of the total, were definitely known to be transmitted in this way, while for the reasons mentioned above this is certain to be an underestimate.

Group 2 of Table II affords the greatest and most painful surprise. It appears from this that no less than 21.92 per cent. of the total number of infections considered were transmitted to the patients by physicians, mostly by vaccination. Vaccination at the present day in this country is not responsible for so many infections whatever may be the case in certain parts of Europe. However, the number of

patients infected by physicians, according to Scheuer, points a moral as to the necessity for scrupulous care in the disinfection of instruments.

Group 3 indicates clearly the great danger to which physicians and attendants are constantly exposed, and needs no further comment. Neither does the great danger of handling syphilitic children require further discussion, the figures show that 17.93 per cent. of the total infections were transmitted in this manner.

Those interested in the exact methods of transmission in individual cases will find them described in great detail by Bulkley and Scheuer. For the present purpose, which is to provide a basis for the consideration of sanitary measures, the classifications presented afford more information than a detailed consideration of individual cases.

Syphilis Fravorum.—We have already seen that the great majority of the cases of marital syphilis, hereditary syphilis and even extragenital infections are derived from men already infected from some other source. By determining this source of infection the inquiry is pushed to its logical conclusion.

Such statistics are difficult to obtain in this country where records as to the source of the infection are seldom kept, but figures are available from both Paris and Berlin. Fournier⁵⁵ found that of 867 men infected with syphilis and observed in hospital practice the source of infection was as follows:

	Number of cases.	Per cent.
Open prostitution	625	72.0
Clandestine prostitution	46	5.3
Mistresses, theater women, etc	52	6.0
Working girls	100	11.5
Servant girls	20	2.3
Married women	24	2.7

Fournier evidently made a distinction between clandestine prostitutes and working girls who were immoral, a distinction that is without much difference. His figures show that among the class of men seeking treatment in the hospitals of Paris, 72 per cent. of all syphilitic infections were derived from registered prostitutes, 25.1 per cent. were

derived from clandestine prostitutes and general immorality and only 2.7 per cent. of these infections were derived from adulterous relations.

Blaschko⁵⁵ presents a similar table which shows 80 per cent. of his polyclinic patients with syphilis were infected by regular prostitutes, 15 per cent. by clandestine and irregular prostitutes and only 5 per cent. through adulterous relations.

Further, according to Blaschko, Puche found that of 510 cases of syphilis in Paris, 374, or 73 per cent., were infected by inscribed prostitutes, and that Tschistjakow found that of 500 patients who knew the source of their infection, 85.6 per cent. were infected by prostitutes and only 14.4 per cent. by women who were not prostitutes.

Riggs⁵⁶ gives the following table indicating the source of infection among sailors who contracted venereal disease in Norfolk, Va., or vicinity:

	Number of disease.	Chancroid.		Gonorrhoea.		Syphilis.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.
Inmates . . .	184	34	17.9	139	75.5	12	6.5
Street-walkers .	138	24	17.3	102	73.9	12	9.4
Clandestines .	43	4	9.3	36	83.7	3	6.9

Snow⁵⁷ states that the records of a venereal clinic for men in New York investigated during the course of a year showed the street prostitute to have been the source of infection in 36.6 per cent., house prostitutes in 18.9 per cent., domestics in 10 per cent., friends in 10 per cent., working women in 7.7 per cent., wives in 1.5 per cent. and unknown, 14.7 per cent.

There is good reason for believing that among the better class of private patients the percentage of infections derived from prostitutes is not so high. Fournier analyzed 387 cases of gonorrhoea among his private patients and found that only 3.1 per cent. were infected by regular prostitutes, while 90 per cent. were infected by clandestines and 6.6 per cent. were infected by married women. We may assume perhaps, that the figures for syphilis would not be very different among

this same class of men, and that therefore among the better classes the great majority of infections are derived from clandestines rather than from regular prostitutes. But since these better classes form a comparatively small part of the population, and since syphilis is not so prevalent among this type of men as among the poorer classes, the conviction is forced upon us that the great bulk of syphilitic infections among men are derived from regular prostitutes. The proportion of infections derived from adulterous relations is so small as to be negligible, so that we may conclude that more than 90 per cent. of sexually acquired syphilitic infections in men are derived from prostitutes either open or clandestine.

This simply means that any sanitary measures taken for the prevention of syphilis which do not include some method for treating the problem of prostitution are doomed in advance to failure, since they will ignore the main source and root of the disease.

REFERENCES.

1. Ricord: De la syphilis et de la contagion des accidents secondaire, Paris, 1853.
2. Nouveau traité des Maladies vénériennes, d'après les documents puisés dans la clinique de M. Ricord, by Dr. Melchoir Robert, Paris. J. B. Baillière et fils, 1861, pp. vi and 503 *et seq.*
3. Buba: Die Contagiositätsdauer der Syphilis, Inaug. Dissertation, Leipzig, 1905.
4. Finger: Wann dürfen Syphilitische heirathen, Heilkunde, 1897, i, 351.
5. Barthelemy: Note sur la prolongation excessive de la periode secondaire, et par consequent de la contagiosité de la syphilis, dans ses forms bénignes, Bull. de la Soc. Française de Derm. et de Syph., 1896, vii, 263.
6. Feulard: Durée de la period contagieuse de la syphilis, Ann. de Derm. et de Syph., 1896, 3d series, vii, 1025-1048.
7. Newmann: Dauer der Contagiosität der Syphilisprodukte; Contagiosität der tertiären Syphilis, Wien. med. Presse, 1899, xl, i.
8. Tarassewitch: Contagiosite Syphilitique Tardive, Thèse de Paris, 1897.
9. Kromayer: Syphilitische Uebertragung nach 20 jähriger Ehe und 30 jähriger Infection, Dermat. Ztschr., 1897, iv, 708.
10. Tschistjakow: Die Condylomatöse Periode der Syphilis, Inaug. Dissertation, Thèse St. Petersburg, 1894.
11. Landouzy: Sur le contagion syphilitique au dela de la periode secondaire, Comptes rendus du I Congrès de dermat. et syph., Paris, 1889, p. 713.
12. Fournier: Echéances du Tertiarisme, Comptes rendus du I Congrès de dermat. et syph., Paris, 1889, p. 717.

13. Lassar: Ueber die Dauer der Contagiosität der Syphilis, *Dermatologische Ztschr.*, 1896, iii, 533.

14. Doutrelepont and Grouven: Ueber den Nachweis von Spirochete pallida in tertiar-syphilitischen Produkten, *Deutsch. med. Wchnschr.*, 1906, xxxii, 908.

15. Tomaszewski: Ueber den Nachweis der Spirocheta pallida bei tertiärer Syphilis, *München. med. Wchnschr.*, 1906, liii, 1301.

16. Finger und Landsteiner: Untersuchungen über Syphilis an Affen, II Mittheilung, *Archiv f. Dermat. u. Syph.*, 1906, lxxxi, 147.

17. Neisser: Pathologie und Therapie der Syphilis, Berlin, 1911, Arb. a. d. k. Gsndtsamte., 1911, xxxvii.

18. Hoffman: Die Etiologie der Syphilis, Berlin, 1906, p. 43.

19. Uhlenhuth und Mulzer: Weitere Mittheilungen ueber die Infectiosität des Blutes und anderer Körperflüssigkeiten syphilitischer Menschen f. das Kaninchen, *Berl. klin. Wchnschr.*, 1913, I, 769. Also, Ueber die Infectiosität von Milch syphilitischen Frauen, *Deutsch. med. Wchnschr.*, 1913, xxxix, 879.

20. Voss: Ist die Syphilis durch Milch übertragbar? *St. Petersburger Med. Wchnschr.*, 1876, i, No. 23, 1.

21. Dreyer und Toepfel: Spirochete pallida in Urin bei syphilitischer Nephritis, *Dermat. Centralbl.*, 1906, ix, No. 6, 172.

22. Pasini: Infectiosität der physiologischen Secrete bei hereditärer Syphilis, *Archiv f. Dermat. u. Syph.*, 1908, xcii, 236.

23. Hoffman: Die Aetiologie der Syphilis, *Dermat. Ztschr.*, 1909, xvi, 687.

24. Nichols, H. J.: Observations on the Pathology of Syphilis, *Jour. Am. Med. Assn.*, 1914, lxiii, 466.

25. Warthin: Persistence of Active Lesions and Spirochetes in the Tissues of Clinically Inactive or "Cured" Syphilis, *Am. Jour. Med. Sc.*, 1916, clii, 508.

26. Hartmanni: Beiträge zur Lebensdauer der Spirocheta Pallida, *Dermat. Ztschr.*, 1909, xvi, 633.

27. Gastou et Comandon: Preuve donné par l'ultra microscope de la contagion possible de la Syphilis par les verres à boire, *Bull. de la Soc. Franç. de Dermat. et Syph.*, 1908, xix, 292.

28. Scheuer: Die Syphilis der Unschuldigen, Berlin, 1910, Urban und Schwarzenberg.

29. Landsteiner und Mucha: Zur Technik der Spirochaetenuntersuchung, *Wien. klin. Wchnschr.*, 1906, xix, 1349.

30. Eitner: Ueber Beobachtungen an der lebenden Spirochaete pallida, *München. med. Wchnschr.*, 1907, liv, 770.

31. Bronfenbrenner and Noguchi: On the Resistance of the Various Spirochetes in Cultures to the Action of Various Chemical and Physical Agents, *Jour. Pharmacol. and Exper. Therap.*, 1913, iv, 333.

32. Zinsser and Hopkins: The Viability of the Spirocheta Pallida in Diffuse Light at Room Temperature, *Jour. Am. Med. Assn.*, 1914, lxii, 1802.

33. Shamberg: An Epidemic of Chancres of the Lip from Kissing, *Jour. Am. Med. Assn.*, 1911, lvii, 783.

34. Almkvist: Ueber Syphilis mit verstecktem Primäraffekt, *Dermat. Wchnschr.*, 1913, lvi, 190.

35. Lane: Syphilis d'emblée, *Lancet*, June 15, 1912, i, 1605.

36. Mueller: Kryptogene Syphilis (Syphilis d'emblée), *Dermat. Ztsch.*, 1898, v, 213.

37. Hutchinson: Syphilis, Cassell & Co., 1909, p. 34.

38. Jullien: Kurze Bemerkung über zwei Fälle von Syphilis d'emblée, Monatsch. f. prakt. Dermat., 1902, xxxiv, 531. Also described at length by Lane.³⁵
39. Waelsch: Ueber Syphilis d'emblée und die Berufssyphilis der Aerzte, München. med. Wchnschr., 1909, lvi, 850.
40. Bettman: Zur Frage der Syphilis d'emblée, Arch. f. Dermat., 1910, c, 145.
41. Fordyce: Modern Diagnostic Methods in Syphilis, New York Med. Jour., 1914, c, 597.
42. Hazen: A Series of Twenty-five Extragenital Chancres, Interstate Med. Jour., 1916, xxiii, 661.
43. Nonne: Der Heutige Standpunkt der Lues Paralyse-Frage, Archiv f. Dermat. u. Syph., 1914, cxiv, 239.
44. Fournier: La syphilis des honnêtes femmes, Bull. de l'Acad. de méd., 1906, lvi, 190.
45. Bulkley: Syphilis in the Innocent, Bailey and Fairchild, New York, 1894, p. 197.
46. Fournier: Syphilis et Marriage, G. Masson, Paris, 1880.
47. Diday: Le Peril Vénérien dans les Familles, Paris, 1881, Asselin et Cie.
48. Sullivan: Study of the Children of Female Drunkards in the Liverpool Prisons, Med. Temp. Rev., 1900, iii, 72.
49. Haberman: Hereditary Syphilis, Jour. Am. Med. Assn., 1915, lxiv, 1141.
50. Fournier: Quoted by Finger, Ref. 4, Heilkunde, 1897, i, 348.
51. Raven: Serologische und Klinische Untersuchungen bei Syphilitiker Familien, Deutsch. Ztschr. f. Nervenhe., 1914, li, 342.
52. Veeder: Hereditary Syphilis, Am. Jour. Med. Sc., 1916, clii, 522.
53. Jeans: Familial Syphilis, Am. Jour. Dis. Child., 1916, xi, 11.
54. Fournier: Les Chancres Extragénitiaux, Paris, 1897.
55. Blaschko: Syphilis und Prostitution, S. Karger, Berlin, 1893, pp. 84-86.
56. Riggs: The Prevention of Venereal Diseases at the Naval Training Station, Norfolk, Va., U. S. Naval Bulletin, 1917, xi, 1.
57. Snow, William F.: Occupations and the Venereal Diseases, Jour. Am. Med. Assn., 1915, lxv, 2054.

CHAPTER III.

PERSONAL PROPHYLAXIS.

HAVING discussed the wide prevalence of syphilis, and the sources and methods of infection, we are led naturally to consider what methods may be employed to reduce the incidence of the disease. These methods may be logically divided into those that may be taken by the individual, and those that may be taken by the community. We propose here to discuss those methods that may be taken by the individual.

I. METHODS THAT MAY BE TAKEN BY THE INDIVIDUAL TO PREVENT GENITAL INFECTION.

That prophylactic measures taken by the individual constitute one of the most important methods for the reduction of syphilis can hardly be doubted, provided these methods are efficacious. Marschalko¹ as a result of the discussion that took place at the Brussels Conference in 1901 concludes "That the present system of regulation of prostitution can produce little result in the reduction of syphilis and no results whatever in the reduction of gonorrhoea and that it is therefore time to place the prophylaxis of venereal diseases upon a sound basis, educating the public to place the chief dependence upon personal prophylaxis."

But these methods of personal prophylaxis constitute one of the subjects concerning which there is endless debate, and there has been no consensus of opinion either as to the efficacy of these methods or as to their morality. The writer will endeavor to present the facts available that bear on this question, with the conclusions that he deduces from these facts, in the hope that those who differ from his conclusions will at least find the presentation of the facts of interest and value.

The methods that have been used to avoid syphilitic infec-

tion may be classified as surgical, mechanical, and chemical; historically they have been evolved in this order.

The Surgical Method.—*Circumcision.*—This operation is so old that it would be unprofitable to discuss its origin. It has become a religious ceremony among certain races, among whom it has been practised continuously from periods of remote antiquity to the present time. We do not know whether the operation was devised as a protection against venereal diseases or for some other reason, but at the present time it is often recommended as a prophylactic against such diseases.

A priori reasoning would lead us to expect that circumcision should diminish susceptibility to syphilitic infection, and that therefore if it were generally practised, the present incidence of syphilis would be diminished. For even if it be granted that the prepuce is not more liable to infection than the remainder of the penis, yet the prepuce would be the portion of the penis to receive the infection in a percentage of cases, depending upon the extent of the skin and mucous membrane on the prepuce as compared with the extent of skin and mucous membrane on the remainder of the penis exposed to infection. The removal of the prepuce would therefore diminish the area exposed to infection to just that extent.

But it is quite possible that the prepuce is more liable to infection than is the remainder of the penis, both because of its delicate mucous membrane, and because the folds into which it is thrown serve to retain the infectious secretions. Jonathan Hutchinson² states that "the most frequent position for chancres is the reverted prepuce just behind the corona." Freeland³ has compiled the following figures to show the relative frequency with which the primary lesion appears on the prepuce, as compared with primary lesions appearing elsewhere on the male genitalia:

	Number of initial lesions.	Number on prepuce and furrow.	Percentage on prepuce and furrow.
Fournier	423	314	74.2
Clerc	325	234	71.6
Berkeley Hill	150	111	74.0
	—	—	—
Total	898	659	73.3

From these figures Moyer⁴ concludes that were circumcision generally practised the incidence of syphilis might be reduced from 50 to 70 per cent.

Moreover, in addition to this liability to infection of the prepuce itself, this covering renders the glans penis more susceptible to infection. The mucous membrane of the glans is always kept soft and delicate and thus rendered more liable both to abrasions or to actual penetration of the treponema through intact mucous membrane. Often the mucous membrane of the glans is sodden with retained secretions, and should these secretions decompose or become irritating the mucous membrane becomes excoriated. It is generally supposed that a solution of continuity is necessary for the penetration of the *Treponema pallidum*. Such solutions of continuity are therefore already provided by the maceration caused by the retained secretions of a redundant prepuce, and are still more likely to occur during coitus from friction and hair cuts.

While the writer does not believe that such solutions of continuity are essential for the penetration of the *Treponema pallidum*, they certainly favor infection. Circumcision therefore removes a useless appendage which experience has shown to be peculiarly liable to syphilitic infection, and the hardening of the mucous membrane of the glans that follows circumcision most certainly renders syphilitic infection much more difficult both by reducing the liability to abrasions either before or during coitus and by affording a greater resistance to the penetration of the treponema. On theoretical grounds alone there seems to be sufficient reason to recommend circumcision as a proper precaution to be taken especially where the foreskin is unduly long or tight. It can be recommended generally for the undoubted reason that it favors cleanliness, with the expectation that it will result in a considerable degree of protection against syphilis and possibly other venereal infections if the individual fails to follow the recognized standards of morality in regard to continence prior to marriage.

Actual statistics as to the prevalence of venereal disease among the circumcised as compared to the uncircumcised

are very difficult to obtain. We know so little concerning the real incidence of syphilis in any race or locality, and even when Jew and gentile live together in the same community, and if it were possible to learn the incidence of syphilis in the two races, it would still prove little because we would have no information in regard to the relative amount of exposure to infection in the two races.

Jonathan Hutchinson (quoted by Freeland), however, gives the following figures concerning 330 cases of venereal disease among hospital patients, about one-third of whom were Jews:

	Total venereal cases.	Gonorrhoea.		Syphilis.	
		No.	Per cent.	No.	Per cent.
Not Jews	272	107	39.3	165	60.6
Jews	58	47	81.0	11	18.9

This table indicates not only that the incidence of syphilis is far less frequent among the Jews, but that the incidence of gonorrhoea is far more frequent, thus apparently indicating that the comparative immunity to syphilis of the Jews was not due to any excess of morality, but rather, in the absence of any other reason, to circumcision. Hutchinson⁵ elsewhere states categorically that chancres are less frequent among Jews. Freeland³ presents no figures, but states that "During the three years in which I served as surgeon to the Peninsular and Oriental Steam Navigation Company I never remember to have seen a primary syphilitic chancre among the Lascar crew, who, being Mohammedans, are circumcised to a man, while among the Sedi boys, who, for the most part, grow long foreskins, primary sores were not uncommon nor were the European crew exempt. Other venereal diseases were prevalent among the Lascars, so that their immunity could not be ascribed to any greater morality on their part."

Breitenstein⁶ quotes the figures compiled yearly by the Dutch-Indian Army, which includes Europeans and Malays living under what are claimed to be similar circumstances. According to these figures the Malays, who are circumcised, have from two to five times less syphilis than the uncircumcised Europeans. Thus in 1895 the rate was 0.8 per cent., for the natives and 4.1 per cent. for the Europeans. It is

stated that the opportunity to acquire syphilis is the same for both races, since the women who act as prostitutes and are the source of syphilis are frequented by both races. Every soldier may have a housekeeper and live with her in barracks, and both races may marry. Real marriage is more frequent among native soldiers than Europeans, but this is not thought to be the reason for the natives' comparative freedom from syphilis, because most of these native women are really common.

These statistics, however, fail to take into account the probability that European soldiers will consult a physician more freely than will natives, and therefore the real amount of syphilis is more apt to be known among Europeans than among natives.

All such statistics are subject to so many fallacies that no good purpose would be served by quoting them at greater length. The subject of circumcision may be summarized briefly as follows: On theoretical grounds there seems to be sufficient reason to recommend circumcision as a preventive of syphilitic infection, and the available statistics indicate that when circumcision is generally practised this procedure does actually effect a reduction in the incidence of syphilis. The extent of this reduction cannot be ascertained with certainty.

Mechanical Methods.—According to LePileur,⁷ Fallopius devoted a chapter of his works published about 1555 to preventives of the "French disease." He recommended careful washing before and after each act of intercourse, and also the use of a mechanical device to place over the head of the penis. This latter was probably useless, although Fallopius is quoted as saying, "Ego feci experimentum in centum et mille hominibus et Deum testor immortalem nullum eorum infectum." This is apparently the first record of an attempt at a mechanical device for protection.

The condom was invented early in the 18th or late in the 17th century in England. It was described by Turner in 1717, who attributed its invention to a Dr. Condon, from whom the device was named. LePileur, who has made a study of this literature, questions the existence of Dr. Condon,

and thinks it more probable that the name is derived from the Latin verb *condere*, meaning to hide or to protect. The first condoms were made from the cecum of lambs, which were dried and rendered pliable by rubbing between the hands with oil of almonds. Later rubber was used, and as the art of manufacturing rubber was yet undeveloped, the first rubber condoms were very unsatisfactory and broke or tore during use. During this period the condom was condemned as unreliable by many physicians. In recent years this objection has been practically removed by the use of a better grade of rubber, so that there is little danger that the condom will break during use if it is not too old and has been tested previously.

Most authorities agree that the use of a condom is an almost certain protection against syphilitic infection, being even more reliable than prophylactic ointments. Thus Butte⁸ in reporting 2 cases of syphilitic infection following the use of calomel ointment, said that "if they had used a vulgar condom of good quality the result would have been different." The objections to the use of such a mechanical device are practical and moral. It is expensive, can be purchased only with some difficulty, and is seldom available when needed. It is open to objection on the part of the moralist, on the ground that it is improper to sell or distribute an article which will encourage immorality by making it safe. This point is discussed later. In regard to the protection afforded we may conclude that the condom if properly tested and made of good rubber will afford practically complete protection to anyone who can obtain and will use it, and it may therefore be recommended to those individuals who persist in immorality in spite of advice to the contrary.

Chemical Methods of Prevention.—It is often assumed that mercurial ointments for the prevention of syphilis came into general use only after Metchnikoff's observations on the prevention of syphilis in apes by the use of calomel ointment. This is not the case, for such ointments were in very general use long before the time of Metchnikoff. According to LePileur,⁷ Agato in 1564 used fumigations of cinnabar as a prophylactic, and Pierre Desault, of Bordeaux (1733), de-

scribed the use of mercurial ointment as a prophylactic after coitus. Desault reasoned that as mercury cured syphilis and killed the "small worms" that had penetrated the body it ought to have the same action upon these organisms which were in contact with some part of the body but had not yet entered.

Warren, an English physician, in 1771 advised every man of pleasure to carry with him a box of mercurial ointment, a bottle of weak solution of caustic potash and a syringe. One of the things that threw discredit upon unguents with or without the use of mercury was the vogue obtained by liquid prophylactics about this time. Thus about 1770 Guilbert de Preval, a regent of the faculty of the University of Paris, sold a so-called "Eau Antivenerienne," which was a fraud. He claimed that it contained no mercury. It was proved to contain mercuric chloride, but in amount too small to prevent the disease. For thus selling a secret remedy and the deception as to its composition, Preval's name was erased from the list of members of the faculté de Paris. Many other solutions were used, including Labarraque's solution, perchloride of iron and various mercurial preparations and simple unguents.

A few citations from various writers will indicate the status of prophylaxis against syphilis just prior to Metchnikoff's work. Behrmann,⁹ in 1899, states that nothing is known concerning the cause of syphilis, but that as we can prevent smallpox without knowing the cause so we should attempt to prevent syphilis. Since it is known that mercury destroys the syphilitic virus after it enters the blood, and since we apply calomel and mercurial plasters to the chancre, he suggests the inunction of mercury after coitus to prevent infection, and gives direction for its use.

Cohn,¹⁰ in the same year, recommends a form of prophylaxis often advised by him in practice, viz., heavily smearing the penis with a mercurial salve ante coitum and washing with a mercurial soap (sapo ciner., Unna) immediately after coitus.

Richter,¹¹ in an article written in 1901, refers to Behrmann's method, namely, the use of gray ointment (66 per cent. fat

and 33 per cent. mercury) as a protection against both syphilis and gonorrhoea. He quotes one observation concerning a young man who served as an experiment for four weeks, during which time he had about forty cohabitations with eighteen open or clandestine prostitutes, using the above prophylactic. Two of the prostitutes were known to be in the acute stage of gonorrhoea and one in the acute stage of syphilis, yet he escaped all infection.

Loeb,¹² in 1901, refers to 47 cases that had used gray ointment following exposure. Syphilitic infection followed twice in spite of all inunctions. Loeb believed the method recommended by Dr. Max Joseph¹³ namely, to first anoint the member with fat and subsequently to disinfect with sublimate solution, is best. With this method in more than 100 cases he had seen only 1 case in which syphilitic infection occurred in spite of these precautions, and states that this proves nothing except that no method will succeed invariably.

Guiard,¹⁴ writing in 1901 and referring to the great activity of mercury as a cure for syphilis says: "It is certain that the quantity which circulates in the body and suffices for a cure is infinitesimal. In prescribing 0.3 gm. per day, an average dose for a man, and admitting it is completely absorbed, there is hardly for 6 liters of blood a proportion of 1 to 200,000. If the microbe of syphilis cannot withstand this it is irrational to suppose that it can withstand an application of 1 to 4000 or 1 to 5000 when it has not yet penetrated and when the drug is therefore applied direct." Such quotations might be considerably extended, but the above indicate pretty clearly the status of syphilitic prophylaxis prior to Metchnikoff's experiments. It will be remembered that at this time the cause of syphilis remained unknown, since it was not until 1905 that Schaudinn and Hoffmann¹⁵ discovered the *Treponema pallidum*.

In 1903 Metchnikoff and Roux¹⁶ published their experiment in which they demonstrated that syphilis could be transmitted to chimpanzees. This afforded an opportunity for direct experimental work on the efficacy of prophylactics against syphilis, of which they at once took advantage. These

experimental results were published in 1905,¹⁷ and among them were the following: A chimpanzee was inoculated on both eyebrows with a virus obtained from the indurated chancres of two persons. Three-quarters of an hour after the parts were rubbed for ten minutes with mercurial ointment (Hg. 100 gm., benzoated lard 100 gm.). This treatment resulted in local inflammation. Syphilis failed to develop, although a control chimpanzee inoculated in the same way with the same virus developed chancres on both eyebrows after an incubation period of twenty-eight days. In order to prove that the first chimpanzee was not infected, and also that it could develop syphilis, a second inoculation with human virus was made on both eyebrows and on the penis forty-nine days after the first inoculation. Thirty days after this second inoculation (seventy-nine days after the first) a typical chancre appeared on the left eyebrow followed by hypertrophy of the glands, and two chancres appeared on the penis nine days after the one on the eyebrow, with inguinal adenitis. About a month later a mucous patch appeared on the upper lip.

Since the above mercurial ointment was found to be rather irritating, Metchnikoff and Roux substituted calomel in later experiments. This ointment was composed of 10 parts of calomel and 20 parts of lanolin. A monkey was inoculated in the same way with human virus. An hour after the inoculation the two eyebrows were rubbed with the calomel ointment. The animal remained free from syphilis for more than two months, although an untreated control monkey developed a typical chancre after forty days. Two months after the first inoculation the first monkey was again inoculated and twenty-four days later presented typical chancres at the sites of inoculation; thus proving that it was susceptible to syphilis. In another experiment three monkeys were inoculated. One served as the control and the two others received local treatment with calomel ointment one hour after the inoculation. The control monkey developed typical chancres on both eyebrows after twenty-eight days, while the monkeys treated with calomel ointment remained well for sixty-eight days. Finally, in order to determine how

long the syphilitic virus remained localized, they inoculated the ear of a monkey. Twenty-four hours later the part inoculated was removed. This monkey remained well for sixty days after this inoculation of the ear, when it was inoculated a second time on both eyebrows. These later inoculations resulted in typical chancres. The authors concluded that the virus remains localized for at least twenty-four hours.

In a later communication published in 1906, Metchnikoff and Roux¹⁸ state that having tried twelve experiments on monkeys with uniformly satisfactory results they next performed the experiment on a man. A student of medicine offered himself, and they assured themselves that he had never had syphilis, either acquired or hereditary. On February 1, in the presence of Doctors Queyrat, Sabauraud, and Salmon, they made three scarifications on the left side of the balanopreputial fold with a Vidal scarificator charged with syphilitic virus. This virus had just been taken from an indurated chancre of the penis from a patient in the service of M. Humbert. This chancre was of two months' duration and was accompanied by inguinal adenopathy. The right side of the balanopreputial fold was also inoculated in the same way with virus obtained from a chancre of nine or ten days' duration. The second source of virus was a patient in the service of M. Queyrat, and this patient also had inguinal adenopathy and had received no treatment. The same virus was inoculated in a chimpanzee, which, however, died of pneumonia after ten days, and also into both eyebrows of four macacus monkeys. An hour after the inoculation the parts inoculated on the man and on one monkey were rubbed for fifteen minutes with the 30 per cent. calomel ointment. Twenty hours after the inoculation the eyebrows of the second monkey were rubbed with the same ointment. The other two monkeys were left as controls. The man did not develop syphilis, though watched for more than three months. Seventeen days after the inoculation the two control monkeys that were not treated with the ointment both developed primary lesions, while the monkey treated after a twenty-hour interval developed a chancre after thirty-

nine days' incubation. It is interesting to note that the subject of this experiment was Maissonneuve,¹⁹ who published this experiment on himself as part of his thesis for the doctorate.

This experiment affords direct evidence that men as well as apes may be protected from syphilis by the application of calomel ointment. It is especially important to note that in all of these successful experiments the prophylactic calomel ointment was applied one hour after the inoculation, and that while there is evidence that the syphilitic virus may remain localized for twenty-four hours, or that it does not gain access to the systemic circulation, prophylaxis applied twenty hours after inoculation failed to protect.

These experiments of Metchnikoff and Roux attracted wide attention because of a very general interest in the subject, and in most quarters there was a disposition to accept them as authoritative and a definite solution of the problem of prophylaxis against syphilis. Calomel ointment was recommended as a prophylactic by many physicians, and was compounded and sold for the same purpose by many pharmacists.

But dissenting voices were soon raised in criticism, directed at supposed errors in the experimental work, calling attention to instances in which calomel ointment failed to protect in practice and condemning the method as immoral. One of the earliest of these critics, Levy-Bing,²⁰ pointed out that in regard to the experiment on Maissonneuve there was no scientific proof that he was free from acquired or hereditary syphilis, nor was it absolutely proved that he was not infected. He also reported one of the first cases in which the calomel ointment failed to protect, a case of Gaucher's, in which exposure occurred May 19, 1906, and calomel ointment was used immediately after; but a chancre developed on June 13, and on July 17 the patient developed a generalized macular eruption. Levy-Bing concluded that inunction with calomel ointment may not afford absolute security to those who use it even when it is applied during the first hours following exposure. Other similar cases in which the use of calomel ointment failed to protect were soon reported, but it is obvious that these occasional failures in practice do not invalidate

the experiments of Metchnikoff and Roux. The experimental prevention of syphilis in the laboratory, where all conditions are rigidly controlled, is one thing; the prevention in general practice, often among ignorant people and with conditions uncontrolled, is quite another thing. These two phases of the subject should be discussed separately.

The only really serious effort to refute the statements of Metchnikoff and Roux by experimental evidence was made by Neisser,²¹ who stated that "The categorical statements of Metchnikoff are contradicted not only by *a priori* reasoning, but also by my experiments which show that inunctions and washes do not regularly prevent infection." Neisser's experiments may be tabulated as follows:

Infection was prevented in the following experiments:

Acid carbol. pur.	1	experiment
Sublimate solution 2 to 1000	4	"
Sublimate solution 3 to 1000	4	"
Sol. silver nitrate, 5 per cent.	3	"
Calomel in normal saline	3	"
Calomel, 30 per cent. in vaseline	1	"
Calomel, 10 per cent. with soap	1	"
Washing with water, fifteen minutes	2	"

Experiments were negative. Infection followed.

Iodoform, one hour	2	experiments
Ungt. cinereum, one hour	1	"
Ungt. cinereum, ten minutes	2	"
Sublimate 1 to 1000, one hour	1	"
Calomel and salt solution, 10 per cent., one hour	1	"
Calomel, 10 per cent. water, salve, one hour	1	"

From this it will be seen that in Neisser's experiments calomel ointment, 30 per cent., protected in the only experiment in which it was used. Metchnikoff²² promptly replied to Neisser's objections and pointed out that Neisser had only used 10 per cent. calomel ointment while he had used from 25 per cent. to 33 per cent. In order to determine whether less than this amount would be effective, Metchnikoff inoculated five monkeys from a chancre. One hour after two monkeys were rubbed with 10 per cent. calomel ointment in lanolin and two others were rubbed

with 20 per cent. calomel ointment; the fifth monkey served as a control. One of the four treated monkeys died before the end of the experiment; but the three others developed undeniable chancres after the proper period of incubation. Metchnikoff stated that this experiment indicated that to be effective the ointment must contain at least 25 per cent. of calomel, and he recommended 33 per cent. He reiterated his belief that "Experiments on the preventive action of mercurial ointment on monkeys are sufficiently numerous and conclusive to form the basis of a prophylaxis against syphilis."

Vorberg²³ thought that Neisser's failures to protect with calomel ointment were to be explained on the ground that Neisser inoculated his virus too deeply. In describing his experiments, Neisser states that the animals were deeply scarified over both eyebrows and then inoculated with the virus. It is apparent that if inoculations are made in such a manner that the virus may sometimes gain access to the general circulation, that no prophylactic, however efficacious against treponemata on the surface, can be expected to afford protection against such a systemic infection. Metchnikoff in his experiments made inoculations deeper than those likely to occur in natural infections, and rightly claimed that experiments of this character should be made to conform as nearly as possible to natural conditions.

However, it must not be supposed from this discussion that Neisser was opposed to prophylaxis against syphilis. On the contrary he advocated it, and his opposition was only directed against the use of calomel ointment because he believed a solution of mercury chloride was much more effective. Neisser continued his experiments in collaboration with Siebert,²⁴ stating that, with the discovery of the transmissibility of syphilis to apes, experimental investigations on personal prophylaxis were placed on a sound basis. All experiments on vaccination or immunization have failed; and consequently all prophylaxis must center on the destruction of the virus at the port of entry.

Various disinfectants were first tested *in vitro*, the method of experiment being as follows: Syphilitic apes were killed

and the spleen, testicles and bone marrow ground up and emulsified. This mixture furnished a rich inoculation material which seldom failed to inoculate controls with syphilis. Certain amounts of this material were then mixed with the disinfectant to be tested, and after a varying length of time this mixture was injected into animals, using control animals with the untreated virus. Many experiments of this character were performed; but for our purpose it suffices to note that water and salt solution alone were shown to have no deleterious effect upon the virus, while the sublimate solution gave the best results, a solution of 1 to 10,000 killing all treponemata in fifteen minutes. Stronger solutions of mercuric chloride (1 to 5000) when mixed with blood or albuminous fluids were not so effective, owing to the combination of the mercury with the albumin. Thus in one experiment in which the virus was mixed with mercuric chloride solution, 1 to 5000, for fifteen minutes, of two monkeys inoculated, one was protected but the other developed a chancre. Calomel and calomel oil in 10 per cent. addition to the virus was also effective. The calomel oil was described as a colloidal preparation of calomel which was partly soluble. In all, eight monkeys were inoculated with virus that had been mixed with 10 per cent. calomel. All remained free from syphilis, showing that even insoluble calomel has *in vitro* a definite lethal action on the treponema.

Disinfection experiments on apes were next undertaken. These experiments were divided into two classes, in one of which disinfection was attempted by fluids and in the other by salves. The animals were deeply scarified over both eyebrows and then inoculated with the virus above described. After a given length of time the disinfecting agent was applied. In all 52 experiments were performed, using various antiseptics. Out of three experiments in which mercuric chloride solution, 1 to 1000, was used one hour after inoculation two monkeys developed chancres. Of four experiments using mercuric chloride, 1 to 500 solution applied one hour after inoculation, all four remained uninfected. Mercuric chloride, 1 to 500 with 20 per cent. glycerin, was then tested. It was applied to five monkeys fifteen minutes after inocula-

tion; to three monkeys three hours after inoculation; to one monkey after six hours, and to two monkeys after twenty-four hours. All of these monkeys remained free from syphilis.

In regard to calomel ointment a smaller number of experiments were performed. Four monkeys were inoculated and treated fifteen minutes after by a mixture of calomel in salt solution. All four monkeys were protected.

Four monkeys were inoculated and treated with 10 per cent. calomel ointment one hour later; all four were infected. (It is to be noted that Metchnikoff's monkeys were also infected when he used 10 per cent. calomel ointment.)

Three monkeys were inoculated and treated with a 33 per cent. calomel ointment in water and lanolin. Two were protected and one was infected. Neisser concluded that the attempts at disinfection with salves were unsuccessful, and an investigation was undertaken to determine the cause of this failure.

To an unprejudiced outsider it would appear that Neisser was hardly fair in this controversy. He tried all sorts of antiseptics, but made only three experiments with calomel ointment made up in the proportion recommended by Metchnikoff. Of these three experiments we may say that they were more successful than the three in which mercuric chloride solution, 1 to 1000, was used. Two out of three experiments in which calomel ointment was used resulted successfully in protecting the animals, while only one out of three in which mercuric chloride, 1 to 1000, was used resulted in protection. 1 to 1000 is quite as strong as mercuric chloride can be used in practice, and therefore the experiments in which 1 to 500 mercuric chloride were used as well as the numerous failures of salves made with other antiseptics than mercury are beside the point. Neisser had started with a preconceived opinion as to the relative value of mercuric chloride solution and calomel ointment, and if his experiments did not bear out his opinion, so much the worse for the experiments.

Neisser thought that calomel ointment was not as effective as sublimate solution for the following reasons:

1. Because of the comparatively slight disinfectant action of calomel as such.

2. This activity is much further reduced because of its incorporation in a fatty salve.

3. All fatty salves adhere badly to eroded, wet and bleeding surfaces.

He recommended a prophylactic composed of amyllum, tragacanth gelatin and mercuric chloride, for which he claimed the following advantages:

1. The active constituent, mercuric chloride, is a powerful disinfectant.

2. In this compound the action of the bichloride is not affected or diminished.

3. This preparation adheres well to damp and bleeding surfaces.

4. It is innocuous even after it has remained on the genitalia for twenty-four hours.

5. It has prevented infection in nine out of eleven experiments.

This practically concludes the experimental work upon which the prophylaxis of syphilis is based. There are a few other experiments scattered through the literature, such as those of Hugel,²⁵ but these are inconclusive and of little value.

Thus we are naturally led to a discussion of the relative value of unguents and fluid disinfectants as prophylactic agents. Koch²⁶ found that carbolic acid in an oily solution lost its disinfectant power. Spores remained alive and virulent in 5 per cent. carbol oil for at least 110 days; and bacilli remained alive at least four days in this fluid. Wolfhügel and von Knorre²⁷ showed that this loss of disinfectant power is due to the fact that carbolic acid in water solution is dissolved out by oil much more easily than carbolic acid in oily solution can be dissolved out by water. This is apparently due to the powerful affinity which oil possesses for carbolic acid, and the inactivity of carbolic acid in oily solution is due largely to the fact that the watery plasma of the bacterial cell cannot abstract the carbolic acid from the oil. It is evident therefore that in an ointment

made up of carbolic acid and vaselin, a preparation frequently used, the carbolic acid will have lost much of its disinfectant power.

But there is a fundamental difference between antiseptics soluble in fat and those that are insoluble and simply form a mixture. Gottstein²⁸ found that fat-soluble antiseptics mixed with lanolin follow Koch's law and are inactive. In experiments in which salves of 5 per cent. carbolic acid, thymol and menthol were used and mixed with a fluid culture of prodigiosus, plates after five minutes, one hour and twenty-four hours, showed that unrestrained growth occurred. But a salve of sublimate lanolin acted quite differently, and Gottstein asserts that it is as active a disinfectant as a watery solution of sublimate. Threads carrying anthrax spores were treated with sublimate lanolin and introduced under the skin of animals. These animals lived, although control animals in which the threads were treated with lanolin alone or with lanolin mixed with balsam of Peru died of anthrax. Thus a body like mercuric chloride which has a greater solubility affinity for water than for oil maintains its disinfectant properties in a fatty salve emulsion, while every substance possessing a greater solubility affinity for fats than for water loses its disinfectant properties in fats.

This subject was again investigated experimentally by Breslauer.²⁹ Fluid cultures of various organisms were made and glass slides were immersed in them and then dried. These slides were then placed in the salves to be tested for various periods, and after removal were washed twice with ether and placed in bouillon, which was watched fourteen days for growth. Breslauer found that all the salves tested had disinfectant properties, but that salves in which lanolin and unguentum leniens were used were much more active than salves in which other fats were used. Official lanolin was much more active than anhydrous lanolin. His conclusion was that the disinfectant power of a salve depended largely on the water content of the base used.

From these considerations it appears that Neisser was wrong in his belief that calomel would lose its disinfectant power when incorporated in a salve. For while calomel

is but slightly soluble in water it is not soluble at all in the fats used for salves. It is also clear that Metchnikoff's original recommendation that the salve should be prepared with lanolin should be followed, since because of its water content the calomel will be more active in this base. It may be further pointed out that when such an ointment is prepared, using an insoluble or comparatively insoluble substance, great care must be taken in the incorporation of the ingredients. For although the dry medicament is finely divided in a fatty base there must necessarily remain "dead points" in the spaces between the particles of medicament. The more thorough the mixture and subdivision of the powder the smaller are the dead points. And the greater the amount of water in the base the greater is the tendency of the drug to become soluble and so diminish the dead points.

We may therefore conclude that a calomel ointment to be effective must contain 33 per cent. of calomel, should be incorporated in lanolin as a base and that great care should be taken in its preparation to ensure thorough mixing. No doubt many failures of this agent in actual practice and even in some experiments may be attributed to ignorance or negligence on the part of the pharmacist in not following these directions.

A solution of mercuric chloride, 1 to 1000, or salves made of sublimate in the same proportion are undoubtedly more active disinfectants than calomel in any form. On the other hand, mercuric chloride is subject to several serious objections. It is not nearly so effective a disinfectant in practice as in theory because of its well-known tendency to combine with albumin, and the danger of poisoning following absorption or accidental ingestion is by no means inconsiderable. Such accidents occur with sufficient frequency to warrant the condemnation of mercuric chloride as a prophylactic agent on this ground alone. Furthermore, if used in solution, it quickly dries and its disinfectant action is brief in duration, while calomel ointment may remain applied for hours so that continuous local action is obtained and perhaps even some degree of absorption attained.

For all these reasons calomel ointment is believed to be preferable to mercuric chloride in any form as a prophylactic against syphilitic infection, though it cannot be denied that such a preparation as that recommended by Neisser would not be so dangerous as a solution of sublimate, and did prove fairly effective in his hands. The objection that Neisser raises against an ointment, namely, that it adheres badly to wet and bleeding surfaces, is purely theoretical. In practice no difficulty is experienced on this score, particularly when the patient follows directions as to careful ablution with soap and water followed by drying before applying the ointment.

It may be safely concluded that laboratory experiments have demonstrated that syphilitic infection may usually be prevented by means of this prophylactic ointment if it is applied reasonably early after exposure. Since Metchnikoff's experiments were uniformly successful, and since Neisser's experiments are open to criticism as indicated above, we may possibly infer that with a proper technic, syphilitic infection may always be prevented by the use of this ointment in laboratory experiments.

It next becomes necessary to determine what results have followed the use of this prophylactic in actual practice. This subject may be discussed under two heads: (1) isolated instances either followed by success or failure, and (2) the statistics indicating the success or failure of the method when it has been in use by large bodies of men, such as soldiers or sailors.

Isolated Instances.—One of the first, related by Metchnikoff,²² was a patient of Dr. Picquet. A young man passed the night with a woman and in the morning found an erosion on his penis. Before noon the girl was examined and found to have numerous mucous patches on the vulva and in the throat, with adenopathy and other evident signs of actively contagious syphilis. At 4 P.M. the man rubbed his penis with 25 per cent. calomel ointment, which was allowed to remain for forty-eight hours. This man remained absolutely free from infection, and the doctor who knew the man well stated that he had never had acquired or heredi-

tary syphilis. Metchnikoff states that this observation may be compared with a laboratory experiment.

It is indeed probable that if the ointment had not been used the erosion on the penis would have served as the portal of entry for the syphilitic virus. But we must admit that because a given individual is not infected after coitus with an infected woman, followed by the use of calomel ointment, this does not constitute proof of the action of the calomel ointment. For even syphilis is not invariably contagious, and some people probably escape it after being exposed without the use of any prophylactic, a fact soon pointed out by Gaucher,³⁰ Gerson³¹ and others.

This objection loses its force, however, with the multiplication of such instances, for if a large number of individuals are protected after exposure to women known to be syphilitic we cannot assume that they would all have escaped infection had they used no prophylactic. There are numerous such cases in the literature, all of which cannot be quoted at length. Bonnet³² reported a considerable number of cases in which gray mercurial ointment, calomel ointment or even vaselin alone were used with success in preventing the development of syphilis. Among these observations there were seven in which intercourse occurred with women having at the time active and highly infectious secondary lesions. In several of these cases the dangerous intercourse was repeated a number of times on different occasions, and in two of the observations in which the use of calomel ointment prevented the development of syphilis in the man that used it the infectiousness of the lesions in the woman was demonstrated by the infection of other men who were exposed at about the same time but did not use any prophylactic. Thus in one observation three friends consorted with the same woman, but the only one to develop a chancre was the one who refused to use the mercurial ointment, which the other two used profusely.

A very interesting case was reported by Wolbarst.³³ On May 2, 1908, he was called to treat "A," a young man, aged twenty-two years, single, with a negative venereal history. "A" and a friend "B" had spent the night with a woman

who they discovered later, by her own admission, was suffering from active syphilis. Both "A" and "B" had copulated several times during the night and the chances of infection were as good as they could possibly be. "B" had caught a train for the West. "A" was treated with calomel ointment (30 per cent. in lanolin), which was rubbed in for five minutes within six hours after his first exposure. The woman was brought in and the examination showed that she had papules on the labia, condylomata about the anus and specific ulceration about the tongue and lips. For three weeks "A" reported every other day, with negative results. On June 3 he brought friend "B," who had a typical indurated chancre on the coronal sulcus, followed in a few weeks by an unmistakable papular eruption, which disappeared under mercurial treatment. "A" was observed for more than four months and remained free from syphilis. We have here these ideal conditions—simultaneous and repeated exposure of two susceptible young men to the same syphilitic virus. One man receives prophylactic treatment within six hours and escapes the disease, while the other is not treated and develops syphilis, thus acting as a control.

The above instances are as convincing as laboratory experiments, and taken with the laboratory experiment on Maissonneuve, they afford convincing evidence that syphilitic infection may often be prevented by the use of calomel ointment.

But it must not be expected that this prophylactic will be invariably successful when used under the ordinary circumstances attending exposure. Butte⁸ reported 5 cases in which "he had occasion to listen to the complaints of those who developed chancres in spite of the use of calomel ointment," though he states that in only 2 of these cases was he convinced that the method was exactly followed and the ointment well prepared. Gaucher³⁰ also reported two failures and Carle³⁴ reported three.

The list of such failures might be considerably extended, but it would be to no purpose. They do not indicate that calomel ointment is not an efficient prophylactic, but merely that we cannot expect that it will be invariably successful

in practice. To determine just what may be expected of this prophylactic in practice we must consult the statistics afforded by considerable bodies of men who have used it for certain periods of time.

While there is no dearth of literature on this subject, real facts and figures are very difficult to obtain. With rare exceptions those who have introduced the use of the prophylactic among troops or other large bodies of men are enthusiastic in regard to the results obtained, but the figures and statements they present would hardly serve to convince the critical. It must be remembered, however, that this subject is one concerning which it is almost impossible to collect accurate statistics, and since the consensus of opinion as to the value of the prophylactic is very general this fact should carry some weight. The following may be quoted as examples of the literature on this subject:

Acevedo,³⁵ in 1908, reported the results following the application of prophylaxis in the Chilean navy. The prophylaxis consisted of washing with soap and water followed by 1 to 1000 bichloride solution for fifteen minutes, and thereafter the application of an ointment of red oxide of mercury. 1435 treatments were recorded following exposures in ports all over the world, including Cape Town, Algiers, Malta, Colombo, Shanghai, Yokohama, San Francisco and Valparaiso. Out of this considerable number of treatments only 3 cases developed syphilis. While such an observation is uncontrolled in many respects it would seem probable that there would have been a much greater percentage of syphilitic infections among sailors under these circumstances had no prophylactic been used.

Feistmantel,³⁶ in 1905, divided the soldiers of the Budapest garrison into four groups: The first group received pastilles of potassium permanganate, the second group used a solution of potassium permanganate in barracks, the third group used a wash of 1 to 1000 bichloride solution and the fourth group used simply soap and water. No reduction in venereal disease was observed in the fourth group, but Feistmantel claimed that in the other three groups only those were infected who failed to apply the prophylactic or who used it

later than three hours after exposure. He claimed by this method to have reduced the incidence of venereal disease from 57.6 per thousand to 21.8 per thousand. These figures, however, include the reduction in gonorrhoea and chancroids, and afford very little information with regard to prophylaxis against syphilis.

Tandler (quoted by Neisser²⁴) observed a great reduction in the number of syphilitic infections among a detachment of troops following the introduction of a prophylactic wash of 1 to 1000 bichloride solution. Of 1560 exposures followed by this prophylactic only three men developed syphilis, a considerable diminution in the previous proportion of syphilitic infections in that command.

Michels³⁷ reports an attempt to protect the crew of a commercial ship from venereal disease while at Yokohama. He states that he could usually estimate that after leaving Yokohama at least 5 per cent. of the crew would develop venereal disease. The men were given small flasks containing 5 c.c. of fresh 10 per cent. protargol solution, together with vaselin and sublimated soap. Before coitus the men were supposed to place a few drops of protargol in the urethra and to use the vaselin. After coitus they were to wash with the sublimate soap and water and again place a few drops of protargol in the urethra. The 200 men were in Yokohama nine days, and as the result of the introduction of this prophylactic not a single case of gonorrhoea or chancroid developed. One man developed a chancre and secondaries, but he had been exposed twice, and admitted that on the second occasion he forgot his prophylactic and left it on the boat.

Wickes³⁸ described in 1908 his experience with prophylaxis in the United States navy. This prophylaxis consisted of washing with green soap and water, followed by a sublimate solution of 1 to 2000 and an inunction of a 50 per cent. calomel ointment in lanolin, which was allowed to remain all day with a protective dressing. While in Canton, a heavily infected locality, this treatment was at first optional. But owing to the lack of interest and the irresponsibility of members of the crew, 30 cases of primary syphilis devel-

oped during five months spent in that port. Compulsory prophylaxis was then adopted, and subsequently there were 922 shore liberties in infected Chinese ports and 426 prophylactic treatments. No case of primary syphilis developed on this ship under this system for five months, at the end of which time the article was written.

Siebert³⁹ conducted observations in the German navy at foreign ports, where the circumstances were such that an infection might not unreasonably be expected at each exposure. The prophylaxis against syphilis consisted of washing with sublimate solution and laying a strip of gauze soaked in sublimate solution around the sulcus coronarius. The number of individuals infected ranged from 1 to 2 per cent., including all infections, which under the circumstances Siebert thought was a brilliant example of the value of prophylaxis. Unfortunately he gives no figures to indicate the number of infections with syphilis.

Venereal prophylaxis has been in general use in the United States army and navy since about 1908, and since 1912 the use of prophylactics has been compulsory in the army. If careful records had been kept in regard to the many thousand prophylactic treatments so given the results obtained would be apparent. This has not been done, no doubt partly from a desire to avoid publicity; but many officers have published their opinions, for the most part favorable, and a few have furnished some statistics, among which the following may be mentioned:

Davidson⁴⁰ reported 320 prophylactic treatments, with no infections among those using the prophylactic, although three infections occurred among those not using the prophylactic.

Ledbetter⁴¹ wrote, in 1913, "In my opinion venereal prophylaxis has advanced well beyond the experimental stage, and it is of great value and importance when properly carried out. It is quite true that adverse reports have been made by some of the medical officers of the navy and that others have no faith in the efficacy of the method. Personally, I believe that the negative results noted in the adverse reports

were due to faulty technic or to lack of interest on the part of the medical officer, and that in consequence the method was condemned without a fair trial. It is not enough to institute prophylaxis and then to take only a perfunctory interest in it thereafter. The medical officer must take an intense personal interest in the work, and thus, by his example, his assistants will be stimulated to put forth their best efforts."

The above is the opinion of the majority of the medical officers of the army and navy, and is reflected in the tone of the reports of the Surgeon-Generals. Ledbetter reported the results obtained at Cavite, P. I., for eighteen months. The method used was as follows: The parts were thoroughly washed with green soap and water, 10 per cent. solution of argyrol was injected into the urethra and retained for about half a minute, and 33 per cent. calomel ointment was then rubbed in well and allowed to remain for at least two hours, being covered with a protective dressing. Ledbetter says that before instituting this method the percentage of venereal infections was very high, amounting, as a rule, to 25 to 30 per cent. of all admissions. After prophylaxis was begun there was an immediate drop in the admission rate, and the average for the following year was as follows: Gonorrhoea was reduced from 20 to 25 per cent. of the total admissions to 8 per cent., which include some 30 patients who did not report for the prophylaxis; chancroid was reduced from 3 to 5 per cent. of the total admissions to about 2 per cent., including 10 patients who did not report for treatment; syphilis was reduced from about 20 cases per annum to 1 case, and this man did not take the prophylactic.

Ashford reported⁴² 221 prophylactic treatments, of whom 2 men developed syphilis. One of these men took the prophylactic fourteen hours after exposure and 1 man eight hours after exposure.

Cottle⁴³ reported an instance in which of 560 men on a cruise 516 took the prophylactic treatment 4897 times during eleven months, while 44 by not taking treatment denied exposure. Some of these 44 did expose themselves

because 3 developed gonorrhoea. Out of this large number of exposures only 17 men developed syphilis, and the histories in the majority of these cases showed that the prophylactic was taken as late as ten, eighteen and twenty hours after exposure. The great majority of admissions followed the few long liberties when the prophylactic was given late.

About the best article on this subject is by Riggs,⁴⁴ who records 5103 prophylactic treatments with only 81 infections, as shown by the following table. The prophylactic used consisted of an injection of a silver salt of moderate strength and the use of 33 per cent. calomel ointment.

Hours subsequent to exposure.	Number of treatments.	Number of infections.	Per cent. of infections.
1	1180	1	0.08
2	1172	7	0.59
3	521	4	0.77
4	330	2	0.61
5	199	3	1.57
6	321	5	1.58
7	277	6	2.27
8	390	16	4.22
9	283	10	3.62
10	214	11	5.14
More than 10	216	16	7.40
Total	5103	81	1.58

The above table indicates the efficiency of medical prophylactic treatment, particularly if administered within a few hours subsequent to exposure. It must be remembered that this table gives all infections, but in a previous article⁴⁵ Riggs states that out of 3556 prophylactic treatments there were only 67 infections, and of these only 8 were cases of syphilis.

Exner⁴⁶ gives the following record of prophylactic treatments and the venereal cases of a regiment of regulars for nearly two and a half years. Unfortunately these figures give no information as to the relative number of cases among the men who took the prophylaxis as compared with the cases developing among men who were exposed, but who disobeyed orders and failed to take the prophylaxis, and, moreover, the

figures for infections include all venereal diseases, so that no direct evidence is given in regard to the efficacy of this treatment in preventing syphilis. But in comparing the venereal rate with the amount of indulgence, as indicated by the prophylactic treatments alone, it will be seen that the rate is very low, and we cannot escape the conclusion that venereal prophylaxis as carried out in certain parts of the army is quite effective.

Month and year.	Strength of regiment.	Number of prophylactic treatments.	Venereal cases.
May, 1914	827	53	1
June, 1914	757	103	7
July, 1914	700	146	4
August, 1914	684	178	0
September, 1914	726	196	0
November, 1914	824	227	2
December, 1914	788	151	1
January, 1915	723	278	3
February, 1915	653	379	0
March, 1915	744	354	4
April, 1915	791	397	4
May, 1915	788	678	3
June, 1915	793	663	2
July, 1915	811	657	5
August, 1915	841	523	5
September, 1915	839	490	9
October, 1915	840	332	8
November, 1915	815	305	6
December, 1915	800	350	8
January, 1916	833	402	11
February, 1916	940	450	5
March, 1916	927	370	5
April, 1916	921	405	8
May, 1916	913	450	4
June, 1916	900	285	3
July, 1916	901	372	5
August, 1916	1004	280	9
September, 1916	1068	420	5
October, 1916	1046	450	18

I have a number of reports on the use of the prophylactic in the army that have been sent to me through the kindness and interest of various medical officers, of which the following may serve as examples: Record of prophylactic treatments during the month of September, 1915, at Fort Mills, P. I., and sent through the courtesy of Major Robert Skelton, M. C.:

Time between exposure and prophylactic.	Total number taking prophylactic.	Number protected.	Number unprotected.
1 hour	332	325	7
2 "	151	148	3
3 "	25	24	1
4 "	6	6	0
5 "	5	5	0
6 "	5	5	0
8 "	1	1	0
Over 10 hours	56	52	4
No time stated	4	4	0
Total	585	570	15

Of the 15 cases that developed disease only 1 contracted syphilis, while among the men who failed to take the prophylactic during the same time, 4 developed syphilis. It is believed that this represents about the average results obtained throughout the army. It will be noticed that the majority of failures are among the men taking the prophylactic during the first and second hours after exposure, which is to be explained on the basis that the men often do not tell the truth about the time of exposure, and this is one of the great difficulties in obtaining accurate records of this work.

Major Royal Reynolds very kindly sent me the records of his organization from Nogales, Arizona, from June 1, 1915, to June 30, 1916. The strength of the command for the period was 866, and 4989 prophylactic treatments were given. There was no record of syphilitic infection following any of these treatments and the sick rate for syphilis during the year was only 1.27 per cent., while for the army as a whole it has been about 3 per cent. for many years. This indicates that a very substantial reduction in the amount of syphilis was effected in spite of adverse circumstances, for the prostitutes in this locality are almost all Mexican women of low intelligence and are almost all infected with syphilis. (A Wassermann made at Vera Cruz of 10 prostitutes gave a positive result in 9.) These results are substantially better than the average obtained in the army generally.

The best figures that I have ever seen, and which conclusively prove the value of the prophylactic properly administered, are those very kindly sent me by Colonel Edwin P. Wolfe, Medical Corps, from Fort McKinley, P. I. Colonel

Wolfe was surgeon during the period covered and personally supervised this work. The results obtained in the reduction of gonorrhoea and chancroid were quite as striking and remarkable as the statistics submitted on syphilis, but are omitted as not bearing on the prevention of syphilis.

	Mean enlisted strength.	Prophylactic.		Failures in all diseases.		Primary syphilis.	
		Treatments given.	Men treated.	Apparent failures in all diseases.	Per cent. apparent failures.	Men who took treatment.	Men who did not receive prophylactic.
1913:							
Jan.	3609	761	562	2	0.26	1	9
Feb.	1568	506	492	2	0.39	0	3
Mar.	2413	501	378	2	0.4	0	5
Apr.	3216	568	432	3	0.52	0	3
May	2910	662	508	2	0.3	0	2
June	1951	356	275	2	0.56	0	7
July	1982	389	331	3	0.77	0	2
Aug.	2505	472	382	4	0.84	0	2
Sept.	2492	452	372	0	0	0	1
Oct.	2700	498	376	1	0.2	0	3
Nov.	2543	671	462	0	0	0	1
Dec.	3018	949	533	0	0	0	4
Total	..	6785	..	21	..	1	42
1914:							
Jan.	2165	724	563	0	0	0	3
Feb.	1664	619	500	0	0	0	1
Mar.	3089	988	677	2	0.2	0	6
Apr.	3026	861	627	1	0.11	1	5
May	3232	870	630	3	0.34	0	3
June	3042	818	615	3	0.36	0	1
July	2844	690	538	5	0.73	0	2
Aug.	2591	840	666	6	0.7	0	2
Sept.	1954	701	565	1	0.001	0	2
Oct.	1883	603	446	2	0.33	0	1
Nov.	2487	799	590	0	0	0	1
Dec.	2686	774	606	5	0.64	0	4
Total	..	9287	..	28	..	1	31
1915:							
May	3080	896	749	7	..	0	14
June	2998	802	652	8	..	0	4
July	2982	805	692	5	..	0	3
Aug.	2780	890	722	4	..	0	5
Total	..	3393	..	24	..	0	26

We may conclude that the experimental work on the prevention of syphilis and long experience with the practical use of a prophylactic have given substantially concordant results, namely, that syphilis undoubtedly can be prevented by the use of various prophylactics, and particularly by the use of 33 per cent. calomel ointment. In practice it cannot be expected that the use of the prophylactic will be invariably successful, but it seems reasonable to believe that if properly applied during the first hour after exposure it will prevent the great majority of syphilitic infections. The efficacy of the prophylactic diminishes rapidly as the time between its use and the exposure increases. In addition to this time factor there will be variations in efficacy in practice, depending upon the care with which the calomel ointment is compounded and upon the intelligence and thoroughness with which the prophylactic is applied.

When dealing with large bodies of men experience has shown that good results can only be expected from the use of the prophylactic when medical and other authorities unite to instruct the men in its value and in the method of use. Finally, the prophylactic must be provided and its use made compulsory by the imposition of various penalties in case of neglect to use the prophylactic after exposure. And in order to enforce this regulation, frequent venereal inspections are necessary to prevent the concealment of disease on the part of those men who wish to avoid the penalties.

It is quite possible to adopt such measures in the military services, though it has been abundantly shown that the success of such measures depends upon the interest and continued vigilance of both the medical officer and the commanding officer, and the work must be continued because experience has shown that it may be successful, and that every means available must be used to reduce the prevalence of venereal diseases. It seems evident that we cannot anticipate very satisfactory results from the introduction of prophylactic methods among bodies of men not under strict discipline, military or otherwise, although the very best results may be anticipated from the use of the prophylactic

by intelligent and instructed individuals. Under these circumstances each civil sanitary officer must decide for himself to what extent he will make use of prophylactic methods after taking into consideration all the local conditions.

As there have been so many variations in the method of using a prophylactic, it appears that it will be of some service to outline a satisfactory method.

Before intercourse use a liberal amount of vaselin or other lubricant. This aids in preventing abrasions and forms a coating through which infectious organisms can only penetrate with difficulty. As soon as possible after intercourse:

1. Wash the genitalia thoroughly with soap and water, using plenty of soap. Reasoner⁴⁷ has found that soap solution kills *Treponema pallidum* very promptly, and there is good evidence that chancroidal infection may also be avoided very largely by a thorough cleansing with soap and water.

2. When the prophylaxis is performed under medical instruction or by a man of sufficient intelligence this may be followed by a wash of 1 to 1000 mercuric chloride. The efficacy of this solution is undoubted, but it should not be used by ignorant persons, nor should bichloride of mercury tablets be issued as a routine.

3. Dry, and apply about 1 dram of 33 per cent. calomel ointment in lanolin. Anhydrous lanolin should not be used and the ointment should be most thoroughly mixed. This should be well rubbed in, paying particular attention to the glans, corona and prepuce, but neglecting no part of the penis and the anterior portion of the scrotum. This should be rubbed in for at least ten minutes, and should not be removed but should be allowed to remain for twelve hours, meanwhile protecting the clothes by the application of an impervious paper napkin. This favors absorption and ensured prolonged action of the mercury on any organisms that may remain.

4. For the prevention of gonorrhoea a suitable solution of some silver salt may be instilled into the urethra.

The Ethics of Venereal Prophylaxis.—It may be expected that there will be differences of opinion concerning the morality of venereal prophylaxis. The attitude taken toward

this question by any individual will be based quite as much upon his feelings and training as upon cold reason, for there is no fixed standard of morality to which all such questions may be made to conform. It need cause no surprise therefore that equally intelligent and well-meaning people have taken sides on the question of the morality of venereal prophylaxis. Each sanitarian must settle for himself both the morality and expediency of using prophylactic methods to prevent venereal diseases, and all that can be done here is to give certain reasons for believing that such efforts are not immoral.

The main objections to such prophylaxis are based on two beliefs that are very generally held, namely, that venereal diseases are a punishment for immorality, and that the fear of venereal disease deters many from vice, so that by removing this fear we actually encourage vice.

Venereal diseases are not a punishment for immorality. The prime essential of a punishment is that it should be justly applied; that is, the person who errs should always be punished, the person who does not err should not be punished, and the severity of the punishment should be proportionate to the heinousness of the offence. Venereal diseases do not fulfil any of these requirements of a just punishment. Of the many who indulge in illicit intercourse, some are infected and some are not, and many innocent wives and children are also infected. The man who betrays an innocent girl escapes all infection for the very reason that she is innocent, and yet his offence is far more flagrant than that of the man who consorts with a prostitute and becomes infected. Moreover, one man contracts syphilis and another gonorrhoea, thus providing different grades of punishment for the same offence. One man who contracts syphilis perhaps at his first offence may develop paresis or locomotor ataxia, while the syphilis acquired by the man who is habitually immoral may cause him little inconvenience. We must believe that God is just, and it is difficult to believe that a just God ever devised such an unjust punishment. The belief that disease is a punishment for sin is an obsolete theology. No one would now consider typhoid fever or furunculosis a punishment for sin whatever may have been thought in Job's time. Disease is the result

of our own ignorance and carelessness, and venereal diseases are no exception to the rule.

The idea that the fear of venereal disease acts as a deterrent to immorality is a very widespread delusion. Fear is a very poor deterrent under any circumstances. At one time poisoners were boiled alive, but this cruel and unusual punishment did not put an end to poisoning, which was a more popular form of murder then than it has ever been since. Our treatment of criminals has been based on the belief that fear of punishment would prevent crime, but modern penologists are telling us that this is a mistake and that we must reorganize our penitentiaries, substituting education and moral encouragement for fear. The fear of hell did not make men moral even in the not very remote past, when the belief in a real physical hell was very vivid. If the fear of hell itself had so little deterrent effect, how can we suppose that the distant prospect of a possible venereal infection would act as an effective deterrent?

Moreover, this supposed fear of venereal diseases is to all intents and purposes non-existent. Young men who are the chief sufferers from venereal diseases feel little fear of them because it is one of the characteristics of youth to fear nothing. Those who know young men or have not forgotten how they felt when they were twenty years of age will need no further argument on this point. It has been assumed that this lack of fear of venereal diseases on the part of young men was due to ignorance. This is believed to be an error. It is true that most young men are not well informed as to the nature and ultimate consequences of venereal diseases, but all young men know that such diseases exist, and imagination often makes the unknown more terrifying than the known. Medical students who are well informed on the subject are no more moral than other parts of the student body. But, it will be objected, this is all theoretical. It will be well therefore to cite facts indicating the indifference to fear of venereal infection. I have known many cases in which for various reasons men have consorted with women whom they knew were infected. In one post where the duty was very severe and where it was the custom to admit all cases of

venereal disease to the hospital a number of the men deliberately exposed themselves to women who were known to have infected other men, in order that they might contract gonorrhoea and be placed in hospital, thereby escaping disagreeable duties. In another case infected prostitutes were detained for treatment in a certain building. These women subsequently complained that certain men had gained access to this building and had had intercourse with them. The reason the men committed this offence with women known to be infected and the reason the women complained was the same, namely, the men had not paid.

While such instances may be held to be unusual and to pertain only to the baser types of men, they speak volumes for the contempt in which the fear of venereal infection is held by many men.

Furthermore, many men who are not so debased continue to expose themselves after they have actually suffered one venereal infection, and this constitutes strong evidence that fear of infection does not act as a sufficient deterrent to immorality. Brandweiner⁴⁸ states what is common knowledge among practitioners, that it is very frequent to observe several venereal diseases in one person, and it is not to be supposed that they were all acquired at one exposure. Of 905 patients combined diseases were present as follows:

Soft chancre and gonorrhoea	166 times
Soft chancre and syphilis	158 "
Gonorrhoea and syphilis	894 "
Chancroid, gonorrhoea and syphilis	87 "

Vedder⁴⁹ found that out of 531 Porto Rican soldiers examined the following men had had several venereal infections:

Syphilis and chancroids	26, or 4.8 per cent.
Syphilis and gonorrhoea	27, or 5.0 "
Chancroids and gonorrhoea	39, or 7.34 "
Syphilis, chancroids and gonorrhoea	12, or 2.26 "

If so many men continue their immoral relations although actually suffering from venereal disease, and persist although infected again and again, why should we suppose that fear

of infection will prevent immorality? Personally, I conclude that fear of infection is practically non-existent, and that even when it does exist it is a very feeble deterrent as compared with the imperious instinct upon which the perpetuation of the race is based.

If fear of venereal disease is so impotent to prevent immorality we need not suppose that the introduction of a venereal prophylaxis will encourage vice by removing this fear. Furthermore, there is no occasion for removing any fear that may actually exist, for as we have already seen we cannot guarantee that the prophylactic measures will invariably succeed in preventing infection. So much for the negative side of the argument.

On the positive side, we may affirm that it is a duty and the highest morality to endeavor to preserve our bodies in health. Obviously the individual should protect himself from venereal diseases by living a moral life. But suppose he has committed a fault and exposed himself. If he does not endeavor to prevent infection by using a prophylactic of known efficacy he commits a second fault of omission, and two wrongs never yet made a right.

However, we still have to face the problem of expediency. In the military services, prophylaxis is most efficient. The medical officer who insists upon prophylaxis does not encourage immorality, but, on the contrary, he should do and usually does everything in his power to discourage it. But knowing that in spite of any efforts he may make in this direction, a certain percentage of the men will persist in immorality, he would be derelict in his duty to the man and to the government if he did not endeavor to prevent infection.

The question is somewhat more complicated in civil life where men are under no authority or discipline. Snow's conclusions on the matter⁵⁰ are as follows: "Such prophylactic measures can succeed in only a percentage of those cases in which adequate instructions have been given, and the individual has the intelligence to apply properly the prophylactic immediately or within a few hours of exposure. Obviously these requirements are not likely to be met by the immature boys, the drink-befuddled men, the defective girls, the

average prostitutes who constitute the bulk of the citizens who might be protected by this method. It seems apparent that prophylaxis can wisely be made use of only under the advice of physicians who are fully informed of the circumstances of each case and have an opportunity to observe each individual until the danger of infection is passed. It therefore becomes undesirable to advocate publicly such measures for individuals without such supervision."

It is certain that venereal prophylaxis cannot be applied in civil life with the same prospect of success as in the army for obvious reasons. But inasmuch as a certain number of infections might be prevented it seems as though the above conclusions were somewhat pessimistic and that the use of the prophylactic should be encouraged. Even if no more is to be done in this direction than advocated by Snow it would seem that this effort should at least be systematized. At present there is no way in which physicians in civil life can obtain information on the subject for dissemination to patients, nor can they be assured of obtaining a reliable supply of calomel ointment, and, as we have seen, the success of prophylaxis depends greatly upon the percentage of calomel in the ointment and the care with which it has been compounded. It would seem that the health officers of various cities might obtain a supply of satisfactory prophylactic packets for issue to physicians, at the same time sending a circular for the patients explaining the method of use and what results might be expected from their use. Physicians could then distribute these packets to such of their patients as experience has demonstrated are likely to need them. Sanitary officers will naturally have to decide for themselves to what extent they wish to go in this matter, and this chapter has been written with a view of presenting the facts on which such a decision can be based.

II. METHODS THAT MAY BE TAKEN BY THE INDIVIDUAL TO PREVENT EXTRAGENITAL INFECTION.

As pointed out in the previous chapter, although accidental extragenital infections have been acquired in every conceivable

way, yet the great majority of these infections have been acquired as the result of a small number of insanitary practices, most of which can be controlled or entirely prevented by the individual.

Buccal infections were found to be the most numerous of all extragenital infections, constituting about 43 per cent. of all extragenital infections, while nearly 60 per cent. of these buccal infections are caused by promiscuous kissing.

Kissing.—This is a subject that is difficult for a person with a sense of humor to treat seriously, and yet it must be seriously considered as the most important single method by which accidental syphilitic infection is transmitted. No sanitarian outside of the comic paper expects to prohibit legitimate kissing, and yet it is certain that the general public must be educated to stop promiscuous kissing. The male mind can scarcely understand why certain women insist on kissing every woman and child that they meet. Parents should insist that their children be not kissed by stray callers, and particularly not by servants and nursemaids who are frequently of loose morals and who may become infected at any time even though not syphilitic when employed. When the public understands that not only syphilis, but also pneumonia, influenza, the common cold and other diseases may be transmitted through kissing, the practice will become automatically reduced to normal and proper limits.

Instruments Used in Various Trades.—Many cases of accidental infection have been transmitted as the result of the common use of various instruments, such as blow-pipes and pipettes. So far as possible in these trades all workmen should have their own instruments, and the use of such instruments in common should be prohibited.

Smokers' Articles.—Many cases are on record in which the victim was infected after using a pipe or smoking cigars or cigarettes previously used by a syphilitic. It can hardly be supposed that persons of this caliber can be reached by the processes of education, but an attempt may be made whenever possible.

Drinking Glasses.—The common drinking glass has also been responsible for many infections. However, it is hardly

necessary to make recommendations on this subject at the present day of bubbling fountains, paper drinking cups and individual communion cups. Every sanitary officer should be on guard to eliminate the common drinking glass at schools and other institutions under his control, and the use of paper cups at soda-water fountains and other public drinking places should be enforced whenever possible. While these are properly public health measures when taken by the sanitary officer, yet every individual can protect himself by refusing to use a common cup. A good rule for the individual is to put nothing in the mouth that has been in the mouth of another person. The general adoption of this rule would practically eliminate buccal syphilitic infection by intermediate objects. The same rule should be enforced, so far as possible, in the case of children. Children have been infected by a syphilitic nurse who tested their food with the same spoon used by the children. No eating utensils should be used by more than one person until cleansed.

Minor Operations.—Another important group of infections are those caused by minor operations, mostly by ignorant persons, though the skirts of the medical profession are not entirely clean in this matter. The great number of infections that have been transmitted through the practice of vaccination constitutes a serious reproach and one that has undoubtedly furnished a basis for some of the antivaccinationist charges. Whenever any serious objection is made against our customs or methods on the part of the laity it is well to investigate the matter with an open mind. Homeopathy would have died at birth had it not been for the practice of many of the profession at that day of bleeding and purging their patients to death. Christian Science would not flourish today were it not for the fact that no patient can gain a respectful hearing who cannot furnish some objective signs that we can detect by our present admittedly imperfect methods of physical examination. That syphilis is transmitted today by vaccination in any sufficient number of cases to warrant any sanitary action I do not believe, although a suit for malpractice would appear justifiable. In

this case, as in the case of homeopathy, we are suffering for the sins of our predecessors. Every physician who is required to perform vaccination *en masse* should be on guard in this matter. In this day of bovine lymph the accident can only occur through using the same knife or other instrument for scarification on numbers of people. For this reason, when vaccinating a number of people, care should be exercised, and the same knife or scarificator should not be used on more than one person without sterilization.

Circumcision.—Circumcision performed as a rite at birth has been responsible for many infections. Among intelligent Jews this operation is today performed in accordance with accepted surgical technic, and it is only among the ignorant, whom it is most difficult to reach, that the danger of infection exists. Personal prophylaxis may be secured to some extent by education of these people in the use of better methods, and for the rest the sanitary officer may endeavor to insist upon the use of aseptic methods on the part of those persons performing this operation. Infection has been transmitted by barbers with sufficient frequency to merit attention. This has usually followed from the treatment of a cut by a syphilitic barber, who either touched the cut with a caustic stick wet with his own saliva or applied a piece of plaster wet with his own saliva. Such infections may be avoided by observance of the following rule: permit no person to apply to any injury any plaster or object that is moistened with saliva. The sanitary regulation of barbers and barber shops is generally undertaken by most municipal health departments and need not be discussed in this place.

Tattooing.—A certain number of infections have been transmitted by tattooing when the operator used his own saliva for mixing the pigment or wetting the needles. It should be sufficient to point out that any individual who wishes to supplement the art galleries on his person should insist that the operator use sanitary methods and does not use his own saliva in the process. These operators should also be licensed and subject to public health regulation.

Physicians, Nurses, and Those in Attendance on the Sick.—The number of syphilitic infections transmitted to physicians

and those in attendance on the sick are so numerous that the disease may be well called an occupational disease of physicians. Obstetricians are now insisting on the use of the gloved hand in making vaginal examinations of women in labor in order to avoid infection of the woman, but the measure is equally important to prevent syphilitic infection of the physician. No vaginal or rectal examination should be made except with the gloved hand. The physician should endeavor at all times to keep the skin of his hands intact, but small abrasions and hangnails are so common that gloves should be used as an additional protection much more frequently than is the case at present. Fortunately, the surgeon is now protected, owing to the almost universal use of rubber gloves in operating, but I have seen many physicians palpate a suspected chancre with the ungloved hand to detect induration. Nurses should be instructed as to the danger of acquiring infection in such operations as catheterizing female patients, and should also wear rubber gloves when performing such services. In case the patient is known to be syphilitic the nurse should be informed of the fact, and the physician should give explicit instructions enabling her to avoid infection. Midwives should be taught to use rubber gloves for their own protection as well as that of the patient. While dentists can probably not wear rubber gloves, they should be thoroughly familiar with the appearance of the mucous patch, and should use the utmost caution in operating on their syphilitic patients to avoid abrasions of the skin. Hangnails or existing abrasions should be covered with collodion. It is taken for granted that all dental instruments are always sterilized subsequent to one operation and before operating on a new patient. It should not be necessary to make rules for the medical profession, but having recognized the frequency of accidental infection, every physician should be able to make his own rules for the avoidance of this infection. The habitual use of the rubber glove whenever the hand or fingers are brought in contact with mucous surfaces will avoid the majority of infections.

Wet-nurses.—In the past many infections have been transmitted both from the nurse to the child and *vice versa*.

Since methods of artificial feeding have been improved the employment of wet-nurses has fallen off, and this method of transmission is not of great importance today. Should a wet-nurse be employed, however, the danger in this individual case is exactly the same as it has been in the past. Whoever employs a wet-nurse should insist on a careful medical examination to detect the presence of syphilis, including a Wassermann reaction, and the nurse should equally insist on a similar examination of the infant to be nursed, and also of the mother, unless the physician is able to assure her from his previously acquired intimate knowledge of the family that syphilis does not exist.

SYPHILIS AND MARRIAGE.

It is impossible to prevent the marriage of syphilitics by law, although legislation making syphilis a bar to marriage has been attempted by several States. According to Cabot⁵¹ "Nine States, namely, Indiana, Michigan, North Dakota, Oregon, Pennsylvania, Utah, Vermont, Washington and Wisconsin, have legislation which purports to make syphilis a bar to marriage; but in most of them the laws are such as to be largely worthless. Thus the enlightened legislation of Utah, Washington and North Dakota prohibits marriage of persons having syphilis except where the female is over forty-five, apparently having no interest at all in the lady after that period. The solons of Wisconsin and Oregon prohibit only the male, allowing the female to disseminate the disease at will. Utah and Michigan forbid the marriage but require no affidavit. Indiana, Pennsylvania and Washington require an affidavit and thereby put a premium on perjury. North Dakota, Oregon and Wisconsin require a medical certificate showing freedom from such disease. Those States which forbid the marriage of the syphilitic but require only an affidavit or nothing at all obviously cannot expect to diminish the number of such individuals who marry, and these laws therefore in practice only enable the State to step in after the fact. Such laws, while perhaps of

interest in divorce proceedings, cannot be regarded in any sense as public health measures. The States which require a medical certificate have undertaken a much more pretentious measure, and it is of interest to look into the question in some detail."

The Wisconsin law requires that "Such certificates shall be made by a licensed physician, shall be filed with the application for license to marry, and shall read as follows, to wit:

"I.....(name of physician).....being a legally licensed physician, do certify that I have this.....day of..... 19..... carefully and thoroughly examined(name of person)....., having applied the recognized clinical and laboratory tests of scientific search and find him to be free from all venereal diseases so nearly as can be determined."

It was provided in the law that the fee for this examination should not exceed \$3.

The absurdity of such a law is so self-evident that no long discussion of it is required. An examination to exclude the presence of venereal disease at any given moment is impossible. Even to say that such disease is probably absent requires a most intensive examination by a specially trained man, combined with the results obtained by various laboratory investigations. All of these findings must be interpreted in the light afforded by the history, and may readily be worthless if the patient is attempting to deceive. Since no reputable physician will undertake such an examination for a fee of \$3, the law, in the words of Cabot, "gives rise to a false sense of security, protects the unscrupulous, penalizes the honest, and deceives the community in general by what can only be described properly as fake certificates."

It would be possible to require by law a negative Wassermann if the State makes suitable provision for obtaining a free Wassermann test at a public laboratory. Such a test would, of course, not definitely exclude the possibility of syphilis, and it would exclude certain individuals who have a positive Wassermann, but who are incapable in all probability of transmitting their infection.

It is clear therefore that the great burden of responsibility in regulating the marriage of syphilitics must be borne by the physician who treats such cases. Shall he permit the marriage of his syphilitic patients, and if so, when? Shall we adopt a counsel of perfection and forbid every syphilitic to marry until he is cured, and if so, what shall we adopt as a standard of cure? Or shall we adopt certain rules which experience has indicated form a fairly safe guide?

As this is a matter concerning which there is much honest difference of opinion, it would be presumptuous for any man to state categorically a set of conditions to which every syphilitic would have to conform before being permitted to marry. But it is quite permissible to discuss the subject and to outline principles that it is believed will afford safe guidance in the majority of cases. In doing this we should duly weigh past experience together with our more recent knowledge of the disease.

Fournier⁵² said: "We are consulted in this matter solely as physicians, and as physicians we must answer without being influenced by any other considerations whatever. It must be understood in advance that many will ignore and defy the prohibition and will marry in spite of it."

"All kinds of arguments will be advanced, such as an engagement already existing and similar family or personal reasons. But the physician must ignore all such arguments and stick to the pathology of the disease as exhibited in that particular patient." Fournier thought that, with a few exceptions, syphilis constitutes only a temporary bar to marriage, after which period the patient reverts to a state of health sufficient to qualify for a husband and parent. He was able to give 87 observations on syphilitics who married and did not infect their wives and who had a total of 156 infants who were absolutely healthy (it must be remembered that this was before the days of the Wassermann reaction). As the result of his great experience Fournier concluded, in 1880, that marriage should be prohibited to every man having syphilis which was transmissible, and that it ought to be permitted to men in whom the disease was in such a condition as not to be transmissible. He summarized

the general rules governing the marriage of syphilitics as follows:

1. Absence of actual specific lesions.
2. Advanced age of the infection.
3. A certain period of absolute immunity.
4. Non-menacing character of the disease.
5. Sufficient specific treatment.

That these rules were considered rather severe may be gathered from the following remarks of Hutchinson² (page 553) as late as 1909: "Within the memory of some of us surgical authorities would sanction marriage after a brief treatment and only a few weeks' interval from the disappearance of the secondary symptoms. Next more cautious counsels prevailed, and a year was insisted upon, then two years, and finally the observation of possibilities has induced some authorities, chiefly of the Paris school, to suggest five years as a minimum, and to prefer even longer periods. The question under discussion at the present time is whether Professor Fournier's dicta do not take rank as counsels of perfection and whether the two years' rule, now generally acted upon in British practice, is not sufficient to secure reasonable social safety. It is to be understood that those who are content with this rule advocate continuous treatment with mercury during the two years." . . . "We must not base our general rules on this very important question upon exceptional facts. . . . It is to be remembered that although, in fear of syphilis, a surgeon may forbid marriage he cannot enforce continence. In most cases the risk—often an imaginary one, or at most infinitesimally small—is simply shifted from a wife to a concubine, from one of the richer classes, it may be, to one of the poorer." . . . "Counsels of perfection are often not trustworthy. I unhesitatingly record my conviction—that of an old man who has had much social experience—that, provided the two years' interval be observed, the dangers to society from needlessly prolonged celibacy infinitely exceed the risks of the communication of syphilis. . . . We must not attempt too confidently to control nature, nor must we bring our imperfect knowledge rashly into predominance in practical affairs."

Finger's conclusions, written in 1896, are as follows:⁵³

1. While untreated syphilis may lose its contagiousness and power of hereditary transmission, yet in numerous cases these powers may be retained for many years.

2. Systemic treatment shortens the contagious period so that at the end of four or five years the danger to wife and children is small in the majority of cases.

3. Experience shows, however, that in the most carefully treated cases a small fraction may retain the capability of transmitting the infection for fourteen or fifteen years, or even longer.

4. It follows therefore that no definite rule can be deduced that will always be satisfactory.

The minimal conditions outlined by Finger are as follows:

1. A mild normal course of the disease. Severe, visceral syphilis and malignant syphilis are excluded.

2. An interval of at least five full years between infection and marriage.

3. An interval of three years from the last syphilitic manifestation to marriage, with careful observation to determine the existence of slight erosions and other symptoms.

4. A correspondingly systematic treatment of the disease.

5. An energetic mercurial treatment just before the marriage.

6. It is the duty of the physician to warn the patient that marriage may not be absolutely safe. That he must watch for small erosions on the genitalia or in the mouth that may infect his wife. The family physician should know the facts so that he can watch both wife and children, and afford prompt treatment should it become necessary.

The reasoning of Fournier is unassailable. Marriage should be prohibited to every man who may transmit his infection to his wife or children, and it should be permitted to men who cannot transmit the infection. There is also truth in Hutchinson's contention that counsels of perfection are often not trustworthy in practice. It will probably not be possible to insist on a cure in all cases. The serological findings undoubtedly afford the best index as to whether a cure has been effected, and it can hardly be claimed that a man having a positive

Wassermann reaction is cured even if he has had no other clinical manifestations of the disease for many years. The Wassermann reaction may be persistently positive in spite of efficient treatment. If this is caused by an aortitis or a cord lesion the man is incapable of transmitting his infection, though it may be economically a poor risk for him to assume the burden of a family with the possibility of his early death from these conditions. And how can we be sure in any case that the testicles are not affected and that the infection cannot be transmitted by this route even though there have been no external clinical manifestations for years?

It appears to the writer that it is sufficiently evident that the character of the disease is such that it is impossible to issue any guarantee of safety whatever except in the presence of a definitely established cure. To such cured patients we may unhesitatingly give the desired permission to marry.

Standard of Cure.—Almost every man who deals with syphilis has his own standard derived from some authority, and no man should attempt to set up a standard of his own without a vast experience. The army experience with this disease is very large and is more satisfactory than most private practice because the men are continuously under observation for several years. In 1911 the following standard was tentatively adopted:⁵⁴ One year without treatment, without any suspicious clinical symptoms, with a number of negative Wassermann reactions and no positive ones. This standard was soon shown to be insufficient, for it was found that cases could go for twenty-four months without symptoms and with a continuously negative Wassermann reaction and later develop a positive reaction, while many cases negative with the usual reaction would give a positive provocative Wassermann reaction. The standard was therefore changed as follows: One year without treatment, without any suspicious clinical signs, with several negative Wassermann reactions and no positive ones, and with a negative provocative Wassermann reaction and luetin test at the end of the year. This standard has been used for about five years, during which time the records of about 5000 completed cases have been received. However,

many of these cases were separated from the service before the period of observation was completed, many of them were old intractable cases from the start, and in other cases a sufficient attempt was not made to fulfil the standard of cure. However, about 120 cases have fulfilled this standard, and of these cases it may be said that in no case has there been evidence that the man was not cured, while in several instances there has been evidence that the man was cured, as shown by the fact that a new syphilitic infection was acquired. The writer believes therefore that this standard, while rather severe, is a very good indication of a real cure. As some doubt has been thrown on the specificity of the luetin reaction, this might be omitted from the standard, and a negative examination of the spinal fluid (cells, colloidal gold, globulin and Wassermann reaction) should be added, as experience has shown that positive results are obtained not infrequently from such examination of the spinal fluid even when all other tests are negative.

If our army experience is any indication of conditions in civil practice it seems probable that very few men will be able to fulfil these conditions. The difficulty in securing cures is due not only to the difficulty in curing the disease, which is admittedly great, but even more to the peripatetic habit of the average patient with venereal disease, which renders it impossible for the physician to follow the patient long enough to fulfil the conditions. This matter should be impressed upon the victim of syphilis at his very first visit. Most men expect to marry at some time in the future, and if the necessity of complying with such a standard before marriage is impressed on the patient, some at least may be able and willing to comply. The cost of the Wassermann examinations in cases so followed is considerable, and State and city boards of health can perform a most admirable service to the community by following these treated cases free of charge.

In regard to the men who cannot comply with a standard of cure it is the opinion of the writer that the physician must use his best judgment applied to the facts of the individual case. Permission to marry should be withheld until the man fulfils

certain conditions, and should only then be given accompanied by a warning that the marriage may not be absolutely safe. The rules formulated by Finger and already quoted seem excellent, except that the use of salvarsan and a negative Wassermann are not required by Finger. As thus modified these rules would be as follows:

1. A mild normal course of the disease.
2. An efficient course of treatment with both salvarsan and mercury in accordance with the best practice in the treatment of syphilis.
3. An interval of at least four full years between infection and marriage.
4. An interval of three years from the last syphilitic manifestation to marriage, with careful observation to determine the existence of symptoms.
5. A negative Wassermann reaction just before marriage, best confirmed by a test at a second laboratory to ensure accuracy.

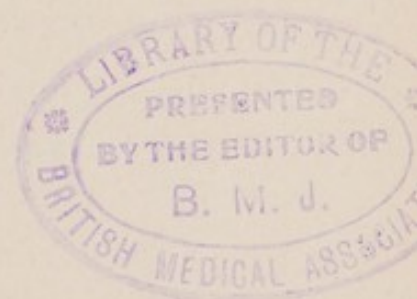
Wassermann-fast Cases.—If these cases comply with the other conditions just mentioned it is very probable that they might not infect either wife or children. In such cases the physician might reasonably take the position of advising against marriage, though not absolutely prohibiting it, pointing out to the patient the possible danger of aneurysm and cerebrospinal syphilis in later life. A most careful physical examination would be made to determine, if possible, the location and nature of the active focus of the disease giving rise to the positive Wassermann. Further, it can only be said that this examination and diagnosis, and the stating of the case to the patient in such terms that he can form an intelligent opinion of his own situation, and yet in such terms that he will not lose all hope and meditate suicide, will tax all the skill, ingenuity and judgment of the physician.

REFERENCES.

1. Marschalko: Reflexionen über die Prophylaxe der Venerischen Erkrankungen, München. med. Wehnschr., 1901, xlvi, 827.
2. Hutchinson, Jonathan: Syphilis, 1909, Cassell & Co., p. 16.
3. Freeland: Circumcision as a Preventive of Syphilis and Other Disorders, Lancet, 1900, ii, 1869.

4. Moyer: Circumcision in Restricting the Spread of Syphilis, Jour. Am. Med. Assn., 1901, xxxvi, 886.
5. Hutchinson, J.: Two Clinical Lectures on Primary Syphilitic Chancres, Lancet, 1900, i, 1575.
6. Breitenstein: Die Circumcision in der Prophylaxis der Syphilis, Dermat. Centralbl., 1902-1903, vi, 34.
7. Le Pileur: Les Préservatifs de la Syphilis a travers les Ages, Ann. des Maladies Vénériennes, 1907, ii, 501.
8. Butte: Deux Cas d'Infection Syphilitique malgré l'Emploi prophylactique de la Pommade au Calomel, Le Bull. méd., 1908, xxii, 114.
9. Behrmann: Die Prophylaxe der Syphilis bei Männern, Dermat. Centralbl., 1899, iii, 172.
10. Cohn: Zur Prophylaxe der Syphilis bei Männern, Dermat. Centralbl., 1899, iii, 237.
11. Richter: Zur Prophylaxe der Geschlechtlichen Krankheiten, Dermat. Centralbl., 1901-1902, v, 130.
12. Loeb: Ein Statistischer Beitrag zur Prophylaxe der Geschlechtlichen Krankheiten, Dermat. Centralbl., 1901-1902, v, 322.
13. Max, Joseph: Lehrbuch der Prophylaxe bei Haut und Geschlechtskrankheiten, 1894, Georg Thieme, Leipzig.
14. Guiard: La Prophylaxie Publique des Maladies Vénériennes par l'Immunization Préventive antiseptique des Prostitutes, Ann. de dermat. et de syph., 1901, ii, 1037.
15. Schaudinn and Hoffman: Vorläufiger Bericht über das Vorkommen von Spirochaeten in Syphilitischen Krankheitsproducten und bei Papillen, Arb. a. d. k. Gsndhtsamte., 1905, xxii, 527.
16. Metchnikoff and Roux: Études Expérimentales sur la Syphilis, Ann. de l'Inst. Pasteur, 1903, xvii, 809.
17. Metchnikoff and Roux: Études Expérimentales sur la Syphilis, Ann. de l'Inst. Pasteur, 1905, xix, 683.
18. Metchnikoff and Roux: Recherches sur la Syphilis, Bull. de l'Acad. de méd., 1906, lv, 554.
19. Maissonneuve: Expérimentation sur la Prophylaxie de la Syphilis, Thèse de Paris, 1906, Steinheil. See also Vorberg: Ueber Syphilis Prophylaxe, Med. Klin., 1916, ii, 733.
20. Levy-Bing: La Pommade au Calomel peut-elle Prévenir l'Inoculation de la Syphilis? Ann. des Maladies Vénériennes, 1906, i, 115.
21. Neisser: Die Experimentelle Syphilisforschung nach ihrem gegenwärtigen Stande, Verhandl. d. deutsch. dermat. Gesellsch., 1906, p. 83.
22. Metchnikoff: Rapport sur la Syphilis Expérimentale, Verhandl. d. deutsch. dermat. Gesellsch., 1906, p. 237.
23. Vorberg: Ueber Syphilis Prophylaxe, Med. Klin., 1906, ii, 733.
24. Neisser: Pathologie und Therapie der Syphilis, Arb. a. d. k. Gsndhtsamte., 1911, vol. xxxvii, chapter xv.
25. Hugel: Études Expérimentales sur la Syphilis, Ann. des Maladies Vénériennes, 1908, iii, 47.
26. Koch: Ueber Desinfection, Mitth. a. d. k. Gsndhtsamte., 1881, i, 234.
27. Wolfhügel and V. Knorre: Zu der verschiedenen Wirksamkeit von Carbolöl und Carbolwasser, Mitth. a. d. k. Gsndhtsamte., 1881, i, 352.
28. Gottstein: Sublimat-lanolin als Antisepticum, Therap. Monats., 1880, iii, 102.
29. Breslauer: Ueber die antibakterielle Wirkung der Salben mit besonderer Berücksichtigung des Einflusses der Constituenten auf den Desinfectionsverth, Ztschr. f. Hyg. u. Infectionskrankh., 1895, xx, 165.

30. Gaucher: Encore la Pommade au Calomel, *Ann. des Maladies Vénériennes*, 1906, i, 219.
31. Gerson: Bemerkungen zu dem Vortrag von E. Metchnikoff über Syphilisprophylaxe, *Med. Klin.*, 1906, ii, 467.
32. Bonnet: Sur la Prophylaxie de la Syphilis, Thèse de Lyon, 1904.
33. Wolbarst: A Contribution to the Subject of Syphilitic Prophylaxis by the Use of Calomel Ointment, *Med. Record*, 1908, lxxiv, 711.
34. Carle: Quelques Reflexions Prophylactiques Sanitaire et Morales, *Lyon méd.*, 1908, cx, 289.
35. Acevedo: Prophylaxe de la Syphilis, *Mal. Cutan. et Syphilitiques*, 1908, xix, 868.
36. Feistmantel: Der Persönliche Schutz vor Geschlechtlicher Infection, *Wien. med. Wchnschr.*, 1905, lv, 606.
37. Michels: Ein Beitrag zur Prophylaxe der Geschlechtskrankheiten, *Dermat. Centralbl.*, 1901-1902, v, 226.
38. Wickes: Venereal Prophylaxis, *U. S. Naval Med. Bull.*, 1907-1908, i-ii, 172.
39. Siebert: Zur Prophylaxe der Geschlechtskrankheiten, *Deutsch. med. Wchnschr.*, 1909, xxxv, 677.
40. Davidson: Venereal Prophylaxis, *The Military Surgeon*, 1912, xxxi, 195.
41. Ledbetter: Venereal Disease in the United States Navy: Prevention and Prophylaxis, *The Military Surgeon*, 1913, xxxii, 553.
42. Ashford, M.: Statistical Report of Venereal Prophylaxis, *The Military Surgeon*, 1914, xxxv, 9.
43. Cottle: Venereal Disease Aboard Ship, *Naval Med. Bull.*, 1915, ix, 571.
44. Riggs: A Study of Venereal Prophylaxis in the Navy, *Social Hygiene*, 1917, iii, 299.
45. Riggs: Prevention of Venereal Diseases at the Naval Training Station, Norfolk, Va., *U. S. Naval Medical Bulletin*, 1917, xi, 1.
46. Exner: Prostitution in its Relation to the Army on the Mexican Border, *Social Hygiene*, 1917, iii, 217.
47. Reasoner: The Effect of Soap on Treponema Pallidum, *Jour. Am. Med. Assn.*, 1917, lxviii, 973.
48. Brandweiner: Statistics of Venereal Diseases, *Arch. f. Dermat. u. Syph.*, 1908, xci, 9. Abstract in *Ann. des Maladies Vénériennes*, 1908, iii, 709.
49. Vedder: The Prevalence of Syphilis in the Army, *Bulletin No. 8*, War Department, Office of the Surgeon-General, 1915, p. 52.
50. Snow, W. F.: Public Health Measures in Relation to Venereal Diseases, *Jour. Am. Med. Assn.*, lxvi, 1007.
51. Cabot, Hugh: Syphilis and Society, *Social Hygiene*, 1916, ii, 347.
52. Fournier: Syphilis et Mariage, Paris, 1880.
53. Finger: Wann Dürfen Syphilitische Heirathen? *Heilkunde*, 1896, i, 338.
54. Nichols, H. J.: The Cure of Syphilis, *Bulletin No. 3*, War Department, Office of the Surgeon-General, 1913, p. 129.



CHAPTER IV.

PUBLIC HEALTH MEASURES.

"Myself when young did eagerly frequent
Doctor and Saint, and heard great argument,
About it and about; but evermore
Came out by the same door as in I went."

THE root of the venereal disease problem lies in prostitution. It would seem that pessimism or the habit of looking only on the dark side of things receives its justification here, for prostitution is a subject that appears to have no bright side. Nothing is more discouraging than the fact that after so many years of discussion and endeavor to deal with the problem we have made so little progress in practical methods of dealing with this ulcer of the body politic. The natural tendency is to turn from the discussion of such an unprofitable and disgusting subject, but since prostitution is the chief cause of the present prevalence of syphilis, any work dealing with syphilis and public health that omitted this subject would be incomplete. While the discussion of prostitution must necessarily be brief, an effort will be made to present sufficient facts to indicate the hopeful method of attacking this problem.

Prostitution is a sociological problem, and its eradication depends upon the study of the conditions operating to produce it and the adoption of measures that will remove these causes. But venereal diseases are a present menace to society, and the sanitarian wishes to know what practical measures he may take at once in regard to prostitution to limit the spread of these diseases. These are two different phases of the subject that should be discussed separately.

PROSTITUTION AS A SOCIOLOGICAL PROBLEM.

There is good reason to believe that sexual promiscuity is as old as the human race, since anthropologists tell us that

before the development of the family promiscuity was general, and our knowledge of the animals from which the human race developed appears to confirm this view. Therefore promiscuity or, at least, polygamy is biologically a natural condition, and monogamy has developed as the result of moral and economic considerations. But the latter have not as yet been sufficient to entirely restrain man from his tendency to promiscuity, and this is the ultimate cause of prostitution.

The origin of venereal diseases is shrouded in obscurity. Promiscuity among the animals is not productive of disease with the single exception of dourine, or so-called horse syphilis, which is a trypanosome infection transmitted by sexual congress. But it is useless to speculate upon the biological origin of venereal diseases. Gonorrhoea at least is known to have existed from early antiquity. Many have thought that syphilis was brought back from America by the sailors with Columbus and thence spread over Europe, but there is no proof that this view is correct. In no case has undoubted syphilis been demonstrated in pre-Columbian bones, while, on the contrary, there is considerable evidence that syphilis was common in Europe before the discovery of America but was not distinguished as an independent disease, being confounded with leprosy and other diseases. Mercurial inunctions were a popular form of treatment in Europe long before the time of Columbus, and it is difficult to understand to what their popularity was due if syphilis was non-existent. But while there are differences of opinion on this point which can hardly be regarded as settled, there are certainly grounds for believing that sexual promiscuity with its accompaniment of venereal disease has been with us since before the dawn of history. If sexual promiscuity ceased, gonorrhoea and syphilis would soon become extinct diseases. But since the human race has made so little moral progress in its long development through the ages it is hardly to be expected that a sudden revolution in morals will occur during the present generation.

This does not mean that we should not "hitch our chariot to a star." Ideals are our most precious asset, and it is well to have clearly before us the ideal of a community free from vice, and the education of a new race of men who will have

the same standard of sexual purity for themselves as for the women they expect to marry. But it is well to remember that such high ideals are only slowly realized, and that in the meantime we are compelled to live in the world as it exists today.

Sociological Reform.—Since the *raison d'être* of prostitution is to be found in the biological origin of the race and the struggle between a perfectly natural appetite and moral and economic laws, it follows that any conditions that make marriage easy will proportionately reduce prostitution, while those social conditions that make marriage difficult or defer the age of marriage encourage prostitution. In primitive communities where marriage occurs at an early age prostitution is almost unknown. When the community becomes more complex, as in cities, the age of marriage is almost always deferred. The man who derives his living from the soil in a country where land is easily obtainable may be economically independent and may marry at the age of twenty or earlier. In the city a long period of intensive education becomes necessary before economic independence can be achieved, and the age at which marriage is possible is deferred for from five to ten years. Reproduction is a physiological possibility at a very early age (puberty), and if governed solely by physiological laws would normally occur not much later than eighteen years of age. The perpetuation of the species is not dependent on the whims of individuals, but is ensured by means of a most imperious instinct, the sex appetite. This appetite is far stronger in the male than in the female, and hence we find that it is almost always the male who seeks his mate. If this instinct were promptly obeyed in a legitimate way, marriage would generally occur somewhere between eighteen and twenty years of age. But physiology and sociological conditions are not on speaking terms and make their arrangements quite independently, and as both are equally imperious and exigent, prostitution is the natural result. The demand on the part of the male creates the supply and will continue to do so until, as the result of education to a higher moral plane or changed economic conditions, the demand ceases.

It is frequently stated, and very generally believed, that

women are driven into prostitution because they are not paid a living wage. This may occasionally be a cause of prostitution, but it is a very minor cause, as shown by investigations into the previous occupations of prostitutes. Stromberg found that out of 462 prostitutes there was not a single case in which the economic cause was the determining factor. Welander in his studies of prostitutes in Stockholm found that 60 per cent. of them were previously in domestic service and were in comfortable circumstances. Leonhard's examination of the records of 600 prostitutes in Düsseldorf failed to establish poverty as a reason for prostitution. Kneeland found that at the Bedford Reformatory out of 279 cases economic conditions were thought to be responsible for the adoption of a life of prostitution in only 19 cases.¹

We see, therefore, that very few prostitutes allege poverty as a compelling cause. A very large percentage come from the ranks of domestics, who may not be richly paid, and whose hours of labor may be hard, but who are at least fed, clothed and housed and cannot have been driven into prostitution by destitution. There may be a thousand contributing causes, including the fact that many girls who are mentally deficient or morally weak find this life an easier mode of support than more legitimate occupations; but the essential cause is the demand on the part of the male that his sexual appetite be satisfied, and as legitimate marriage is impossible, prostitution, the white slave traffic and venereal disease are the natural consequences.

That prostitution is supported almost wholly by the unmarried is shown by the following figures compiled by Brandweiner:²

MALES.

Disease.	Total.	Single.	Married.	Widowed or divorced.
Chancroid . . .	980	895	75	10
Gonorrhœa . . .	1365	1179	162	24
Syphilis	2264	1962	270	32

FEMALES.

Disease.	Total.	Single.	Married.	Widowed or divorced.
Chancroid . . .	941	906	29	6
Gonorrhœa . . .	1670	1618	43	9
Syphilis	2900	2660	210	30

We have already seen that the great majority of venereal diseases are derived directly from prostitution, and the prevalence of these diseases among the single is a sure indication that it is the unmarried who turn to prostitution. The fact that the greatest incidence of venereal diseases is between the years of twenty-one to twenty-five indicates that it is just during these years, when marriage should have occurred, that most of the exposures have taken place.

Further evidence that the prostitute draws her clientele chiefly from the unmarried may be found in statistics presented by Snow.³ During one year 369 new cases were classified in a Boston dispensary for venereal diseases, with the following result: those single under twenty-one years comprise 23.5 per cent. of all cases, single over twenty-one years 65 per cent. of all cases, so that 88.5 per cent. were single. The married under thirty years furnished only 6 per cent. and over thirty years 5.5 per cent., so that the total married cases were 11.5 per cent. In the same article it is shown that the source of infection in 55.5 per cent. of cases is the prostitute; that domestics, friends, working women and unknown sources were responsible for 42.4 per cent., and that only 1.5 per cent. of the cases of venereal disease were traceable to adulterous relations with married women.

If this statement of the cause of prostitution is correct it affords little hope that this evil will be eradicated in the near future. Numerous writers have advised that earlier marriages should be encouraged. This is much like encouraging us to keep cool in the summer with the thermometer at 95° or advising a sick pauper that a sea voyage would benefit him. Earlier marriage, however desirable this may be, will hardly be made possible without a radical change in economic conditions. Incidentally it may be emphasized that sanitation is more closely united with economic problems than is generally realized. If we study tuberculosis or infantile mortality in the cities we at once encounter the housing problem. Overcrowding in the cities will have to be prevented and suitably spacious habitations provided before these and other diseases can be reduced much below their present levels. Malaria in the South resolves itself into

communities too poor to provide proper drainage and screening or to secure proper treatment. The eradication of beri-beri in the Orient is purely an economic problem, entailing the substitution of undermilled rice or other beri-beri-preventing foods for the too exclusive use of the highly milled and beri-beri-producing rice, which for the most part is eaten because the natives are too poor to purchase a more liberal diet. Economic changes are in the air, and the time may come sooner than we expect when there will no longer be any abject poverty, with its accompaniment of disease, and conditions may then become so changed that young people can marry earlier. In the meantime the sanitary officer cannot expect any assistance from this direction.

Even granted that marriage must be delayed, prostitution would be eradicated if we could educate our young men to abstain from irregular sexual relations before marriage, and this brings us naturally to the subject of education.

Education.—The proper type of education is of the greatest value in the prevention of immorality and of venereal diseases. But in recent years the idea has developed that general sex education of the young, and particularly instruction as to the nature and consequences of venereal diseases, would prove efficacious. Anyone who opposes sex education of the young today is in danger of being classed as a dangerous reactionary, yet I feel sure that unless this instruction is properly given, which is most difficult, that it will do more harm than good. Some of it excites morbid curiosity, and there is a peculiar twist to human nature that drives most of us to want to do anything that we are specifically charged or advised not to do. The general reluctance of parents and teachers to discuss sex matters with the young is ascribed by many to prudery, but I believe, on the contrary, it is a safe instinct to follow. Experience indicates that there is more venery among Latin races, among whom discussion of sex topics is more or less open, than among Anglo-Saxon races, where the sex topic is taboo and where jokes such as are freely published in *La Rire* would cause the suppression of the journal.

Admitting that a certain amount of sex information is

desirable for children, it should be supplied by parents, and such instruction has no place in schools below the rank of colleges.

Mr. Mark Sullivan wrote in *Collier's* as follows: "It seems clear that experience so far shows that the whole problem of sex had better be approached in the spirit of personal reserve that we associate with the better sort of home life rather than in the spirit of eager curiosity and practical experimentation that we associate with the school. . . . Any system of instruction which gives a knowledge of sex hygiene merely as mechanical knowledge will be a great mistake. Any instructors given this responsibility must have the spiritual force to conquer these problems and the personality to compel their pupils to reverence. Anything less will be instruction for dogs, not for human beings." To these sentiments we unhesitatingly subscribe.

The idea that sex education will prevent venereal diseases is based upon the belief that men did not realize the dangers of infection, and in instructing young men efforts have been made to depict the most frightful ravages of venereal diseases with the purpose of instilling a wholesome fear. It seems to me that such efforts are futile. There is plenty of evidence to show that even one attack of a venereal disease does not act as a deterrent to future immorality, and medical students who are presumably informed are no more moral than other members of the student body. The average youth knows the danger of infection, but he either ignores it or is sufficiently egotistic to believe that either he or his mistress is different, and that he will escape the contagion that is visited upon weaker vessels. We have already discussed this subject in a previous chapter, and concluded that fear is a poor deterrent.

For these reasons no great results can be expected of such sex education. The only education that will effect a reduction in immorality is the education that forms character and, as Huxley says, "Molds the desire to live in accordance with the laws of nature." Such education we have always had. It is true that such education has often been insufficient in quantity, while some individuals have escaped it entirely, and that we must do all in our power to increase the facilities

for such education. But it is hopeless to expect that any great immediate reduction in the amount of immorality and the number of venereal diseases will be effected by our present attempts in that direction.

THE CONTROL OF VENEREAL DISEASES.

At the present day the sanitarian is confronted with the problem of the present prevalence and dissemination of venereal diseases, the magnitude of which we have already partly seen. Faced by this problem the sanitarian may take the attitude of the ostrich or that assumed by Mr. Podsnap and refuse to entertain the disagreeable topic. Or he may proceed to take active measures against the evil. In either case the sanitary officer will be criticized, and knowing that this criticism will be aimed at him, his position must be carefully thought out, and he must be convinced that the measures he proposes to take will be efficient, will be practicable and will not be immoral. How shall he deal with prostitution?

In the first place it is apparent that though he may be in sympathy with economic and moral reform and may do all in his power to further it, his problem is not the eradication of prostitution but the limitation of venereal disease. Prostitution is a sociological problem that is only to be solved with time and the evolution of the community to a higher moral plane. In the meantime the sanitary officer wishes to take some steps toward reducing the prevalence of venereal diseases, and his only dealings with prostitution are directed toward that end, though the measures he adopts should not be out of harmony with the aspirations toward social reform.

In the past, reformers and sanitarians have been able to find no common ground upon which to stand in dealing with this question. This is not only because there are at least two sides to every question, but because our conception of the problem and the attitude we take toward it is inevitably based quite as much upon our feelings and our training as upon cold reason. There are inevitable differences of opinion with regard to ethical questions, and it need cause no surprise, therefore, that there have been differences of opinion in regard

to the morality of various measures that have been applied to prostitution for the purpose of reducing the venereal infections. The practical sanitarian is inclined to insist that we must strip the question of its moral aspects and treat venereal diseases like any other infectious disease. The moralist replies that this cannot be done, and it appears to me that both are only half-right.

Venereal diseases are not like other infectious diseases because they do involve a moral principle. It is often argued that this does not hold because there are a large number of innocent infections with both syphilis and gonorrhoea. The percentage of innocent infections is not absolutely known, but granting, for the sake of argument, that 50 per cent. of the venereal infections are innocently acquired, how can we ignore the moral side of the question so long as the remaining 50 per cent. are due to immorality? Moreover, every case of venereal disease is at most but two or three removes from immorality. The wife suffers from an innocent infection, but the husband acquired the disease directly as the result of illicit intercourse.

Yet those who confine themselves to high moral concepts without suggesting any practical method to help their fellow-sufferers are equally in the wrong. Neglect to act is quite as culpable as an erroneous action, as is illustrated by the priest and the Levite who went by on the other side. With these as our principles, what measures can be taken to reduce the venereal disease that results from prostitution?

Excluding sociological reform, with which the sanitarian is not immediately concerned, there are apparently only four ways of dealing with this problem, namely, *laissez-faire*, suppression, regulation and a method that has never yet been tried, the systematic treatment of all infected.

The practice in this country has in general been confined to *laissez-faire*, varied by spasmodic attempts at suppression. This policy is responsible for the present prevalence of venereal diseases, and since we are attempting to improve this situation, and since it can hardly be called a policy but is rather the result of indifference, it is unnecessary to consider this method further.

Suppression.—At the present stage of our sociological development, suppression does not, and probably cannot, suppress. Virtue cannot be secured by legislation, and efforts to change morals by legislation will fail so long as public opinion does not support them. Instead of correcting the abuse aimed at, such laws frequently result in the dissemination of immorality and vice, the corruption of the police, and the failure to enforce the law breeds contempt for it. Those who believe in suppression do not deny these general principles. They reply that laws against murder do not prevent murder entirely, but they do make it less frequent and help us to punish it when it does occur. Repressive ordinances against prostitution, while not suppressing it entirely, drive the traffic into obscurity and reduce it to a minimum. Vice is not flaunted in public but is driven into corners where the vicious will find it, but where it will not entice the innocent and unwary.

I believe this argument loses sight of the fact that we can only have laws enforced in so far as they are in accord with public sentiment. The law against murder is an accurate expression of public sentiment, and yet it lags in its execution, for it is only the exceptional murderer who is detected, and when detected he frequently escapes conviction, and after conviction he is often pardoned. Can we say that even this law is well enforced? The enforcement of laws that, on the contrary, are written on the statute books in defiance of public sentiment is a scandal. The law against Sunday opening of saloons in a city where the majority of the population want them open is never enforced except by an occasional spasm. Laws or regulations for the suppression of prostitution are necessarily enforced in the same spasmodic way, for while we may not like to admit it, the demand for the prostitute is quite as strong as the demand for liquor.

In the Chicago Vice Report it is estimated that 1012 women on the police lists received over 15,000 visits a day, or 5,500,000 a year, and these women constituted only one-fifth of the professional prostitutes of Chicago. If the average continues then the 5000 prostitutes of Chicago were receiving more than 25,000,000 visits a year. And these professionals

did not begin to represent the whole illicit traffic of the city, as it is admitted that clandestine prostitution and occasional vice were beyond all measurement. This gives some idea of the enormity of the impulse and demand behind the social evil, which it is proposed to repress and ultimately to annihilate. As the Commission states: "So long as there is lust in the hearts of men it will seek out some method of expression. Until the hearts of men are changed we can hope for no absolute annihilation of the social evil."

We can judge of the effect of suppressive ordinances by observing the effects of the prohibition of liquor. William Allen White, in a discussion on prohibition in Kansas, in which he concludes that prohibition is a success, says: "Prohibition, of course, does not prohibit. Nothing has hurt the cause of temperance in this country so seriously as the delusion that a law on the statute book will prohibit the sale of liquor in a city, a county or a State. A prohibitory law only gives men and women who desire prohibition an opportunity to secure it by long years of wise, brave, hard work."

Even less is to be expected from the attempt to suppress prostitution, because while the fight on liquor has been conducted in the open, with all the great assistance of the widest publicity, the campaign against prostitution has never as yet been given this wide publicity. It is a filthy subject, avoided by all public prints and by most of the people who unhesitatingly enter the fight against the liquor traffic. If therefore we are not ready to enter a long and hard campaign against prostitution, laws for suppression cannot be enforced, and if not enforced, they amount to no more than *laissez-faire*.

Spasms of virtue on the part of a community do harm rather than good, because nothing is accomplished either for morals or hygiene by transferring immorality from the brothel to the street and stopping there, while under these conditions many people actually delude themselves into the belief that something definite has been accomplished.

The recent experience of the city of Washington is a concrete illustration of the force of this argument. A notorious red-light district had existed in one of the most public and

frequented portions of the city for many years. Congress decided that this state of affairs should not continue, and on February 7, 1914, passed the so-called Kenyon law, an act to enjoin and abate houses of lewdness, assignation and prostitution. As the result of this act the red-light district was wiped out, but no provision was made to supply a legitimate occupation for the inmates. When the bill went into operation most of the prostitutes took a train out of town. No one seems to have questioned the morality of unloading undesirables upon a neighboring community. But most of these women took a return train to Washington and are now scattered throughout the residential districts and in apartment houses. Physicians and police officials who are in a position to know assure me that there are just as many public women in Washington today as before the district was closed. Nor has venereal disease been perceptibly diminished. The various specialists in these diseases see the same number of cases now as formerly, and in the army posts near the city, where the men who expose themselves are required to report at the hospital for prophylactic treatment, there have been just as many prophylactic treatments given as before the district was closed.

It appears logical to conclude that the sanitary officer should not oppose efforts directed at the suppression of prostitution, especially when such efforts represent the moral sense of the community and not only the desires of a few reformers. But he is under an obligation to point out that such efforts have usually failed, that they are sure to fail unless the public will insist on and work for the enforcement of the law, not for a few weeks or months but continuously. And, finally, he should insist that as even rigid enforcement of the law cannot be expected to eradicate either clandestine prostitution or immorality, that there should be ample provision for the diagnosis and treatment of venereal diseases, particularly syphilis.

For the eradication of prostitution we must wait until humanity has been educated to that moral plane where sexual appetite shall be brought to heel by an inflexible will acting at the behest of high morality. Granting that educa-

tion may eventually result in such sociological progress, this result will only be obtained in the distant future. In the meantime, prostitution is to remain with us, its prevalence little if at all diminished by repressive measures. What possibilities lie in regulation?

Segregation and Reglementation.—It is obvious that regulation cannot be attempted in the presence of repressive measures, since regulation presupposes the recognition by the law of a traffic that while obnoxious cannot be suppressed.

At the outset it may be safely stated that, reviewing the history of prostitution, and the sanitary measures taken to prevent venereal disease as a result of prostitution, "practically every attempt to control either the one or the other, whether by segregation, medical inspection or by whatever means attempted, has been a fiasco." This fact is generally admitted, and is clearly brought out in Abraham Flexner's work on *Prostitution in Europe*.

Flexner and others believe that this failure is inherent in any attempt to regulate prostitution. It is therefore pertinent to raise the question whether this is the case or whether the failure in the instances cited was not due to the method in which regulation was applied.

In order to answer this question it is necessary to consider the criticisms that have been directed at the various systems that have been adopted. These may be considered in the following order:

I. Criticisms of the manner in which regulation has been applied.

1. Because the medical inspection and control of prostitutes has been so superficial and inadequate as to be a farce. Thus Flexner says with regard to the Paris examination: "All day long a dismal succession of groups of abandoned women file into the rudely equipped rooms, in which two physicians ply their repellent task perfunctorily. A line is formed; with open jaws and protruding tongue they march rapidly past; the doctor uses one spatula for all, wiping it hastily on a soiled towel from time to time. This finished, the same group in quick succession ascend two surgical chairs to permit a cursory vaginal inspection; the physician, station-

ing himself between them, loses no time, for one woman is assuming the recumbent position while he is engaged in the examination of another; he switches back and forth as rapidly as the women can get up and down—indulging in good-humored and sometimes unseemingly jocularities as the work proceeds. Of the two physicians employed on the occasion of one of my visits, one used a rubber glove, the other a rubber finger—in both cases the same for all; though wiped on a towel from time to time, neither was changed or cleansed. On one occasion I observed one of the physicians examine twenty-five to thirty girls without changing, washing or wiping the rubber fingers he wore, and a number of those examined were adjudged “diseased.” The speculum was rarely used. In one instance pressure by the finger on the urethra discharged an abundant suspicious secretion; the same finger, unwashed, was used in examining the next case; in another instance the same rubber finger was used on the genitalia and about the mouth. The inspections consumed from fifteen to thirty seconds each. “For vaginal examinations,” so read my notes made on the spot, “it takes less time to examine one woman than it takes another to mount the examining chair and offer herself for examination, despite the fact that her clothing has been adjusted before entering the room.”

This is medical inspection at its worst! As Flexner says, the clinical method is utterly incompetent to detect any considerable portion of infectious disease. “Güth tells of a series of cases, 35 per cent. of which showed clinical symptoms of gonorrhoea; the microscope showed 90 per cent.” “Dr. Möller, of Stockholm, states that in 1874, 19 cases of gonorrhoea were found among 298 prostitutes by clinical methods (6 per cent.); partial use of the microscope in 1904, with 408 registered women revealed 749 cases, or 174 per cent.”* “This being the result of incomplete use of the microscope, to how much infection did the privileges conferred by regulation lead in Cologne in the year 1905, when among 2048 prostitutes examined in the course of the year

* Many of these women must have been found positive repeatedly.

148 (*i. e.*, 7.2 per cent.) were pronounced venereally diseased? Or at Vienna, when, out of 2116 enrolled women, 87 were found to be suffering with gonorrhoea and 162 with syphilis in the course of the year 1907."

These criticisms are all justified. The fact is that medical inspection and regulation as it has been practised in the past has generally been utterly farcical and inefficient. The bad results obtained from this inefficient regulation should not, however, close our eyes to the fact that an efficient inspection is possible at least so far as the medical side of it is concerned.

Thus, in some other cities Flexner found the inspection to be much more efficient. In Berlin, Flexner says, "Women under control are required to report to police headquarters for examination twice weekly if under twenty-four years of age; once a week if between twenty-four and thirty-four years of age, and fortnightly if over thirty-four. In addition, the inscribed or controlled prostitute is reexamined whenever arrested for any offence, regardless of the date of her last or her next regular examination. Clandestine prostitutes may be subjected to compulsory examination at the discretion of the bureau chief, the examination being conducted by a woman physician attached to the division for this purpose. By special request an examination by an approved private physician may be substituted. In either event the woman herself is at no expense for the examination.

A staff of eight police physicians and four microscopists are occupied with medical inspection, of whom four are on duty at one time; the work goes on daily, except Sunday, from nine to twelve o'clock and from twelve to three. The examination consists of a clinical inspection and the use of the speculum. For the detection of gonorrhoea, microscopic examinations of the secretions are made fortnightly in case of women under thirty-four; monthly, in case of older women. At any time, however, when appearances are suspicious, the physician is instructed to ask for microscopic examination without waiting for the regular day. Female assistants are provided for this work; the word of the assistant is sufficient in case the microscopic preparation is found to

be negative; the physician must by his own observation confirm a positive result. The medical policy of the police department is directed by a physician who holds the rank of commissary, the sole instance in all Europe of medical control of what is admittedly a sanitary matter.

Inscribed women discovered to be infected are confined under duress in a municipal hospital, on the theory that, being professional prostitutes, who can maintain themselves only by plying their business, they must be interned in order that the carrying on of their business may be temporarily suspended. In very rare cases, however, even when found to be diseased, they are permitted to retain their freedom provided an approved physician makes himself responsible for their systematic treatment, and provided, further, that there is reliable evidence to show the possession of resources which will enable the women in question to keep their engagement to refrain from plying their vocation for the time being. Women are also at times released from the hospital on condition that they report at intervals for further treatment; should this understanding be violated they are once more interned.

Clandestine and occasional prostitutes if found diseased on being arrested are somewhat differently managed. If without resources they are sent to the hospital; but the bureau chief may, in his discretion, permit them to remain at large on condition that they place themselves in charge of a competent physician. It is, however, admitted that pledges, whether given by clandestine or registered women, are not to be relied on.

At both hospital and police headquarters in Berlin conscientious and intelligent efforts have been made to provide satisfactory arrangements. Registered and non-registered women are scrupulously separated at every stage, on the ground that the latter group may contain young, innocent or, at least, not yet hardened persons, who should not be further contaminated by the carelessness of the State. Premises not adapted to this end have therefore been extensively remodelled. The rooms utilized for the medical examinations at the police headquarters are light and equipped with a

modern examining chair, hot and cold water, and electric light; the microscopic room has the necessary equipment for clean and accurate work. The hospital, though old and small, has been latterly renovated and its staff reorganized. The present medical chief of police division in charge of venereal disease is a specialist of distinction, who has made important contributions to the literature of the subject on both medical and sociological sides. The division possesses an excellent laboratory manned with trained assistants; and it is properly equipped with microscopes, culture ovens, animals for experimental purposes, etc. Patients are examined separately in a clean, well-lighted room, containing all necessary paraphernalia. Women at different stages of demoralization—registered, non-registered, first offenders—are scrupulously kept apart; clean and orderly as the women are in appearance, there is nothing in their demeanor or surroundings to suggest prison confinement.”

“The quality of the examination varies widely. At Berlin, typical of the four best, clinical inspection is made of the mouth, hands, feet and other external surfaces; the genitalia are invariably explored with the speculum; microscopic examinations for gonococci are made fortnightly, or oftener in suspicious cases. The magnitude of the work may be roughly indicated as follows: On the basis of 3500 inscribed women, each examined twice weekly, 28,000 clinical examinations would be made monthly—3500 by each of the eight physicians. As a matter of fact the figures are smaller, since biweekly examinations are required only of women under twenty-four. It would be nearer the truth to estimate that each physician makes from 1500 to 2000 clinical examinations monthly. In August, 1911, each of the four assistants made 2646 microscopic examinations for gonococci, an average of 98 for each working day. It is estimated that, on the average, three minutes are available for the examination; but as this takes no account of time lost, the actual duration of the operation is much less. Women sent to the hospital are discharged only after three successive negative findings, followed by an examination at police headquarters confirming this result.”

This may be taken as an example of medical inspection and regulation at its best in Europe. It is noteworthy, however, that no mention is made of the Wassermann reaction. If this is not performed, obviously the greater number of cases elude detection, even with such a well-conducted system of regulation. Moreover, the time allotted to the examination of each patient is insufficient.

2. Not all of even the registered prostitutes are examined. Many absent themselves. Thus: "In Stockholm Möller found that of 857 controlled women 286 were missing after one month, 109 more after two months, 100 more after three, 76 more after four; at the close of the fifteenth month 5 per cent. were left."

"A cursory inspection of police records at Bremen showed me that with few exceptions a woman was rarely on the rolls longer than a few months."

"Of 629 women newly inscribed in Breslau during the year 1886, 147 dropped out in the first year, 94 in the second and 80 in the third."

"In addition visits are frequently missed, so that those who remained on the rolls are examined less frequently than the regulations require."

3. Only a few of those actually found to be diseased are withdrawn. "The examining physicians realize the slipshod nature of their work. A suspicious secretion having been noted by a bystander in the case of a woman pronounced well, the physician was asked how he knew. He shrugged his shoulders; I don't know, but there is no way to tell. If we kept cases like that we'd keep over half. We can't keep them—we haven't space—though we aren't sure that they are well."

"On the occasion of my visit to St. Lazarre 170 venereal women were confined there, and I was informed by the chief clerk that this was a fair average; these are the scapegoats for the venereal disease in circulation among the prostitutes of the French capital. Assuredly the temporary withdrawal of 170 infected women from the thousands with whom Paris teems is utterly without influence in the long run, more especially as these women are themselves turned adrift

before their infectiousness has passed. Regulations of this type have less effect in reducing disease than a rainy night, or a spurt of police activity."

4. Even if detected and detained, prostitutes are not detained long enough to render them non-effective.

In regard to the above criticism we find among others the following: "Dr. Commenge, head of the Paris Bureau, reported to the Brussels conference that in the two decades between 1877 and 1897, 15,095 syphilitic prostitutes were confined in St. Lazarre, an average of thirty days each. In Vienna between 1893 and 1896, cases of gonorrhoea were detained from eighteen to twenty-one days and cases of syphilis from twenty-one to twenty-seven days. The police bacteriologist of Budapest states: 'One and the same prostitute might come into the hospital repeatedly for the same infection. We know that syphilis lasts for years; it is undeniable that since the hospitals are crowded and the beds therefore insufficient in number, prostitutes are obliged to leave before they are cured; syphilitics are kept at least three weeks, gonorrhoeics at least two.'"

II. Faults which, if they exist, are inherent in any system of regulation.

1. One indictment against regulation is the statement that it promotes irregular intercourse because of a widespread impression that it is safe. Indeed, if the regulation is inefficient, as has practically always been the case, that venereal diseases may be actually increased as the result of the increased indulgence following this false impression of security. Thus Flexner says: "The complacent attitude toward indulgence implied in the mild effort made by the State to remove or reduce its dangers indubitably diminishes internal inhibition on the part of the male. Nothing is more certain in the domain of effort and ethics than that good conduct is largely the response of the individual to the expectation of society. Men can because they think they can. Social stigma is a most powerful deterrent; social assent a powerful stimulus. Regulation implies the absence of any expectation of male self-restraint; it is society's tacit assent to laxity. Nay, more, it is an invitation to laxity in so far as it deprives

dissipation of one of its terrors, for the existence of medical regulation must be interpreted as employing a certain degree of efficacy in the attainment of its object. There can, therefore, be no question that State regulation of vice increases the volume of irregular intercourse, and the number of those who participate in it. Certain it is that the notion that male self-control is both possible and wholesome has spread *pari passu* with the attack on regulation and with the elevation of the status of woman that invariably accompanies this movement."

2. A second serious objection urged against relementation is that minors cannot be inscribed and regulated.

"Immoral girls still in their minority are at once the most attractive and the most dangerous prostitutes; ignorant and reckless, they are quickly infected and their infection is distributed to a larger clientele. How many infecting foci escape sanitary control by the exclusion of minors a few figures will make clear. Out of 4341 cases of obviously infectious syphilis in Viennese prostitutes, 44.9 per cent. were between fifteen and twenty years of age, 38.1 per cent. between twenty-one and twenty-five.

"The chief physician of the Vienna police, in 1908, gave a most striking proof of the collapse brought about by excepting minors for regulation, as he admitted must be the case: in 1900, 329 prostitutes were newly enrolled, 303 of whom (92.2 per cent.) were between fifteen and twenty-five years of age; in that year 2686 cases of venereal disease were detected among inscribed women. In 1907, 83 prostitutes were newly enrolled, of whom 63 were between fifteen and twenty-five years old; 426 venereal cases were discovered in that year. In the same measure as the enrolment of minors declines the total amount of disease discovered declines correspondingly."

3. A third serious objection brought against regulation is that under any system the registered prostitutes form only a small portion of the total army of prostitution. Clandestines are not affected. Flexner says (page 243): "I have repeatedly pointed out that on any rational definition of prostitution the total army of prostitutes is many times as large as the registered portion. Most of these women ply

their business unhindered. Having had precisely the same history as the registered women, and conducting their affairs with similar promiscuity, disease is of course equally rife among them. Yet so long as they conduct themselves with discretion they are free from public interference; in towns where compulsory enrolment takes place (*e. g.*, Berlin and Hamburg) they must be thrice warned before they are arrested and compelled to submit to medical examination with a chance of compulsory registration; elsewhere, as at Bremen, Munich, Stuttgart, etc., they are, if arrested for disorder, medically inspected, but are in no event compelled by forced inscription to submit to regular examination afterward. Thus only the disorderly clandestine or non-inscribed woman is ever anywhere inspected at all. The cautious street-walker and fashionable and showy women who in Berlin frequent the Palais de Danse are never inscribed, despite their notorious character. Women of the latter type are, in fact, nowhere enrolled, yet they do a large business, dangerous not so much on account of syphilis, which is with them long since a matter of the past, as on account of gonorrhoea from which they are chronic sufferers. How much disease regulation in one way or another thus permits to go untouched among the non-inscribed is made clear by the amount of disease detected among the small part of clandestine or non-registered prostitution that the police lay hold of. A single clinical examination of each of the 12,825 non-inscribed women arrested in Berlin in five successive years (1903-1907 inclusive) showed 17 per cent. venereally diseased; of 1514 arrested in 1909 and 1910, 421 were diseased. At Cologne the percentage is much higher; 660 non-inscribed women were arrested in 1906, 178 were infected; 1626 were arrested in 1911, 304 were infected. At Vienna 1319 such arrests were made in 1910; 222 cases of infection were discovered among them. It must be emphasized that the police surgeons get hold of these women, not because they are diseased, but because they are disorderly. Had they remained sober and quiet, regulation would have permitted them to continue undisturbed in the work of spreading infection, precisely as it does not touch the thousands of others, who, however

diseased, are careful to keep the peace. The amount of disease thus surprised is interesting as a symptom of the vastly larger amount that wholly eludes observation; and, finally, the disease thus detected is—like the disease occurring among inscribed women—but a part of that actually existing among those examined; and like all the rest, is readmitted to circulation while still infectious after an inadequate period of detention.”

4. A fourth objection against regulation is that only the female prostitute is regulated. Under all systems that have been tried the male offender escapes scot-free.

Thus Flexner says: “A final absurdity remains to be pointed out. What can it avail to incarcerate for brief periods a few unhappy women if meanwhile the manufacture of fresh foci of infection proceeds unhampered? So long as regulation completely omits men, new sources of infection are produced far more rapidly than by any known method they can be eradicated. A vicious circle exists. Men infect the beginners—themselves at the time out of reach—who in their turn infect other men. I pointed out in the opening chapter that prostitution is a concept involving two persons. Logic and justice alike require that both parties be considered as equal partners in the act; and in no respect is it more completely impossible to omit either of the two essential factors from the reckoning than in the matter of disease. Society has chosen to overlook the man, but Nature has righted the balance by impartially distributing disease and suffering; nor will she permit herself to be outwitted by any one-sided scheme, even though it be far more extensive and efficient than regulation has thus far anywhere been.”

5. Another objection often urged against regulation is that it is an unwarranted invasion of personal liberty. By what right do we subject women to a compulsory physical examination, and what guarantee have we that innocent women and girls may not by some combination of circumstances be subjected to this indignity?

6. A sixth and most serious objection is that it is claimed that regulation makes the State a partner in immorality. From the moral point of view the city simply becomes a high

class procurer. This objection is most difficult to answer, and is the main reason why regulation has seldom been adopted in this country.

There are answers to this objection, but they fail to satisfy the moral sense of the community. Every objection that has been raised can be answered. To those who object that regulation discriminates against the woman and allows the male to go free, it may be answered that the man who goes to a bordel is not a prostitute any more than a man who buys a ring at a jeweller's shop is a jeweller. The essence of prostitution is the making a business of the traffic, and this the woman does and the man does not. Of the total number who visit these places only a certain percentage are habitués, and the remainder are occasional visitors or perhaps never go more than once or twice.

There is no question of a double standard of morals. The man who purchases may be no better than the woman who sells so far as this offence is concerned. But the man sins occasionally, the woman sins habitually as a matter of business. In regulating prostitutes and not the men there is no intention to discriminate against the woman, but she is regulated because she has a place of business, and it is possible to reach her while it is impossible to reach the man. When we attempt to regulate the liquor business we regulate the saloon, but we do not attempt to regulate the individual purchaser. The moral side of the question is not considered, but we can reach the seller while it is difficult or impossible to reach the buyer.

The faults that have been found with the medical service of inspection have undeniably existed. But they are not necessary. Theoretically it would be easy to describe a satisfactory and efficient method of medical inspection. It would, however, be very costly, and it is doubtful whether the community would bear the expense of a properly conducted inspection.

Discussion might be endless, but it is stale and unprofitable. Systems of regulation have not worked in the past, and while it cannot be denied that this is no proof that they cannot be made to work, it constitutes weighty evidence in favor of the

belief that with our defective organization and human frailties they will not work in the future either. Add to this the undoubted fact that the moral sense of the community is opposed to regulation, and the situation becomes such that the sanitary officer might as well abandon any intention to establish such a system, even though he personally may believe in it.

Treatment.—If it is true that suppression will fail to entirely suppress prostitution, then even though this method is adopted by the community it must be combined with a systematic effort to treat those infected if the prevalence of venereal diseases is to be appreciably diminished. If in addition it be granted that regulation is impossible and sociological reform a matter of gradual evolution, we are logically driven to accept systematic treatment as the only method left to the community to reduce the number of venereal infections, and particularly the number of syphilitic infections with which subject this work deals.

Moreover, in addition to being the only method available it is the most hopeful method for several reasons. It is the one method upon which everyone, whatever their moral beliefs, can agree, for the morality of the healing of the sick is above suspicion, and no one will challenge the morality of the attempt to treat all venereal diseases. From the sanitary point of view the treatment of the infected is perhaps the most efficacious single method that can be applied. It is obvious that if all infected individuals are rendered incapable of transmitting their infection the disease will disappear.

To accomplish this end, systematic treatment is necessary. Syphilis has been treated for hundreds of years without accomplishing anything from the sanitary point of view, but the disease has been treated spasmodically and inefficiently. The individual patient has or has not received proper treatment—and usually has not—because he has been too ignorant or too poor to pursue a proper course of treatment. We cannot rely on the efficacy of treatment given under these circumstances and cannot expect that any appreciable reduction in the number of new infections will result from treatment so pursued. It is certain therefore that if anything at all is

to be done a collective effort must be made by the community to accomplish the effective treatment of venereal diseases, particularly syphilis. We are in a better position to do this than ever before, because our knowledge of the etiology of syphilis is now sufficiently complete for sanitary purposes; we have at our command efficient methods of detecting the disease, namely, the Wassermann reaction and more especially the examination of the primary lesion for treponemata, whereby the diagnosis may be established at a time when the disease is curable; and finally we have two remedies at our command that are specifics, salvarsan and mercury.

Since we cannot rely upon the individualistic methods of the past for sanitary results it becomes necessary to discuss the methods that the community may take in securing effective treatment of those infected. Before the community can insist upon the efficient treatment of all syphilitics it becomes necessary to know who are the syphilitics, how many of them there are, where they are located and to provide sufficient facilities for treatment. This naturally leads to the discussion of notification.

Notification.—The best opinion of today holds that notification is an impracticable measure. Notification has been tried in the past and has failed. Thus to quote only a single instance, Christiania, a city of slightly over 250,000 inhabitants, tried this measure. According to the Health Inspector Dr. Ustvedt,⁴ during the year 1915 its medical practitioners and infirmaries notified 2424 new cases of venereal disease, of which gonorrhoea accounted for 1549, acquired syphilis 585, chancroid 243 and congenital syphilis 47. During the last ten years the annual notifications have averaged 0.84 per cent. of the population, and in 1915 the percentage was 0.96. From this it may be seen what a farce notification may become. In the United States army, in 1915, the venereal rate was 8.36 per cent. for enlisted men in the United States, the lowest rate obtained for many years. The admission rate for syphilis alone was 17.24 per thousand, also the lowest figure in many years. It is obvious that in Christiania the law was ignored.

The British Royal Commission did not favor notification. The British Medical Association appointed a committee, consisting of the chairmen of all standing committees, to consider what should be the attitude of that body in regard to notification. They arrived unanimously at the conclusion that such a system would be unfortunate. The main objections found by the committee were that such a law would lead to the concealment of venereal diseases, and that even if notification were made it would not help any in the treatment of such diseases. The British Medical Association is of the opinion that there are two indispensable preliminary steps to such a law. (1) Facilities should be provided by the community so that the suffering individuals may be assured of proper treatment, regardless of their financial condition. (2) That charlatans should be put out of business by directing heavy penalties against the advertising of quack nostrums and the attempt to treat venereal diseases by unqualified or incompetent persons.

That all in England are not satisfied with this conclusion is shown by the fact that a letter was issued, signed by a large number of women of distinction, and calling on the wives and mothers of the Empire to demand the compulsory notification and treatment of venereal diseases. These women were dissatisfied with the conclusions of the Royal Commission and find it almost incredible that men and women known to be infectious should be at liberty to spread the contagion when and where they will. The letter states that "the obvious remedies for every contagious disease are notification and compulsory treatment, and other dangerous and contagious diseases are thus treated."

The National Council for Combating Venereal Diseases issued the following answer: "Compulsory notification is obviously only one of the many means to an end, namely, the suppression of these diseases, and a more comprehensive scheme is necessary if that end is to be attained. To be effective the scheme must in our judgment include as the first and most necessary measures: (1) The provision in every area of adequate facilities for prompt diagnosis and efficient treatment, free of charge. (2) The prohibition

of quack treatment. (3) Granting of privilege to any communication made in good faith by a medical man in order to prevent the spread of infection. Notification must be futile unless accompanied by police measures for enforcing treatment which could not be given until full facilities has been made available to all classes. When these facilities have been provided, the question of compulsion can be considered.”⁵

Opinion is very similar in this country. Thus in a discussion on the subject⁶ Dr. Emerson, of New York, objected to reporting on the ground that it was useless. He is reported to have said: “What are you going to do? Are you going to placard the house? Are you going to quarantine the individual? What are you going to do with your patient when you have got him reported? So far as I can see this reporting of venereal disease amounts simply to stating that we know how many there are, don’t know where they are, can’t keep them located, and can’t deny them free movement through the community.”

Dr. Hugh Cabot, of Boston, has the following to say with regard to notification:⁷

“At the outset of any attempt to estimate the value of reporting as a public health measure it is necessary to distinguish between true reporting and false reporting. True reporting requires that the case be notified to the health authorities by name and address precisely as are other cases of contagious diseases, including tuberculosis. False reporting is reporting by number or by some quasi-secret method and is evidently an attempt to deal with these conditions in a manner not thought applicable to other forms of contagious disease. On the question of the value of reporting there are three types of opinion:

“1. The opinion of the public health officer.

“2. The opinion of the practising physician.

“3. The opinion of the enthusiastic layman (generally woman).

“1. Broadly speaking, the opinion of the public health officer has generally been in favor of reporting. In June, 1913, the annual conference of State and territorial public

health authorities with the United States Public Health Service approved a model law for morbidity reports prepared by a committee of that conference. This law provided for the reporting of venereal disease, including gonococcus infection and syphilis, but in the section specifying how the reporting should be done there is inserted, 'Provided that in the reports of cases of venereal disease the name and address of the patient need not be given.' It thus appears that though, as a group, they favor reportability they recognize the difficulties that stand in its way are prepared to temporize with half-way measures. Such measures can only be justified on the ground that they represent a step toward true reporting and are intended to get public opinion accustomed to the appearance of these diseases in the weekly or monthly reports and later to support the attempt to make these diseases truly reportable. To this it may properly be objected that reporting by number not only has no statistical value but it is positively misleading. There is no method of identification of the cases, and while it is to be presumed that a large number of cases will not be reported at all, it is equally to be presumed that the same patients will be reported upon a variety of occasions by different physicians or institutions, this conclusion being justified by our knowledge of the extremely peripatetic habits of these individuals.

"2. The opinion of the practising physician and particularly of those physicians who deal with syphilis on a large scale has been almost unanimously opposed to reporting. They reason that if physicians are required to report these patients by name they will in a short time, if they are honest, have no patients to report. This will have the exceedingly undesirable effect of throwing this disease into the care of the dishonest physician, the quack, and the charlatan, and, far from acting as a method of controlling the diseases, it will not only make it less controllable but more severe in its manifestations. They further reason that if the reports are really private if made by name, they are of no practicable value to the health officer since by the very nature of his agreement with the patient he is stopped from using the information for the benefit of the public health, and finally

they point out that if the report is made only by number, no important statistical evidence will be obtained, duplication will certainly occur, and no benefit will result. That the latter argument is cogent seems to be borne out by the experience of New York City where physicians and institutions have been urged to report by number. From the reports of the months of November and December, 1915, and January, 1916, it appears that the number of cases of syphilis reported in a week varies from 564 to 195, and surprisingly enough, the number of cases of syphilis reported is almost double the number of cases of gonococcus infection during the same period, 4114 as against 2379. That there are doubtless a variety of perfectly good reasons for this extraordinary result may be admitted but it collides so violently with the facts and with common sense that it is impossible to regard such figures as having scientific or even social value.

"3. While it may be doubted whether it is worth while to introduce into this discussion lay opinion, it should be borne in mind that lay opinion has been an exceedingly important factor in placing legislation about these matters upon the statute books, and though we may properly believe that such opinion is rarely based upon a knowledge of facts that would entitle the individual to any opinion at all, we cannot disregard it as a factor in social activity. Average lay opinion appears to take the view that the prevalence of syphilis in the community is a shocking condition largely aided and abetted by the medical profession in their attempt to shield their patients. There has been much agitation from women's clubs and associations, and particularly from the more boisterous advocates of women's suffrage, most of whom regard the problem as a simple one, and the remedy to lie in universal suffrage. Very generally lay opinion has supported suggestions to make this disease reportable, and much existing legislation has come either from this source or from the advocacy of the public health officer with an amiable disregard of the gross improbability that such legislation will serve any useful purpose and the almost absolute certainty that it will only encumber the statute books with

laws that are unenforcible and serve no purpose other than to bring the law into well-merited contempt.

“After a pretty thorough study of this question of reporting, I cannot avoid the opinion that it has been worthless as a method of assisting in the control of this particular variety of contagious disease. Public opinion has stamped syphilis as a shameful disease, as we all know without sufficient justification, and has therefore driven these unfortunate persons into hiding. From this hiding they have begun to emerge, and are more and more seeking the advice of well-trained and honest physicians. From these physicians they expect and will receive protection since they have entered into an implied contract and one which cannot properly be disregarded. To the extent that the treatment of syphilis is in the hands of such practitioners, to exactly that extent the disease cannot be made reportable. Such portion of the cases as are in the hands of dishonest practitioners and charlatans are inaccessible to the law, since these people will beat not only the law, but the patient. Any law that is to achieve success must be of practical benefit to the patient, a fact that must have been commonly overlooked by the advocates of reportability. As generally proposed it is an attempt to protect the community against a contagious individual without any corresponding benefit to him and with a very large probability that it will do him considerable damage. Until such time as we are prepared to enact legislation which will be of at least as much benefit to the syphilitic as to the community, we may as well dismiss this kind of legislation as a factor in improving the situation.”

I have quoted these criticisms of notification at length, not because I agree with the conclusions drawn, but because they contain real objections which must be met, and met successfully before notification can be enforced. I think that the lay opinion that the prevalence of syphilis in the community is a shocking condition and that something must be done about it is fully justified by the facts, and as it is upon lay opinion that we must depend for the enforcement of any law, this is to be considered as the hopeful sign that notification can be made to work providing the objec-

tions already referred to are done away with. It serves no purpose to point out that all cases will not be reported and that the statistics so secured are of questionable value. For the matter of that, birth registration cannot be regarded as a distinguished success in this country, and yet no one would argue that we should not attempt to enforce this law. The betrayal of the confidence of the patient is simply a bugbear. We betray this confidence every day when we report infectious diseases, often to the great inconvenience of the patient who must be quarantined. No physician would hesitate to report smallpox or cholera or leprosy though this betrays the patient's confidence quite as much as if the disease were syphilis. If the law compelling notification of venereal diseases were passed, and its enforcement demanded by lay opinion, the physician will be under a moral compulsion to obey the law. The community is also our patient and besides issues our license to practice, and we should think quite as much about violating the confidence of the community as about the confidence of the individual patient.

The real objections that must be met are that notification will turn these cases over to quacks and charlatans, that it must be made a benefit to the patient as well as to the community, and that ample facilities for treatment for all classes of patients must be first provided.

Quacks and Quack Remedies.—At the present time a very large number of men suffering from venereal disease go to quacks, or after a home-made diagnosis take some proprietary remedy. To their disgrace a large number of daily papers are full of the advertisements of such persons and remedies, although journals of the better class have for some time closed their pages to such advertising. Under existing circumstances there can be little doubt that if venereal diseases were made reportable, the volume of this traffic would be very greatly increased to the detriment of the patient and of public health. But we do not conclude from this fact that we should abandon the ideal of notification, for as we have seen, the only hope left to society for the control of these diseases lies in effective treatment of all cases,

and this can only be secured by notification. On the contrary, the conclusion is fairly obvious that the community should eliminate the quack and the nostrum sold for the treatment of venereal disease. While this is a matter of considerable difficulty it is by no means impossible. The existing laws are sufficient in most communities to remedy this matter if they were only enforced, and where they are insufficient, they should be changed.* The times are favorable for such an advance. Many communities with the coöperation of wide-awake medical societies and prosecuting attorneys have succeeded in compelling their quacks to close their doors, and the United States Government has shown a disposition to close the mails to any remedy that can be shown to be fraudulent, and the better class of journals no longer accept their advertising. If medical men and societies will only insist on the enforcement of the law the major part of quackery will disappear. The sanitary officer should take a leading part in such action. Whenever medical men assail quackery they always fear the accusation that they are persecuting these men because of professional jealousy. None but the ignorant will bring this accusation, but if the city itself, actuated by the public health officials, can be brought to take this action, even the ignorant can hardly believe that professional jealousy is the motive.

As for the quacks that cannot be reached by the law, the licensed medical men who disgrace their profession by advertising that they cure or treat venereal diseases, the life of their business is advertising. An effort should be made by medical societies and all whom they can enlist to persuade the daily papers to refuse this type of advertising. There is already a campaign for clean advertising, and reputable advertisers are learning that the reputation of their product suffers from being advertised by the same sheet that reeks with "Specialists" and private remedies. City ordinances should prohibit the pasting of quack notices concerning the treatment of these diseases in public places and in saloons, and wherever possible and advisable the city should sub-

* See Appendix for law of Western Australia and Law of State of Missouri.

stitute for these notices a simple statement of the places which the city affords for the free consultation and treatment of these diseases. Quackery is not so profitable or so easy as was formerly the case, and it can be made almost impossible. Outside of a desire for secrecy and a hesitancy about consulting the family physician for such ailments, the main source of revenue of the quack is the ignorant man who believes the statements in the advertisements, and the deluded mortal who believes he is going to secure a cure in a shorter time and for less expenditure than if he went to a qualified physician. When proper facilities are afforded the poor for the treatment of this class of diseases, one of the main props of the quack will have been removed. They are not in business for their health, and they will not be able to compete with the free clinics maintained by the city or by the hospitals.

How may notification be made a benefit to the patient as well as to the community? It appears to me that if every patient so reported is assured of efficient treatment to relieve his condition, that he will be most distinctly benefited, for it can hardly be claimed that he has any assurance of such treatment under the present system. Let us suppose such a law in operation, and follow its results. A well-to-do patient consults his family physician or a skilled specialist. After a thorough examination, including a Wassermann reaction which is performed by the city free of charge, the physician says: "Mr. Jones, I am very sorry to tell you that you have an undoubted chancre, which, as you know, is the initial lesion of syphilis. Now, under the law I shall be compelled to report you to the health officer as having contracted syphilis, but this need really give you no concern at all. The health officer is a physician who is no more disposed to violate your confidence than I am myself. All he wants in the matter is to be sure that all contracting this disease will receive efficient treatment; and if you will agree to submit to the treatment that I will prescribe, will present yourself at certain intervals in order that I may ascertain that you are not suffering from any manifestation of the disease, and will not go to another physician without giving

me due warning, I will inform the health officer that this case is under my personal supervision. Under these circumstances, if I had not told you of the necessity for reporting the case, you would probably have been ignorant of the fact, for the health officer never interferes so long as he is satisfied that patients are receiving proper treatment. The records are kept where no one but the health officer and his qualified assistants who are also physicians have access to them. If, however, you should fail to present yourself for observation at the proper intervals, or should fail to take the treatment I prescribe, I shall be compelled to report this fact, and the health officer might then take such measures as he thinks best to ensure that you receive proper treatment. You are of course at perfect liberty to consult any other physician that you prefer, and the only reason for notifying me is in order that I may be relieved of the responsibility for your treatment. The physician to whom you go will, of course, also have to notify the health officer that he has assumed responsibility for your treatment. While these measures have been taken to protect the public health, I assure you that they are even more for your own benefit, as this is a most treacherous disease, and requires most efficient treatment and careful supervision if you are to be protected from very serious consequences that sometimes ensue later in life, such as aneurysm, locomotor ataxia and general paralysis of the insane. Moreover, if you follow this treatment conscientiously there is a good fighting chance that you may be cured and that you can later marry with a clear conscience, something that you could hardly have been assured of had not these provisions been made for your efficient treatment and continuous observation."

What becomes of the poor man? The physician says: "Mr. Smith, I am very sorry to tell you that you have an undoubted chancre which is the initial lesion of syphilis. This is a most treacherous general disease which will require much expensive treatment, and several years of observation before I can discharge you with safety to yourself or the public. If you feel that you are not able to bear the expense incident to such a course of treatment, I am glad to say that the city

has established a dispensary in charge of men who are very skilful in the treatment of this disease, and who will treat you either free of charge or with only a small charge to cover the cost of the remedies used. I shall be obliged by the law to inform the health officer that you have contracted syphilis, and I am sure that he will insist that you receive proper treatment either from me or some other physician or from the city dispensary to which I just recommended you. So long as you take your treatment you need not fear that there will be any publicity in the matter."

It is impossible to state here every detail of such a conversation, and it is even probable that some features have been omitted which should be explained to the patient at greater length. The point I have been trying to make is that such a system will be a positive benefit to the man himself, to the public and also the long-suffering physician, for under these circumstances it is hardly to be supposed that patients will indulge themselves in peripatetic treatments. They will know that the treatment is being watched by the physician, who is in duty bound to report if treatment is discontinued, and there will be little inducement to change physicians except for some real benefit to be secured, since this will simply mean a fresh report to the health office and a fresh course of observation and treatment. In order to accomplish this the system may readily be devised so that the man will be under observation and treatment continuously from the time the diagnosis is made until he is cured, or until the physician is willing to state that he can be released from further treatment without danger to himself or to the public health. Surely such a safeguard is worth as much to the patient as to the community. Such watchful care will be appreciated by the more intelligent members at least, and these are all the private physician will have to deal with. Other classes must be dealt with in hospitals and dispensaries, which is admittedly a more difficult problem, and which is considered later.

Finally, it may be mentioned that the progressive commonwealth of Australia has recently enacted legislation directed against venereal disease, including provisions for notifica-

tion.* According to this law, on developing venereal disease a person must go to a qualified practitioner for treatment within three days. If he fails to seek treatment he may be fined or imprisoned. The physician must report to the health officials the age and sex of the patient and a diagnosis of his condition, but not the name or address. The patient is to return for treatment at least once a month, and if he remains away from treatment for six weeks, the physician, under heavy penalty, must notify the health authorities, giving this time the patient's name and address, and the health authorities must bring the patient into court and compel him to have treatment. The patient may change his physician, but on doing this he must disclose the name of his previous physician, who must be notified by the second physician that the patient is now under treatment by the latter. Treatment must be continued until the patient can obtain a satisfactory certificate of cure. The health boards have authority to apprehend any person suspected of having a venereal disease that is not being treated and to compel him to submit to examination by qualified physicians and to obtain a certificate of health, or to submit to treatment until such a certificate can be obtained. As this legislation has only been passed after a thorough study of the subject, and after an interval during which reporting by number was practised, it must be assumed that in Australia, at least, they are convinced that notification is both practicable and desirable.

If notification is to be adopted in this country it can only be enforced in case public opinion is behind the law. Nor can efficient treatment for venereal diseases be provided by the community until public opinion will support the necessary institutions. For all of these reasons it is essential that the public be informed in a proper way in regard to the exact facts.

Publicity.—Venereal diseases have spread to their present alarming extent because the public has not been informed of the facts. From the very nature of the case an individual

* See Appendix for this law.

suffering from venereal disease desires to prevent his infection from becoming known. His physician, of course, preserves the secret. Public discussion of the subject has been tabooed. Consequently, although many of the people with whom the average person is brought in contact either suffer or have suffered from these infections, he remains unaware of this and naturally assumes that these diseases are much less common than is actually the fact. Physicians realize the prevalence of venereal diseases and for a number of years the medical journals have been filled with statistics of the most alarming nature, but these articles are seldom seen by the layman, or if he happens to see one, he concludes that this is the effusion of one more crank. The general public is therefore in total ignorance of the alarming frequency of venereal diseases. Even at the present day, when these subjects are discussed more openly than ever before and theaters are filled with people who witness a play like "Damaged Goods," few realize how common the damaged goods really are. If people think of the subject at all they simply think of it as something that exists, but never consider the possibility of such a disease invading their own family. The majority of people in our Southern cities who employ negro servants have the infection in their households at the present time, though it must be added that the danger of contracting infection through the ordinary contact with a domestic must be very slight, since so few cases are reported originating from this source. The remedy for the venereal disease problem lies in publicity of the proper kind. Certainly prurient or curiosity-stimulating articles in the papers are not desirable, but it is believed desirable that the health officer should publish the facts as to the infection in his particular community.* It is a principle lying at the foundation of democracy that when the people have the facts they can be trusted to take the proper action. The facts should therefore be given by circulars from the board of health, which should be distributed to the heads of households. It is, of course, a matter of general knowledge that several up-to-date health

* See Appendix for some of the methods of publicity used by the city of Rochester, N. Y.

departments have already raised the taboo on venereal diseases and discuss the subject in their official bulletins. But the average bulletin issued by the health department does not have a sufficiently wide circulation for this purpose. Information in regard to venereal diseases should be printed in smaller circulars and addressed to the heads of households. When the information obtainable has become generally available the health officer will no longer find his hands tied in all attempts to secure action leading toward the reduction of venereal diseases, but will have behind him an active public opinion which will peremptorily demand that something be done to correct the present state of affairs.

With public opinion thus aroused the health officer may next indicate the absolute necessity for notification if any real progress is to be made in the treatment of venereal diseases from the public health point of view. He may point out the fact that at present it can be safely said there is no community in the United States where the exact facts in regard to the prevalence of syphilis and gonorrhoea are known, that they never will become known without a system of notification, and that many of these cases receive insufficient treatment so that they are a constant source of danger to the community. Objections may be raised to such a course of education of the public by the health department, and it may be granted that in such a process some mistakes will be made. But no mistake could be so bad as the present lethargy and *laissez-faire*. We can at least learn by mistakes.

The Provision of Proper Facilities for Treatment.—We have decided that our future progress in the control of syphilis and other venereal diseases must come through systematic treatment and that notification cannot be effective until ample facilities are provided for treatment. It becomes pertinent therefore to inquire into the sufficiency and efficiency of our present institutions for this purpose in order that we may see what improvements must be made in the near future. Unfortunately but little that is good can be said of our present provision for the treatment of these diseases, for it is neither sufficient nor efficient.

The majority of general hospitals have refused admission

to patients suffering from venereal diseases, no doubt because the managers of these institutions have believed that they were thereby protecting the patients that were admitted and that many patients might be deterred from seeking the benefits of the hospital if they knew that venereal diseases were admitted. That this statement is no gross exaggeration is shown by the following figures presented by Stokes,⁸ who says that in 1914 it was estimated that the city of London, with 7,000,000 inhabitants, had only 163 beds available for the treatment of venereal disease, and the same condition obtained throughout Great Britain. Of 30 general hospitals in New York City a recent investigation showed that only 10 received recognized cases of syphilis; 13 of 30 will not even receive medical cases with complications of syphilis or gonorrhoea. "Chicago has the Cook County Hospital, the only special service I know of in the city, 200 beds to 2,000,000 people." The present insufficiency of hospital facilities may be shown also by the words spoken in praise of present facilities. Thus Post⁹ says: The Massachusetts General Hospital has maintained for nearly two years a separate department for syphilitics, with large out-patient facilities and *a few beds*. The Boston City Hospital has practically done the same thing. The children's hospital has changed its policy and now treats children with syphilis. The Boston dispensary has for many years paid considerable attention to these cases. Worcester has provided a hospital ward for their care. The city of Memphis within a year has arranged matters so that a doctor can send a man with syphilis to a hospital, and he is received and treated as a matter of course as if it were any other disease.

What a state of affairs is disclosed by such comments! Pontoppidan on the basis of his large experience with the Danish system estimates that one bed to 2000 of the population is insufficient to care for the sexual diseases. Even on this very conservative estimate, Chicago should have 1000 beds and New York should have 2500 beds. But all contemporary comment clearly indicates that the attitude of the general hospital toward syphilis and other venereal diseases is slowly changing. We now know that a large

percentage of the patients admitted to all hospitals suffer from a syphilitic infection in addition to the disease or as the real cause of the disease for which they were admitted. If from 15 to 25 per cent. of all the patients admitted are syphilitic, it seems a little foolish to continue to refuse to admit syphilitics to our general hospitals. And this change of opinion should be accelerated, for it is these general hospitals that must provide the beds for the treatment of syphilitics, if systematic treatment is to be adopted by the community. Special hospitals for the treatment of venereal diseases will not serve the purpose, for while any patient might go to a general hospital for the treatment of these conditions, very few would seek assistance in a hospital openly devoted to the treatment of venereal diseases because of the stigma necessarily attached. This fact was recognized by the Royal Commission, which reported against special hospitals and clinics for these conditions. Every general hospital should have a ward or wards assigned for the treatment of syphilis, the exact number of beds depending upon the magnitude of its clientele. It is recognized that the majority of the treatment of syphilitics can be carried out as well by the out-patient department, but hospital beds must be available for patients in the primary and active secondary stages of the disease in order to provide isolation and protect the public during the time that such cases are a menace to those with whom they come in contact. Furthermore, beds are necessary in order that salvarsan or similar drugs may be administered under proper safeguards. The patients should remain in hospital for at least twenty-four hours after receiving this remedy. As no patient would occupy a bed long, since salvarsan usually causes a prompt disappearance of the external lesions, the situation is comparatively simple today as compared with former years when long courses of mercurials were necessary before the lesions were under control. While it would be foolish to attempt to prescribe the number of beds or the size of wards that general hospitals should maintain for the treatment of syphilitics, it will be generally admitted that present facilities are sadly deficient, and that the extension of those

facilities should be among the first steps to be taken to control this disease.

It will probably also be admitted without any long array of statistics that treatment in most of our out-patient departments and clinics for venereal diseases is inefficient. As examples, it may be said that White¹⁰ found that of 1016 cases treated for syphilis in a Massachusetts hospital, 20 per cent. consulted them but once, only 52 per cent. continued treatment six months or more, and but 45 per cent. persevered for one year or more, and 38 per cent. for two years or more. These figures, bad as they are, speak well for that particular hospital under existing circumstances, and it is believed that few clinics hold even 38 per cent. of their cases of syphilis for two years or more.

A recent survey* to determine how many clinics in New York were meeting the requirements of the Associated Out-patient Clinics, reported only 7 approved clinics for syphilitics out of 27. Many of these could with small effort meet the requirements, but 12 were found to be hopelessly bad.

With regard to gonorrhoea, Platt¹¹ found that in four genito-urinary clinics in New York, of the gonorrhoeal patients in the course of a year, 8 per cent. were discharged cured, 17 per cent. ceased treatment of their own accord, improved but not cured, and 75 per cent. ceased treatment unimproved: 28 per cent. made one visit, 11 per cent. made two visits, 7 per cent. made three visits, and 6 per cent. made four visits; so that 52 per cent. made less than five visits. The fault for these conditions is undoubtedly on the part of the patients who are too ignorant to continue treatment, but it is probably due to some extent to the conditions obtaining in the dispensaries. These dispensaries are for the most part poorly equipped, in the poorest rooms the hospital affords, as there is a tendency to believe that any accommodations are good enough for the venereal clinic. There is little privacy, and if the hospital is connected with a medical school the patient is seized upon to furnish clinical material to the students. As a result of this lack of privacy, only the most callous will go to such clinics. In many the medical

* Barringer and Platt, *Social Hygiene*, vol. i, No. 3.

attendants are insufficient in number to give the cases the attention that they should obtain, and they are usually young men who are seeking experience, rather than well-trained men, who for the most part are too busy with their private practice to do much dispensary work; and in many the vicious system of prescribing by number obtains, so that the patient feels that he is receiving only routine attention. As a matter of fact the patient may be mistaken, for a permanganate injection or mercurial ointment for inunctions will not vary for different patients, and might well for convenience be prescribed by number. But the patient knows that private physicians do not prescribe in this routine way, and it is a poor method to use if the confidence of the patient is to be secured.

While not all of these criticisms apply to individual dispensaries, and a few are above criticism, it will probably be generally admitted that the enlargement and improvement of dispensary facilities is equally important with the improvement of hospital facilities. As both hospital and dispensary facilities are what they are solely because of lack of funds for their support, it will become necessary for the city to bear at least part of the expense of such improvements, and this is a logical requirement since the improvements are to be made for the purpose of securing systematic treatment for the direct benefit of the public health. It is a measure that will produce far more results than the elaborate precautions that are now taken by many cities for terminal disinfection after infectious diseases, and sanitary officers should be prepared to advocate that a respectable amount of the public funds assigned to the Health Department should be set aside for the support of hospitals and clinics for the treatment of these diseases. New York City has established a free clinic for diagnosis and advice.

Admitting that the hospital has provided efficient treatment for the patient, it has still not performed its whole duty. Syphilis is notoriously a family disease, and the other cases in the family should receive attention. This class of work means a social service connected with the hospital, and a number of hospitals have instituted such departments.

From the public health point of view another service remains to be performed. In the case of the syphilitic patients with a primary lesion, an endeavor should be made to determine the source of the infection. According to Blaisdell,¹² one clinic had 236 single men and 35 single women with syphilis. With few exceptions the 236 single men represented as many different women who are active foci of infection but who receive no treatment. As most of these women are prostitutes who may be daily infecting other men, the desirability of bringing them under treatment is obvious. This matter will be referred to later at greater length.

We conclude, therefore, that the following are the logical and necessary steps to be taken by any community in the endeavor to control syphilis:

I. By the Health Officer.

1. A proper system of publicity by means of which the facts with regard to syphilis and other venereal diseases may be brought to the attention of tax payers and heads of families, with a view of enlisting support for the passage of a law requiring notification and for increased facilities for treatment and the provision of the necessary funds.

2. An endeavor to secure the passage of a good notification law; and after its passage, the creation of the machinery for its enforcement.

3. The provision of adequate laboratory facilities for the diagnosis of these diseases.

4. The establishment of a sufficient number of dispensaries and clinics, day and evening, pay and free, to accommodate all patients who may suffer from syphilis and are unable to pay a private physician, and for whom existing facilities provided by hospitals are insufficient.

5. The periodic inspection of hospitals and dispensaries, to ensure that they conform with already formulated standards of equipment and management: such institutions should be criticised by recognized efficiency tests.

6. The dissemination of information to the profession with regard to the facilities for diagnosis and treatment afforded by the health department, and with regard to the standard of cure that will be acceptable to the department.

II. By hospitals. See Stokes.⁷

1. The organization of a department of syphilis within the hospital.

(1) The provision of a sufficient number of beds to meet all needs.

(2) The provision of adequate modern laboratory facilities for the purpose of diagnosis and to control the treatment.

(3) *Personnel*.—The department to be under a chief of service who would be a highly trained man who would serve continuously, and who should be directly responsible for everything pertaining to the service. He should be assigned a corps of assistants, including physicians who are willing to serve, interns and nurses.

(4) The establishment of a social service corps of nurses who would follow up each case treated by the hospital. They should be especially instructed so as to reach other cases of familial syphilis, so that they can carry assistance to syphilitic homes rather than knowledge that is discouraging and detrimental.

(5) A routine Wassermann on all patients to detect unrecognized syphilitics. Such cases, when detected, should be treated for that disease by the department of syphilis. In this way the responsibility for the treatment of this disease will all be borne by the one department having the necessary equipment, experience and trained social workers.

2. The out-patient department.

(1) Each hospital should have a special out-patient department for the treatment of syphilis with the proper accommodations.

(2) *Organization*.—It should form a part of the department of syphilis, and like the hospital service should be under the direction of the chief of service who would therefore be responsible also for the proper management of this out-patient service. A separate staff of assistants would be necessary. Patients discharged from the hospital would report here at regular intervals until discharged as cured. A card index system would show for each day the patients that were to report for observation. Clerical assistance in the keeping of these records will be indispensable, as is also a medical service skilled in diagnosis and treatment.

(3) *Equipment.*—The dispensary must have at hand technical equipment for diagnosis and treatment, particularly a dark-field microscope for the diagnosis of the primary lesions. A serological laboratory is not essential, as specimens can be sent to the laboratory of the hospital which is part of the department.

(4) To be of real service to the community this dispensary must be accessible. It should be located on a car line, and the facilities provided must be available at such a place and at such hours as do not involve undue sacrifice of time, money, or convenience to the persons who need treatment. This practically means evening hours, as poor people cannot afford to stop work or forfeit their pay in order to visit a dispensary so long as they are not absolutely incapacitated.

(5) The cost, if any, of these facilities must be within the means of the patients.

(6) These facilities should be organized with due regard to the proper correlation with the Health Department of the City or State.

Treatment of Prostitutes.—It will be seen that no special provision has been made for the treatment of prostitutes, and this is as it should be because any approach to regulation is to be avoided, and because it may be assumed that an attempt at suppression is being made. Nevertheless, as the traffic cannot be entirely suppressed, it must be possible for such of these women as are infected to secure treatment, and it is particularly desirable that the treatment should be supervised and continued until they are no longer a menace to the public health. If the system of treatment already described were in operation, these results would undoubtedly be very largely secured. It is not to be supposed that prostitutes enjoy being syphilitic, or that they would not apply for treatment were it available and within their means, without exposure to undue publicity. Those who can afford it will go to private physicians as they do today; they will be reported to the health officer like any other patient suffering from syphilis, and like any other patient will be kept under observation until they have complied with the recognized standards and can be discharged. If she is unable to

bear this expense, it should be perfectly possible to secure treatment at the hospitals or dispensaries just as do other patients. It is not to be expected that respectable women will make free use of hospital facilities if they think they are to be associated with women of the underworld. But the tendency today in hospital construction is not to build large wards but rather smaller wards or rooms for the accommodation of a small number of patients. This enables certain diseases to be segregated with greater ease, and ensures a greater amount of privacy. Hospitals should keep such a small ward or room for women known to be prostitutes, and such women in the infectious stages of syphilis could be thus treated without exposing them to needless publicity and without wounding the susceptibilities of other patients. A well-equipped department of syphilis should have a number of private rooms for both women and men in the infectious stages, thereby securing both isolation and privacy, and for obvious reasons these rooms should be available without the usual exorbitant charges for private rooms.

However, in addition to this general provision for treatment for all infections, an effort should be made in every case of primary or early secondary syphilis to determine the source of the infection. This will frequently be impossible, but in many cases a man is both able and willing to say where the infection was acquired. In every such case where the source of the infection can be traced, a health officer should visit the case and the diagnosis should be confirmed, either by a clinical examination or by a Wassermann reaction and by both when possible. Treatment should then be urged and if necessary, insisted upon. Should the patient be unable to pay a physician the treatment should be furnished by physicians employed by the city. The law should provide that if the diagnosis is certain and the patient is unwilling to accept such treatment, arrest and confinement may follow at the discretion of the health officer. Thus a prostitute known to be infected would be compelled to receive treatment, and this provision would also include other cases that will not accept treatment voluntarily. This constitutes no abuse of personal liberty. A person who refuses to submit to the recognized

treatment for a dangerous communicable disease is subjecting the entire community to danger of infection, and the power of society to protect itself would be questioned in the case of no other disease. No one considers that the personal liberty of an individual suffering from cholera is infringed when he is quarantined, and there is no reason why a person suffering from syphilis in an infectious stage could not be restrained in a similar manner except that it has not been customary to do so. Nor is it to be supposed that arrests or quarantines would be necessary in any but the most exceptional cases. The power to make an arrest in a case of this kind would simply give power to enforce treatment, for there are very few who would refuse to accept treatment if they knew that quarantine or arrest would follow this refusal.

In a similar way, in the case of women arrested for disorderly conduct or other breaches of public morals, a Wassermann reaction should be made by the city laboratory as a matter of routine. If positive, or should a clinical examination be made, preferably by a woman, and should syphilis be found, the case should be treated. The same rule should also be applied to men arrested for similar offences.

It is somewhat beyond the limits of this work to discuss the sociological aspects of prostitution. It is sufficiently apparent, however, that no attempt to repress prostitution can be successful which does not endeavor to provide some other occupation for the prostitute. Every city that attempts such a campaign should establish a corrective institute for such women, where they may be reformed if possible, and at least educated to perform some useful labor by which they may earn a living wage when returned to the world.

If an effort is to be made to suppress prostitution, solicitation on the streets must be suppressed. Yet what is accomplished by arresting and fining the street-walker? When she is released she must simply work a little harder to recoup herself. Any woman arrested for this offence who cannot give an account of herself, *i. e.*, who has no other means of support, should be sent to such a corrective institution and should remain there until there is at least some hope that she

will enter some other occupation. Here then is the best opportunity to provide treatment for the infected. A thorough medical examination becomes essential if such an institution is to be conducted in accordance with humane considerations, and as such women will be confined for a considerable period of time, there is ample opportunity for treatment which will produce either a cure or will at least practically eliminate all danger of transmitting syphilis, even should the attempt at reformation fail.

Salvarsan.—It will be seen that many of the measures suggested depend for their efficacy upon the provision of treatment either free or at a nominal cost to poor patients. No other method of compulsory treatment can succeed, for it is impossible to insist upon a treatment that is beyond the means of the patient to procure. It has been sufficiently demonstrated that salvarsan is a specific in the treatment of syphilis, and while the fallacy of our original hopes of a "therapia sterilizans magna" is now apparent, this drug still remains the most potent remedy which we can command. Although it is still possible, as in former times, to treat syphilis by mercury alone or in combination with the iodides in the later stages of the disease, such treatment is distinctly inferior in its results to the proper combination of salvarsan and mercury. From the stand-point of public health alone, salvarsan has the merit of causing a much more rapid disappearance of the infectious lesions than can be produced by the administration of mercury alone. Since there can be no dissent from these statements which are almost axiomatic, it follows that cities and States that wish to enforce efficient treatment for all syphilitics must be prepared to furnish salvarsan in large quantities. At present prices the cost of such a procedure would be prohibitive. Some conception of the magnitude of this expense may be derived from the experience of the United States army, which in 1914, for an army of less than 100,000 men, purchased 3610 doses of salvarsan and 5770 doses of neosalvarsan. If the city of New York, with a population of 5,000,000, bought salvarsan on a similar scale at similar prices, it would cost the city \$1,641,500 annually. The price of salvarsan has been little less than a

crime. As the *British Medical Journal* has said (April 1, 1916, p. 493): "Salvarsan has always been a drug of the proprietary class, made in an atmosphere of mystery, under a patent giving a misleading account of its preparation, produced at small cost and sold at a very high price." The luster attaching to Ehrlich's name as the result of his scientific discoveries has been badly dimmed by the gross commercialism with which he has permitted his product to be exploited.

Dr. Shamberg, Director of the Department of Dermatological Research of the Philadelphia Polyclinic, which has been manufacturing this product, states that he can make it for one dollar a dose, and that there is every reason to believe that when the procedure is standardized and with manufacture on a large scale, salvarsan can be manufactured for fifty cents a dose. For a product no better we were compelled to pay \$3.50 before the war. There is every evidence that Congress in the Trading with the Enemy act will repeal this patent, at least during the war. But everyone interested in public health work should endeavor to impress our legislators with the necessity of making this action permanent. Whatever the ethics of the matter from a professional point of view, Ehrlich is now dead and cannot profit further from the patent. There is therefore no valid reason why the patent should be reestablished after the war to the prejudice of the public health. With salvarsan marketed at a price of fifty cents a dose, the price for which it can be made in this country without the protection of a patent, the salvarsan that at \$3.50 per ampoule would cost the city of New York \$1,641,500 would then cost only \$234,500. It must not be supposed, however, that this sum would actually have to be spent for salvarsan by the city. The calculation is based on army figures, and proportionally much less would be required for the women and children in a mixed population. Moreover, it need only be furnished by the city for the poor who cannot purchase it for themselves, and were the price reduced to fifty cents, there would be only relatively few cases for which the city would be compelled to purchase the drug. At the old price of \$3.50, with a considerable fee to the physician administering it, the drug was out of reach of a large part of

the population. Enough has been said to indicate the advisability of permanently abrogating the patent on salvarsan.

Public Health Measures for the Prevention of Syphilis In-sontium.—Innocent syphilis is generally the result by one or two removes of syphilis acquired by promiscuity. Therefore it may be expected that if the measures taken against the latter are effective, innocent syphilis will become much more infrequent than is the case at present. But certain measures may still be taken by the public health authorities to guard against such accidental transmission. One of the most important of these is some control of barber shops.

Barber Shops.—A considerable number of accidental infections have been traced to barber shops, and have generally occurred after a cut which has been dressed by a piece of court-plaster wet with the saliva of a syphilitic barber or touched by an alum stick similarly wet with infective saliva. An ordinance something like the following is in use in a number of cities:

SECTION I. Every barber shop within the town of . . . shall be open to inspection by the Board of Health at any time, and the following rules shall be observed therein:

1. All barber shops, together with all furniture, shall be kept in a clean and sanitary condition.

2. Mugs, shaving brushes, razors, scissors, clipping machines shall be sterilized by immersion in boiling water after each separate use. Combs and brushes shall be thoroughly cleaned with soap and water after each separate use.

3. Clean towels shall be used for each person.

4. Alum or other material to stop the flow of blood shall be applied only on a clean towel or other clean cloth. The wetting of alum sticks or court-plaster with saliva is strictly prohibited.

5. The use of powder-puffs and sponges is prohibited, except that such articles owned by a customer may be used on him.

6. Every barber shall thoroughly cleanse his hands immediately before serving each customer.

7. Every barber shop shall be well ventilated and provided with hot and cold water.

8. No barber shop shall be used as a sleeping room.

9. A copy of this article shall be posted in plain view in every barber shop.

SECTION II. Provides for a fine of ten dollars for each violation.

There are a number of things in this ordinance that have no relation to the prevention of syphilis, but it includes the most important items. Whenever such a provision can be enforced, it would be advisable to provide that each barber should be subject to a physical examination by the health officer at stated intervals, and in those cities where the Wassermann reaction is performed by the city laboratory this test should be included in the examination.

Soda Fountains.—The experiment of Gastou and Comandon, already quoted in a previous chapter, indicates that syphilitic infection may remain on drinking glasses for a considerable period of time. There are so many chancres of the lip acquired innocently and without any knowledge of a possible source of infection by the victim, that it appears probable that many of them are due to the use of drinking glasses that have been recently used by syphilitics. The common drinking cup has been abolished from railroad trains, most schools and public fountains, but the soda-water fountain for the most part continues to offend. After use by one customer the glass is given a hasty rinsing in a can of dirty water under the counter, and the glass is again filled and used by the next person. Under these circumstances it is perfectly possible for syphilis to be transmitted from one customer to the next. Such fountains should be brought under public health supervision. They should be compelled to boil their glasses between each customer served, or to use paper cups that may be destroyed after use by a single customer. For similar reasons all restaurants, particularly those belonging to the quick-lunch type, should be under supervision and inspected at irregular intervals. Not only glasses but silverware should be boiled after each use.

Minor Operations.—All persons who perform minor operations should be licensed by the board of health and should

be under supervision. In this category may be included such operations as tattooing and circumcision. The mixing of pigment with saliva, or holding the needles in the mouth should be absolutely prohibited, and tattooers should be subject to inspection, and if possible, to physical examination.

In any community in which circumcision is performed as a rite by rabbis or other persons not having a medical training, such persons should be licensed by the board of health after an examination sufficient in scope to determine whether the applicant can perform the operation with a proper technic; and a license should be refused those who suck the wound and commit other similar barbarities.

Midwives are already under supervision in most cities, but an earnest effort should be made to instruct these women with regard to the methods of transmission of syphilis, and the danger to them and to their patients in neglecting all possible precautions against this infection. So far as possible they should be encouraged to use rubber gloves. A circular containing this and other information should be sent to every midwife by the health department.

Finally, as the Health Department is compelled to employ vaccinators on a large scale, they should be informed of the danger of transmission of syphilis during this operation, and should be trained not to use the same knife or other scarificator on more than one person without sterilization.

In conclusion it may be pointed out that the foregoing discussion is presented merely as an outline of the method by which the public health officer may approach the problem of the control of syphilis. For the most part, details have been purposely omitted. Conditions vary so much in different cities that a perfectly good set of rules for one city would be inappropriate in another, and without long experience with local conditions it would be presumptuous to attempt to formulate the exact procedure for a given community.

While trying to avoid this blunder, it appears that a little more specific information might prove acceptable. Incorporated in the appendix will be found the details of the procedure adopted in the United States army for the control

of syphilis, and also the method used in Rochester, N. Y. I am indebted to Dr. George W. Goler, the health officer of Rochester, both for sending me the data with regard to this city, and for permission to use it in this connection. It is hoped that the material so presented will not only give some practical hints as to methods of procedure, but will serve to convince those inclined to skepticism that the measures advocated in this chapter are not purely theoretical, but on the contrary have been and therefore can be profitably employed in the control of syphilis.

REFERENCES.

1. Karpas: The Psychopathology of Prostitution, New York Med. Jour., 1917, cvi, 105.
2. Brandweiner: Statistics of Venereal Diseases, Arch. f. Dermat. u. Syph., 1908, xci, 9. Abstract in Ann. des Maladies Vénériennes, 1908, iii, 709.
3. Snow: Occupations and the Venereal Diseases, Jour. Am. Med. Assn., 1915, lxxv, 2054.
4. Venereal Disease in Christiania, British Med. Jour., November 25, 1916, ii, 734.
5. British Med. Jour., 1916, ii, 591.
6. Evans: Municipal Health Officers and Venereal Disease, Am. Jour. Public Health, 1915, v, 884.
7. Cabot, Hugh: Syphilis and Society, Social Hygiene, 1916, ii, 347.
8. Stokes: Hospital Problems of Gonorrhoea and Syphilis, read before American Public Health Association, October 25, 1915. Abstract in Jour. Am. Med. Assn., 1916, lxxvii, 1960. See also, The In-patient Hospital in the Control and Study of Syphilis, Social Hygiene, 1916, ii, 207.
9. Post: Notes of a Conference on the Medical and Social Aspects of Syphilis, Boston Med. and Surg. Jour., 1915, clxxiii, 867. Also *ibid.*, 1915, clxxiii, 161.
10. White: Statistics of Syphilis, Jour. Am. Med. Assn., 1914, lxxiii, 459.
11. Snow: Public Health Measures in Relation to Venereal Diseases, Jour. Am. Med. Assn., 1916, lxxvi, 1003. See also Weber: The Treatment of Venereal Diseases in General Dispensaries of New York State, Social Hygiene, 1917, iii, 341. Also Barringer and Platt: A Survey of Venereal Clinics in New York City, *ibid.*, 1915, i, 344.
12. Blaisdell: The Menace of Syphilis of Today to the Family of Tomorrow, Boston Med. and Surg. Jour., 1916, clxxv, 7.



APPENDIX.

TECHNIC OF WASSERMANN.

Cell Suspension.—Blood from a normal individual may be collected in small flasks filled with salt solution or in a graduated centrifuge tube filled with citrate solution. Centrifuge and wash cells thoroughly (three or four washings). At the last washing, pack cells by running centrifuge for a given length of time at a certain speed, so that cells will always be packed to a similar density. Pour off supernatant fluid. Each 0.1 c.c. of packed cells will make 2 c.c. of cell suspension in normal salt solution (a 5 per cent. suspension).

Complement.—The pooled serum of several guinea-pigs that have been freshly bled. To each 1 c.c. of serum add 1.5 c.c. of 0.85 per cent. salt solution, making a 40 per cent. complement.

Amboceptor.—The serum of rabbits that have been immunized to human red cells. Rabbits are immunized by intravenous injection of 0.5 c.c., 1 c.c., 2 c.c., 3 c.c.; washed and packed human red cells at five to seven days' interval. The last injection of 3 c.c. may have to be repeated several times. When the preliminary titration shows that the rabbit's serum contains sufficient hemolysin the rabbit is bled. Human amboceptor is more difficult to prepare than sheep amboceptor, and is never of as high a titer as sheep amboceptor.

Antigen.—A normal human heart is obtained from a recent necropsy. This is washed free from blood and all fat carefully removed. To 100 grams of finely minced heart muscle add 1000 c.c. of absolute alcohol and shake continuously in a machine for twenty-four hours. Filter and keep the alcoholic extract in the ice-box in well-stoppered bottles. When needed for use, 25 c.c. of this extract is fortified with cholesterin. Add 100 mg., thus making solution 0.4 per

cent. cholesterin. Allow this to stand for several days and filter. This antigen is kept in the ice-box. When it is to be used it is diluted with 9 parts of normal salt solution, making a 1 to 10 solution of the original stock antigen.

Titration of Complement.—Each complement must be titrated before use, using the cell suspension, which should not vary from day to day, and an old amboceptor which has been tested often previously with one unit of a known complement. The amboceptor changes in titer so slowly that for all intents and purposes it may be regarded as a non-variable. The new complement is therefore titrated against an amboceptor and a cell suspension which do not vary in strength, as follows:

Tube.	1	2	3	4	5	6	7	8	9
	C.c.	C.c.	C.c.	C.c.	C.c.	C.c.	C.c.	C.c.	C.c.
Complement . . .	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
Cell suspension . . .	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Salt solution . . .	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.1
Amboceptor . . .	1 unit	1 unit	1 unit	1 unit	1 unit	1 unit	1 unit	1 unit	1 unit

Total volume in each tube 1.3 c.c. Incubate for one hour in water-bath at $37\frac{1}{2}^{\circ}$ C., shaking every fifteen minutes, the unit of complement being the last tube in which hemolysis is complete. If complement and amboceptor are both of normal strength this should be tube 4, making 0.05 c.c. the unit of complement. As two units of complement and amboceptor are used in the Wassermann reaction the amount to be used in the actual tests would therefore be 0.1 c.c.

Titration of Amboceptor.—Before killing the rabbit a preliminary titration is made. The rabbit is bled into a Wright capsule, the serum inactivated (heated to 56° C. for one-half hour) and one drop of this serum is diluted with 19 drops of salt solution. One drop of this 1 to 20 dilution should give complete hemolysis in one hour when mixed with 0.1 c.c. cell suspension and one unit of complement. If this fails the rabbit is given another injection. Otherwise the animal is bled and the serum separated and inactivated. This serum is then placed on paper (Schleich and Schull's No. 597 paper is used) and cut in pieces, 8 cm. square.

To each such sheet, 1 to 1.33 c.c. serum is added, an amount that just saturates the sheet, leaving no excess. These pieces of paper are dried on a strip of unbleached muslin by an electric fan and constitute the amboceptor, which must then be accurately titrated.

A complement which has been previously standardized by titrating against an old and known amboceptor is used. The amboceptor paper is cut in strips, 5 mm. wide, and various lengths of this width are titrated against the known complement as follows:

Tube.	1	2	3	4	5
Complement .	1 unit	1 unit	1 unit	1 unit	1 unit
Amboceptor .	1 x 5 mm.	1½ x 5 mm.	2 x 5 mm.	2½ x 5 mm.	3 x 5 mm.
Cell suspension.	0.1 c.c.	0.1 c.c.	0.1 c.c.	0.1 c.c.	0.1 c.c.
Salt solution .	q. s. ad 1.3	c.c. to each	tube.		

Incubate one hour in water-bath.

Suppose that the last tube in which hemolysis is complete is tube 4. Then for this paper a piece 2½ x 5 mm. is the unit, and as two units are used in the Wassermann reaction, a piece 5 x 5 mm. would be used in each tube in the actual tests. This titration must be repeated several times, with different complements, before a new amboceptor is used.

Titration of the Antigen.—Tests for hemolytic power, antigenic power and anticomplementary action must be made. As a matter of fact, having never found an antigen prepared in this way to be hemolytic, this test is confined to one tube in which the antigen is used in five times the amount used in the test, with cell suspension and salt solution. No hemolysis should occur. Should the antigen be hemolytic alone it must be discarded.

Tests for Antigenic Power.—A known positive serum is titrated with the new antigen and an old antigen of known strength as follows:

Tube.	1	2	3	4	5
Positive serum .	0.1 c.c.	0.05 c.c.	0.025 c.c.	0.012 c.c.	0.006 c.c.
Complement .	2 units	2 units	2 units	2 units	2 units
Antigen . . .	0.1 c.c.	0.1 c.c.	0.1 c.c.	0.1 c.c.	0.1 c.c.
Salt solution .	1.0 c.c.	1.0 c.c.	1.0 c.c.	1.0 c.c.	1.0 c.c.

Incubate one-half hour in water-bath and add to each tube 0.1 c.c. cells and two units of amboceptor. Incubate one hour, shaking every fifteen minutes, and read.

An antigen to be usable should give complete fixation in tube 2 at least, viz., with half the amount of serum to be used in the tests. Most cholesterinized antigens will give a double plus in tube 3, with quarter the amount to be used in the tests. By comparing the new antigen with the old in this titration, and discarding antigens that are either too weak or too strong, the reaction will be standardized. That is, an antigen of the same strength will always be used.

The antigen should also be tested with a known negative serum. Twice as much antigen as is used in the tests must give a negative reaction with a known negative serum.

Anticomplementary Test.—All antigens possess to a greater or less extent the power of uniting with complement even in the absence of a positive serum. If this power were at all marked, the antigen would obviously be unsafe to use, as it would cause false positive reactions. The extent of this anticomplementary action is determined as follows:

A dilution of the stock antigen is made with salt solution, 1 to 5, instead of the customary 1 to 10 dilution, and this antigen is titrated.

Tube.	1	2	3	4	5
Antigen	0.1 c.c.	0.2 c.c.	0.3 c.c.	0.4 c.c.	0.5 c.c.
Complement . .	2 units	2 units	2 units	2 units	2 units
Salt solution . .	0.9 c.c.	0.8 c.c.	0.7 c.c.	0.6 c.c.	0.5 c.c.

Incubate in water-bath for one-half hour and add to each tube two units of amboceptor and one unit of cell suspension (0.1 c.c.). Incubate for one hour, shaking every fifteen minutes. Should hemolysis be complete in all tubes the antigen is not anticomplementary in ten times the amount used in the test. A good antigen should fulfil this requirement.

Performance of the Test.—All sera used are inactivated by heating to 56° C. for one-half hour. Two tubes are used for

each test, the front tube being the test proper and the back tube an anticomplementary control to show that the serum alone without antigen cannot fix complement. Should this back tube be positive the test must, of course, be thrown out. Each day the tests are made a known positive serum and a known negative serum must be included as controls. These must be positive and negative respectively or the tests are valueless. The manner in which the tests are set up is indicated as follows:

	1	2	3
	Unknown, c.c.	Known positive, c.c.	Known negative, c.c.
Back tube.			
Serum to be tested	0.15	0.15	0.15
Complement (2 units)	0.1	0.1	0.1
Salt solution	0.9	0.9	0.9
Front tube.			
	1	2	3
Serum to be tested	0.1	0.1	0.1
Complement (2 units)	0.1	0.1	0.1
Antigen	0.1	0.1	0.1
Salt solution	0.9	0.9	0.9

Incubate for one-half hour and add to every tube, both front and back, two units of amboceptor and 1 unit cell suspension (0.1 c.c.). Incubate for one hour, shaking every fifteen minutes. Then remove from the water-bath and read the reactions.

Formerly it was customary to keep tubes in the ice-box overnight and make final readings then. This practice has been discontinued because it is believed that the reaction obtained by reading immediately after incubation is more accurate than the later ice-box reading, and also because it saves at least twelve hours in getting out reports.

Reading. The reaction is read on a two-plus basis. That is:

- ++ = Complete inhibition. No hemolysis.
- + = 50 per cent. inhibition or more; 50 per cent. or more of the cells remain.
- + - = Some inhibition but less than 50 per cent. Less than 50 per cent. of the cells remain.
- = No inhibition. Complete hemolysis.

**LAW OF THE STATE OF MISSOURI FOR THE REGULATION
OF THE PRACTICE OF MEDICINE AND SURGERY.**

“SECTION 5.—Any person practising medicine or surgery in this State, and any person attempting to treat the sick or others afflicted with bodily or mental infirmities, and any person representing or advertising himself by any means or through any medium whatsoever, or in any manner whatsoever, so as to indicate that he is authorized to or does practice medicine or surgery in this State, or that he is authorized to do or does treat the sick or others afflicted with bodily or mental infirmities, without a license from the State Board of Health, as provided in this act, shall be deemed guilty of a misdemeanor and punished by a fine of not less than \$50 nor more than \$500, or by imprisonment in the county jail for a period of not less than thirty days nor more than one year, or by both such fine and imprisonment for each and every offence. Any person filing or attempting to file as his own a license of another, or a forged affidavit of identification, shall be guilty of a felony, and upon conviction thereof shall be subject to such fine and imprisonment as are made and provided by the statutes of this State for the crime of forgery in the second degree.” This law was upheld by the Supreme Court of Missouri rendered in the October term of 1910.

The following bill has been recommended by the Massachusetts State Department of Health:

“SECTION 1.—It shall be unlawful for any person, firm or corporation to sell, furnish, give away or deliver any drugs, medicines or other substances to be used for the cure or alleviation of gonorrhoea, syphilis or other venereal disease except upon the written order of a manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business as such, physician registered under the laws of this Commonwealth or an incorporated hospital through its superintendent or official in immediate charge or upon the written prescription of a physician registered under the laws of this Commonwealth, bearing his legal signature and his office address.

“The prescription when filled shall show the date of filling

and the legal signature of the person filling it written across the face of the prescription, and shall be retained on file by the druggist filling it for a period of at least two years. No order or prescription shall be received for filling or filled more than fourteen days after its date of issue, as indicated thereon.

“The prescription shall not again be filled, nor shall a copy of the same be made except for the purpose of record by the pharmacist filling the same, and it shall at all times be open to inspection by the officers of the State Department of Health, the Board of Registration in Pharmacy, the Board of Registration in Medicine, and the authorized agents of said department and boards.

“SECTION 2.—Any person who for the purpose of evading or assisting in the evasion of any provision of the act shall falsely represent that he is a manufacturer or a jobber in drugs, wholesale druggist, registered pharmacist or registered physician or superintendent or other official immediately in charge of any incorporated hospital, or who, not being a registered physician, makes or alters a prescription or written order for any drug, medicines or other substances to be used for the cure or alleviation of gonorrhoea or syphilis or other venereal diseases, or knowingly issues or utters a prescription or written order falsely made or altered, shall be deemed guilty of violation of this act.”

Section 3 provides that any violation of this act shall be punishable by a fine of not less than \$5 for a first offence, not less than \$100 for a second offence, and by fine and imprisonment for not less than thirty nor more than ninety days for any subsequent offence.

WESTERN AUSTRALIA (ANNO SEXTO),
GEORGII QUINTI REGIS, XXII.

No. 55 of 1915.

AN ACT TO amend the Health Act, 1911-12.

(Assented to, 8th December, 1915.)

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Western Australia, in this

present Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited as the Health Act Amendment Act, 1915, and shall be read and construed as one with the Health Act, 1911 (hereinafter called the principal Act), and this Act and the Health Act, 1911-12, may be cited together as the Health Act, 1911-15.

2. Section three of the principal Act is hereby amended by inserting in its appropriate place the following definition:

“Venereal disease” means and includes gonorrhoea, syphilis (including congenital syphilis), soft chancre, venereal warts and granuloma.

3. The following Part is hereby inserted after Part IX of the principal Act, that is to say:

PART IX.—A.

VENEREAL DISEASES AND DISORDERS AFFECTING THE GENERATIVE ORGANS.

242a (1) No persons other than a medical practitioner, or a person acting under the direct instructions of such a practitioner, shall attend upon or prescribe for any person suffering from any venereal disease for the purpose of curing, alleviating or treating of such disease.

Penalty: Fifty pounds, or six months' imprisonment with hard labor.

(2) The preceding subsection shall not apply to a registered pharmaceutical chemist who dispenses to the patient of a medical practitioner the prescription of such practitioner or to a registered pharmaceutical chemist who sells or any person who, under a permit in writing from the Commissioner (which permit the Commissioner is hereby empowered to grant) sells to any person any patent or proprietary medicine (as defined in section one hundred and eighty-seven of this Act) for the cure or alleviation of any venereal disease, from which such person is suffering: Provided always that such medicine is one that has been approved by the Commissioner as fit to be sold for the cure or alleviation of such disease.

Nor shall the preceding subsection apply to the sale by a registered pharmaceutical chemist in the ordinary course of business of any drug, not being a patent or proprietary medicine which has not been approved as aforesaid, and not being prescribed by him for the cure or alleviation of any venereal disease.

Provided that a permit as aforesaid shall not be granted to any other person other than a pharmaceutical chemist unless no pharmaceutical chemist carries on business within 10 miles of the place of business of such person.

242*b* (1) Every person suffering from any venereal disease shall, within three days of his becoming aware or suspecting that he is so suffering, consult a medical practitioner thereon and place himself under treatment by such practitioner.

Penalty: Twenty pounds.

(2) On any prosecution under this section it shall be a defence if the defendant shall prove:

(i) That he never was, within the period of three days, within twenty miles of a medical practitioner; and

(ii) That he did within such period consult such a practitioner by letter, and has followed, so far as possible, any advice given by the practitioner.

Provided that such proof shall afford no defence if it appears that at any time before the complaint was laid the condition set out in paragraph (i) hereof has ceased to apply to the defendant, and he has not thereupon, personally, consulted and placed himself under treatment by a medical practitioner.

242*c* (1) Every person suffering from a venereal disease who has consulted and placed himself under treatment by a medical practitioner shall (until he has received a certificate of cure) personally attend or cause himself to be attended by a medical practitioner for the purpose of treatment and advice at least once in every four weeks and shall follow, so far as possible, the advice given by any such practitioner.

Penalty: Twenty pounds.

(2) If any such person shall at any time decide to change his medical adviser, or if the medical adviser of such person

shall die, or for any reason be unable or unwilling to attend him further, then such person shall forthwith consult and place himself under the treatment of another medical practitioner, and immediately after doing so shall inform his new adviser of the name and address of his last previous adviser, and the medical adviser so informed shall thereupon send a notification in the prescribed form of the change made by the patient to such previous adviser, if such adviser be living and in the State.

Penalty: Five pounds.

242*d*. Every medical practitioner shall forthwith give notice to the Commissioner in the prescribed form upon becoming aware that any person attended or treated by him is suffering from any venereal disease in an infectious stage. The notice shall state age and sex of the patient and the nature of the disease, but shall omit the patient's name and address.

Penalty: Five pounds.

242*e*. If any patient who has been attended or treated by a medical practitioner for a venereal disease in an infectious stage shall fail to consult or attend such practitioner for a period of six weeks, and the practitioner shall not within that period have received from another practitioner a notice that the patient has changed his medical adviser, then such first-mentioned practitioner shall send to the Commissioner, in the prescribed form, a notice of the facts, stating the name and address of the patient.

Penalty: Five pounds.

242*f*. Every medical practitioner who attends or advises any patient for or in respect of any venereal disease in an infectious stage from which the patient is suffering, shall, by written notice delivered to the patient, direct such patient's attention to the contagious character of the disease, and to the legal consequences of infecting others, and shall by such notice warn the patient against contracting any marriage until he is certified as cured.

Penalty: Five pounds.

242*g*. When any such patient as aforesaid shall become cured of the disease, any medical practitioner shall, on being

satisfied of the fact, give such patient a certificate of cure in the prescribed form.

242*h*. The Commissioner shall conduct free of charge bacteriological or other examination which is required by any medical practitioner who has notified the Commissioner under Section 242*d* that he is attending or treating a person suffering from venereal disease.

242*i* (1) When any person under the age of sixteen years is or becomes liable under this part of this Act to do or submit to any act, matter, or thing, any parent or guardian of such person, who knows that such person is so liable, shall exercise his authority and use his best endeavors to compel or induce such person to do or submit to such act, matter, or things as aforesaid.

Penalty: Ten pounds.

(2) Any parent or guardian of any such person as aforesaid who knows that such person has failed to comply with any provision of this Act with which he ought to have complied, shall report the fact to the Commissioner.

Penalty: Ten pounds.

242*j* (1) Whenever the Commissioner has received a signed statement, in which shall be set forth the full name and address of the informant, stating that any person is suffering from venereal disease, and whenever the Commissioner has reason to believe that such person is suffering from such disease, he may give notice, in writing, to such person requiring him to consult a medical practitioner, and to produce to the satisfaction of the Commissioner, within a time to be specified in the notice, a certificate of such medical practitioner that such person is or is not suffering from the disease, and if such certificate is not produced within the time stated in such notice, or if the Commissioner be not satisfied with such certificate he may, by warrant under his hand, authorize any medical officer of health or any two medical practitioners to examine such person to ascertain whether such person is suffering from such disease, and the said officer or practitioners shall have power to examine the person accordingly, and shall report the result of his or their examination to the Commissioner in writing.

Provided that where the person to be examined is a female, and the examination is to be by two medical practitioners, one of such practitioners shall, if so desired by the person to be examined, be a female medical practitioner, if able and willing to act, and within twenty miles of the place where the examination is to be made.

(2) If the report discloses that the person is suffering from any venereal disease in an infectious stage and is in the opinion of the Commissioner likely, unless detained, to infect other persons, the Commissioner may, by warrant under his hand in the prescribed form and directed to the prescribed persons, order the person to be apprehended, and to be detained for any period not exceeding two weeks in any hospital or any other place, and the Commissioner may by such warrant order any bacteriological and other examinations and investigations to be made of and in respect of such person.

(3) If after such detention it shall appear to the Commissioner that the person is suffering from any venereal disease in an infectious condition, and that further detention is necessary to the interests of the public, and so reports to the Governor, then it shall be lawful for the Governor, at any time and from time to time on the recommendation of the Commissioner, to issue his warrant in such form and directed to such persons as he shall think fit, authorizing and requiring the apprehension of such person and the detention of such person in such place for such time as the Governor may think fit, and the Governor may by any such warrant direct that such person shall be subject to any treatment and examination which the Governor may, on the recommendation of the Commissioner, think necessary in the circumstances.

(4) When any person is subject to detention under this section he may from time to time apply in writing to a judge of the Supreme Court or a resident or police magistrate in the district in which he is detained to be examined by two medical practitioners, and thereupon such judge or magistrate shall by order direct any two or more medical practitioners named in the order, one of whom shall be nominated by the patient or some person on his behalf, to examine such

person accordingly and report the result of the examination to the judge or magistrate, and every officer or authority in whose custody the person is shall permit the examination. If it appears from such report that all the medical practitioners are unanimously of opinion that the person is cured or is free from venereal disease, or if such report disclosed that the person is suffering from venereal disease in an infectious stage, but the Commissioner fails to satisfy the judge or magistrate that the person would be likely to infect others unless detained, then the judge or magistrate shall order the release of such person; who shall be liberated from detention accordingly; provided that no application shall be made by a person so detained within six calendar months of a prior application having been made by such person.

(5) When any person is subject to examination or detention under the provisions of this section, and is found not to be suffering from venereal disease, or to be suffering from venereal disease, but not in an infectious stage, or to be suffering from venereal disease in an infectious stage, but not likely to infect others, such person shall be entitled as of right to inspect any written statement made to the Commissioner under Subsection (1) of this section, and to have a verified copy of every such statement.

(6) This section shall apply to any person undergoing imprisonment, but except in so far as is necessary in order to carry into effect the provisions of this section, the sentence of imprisonment shall not be interfered with; provided that the period of any detention suffered hereunder shall be reckoned as part of the term of imprisonment. If the person still remains liable to serve any portion of the term of imprisonment at the termination of the detention hereunder, the Minister may issue his order to any police officer, directing him to convey the person to the gaol or prison where such person is liable to complete the sentence.

(7) Every warrant issued hereunder may authorize the use of such force as may be necessary to carry it into complete effect, and shall have effect according to its tenor, and all police officers shall on sight of the warrant aid and assist in its execution in so far as they may be requested so to do by any person to whom the warrant is directed.

(8) Any person who contravenes any provision of this section by act or omission or obstructs the carrying into effect of any warrant or order issued thereunder or refuses to do or submit to anything which such person is by this section or any such warrant or order, required to do or submit to, shall be guilty of an offence against this Act.

Penalty: Twenty pounds.

242*k*. No person shall knowingly infect any other person with a venereal disease or knowingly do or suffer any act likely to lead to the infection of any other person with such a disease.

Penalty: Fifty pounds or imprisonment with hard labor for six months.

242*l* (1) The persons having the management or control of any hospital which has received in any financial year a subsidy from the State shall make effective provision for the examination and treatment free of charge, in accordance with regulations made by the Governor (pursuant to the power which is hereby conferred upon him) of such persons or classes of persons suffering from venereal disease as the Governor may by such regulations declare fit to be treated at or by such hospital.

In case default is made in compliance with this subsection the Colonial Treasurer may withhold from such hospital the whole or any portion of any subsidy which would be payable thereto during the next financial year.

(2) Every medical practitioner in receipt of any salary from the State shall examine and treat free of charge to such person any person suffering from venereal disease who shall apply to him for examination and treatment.

And the Commissioner shall pay a reasonable remuneration for such examination and treatment, and shall be liable to be sued for such remuneration in any court of competent jurisdiction.

Any medical practitioner who neglects or refuses to examine or treat any person as provided by this subsection, shall be liable to a penalty not exceeding five pounds.

242*m*. All proceedings under sections 242*a*, 242*b*, 242*c*, 242*d*, 242*e*, 242*f*, 242*i*, 242*j*, 242*k*, in any court shall be heard

in camera; and it shall be unlawful to publish in any newspaper a report of any such proceedings.

Penalty: For a first offence, One hundred pounds, or imprisonment with or without hard labor for not exceeding six months; for any subsequent offence five hundred pounds, or imprisonment with or without hard labor for not exceeding twelve months.

242*n* (1) No person shall publish any statement which is intended by such person or any other person to promote the sale of any article as a medicine, instrument, or appliance, for the alleviation or cure of any venereal disease or disease affecting the generative organs or functions, or of sexual impotence, or of any complaint or infirmity arising from or relating to sexual intercourse or of female or menstrual irregularities.

(2) Any person who—

(a) So affixes or inscribes any statement or anything whatsoever that it is visible to persons being in or passing along any street, road, highway, railway or public place; or

(b) Delivers or offers or exhibits any statement to any person being in or passing along any street, road, highway, pathway, public place or public conveyance; or

(c) Throws any statement down the area or into the yard, garden or enclosure of any house; or

(d) Exhibits any statement to public view in any house, shop or place; or

(e) Prints or publishes any statement in any newspaper; or

(f) Sells, offers, or shows or sends by post any statement to any person, shall be deemed to have published that statement.

(3) The word “statement” includes any document, book or paper containing any statement.

(4) Books, documents and papers published in good faith for the advancement of medical or surgical science are exempt from the provisions of this section.

(5) Any contravention of this section shall be an offence against this Act.

(6) Before any proceedings are taken under this section against any newspaper proprietor, printer, or publisher for printing or publishing any statement in a newspaper, the

Commissioner shall notify the proprietor, printer, and publisher of such newspaper that the publication of the matter complained of is an infringement of this part of this Act; and such proprietor, printer, and publisher shall not be liable to prosecution for an offence against this section except in respect of an offence of the same or a similar nature after such notification.

242*o*. Every person employed in the administration of this part of this Act shall preserve secrecy with regard to all matters that may come to his knowledge in the course of such employment, and shall not communicate any such matter to any other person except in the performance of his duties under this Act.

Penalty: One hundred pounds.

242*p*. So far as personal service of any notice is required under the provisions of this part of this Act, such service shall be effected by an officer of public health.

4. The following section is hereby added to the principal Act.

301. All courts and magistrates shall take judicial notice of all by-laws and regulations made under this Act.

5. All copies of the Health Act, 1911-12, hereinafter printed by the Government Printer shall be printed as amended by this Act under the supervision of the Clerk of Parliaments, and all necessary references to this Act made in the margin, and in any such reprint the short title shall be the Health Act, 1911-15.

THE CONTROL OF SYPHILIS IN THE ARMY.

This order advises continence; directs that the incontinent must take the prescribed prophylactic; prescribes an inspection to detect concealed cases, and directs that all cases be treated.

GENERAL ORDERS, }
No. 17. }

[G. O. 17.
WAR DEPARTMENT,
WASHINGTON, May 31, 1912.

1. It is enjoined upon all officers serving with troops to do their utmost to encourage healthful exercises and physical recreation and to supply opportunities for cleanly social and interesting mental occupations for the men under their com-

mand; to take advantage of favorable opportunities to point out, particularly to the younger men, the inevitable misery and disaster which follow upon intemperance and moral uncleanness, and that venereal disease, which is almost sure to follow licentious living, is never a trivial affair. Although the chief obligation and responsibility for the instruction of soldiers in these matters rests upon company officers, the medical officers should coöperate by occasional lectures or other instruction upon the subject of sexual physiology and hygiene and the dangers of venereal infection.

2. Commanding officers will require that men who expose themselves to the danger of contracting venereal disease shall at once upon their return to camp or garrison report to the hospital or dispensary for the application of such cleansing and prophylaxis as may be prescribed by the Surgeon-General. Any soldier who fails to comply with such instructions, if found to be suffering from a venereal affection, shall be brought to trial by court-martial for neglect of duty.

3. Commanding officers will require a medical officer, accompanied by the company or detachment commander, to make a thorough physical inspection twice in each month of all the enlisted men (except married men of good character) of each organization belonging to or attached to the command. These inspections will be made at times not known beforehand to the men and preferably immediately after a formation. The dates on which the physical inspections of the various organizations are made will be noted on the monthly sanitary reports.

At these inspections a careful examination of the feet and footwear and of the condition of personal cleanliness of the men will be made, as well as careful observation for the detection of venereal diseases.

Cases of the latter will be promptly subjected to treatment, but not necessarily excused from duty unless, in the opinion of the surgeon, deemed desirable. They will be made of record in the medical reports in any case. A list of those diseased but doing duty will be kept both by the company or detachment commander and the surgeon, and the infected men will be required to report to a medical officer for systematic treatment until cured. While in the infectious stages

the men should be confined strictly to the limits of the post. When a venereal case, whether or not on sick report, is transferred to another command, the surgeon will send a transfer slip giving a brief history of the case.

4. All instructions from the War Department prohibiting the publication in printed or other orders of instructions prescribing examinations having in view the detection of venereal diseases among enlisted men, heretofore issued, are recalled.

[1915426, A. G. O.]

BY ORDER OF THE SECRETARY OF WAR:

LEONARD WOOD,

Major-General, Chief of Staff.

OFFICIAL:

W. P. HALL,

The Adjutant-General.

The following are the usual directions for carrying out the system of venereal prophylaxis directed by par. 2, G. O. 17, W. D., 1912.

A suitable, easily accessible room in the hospital (or dispensary) at each post will be selected for this purpose, which should be provided with a good light and such medical supplies, basins, and other equipment as may be necessary. A competent, properly instructed man of the Hospital Corps, or more when necessary, will be on duty there between retreat and reveille, and will be within call at other hours.

The procedure in the case of men reporting for treatment will be as follows:

1. The name, rank, and organization of the soldier, with the day and hour of treatment should be entered for record on a card furnished for the purpose, which will afterward be examined and authenticated by the initials of a medical officer. These records should be regarded as confidential and should be kept in a secure place and not shown to unauthorized persons or except upon proper authority. They will not be preserved longer than three months.

2. The genital organs will be thoroughly washed with soap and warm water.

3. An injection will be made into the urethra of 4 c.c. of the standard solution of 2 per cent. protargol dissolved in

glycerin 15 parts, water 85 parts. This should be retained in the urethra for three minutes. In individual cases when the protargol solution is found to produce an irritating effect, a 20 per cent. solution of argyrol may be used. Other solutions or modifications of these solutions will not be used for routine administration.

4. The entire penis will be rubbed with calomel ointment (30 per cent. in benzoated lard), care being taken that the folds of the prepuce and about the frenum are thoroughly covered. If any pimples or abrasions exist about the scrotum or the pubic region, these should also receive an application of the ointment.

The parts should then be wrapped in a napkin of soft paper furnished for the purpose, in order to protect the clothing.

Stoppage of pay while absent from duty on account of venereal disease. This measure as well as possible trial by court-martial, for disobedience of orders in the case of those men who develop venereal disease but have not taken the prophylactic as ordered, are intended to compel men to take the prophylactic after exposure.

GENERAL ORDERS, }
No. 31.

[G. O. 31.]
WAR DEPARTMENT,
WASHINGTON, September 12, 1912.

1. The following extract from "An Act making appropriation for the support of the Army for the fiscal year ending June thirtieth, nineteen hundred and thirteen, and for other purposes," approved August 24, 1912, is published for the information and guidance of all concerned:

Provided, That no officer or enlisted man in active service, who shall be absent from duty on account of disease resulting from his own intemperate use of drugs, or alcoholic liquors, or other misconduct, shall receive pay for the period of such absence from any part of the appropriation in this Act for the pay of officers or enlisted men, the time so absent and the cause thereof to be ascertained under such procedure and regulations as may be prescribed by the Secretary of War.

2. Absence from duty because of the intemperate use of drugs or alcoholic liquors, or because of incapacity resulting

from venereal diseases not contracted in line of duty, is within the purview of the statute quoted above; and any officer or enlisted man who, on or after August 24, 1912, has been absent or may hereafter be absent from duty for any such cause or causes, is not entitled to pay, as distinguished from allowances, for the period of such absence.

3. Whenever an officer or enlisted man is absent from duty due to causes within the purview of the statute quoted above, the company commander will state in the "Daily Sick Report" his opinion to that effect by noting "No; G. O. 31, 1912," in the column headed "In line of duty" of the "Company Officer's Report," and the surgeon will in like manner record his opinion in the column "In line of duty" of the "Medical Officer's Report." Notice that such an entry has been made will at once be brought to the attention of the officer or enlisted man concerned by the company commander.

When the company commander and the surgeon are in accord, the finding, if approved by the commanding officer, shall be final. Should the company commander and the surgeon disagree, or should the commanding officer dissent, the latter will call a board of officers of not less than two members, one of whom shall be a medical officer, to report upon and make recommendations in the case. Approval by the commanding officer of the findings of this board shall be final; but if the commanding officer disapprove the findings of the board the proceedings will be forwarded for the action of the next higher authority.

In the case of a company commander or of an officer or enlisted man not carried upon the rolls of a company the duties hereinbefore required of the company commander will be performed by the next superior officer under whose command or direction the officer or enlisted man concerned may be serving.

The terms "company" and "company commander" will be understood as including a troop, battery, band, or detachment, and the commanding officer thereof.

4. When it has been determined in the manner hereinbefore prescribed that an officer has been absent from duty due to causes within the purview of the statute quoted above, the proper commanding officer will forward to the division

commander a report showing the inclusive dates of the absence and the cause thereof. This report will be forwarded to the Adjutant-General of the Army for transmission to the Chief of the Quartermaster's Corps, who will take the necessary action looking to stoppage of pay for the period of absence from duty. In cases arising in the Philippines Division, the division commander, at the time of the sending of the original report to the Adjutant-General, will transmit a copy thereof to the Chief Quartermaster, Philippines Division, who will take the necessary action toward securing the proper stoppage of pay.

When it has been determined in the manner hereinbefore prescribed that an enlisted man has been absent from duty due to causes within the purview of the statute quoted above, the proper commanding officer will make notation to that effect on the pay-rolls or on final statements giving the inclusive dates of the absence, and the paymaster will make deduction of pay for such period. If it is impracticable to determine within the month in which the absence from duty occurs that such absence was due to causes which should deprive the soldier of his pay, he will not be permitted to draw pay for that or any subsequent month until the cause of the absence from duty has been determined.

[1945857, A. G. O.]

BY ORDER OF THE SECRETARY OF WAR:

LEONARD WOOD,

Major-General, Chief of Staff.

OFFICIAL:

GEO. ANDREWS,

The Adjutant-General.

Directions in regard to treatment of syphilis.

[Cir. No. 14.]

CIRCULAR }
No. 14. }

WAR DEPARTMENT,
OFFICE OF SURGEON-GENERAL,
WASHINGTON, August 3, 1914.

The following instructions concerning the use of salvarsan and neosalvarsan are published for the information and guidance of medical officers, superseding all previous circulars on this subject:

Indications.—Salvarsan or neosalvarsan is indicated (1) for the rapid control of the manifestations of syphilis, both clinical and serological. For this purpose one or more intravenous injections of the drug are to be given, the dose, interval and number of injections to be determined by the indications presented in each individual case. It should be recognized that the object of this treatment is to secure prompt amelioration of the symptoms only, and that further treatment will be necessary in order to attain more permanent results. (2) For the radical cure of syphilis in the primary stage, in combination with an intensive course of treatment with mercury. The possibility of attaining such a cure is now well established. The highest percentage of successful results is obtained in cases treated in the primary stage before the appearance of the Wassermann reaction; in such cases the diagnosis must necessarily rest upon discovery of the parasite in the initial lesion. The combined treatment consists of from three to six intravenous injections of salvarsan, at intervals of from one to two weeks, combined with an intensive course of mercurial treatment by inunction or intramuscular injection, or by both methods, continued for a period of from one to two months. Salvarsan rather than neosalvarsan should be used, and ascending doses should be given, beginning with one-half of the maximum dose. The administration of mercury must be pushed until the physiological limit is reached. Only patients in good health in other respects, and whose kidneys are known to be normal, are suitable for the intensive treatment. The preparation of mercury most used in this country for intramuscular injection is the basic salicylate. A 10 per cent. suspension is made in liquid petrolatum; 0.6 to 1 c.c. of the suspension is to be given at least once a week.

Contra-indications.—Aside from the ordinary contra-indications, such as severe organic disease due to other causes, two possible complications must be kept in mind—*nervous relapse* and *uremia*. Both these conditions may occur, under certain circumstances, after treatment, during the active secondary stage, and cases in this stage must be treated with special caution. Nervous relapse may occur after inadequate treatment in cases where the nervous system is already infected. In such cases one or two injections of salvarsan,

not followed up by other treatment, may do more harm than good, and a thorough combined course of treatment should be instituted, or mercury alone used.

Recent literature records a number of deaths following the administration of salvarsan and neosalvarsan. A certain proportion of these deaths presented identical symptoms; these occurred in the active secondary stage of the disease, two or three days after the second injection of the remedies. The symptoms presented by these cases resembled those of uremia. In our service, during the past three and one-half years, four such cases have occurred, one after the administration of salvarsan and three after the administration of neosalvarsan. During the period referred to over 31,000 doses of the drugs have been issued. Autopsies and histological examinations in three of the fatal cases showed an intense acute nephritis. The condition of the kidneys prior to the administration of the drug was not known. While the exact explanation of the cause of these deaths is in doubt, the lesion of the kidneys deserves consideration.

It is directed that, in all cases in which it is contemplated to administer salvarsan or neosalvarsan, the urine of the patient be examined, and should any case show evidence of kidney involvement, that these drugs be withheld or used in small doses. A urinary examination will also be made after each administration of salvarsan or neosalvarsan. Intense headache after the administration of salvarsan is a danger signal. To counteract this complication, in addition to the usual measures, adrenalin in one-half-milligram doses administered subcutaneously has been recommended.

Salvarsan versus Neosalvarsan.—Neosalvarsan weighs one and one-half times as much as salvarsan for the equivalent content of arsenic, and the ratio of dosage is therefore 3 to 2; *e. g.*, 0.9 gm. neosalvarsan is equivalent to 0.6 gm. salvarsan. Salvarsan, however, is clinically more effective in proportionate doses than neosalvarsan and should be used when intensive effect is desired, as in attempting a rapid cure. During the year 1913 over 1000 more doses of neosalvarsan were used than of salvarsan, but, while no restriction has been placed on the choice of these drugs, neosalvarsan should not be used to the exclusion of salvarsan simply because it is easier to handle.

Method of Preparation.—Salvarsan.—Salvarsan is put up in sealed ampoules filled with a neutral gas to prevent oxidation, and only intact ampoules should be used. Salvarsan, when dissolved in water or salt solution, forms an acid salt which is too caustic for use; on neutralizing it with sodium hydroxide, the soluble acid salt is changed into a neutral base which is insoluble; further addition of sodium hydroxide converts the insoluble neutral base into an alkaline sodium salt which is soluble; 0.8–0.9 c.c. of a 4 per cent. sodium hydroxide solution is required for each 0.1 gm. of powder—*i. e.*, if the dose is 0.5 gm., 4–4.5 c.c. of the 4 per cent. solution of sodium hydroxide will be required. The end-point is the complete solution of the precipitate; care should be taken not to go beyond this point, as an excess of alkalinity is liable to cause a thrombosis. To avoid this, a small amount of precipitate may be left undissolved.

The solution of salvarsan, prepared as described above, is added to 60–150 c.c. of an 0.85 per cent. salt solution and administered at room or body temperature. The salt solution should be made with *freshly distilled* water, *sterilized* immediately, and kept well stoppered until used. Salt solution made of stale distilled water contains many dead organisms after sterilization and produces severe reactions.

Neosalvarsan.—Neosalvarsan dissolves readily in water and forms a neutral solution ready for use. It is more unstable than salvarsan and should be given immediately after preparation at *room temperature*. It may be given in about 150 c.c. of a 0.4 per cent. salt solution with the standard apparatus, or in concentrated solution, 0.9 gm. in 20 c.c. of distilled water with a syringe.

Intravenous Injections.—These are easily given with the standard apparatus, which should contain a light plug of absorbent cotton in the neck to filter out undissolved particles, etc. The injection tube and needle should be filled with salt solution before the prepared solution is poured into the reservoir, so that salt solution only will escape into the tissues if the vein is missed on the first trial. In most cases it is unnecessary to expose a vein by incision, which incision is justifiable only when absolutely necessary.

Intramuscular Injections.—These should be used only when intravenous injections are impracticable. The alkaline solution of salvarsan is diluted to about 20 c.c. with sterilized water, and 10 c.c. are injected into each buttock. Or the powder may be suspended in 2–3 c.c. of sterile liquid petrolatum which is similarly injected. For the latter method the syringe must be absolutely dry and should be lubricated with oil or the piston will bind. Neosalvarsan may be given in the same way, either in solution in 20 c.c. of sterile water or in suspension in sterile liquid petrolatum. The painfulness and uncertainty of absorption of intramuscular injections are objections to this method.

Plan of Treatment.—In suitable early cases, radical cure in a short time should be attempted on account of the advantages of a successful result. In other cases the chronic intermittent treatment by inunction or injection of mercury should be carried out, using salvarsan when necessary to control symptoms and to reduce a positive Wassermann reaction.

Observation of Cases.—In the absence of symptoms the Wassermann reaction is the only reliable index of the infection; after treatment has been suspended, Wassermann reactions should be made at intervals of one or two months. If they continue negative at the end of a year a provocative reaction should be made. If possible, a luetin reaction and examination of the spinal fluid should also be made before the case is closed. A certain proportion of cases are “Wassermann-fast”—that is, the Wassermann reaction is uninfluenced by treatment; these cases usually have aortic lesions or involvement of the nervous system. In such cases examination of the spinal fluid should especially be made.

The information contained in well-kept syphilitic registers has been found to be of great scientific and practical value, and it is enjoined that every effort be made to follow cases closely and to record important data.

W. C. GORGAS,

Surgeon-General, United States Army.

The Syphilitic Register which accompanies every soldier from the time the diagnosis of syphilis is made until he is cured or is separated from the service by death, discharge or desertion.

(FRONT)

FORM 78

MEDICAL DEPARTMENT, U. S. A.

(Revised Nov. 24, 1913)

SYPHILITIC REGISTER.

IN THE CASE OF

.....
(Surname) (Given name)

.....
(Rank) (Co.) (Regiment or Staff Corps)

BIRTH.

Date.....

Race.....

DATES OF ENLISTMENTS.

.....
.....
.....

FINAL DISPOSITION OF CASE.

Cured.....

Discharged on account of.....

.....

Deserted.....

Died.....

TRANSMITTAL OF REGISTER TO SURGEON-GENERAL.

Date.....

Station.....

Signature.....

.....

(BACK)

INSTRUCTIONS.

1. This Register will be kept in the case of every soldier, and of every general prisoner, who has syphilis. It will be begun at the first station where the diagnosis is made, and will be continued until the patient is cured or permanently leaves the service.

2. A case is considered cured when the following conditions have been fulfilled:

(a) No treatment for one year during which there have been no symptoms, no positive Wassermann reactions and several negative ones.

(b) At the end of the year a negative provocative Wassermann reaction and a negative luetin test.

3. The initial diagnosis, origin of infection, and principal lesions, with the dates of same, will be noted on page 2. Other important manifestations and memoranda worthy of remark will be noted under "Progress of Case."

4. The serum tests to determine the status of the infection will be recorded by the dates and places thereof under "Serum Reactions," indicating in the "Result" column the nature of the reactions by the symbols ++, +, +-, and -.

5. The medicines used and methods of administration will be noted by successive entries in the appropriate columns under "Treatment."

6. The stations where the patient serves or is confined during the period of observation and his movements from one to another will be recorded on next to the last page.

7. When the patient is sent from one station or command to another the Register will be sent to the surgeon of the new station or command in time to arrive with or before the man, if possible. If the Register does not arrive within a reasonable time the surgeon will so advise the surgeon of the old station or command, and meanwhile will start a new Register until the original one is received.

8. Each medical officer will initial the entries made by his direction. He will sign in the appropriate columns the prescribed record of treatments.

9. On cure, or on termination of service or confinement, without reënlisment, the Register will be forwarded to the Surgeon-General.

10. When the case is finally disposed of by discharge on certificate of disability, a full statement of the causes of the disability for which the patient was discharged, and of his present condition due to the syphilitic infection, will be recorded under "Progress of Case."

The intermediate sheets of this register contain appropriate blanks for the date and result of all serum reactions made, and also accurate details of all treatment given, including place and date received, character and amount of drug and method of administration. Other sheets provide for notes on the progress of the case.

METHODS EMPLOYED BY SOME CITIES.

Methods of publicity employed by the city of Rochester, N. Y., and sent through the courtesy of the Health Officer, Dr. George W. Goler. A booklet on Syphilis, Gonorrhoea and Gonorrhoeal Ophthalmia, which is too long to reproduce here, is circulated among physicians and patients.

The following advertisement is inserted in the daily papers:

RESIDENTS OF ROCHESTER avoid quack doctors, quack dentists and patent medicines. Your time and money will be wasted; you will not be cured and your health may be ruined by the use of them; free confidential advice concerning your health at the Health Bureau, Chestnut and James Streets, Mondays and Thursdays, 3 to 4 and Monday, 7 to 8 P.M.

The following statement is used as a poster in suitable places:

VENEREAL DISEASES!

AVOID QUACKS AND PATENT MEDICINES!

YOUR TIME AND MONEY WILL BE WASTED.

YOU WILL NOT BE CURED.

YOUR HEALTH MAY BE RUINED.

FREE CONFIDENTIAL ADVICE CAN BE OBTAINED FROM

THE BUREAU OF HEALTH,

ROCHESTER, N. Y.

On Mondays, 3 to 4 and 7 to 8 P.M. Thursdays, 3 to 4 P.M.

Methods of notifying the patient that he must report for treatment. In use at Rochester, N. Y., and sent through the courtesy of the Health Officer, Dr. George W. Goler.

HEALTH BUREAU.

ROCHESTER, N. Y.....

.....
Please call at the Health Bureau Consultation
on.....

GEORGE W. GOLER, M.D.,
Health Officer.

HEALTH BUREAU.

.....
Unless you report to the Health Bureau consultation on
.....we will ask the police to call
upon you.

GEORGE W. GOLER, M.D.,
Health Officer.

ROCHESTER HEALTH BUREAU,

CONSULTATION.

Name

Address Date

You are required to report on the last date named on the
back of this card.

GEORGE W. GOLER, M.D.,
Health Officer.

HOURS.

Mondays, 3-4 and 7-8 P.M.
Thursdays, 3-4 P.M.

CARD USED FOR RECORD—(BACK).
TREATMENT.

DATE.	DRUG AND METHOD.	RESULTS.
.....
.....
.....
.....
.....

WASSERMANN		REFERRED TO..... DATE.....	REPORT.....
DATE	RESULTS.		
.....		
.....		
.....		
.....		
.....		

REMARKS.....

Letter sent to physicians whose patients have a positive Wassermann:

CITY OF ROCHESTER, EXECUTIVE DIVISION,

HEALTH BUREAU.

DEAR DOCTOR:

We have a Wassermann report of which is . . . +.

It is our observation that a very small percentage of patients affected with syphilis remain under treatment long enough to prevent them from becoming a danger to others and a menace to themselves, and that they are thus unable to conduct themselves in such a manner as not to expose other persons with whom they may be associated to the danger of infection.

It is for these reasons that the Public Health Law has given us power to control such persons. Following out the provisions of that law, we shall require from you a report on the 15th and 30th day of each month, stating that the within-named patient is under your treatment. If the patient goes to another physician a similar report will be required from the next physician. These reports are to be sent until the patient has had at least two negative Wassermanns.

Failing to receive a report, we shall, without further notice, ask the police to secure the patient, and we will proceed against the patient under the Public Health Law.

Respectfully yours,

Health Officer.

Report that must be sent by the physician treating the case, to show that treatment is still being given. Sent through the courtesy of the Health Officer, Dr. George W. Goler.

ROCHESTER, N. Y., 191

This is to certify that is still under my care.

(Signed) M.D.

**VENEREAL DISEASES: REPORTS OF CASES TO THE
DEPARTMENT OF HEALTH.**

AN ORDINANCE

Passed by the City Council June 29, 1917, Requiring the
Reporting of Venereal Diseases.

Be it Ordained by the City Council of the City of Chicago.

SECTION 1.—That the Chicago code of 1911 be and the same is hereby amended by adding thereto the following sections:

1193a. *Venereal Diseases.—Dangerous to Public Health.*—Syphilis, gonorrhoea and chancroid, hereinafter designated venereal diseases, are hereby recognized and declared to be contagious, infectious, communicable and dangerous to the Public Health.

1193b. *Venereal Diseases to be Reported.*—It shall be the duty of every licensed physician, of every superintendent or manager of a hospital or dispensary, and of every person who gives treatment for a venereal disease, to mail to the Department of Health of the City of Chicago a card supplied by this Department stating the age, sex, color, marital condition and occupation of such diseased person, the nature and previous duration of such disease and the probable origin; such card to be mailed within three days after the first examination of such diseased person; provided that, except as hereinafter required the name and address of such diseased person shall not be reported to the Department of Health.

1193c. *Persons Afflicted with Venereal Diseases to be Given a Circular of Information.*—It shall be the duty of every licensed physician and of every other person who treats a person afflicted with venereal disease to give to such person at the first examination a circular of information and advice concerning venereal diseases furnished by the Department

of Health; and in addition to give to such diseased person a copy of this ordinance, and to report to the Health Department that such diseased person has received the two documents herein specified.

1193d. *Change of Physician to be Reported by Patient to Physician First Consulted.*—When a person applies to a physician or other person for treatment of a venereal disease, it shall be the duty of the physician or person consulted to inquire of and ascertain from the person seeking treatment whether such person has theretofore consulted with or been treated by any other physicians or persons, and if so to ascertain the name and address of the physician or person last theretofore consulted. It shall be the duty of the applicant for treatment to furnish this information, and a refusal to do so, or falsely stating the name and address of such physician or person consulted shall be deemed a violation of this ordinance. It shall be the duty of the physician or person consulted where the applicant has heretofore received treatment to immediately notify by mail the physician or person last theretofore treating such applicant of the change of adviser; such notification to be made upon a form furnished for that purpose by the Department of Health. Should the physician or person previously consulted fail to receive such notice within ten days after the last appearance of such venereally diseased person it shall be the duty of such physician to report to the Health Department the name and address of such venereally diseased person.

1193e. *Protection of Others from Infection by Venereally Diseased Persons.*—Upon receipt of a report of a case of venereal disease it shall be the duty of the Commissioner of Health to institute such measures for the protection of other persons from infection by such venereally diseased person as said Commissioner of Health is already empowered to use to prevent the spread of other contagious, infectious or communicable diseases.

1193f. *Reports to be Confidential.*—All information and reports concerning persons infected with venereal diseases shall be confidential and shall be inaccessible to the public,

except in so far as publicity may attend the performance of the duty imposed upon the Commissioner of Health by Section 1193*e* of this ordinance.

1193*g*. *Parents Responsible for the Compliance of Minors with the Requirements of Regulations.*—The parents of minors acquiring venereal diseases and living with said parents shall be legally responsible for the compliance of such minors with the requirements of the ordinance relating to venereal diseases.

1193*h*. *Penalty.*—Any person who violates, neglects or refuses to comply with the provisions of Sections 1193*a*, 1193*b*, 1193*c*, 1193*d*, 1193*e*, 1193*f* and 1193*g* of this ordinance shall be fined not less than twenty-five dollars (\$25.00) nor more than one hundred dollars (\$100.00) for each offence.

SECTION 2.—This ordinance shall take effect and be in force from and after its passage and due publication.

Form sent to physicians:

CITY OF CHICAGO,

DEPARTMENT OF HEALTH.

NOVEMBER 26, 1917.

DEAR DOCTOR:

An ordinance passed by the City Council, June 29, 1917, requires that venereal diseases be reported to the Department of Health.

Enclosed find a circular of information including, on page 10, a copy of the ordinance; also reporting cards and blanks for the use of the doctor in complying with the ordinance.

Yours very truly,

JOHN DILL ROBERTSON, M.D.,

Commissioner of Health.

Form on which physicians report cases:

Time received
by Dept. of Health.

.....191..

I hereby report a case of.....
(Syphilis, Gonorrhoea, Chancroid)

Age:.....Sex:.....Color:.....Married:.....

Occupation:.....

Date of Onset:.....191..

Probable Origin:.....

Have you given patient copy of venereal disease ordinance and
circular of information?..... Has patient been treated for
this disease by anyone previous to his call on you?..... Have
you notified the previous adviser of the patient's change to you for
treatment?.....

Signed.....M.D.

Telephone..... Address.....

.....191

DEPARTMENT OF HEALTH,
City Hall, Chicago.

DEAR SIR:

This is to notify you that

.....
(Name)

.....
(Address)

under my treatment for venereal disease, has not reported
to me within ten days of the time agreed upon, and that I
have not received a report to the effect that he has placed
himself under the care of another adviser.

Respectfully,

.....M.D.

.....
(Address)

.....191

Dr.....

.....

DEAR DOCTOR:

In accordance with the requirements of Section 1193*d* of the Municipal Code of Chicago, I have to notify you that

.....

(Name)

.....

(Address)

formerly treated by you, has now placed himself under my care and treatment.

Respectfully,

.....M.D.

.....

(Address)





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