Syphilis of the innocent : a study of the social effects of syphilis on the family and the community with 152 illustrative cases made under a grant from the United States Interdepartmental Social Hygiene Board / by Harry C. Solomon and Maida Herman Solomon.

SYPHILIS OF THE INNOCENT

A Study of the Social Effects of Syphilis on the Family and the Community

With 152 Illustrative Cases

Made under a Grant from the
United States Interdepartmental Social Hygiene Board

BY

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PREFACE

For some years we have been interested in the family of the syphilitic. This interest has extended beyond the purely medical problems to the social effects of syphilis. There has come the realization that in many instances syphilis is a disease which invades the family. The family being but a unit of the community, it follows that the communal structure is also involved. The United States Interdepartmental Social Hygiene Board has granted us funds for the study and investigation of problems related to the familial and social aspects of syphilis. The results of several studies have been published in current journals, but as our investigations increased it seemed to be more satisfactory to publish them as a unit rather than as separate entities. We have attempted to present the subject of syphilis in its social aspects, portraying the practical problems as they actually arise in the handling of syphilitic cases, and illustrating the text with cases from the clinic. It is our hope that we have been able to show that the problems of syphilis are many more than those of purely medical interest.

Acknowledgment must be made first of all to the United States Interdepartmental Social Hygiene Board whose grant of funds made it possible to carry on many of the investigations and to collect and publish the material here presented. Our revered former chief, Dr. E. E. Southard, suggested the idea of presenting our work in the form of a monograph. While his untimely death prevented him from giving the oversight and advice that he otherwise would have done, we hope that we have profited to some extent by what he did give us.

While the major portion of the material comes from our clinic at the Boston Psychopathic Hospital, we have fortunately been able to collect material from several other sources. We would especially acknowledge our indebtedness to the following persons and institutions:

Dr. C. Morton Smith, physician in chief of the South Medical Department of the Massachusetts General Hospital, Boston,

and Miss Ora M. Lewis, chief social worker of the Department; the Children's Hospital, Boston, for the privilege of using cases from their clinics; Dr. W. A. Hinton of the Wassermann Laboratory of the Massachusetts Department of Public Health who, through his coöperation over a period of years, has enabled us to examine and follow our cases serologically in a manner that is rarely possible, and who gave us access to original statistics concerning the Wassermann reaction on various groups of patients; our present chief, Dr. C. Macfie Campbell, who has been most helpful in reading the manuscript and offering valuable suggestions, in addition to having done everything possible to facilitate our work from the material side; Dr. H. A. Bunker, who has been kind enough to give a very careful reading of the proof.

The work has been greatly lightened by the conscientious and intelligent secretarial assistance of Miss Louise C. Francis and Miss Theresa Vesce. Finally, we acknowledge our indebtedness for editorial assistance and care of publication details to the American Social Hygiene Association and especially to Mr. Kenneth M. Gould.

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CHAPTER I

THE INDIVIDUAL

Syphilis as a Disease.—Syphilis is a chronic, infectious, contagious disease, caused by a specific organism known as the Treponema pallidum, or the Spirochaeta pallida. It is a disease, which, unless cured, runs a course as long as the life of the person infected. It is characterized by exacerbations of symptoms and by long periods in which there is no evidence of disease so far as the subjective feelings of the patient are concerned. It has a tendency, nevertheless, to cause various types of physical and mental deterioration, and may lead to incapacity or death.

Syphilis has a very much broader significance than attaches to mere consideration of the individual who originally acquired the disease. Every syphilitic person must be considered as a *focus of infection,* as a potential danger to the community, in the same category with the "typhoid carrier." He is thus liable to certain rules and regulations for the benefit of the public health. In addition, as the disease may lead to disintegration of the person's mental and physical abilities, the infected individual must be viewed as a possible social liability. He is likely to become incapable of caring for his family, to be the progenitor of defective children, or to become an inmate of a public institution.

Methods of Infection; Incubation and Primary Periods.—It will probably be most satisfactory to sketch the life history of syphilis by considering it in relation to an individual. Infection with syphilis means that the Treponema pallidum, the organism of the disease, has in some manner made its way through the skin or mucous membrane of the body, and thus gained access to the underlying tissues. As a rule this occurs through contact between person and person. It is possible, although less usual, for this contact to occur through the mediation of an object which has been contaminated by treponemata from the body of an infected individual. These

treponemata may then be carried over to the body of a second person. Sexual intercourse is the most frequent method by which the disease is spread, but there are many instances of extragenital infection. For some little time there is no indication that anything has happened. Then at the end of from three to six weeks there occurs what is known as a chancre, or primary sore. The period from the moment that the treponemata enter the body until the appearance of this sore is known as the incubation period. During the incubation period the treponemata which have entered the body begin to multiply. They make their way through the lymphatic vessels which drain the locus at which they entered and reach the blood stream by which they are carried throughout the body. Thus, during this incubation period, although the patient knows of nothing untoward, his body is being invaded by numerous organisms. Finally, after several weeks, the local reaction appears, and with its development the so-called primary period of the disease begins. This local reaction characteristically takes the form of a painless papule, which slowly increases in size, reaching, ordinarily, the dimensions of a small pea. It is prone to assume a crater-like shape, and with the surrounding tissue to become indurated. Unless it is then secondarily infected by some pus-producing organism, there is no purulent exudate, but only a thin serous excretion. The glands which drain this region shortly become enlarged and fairly hard. It is rare, indeed, that they become secondarily infected. Thus, if the sore is on the genitals, the glands in the groin will become easily palpable and have a shot-like hardness. If the chancre is on the lip, the glands under the chin will become swollen.

Diagnosis of Primary Stage by Inspection.—The primary sore is rarely painful or in itself a serious symptom. Occasionally it becomes infected and leads to grave and unpleasant consequences. Such infected chancres are spoken of as phagedenic, and a considerable amount of local damage may be done. Ordinarily the chancre will begin to disappear, with or without treatment, after the third or fourth week. It slowly recedes in size, and soon becomes only a scar. If

the lesion takes on its most characteristic appearance and is located on the genital organs it will readily be recognized by a physician. When, however, it is located on the finger, lip, or tonsil, it is much less likely to be recognized by its physical characteristics. When it occurs inside of the vagina, on the uterus, or in the urinary meatus it may be entirely overlooked. Many times the chancre does not present characteristic features, but may be merely a small excoriation. It not infrequently occurs at the same time with gonorrhea or with what is known as a soft chancre, non-syphilitic in nature. Under these circumstances, diagnosis is not easy by mere observation.

Laboratory Aids to Diagnosis; Demonstration of Organism.—Fortunately, however, there is a more exact method of making the diagnosis than by depending merely upon the physical picture. The most satisfactory method of diagnosis at the early period of the primary stage is by the demonstration of the organism of the disease. This organism is quite characteristic in its appearance. It can best be demonstrated by the dark-field microscope. A drop of the secretion examined in this way by a person expert in the procedure, will practically always demonstrate the treponema in the first weeks of the disease. Every modern clinic dealing with syphilis has facilities for such an examination, and both private and public laboratories are available to the physician who is without the proper equipment.

Wassermann Reaction and Diagnosis.—During the first week or two after the appearance of the primary sore, the Wassermann reaction is negative and thus, at this period, is of no help in making a diagnosis. After the second or third week, and certainly by the fourth or fifth week, the Wassermann reaction becomes positive, and affords another very satisfactory and reliable method of diagnosing the disease. It is very important, however, to make a diagnosis before the Wassermann reaction becomes positive, because the earlier the diagnosis is made and treatment instituted, the more satisfactory will be the results of treatment.

History and Diagnosis.—Later in the primary stage the diagnosis of syphilis is made not only from the Wassermann reaction but from the history, which includes the evidence of exposure and an incubation period of several weeks, followed by the chancre and the enlargement of the regional lymph glands.

Apparent Innocuousness of Primary Period.—Since the discovery of the treponema in 1906 and the Wassermann reaction in 1909, syphilology has entered into a new era. Many more cases are being correctly diagnosed in the primary stage, owing to the possibility of establishing the diagnosis practically as soon as the first objective evidence of a lesion appears, as well as during the first weeks of the disease. Previously to 1906 it was often necessary to withhold diagnosis and delay treatment for some time, in order to watch the course of the disease and see whether the manifestations of the secondary stage would confirm the suspicions of a syphilitic diagnosis. This was really necessary, for one can readily understand what a terrible injustice to the patient it would be to make an erroneous diagnosis of syphilis with its concomitant implications and mental suffering. By our ability to make an early diagnosis one battle has been won against the vagaries of the syphilitic manifestations. One of the ways the disease is still able to get the better of us is due to its apparent innocuousness in this early stage. The chancre may be quite painless and the general condition of the patient seem in no way affected. However, even before the appearance of the chancre the disease has become systemic and the entire body invaded by the treponema. For this reason, localized treatment has relatively little value in curing the general infection. Indeed it has a great disadvantage if applied before the diagnosis is thoroughly confirmed, as the action of mercury on the lesion tends to kill the superficial treponemata, making the demonstration of the organisms very difficult.

Contagiousness of Primary Period; Importance of Early Treatment.—During the first stage the patient is extremely

contagious to others. This contagiousness certainly occurs with the first appearance of the primary sore, and there is a chance that it may be present even earlier. As a rule, several days elapse before the patient seeks advice. During this period he may infect others. As every syphilitic in the primary stage is a most dangerous focus of infection, unless treatment is instituted at once to sterilize the individual, he will continue to be "a carrier" for a long time. Treatment at this early period is of the utmost importance for the reasons, first, that it protects others in the community against the infection; second, because the most good can be done to the individual; and third, because with proper care at this time, the patient may avoid becoming a social liability years later. Thus, for its own protection, society has a vital interest in seeing that the patient receives an early diagnosis and adequate treatment. The care and treatment of syphilis is at least as important to the public as the proper control of smallpox, typhoid fever, or other infections, and it is more prevalent than most of the other infections.

Amount of Treatment for Sterilization of Contagiousness; Hospitalization.—Arsphenamin (salvarsan) has the utmost value in the sterilization of the disease, that is, in producing a noncontagious condition. In the majority of cases, three to five injections of this drug will go a long way toward making the patient noncontagious; at any rate, it will cut down the infectivity to such a degree that he is no longer a danger to anyone except those in the very closest contact. The patient must still use great care, of course, to prevent the spread of his disease, and this can best be accomplished by keeping himself and the implements with which he comes in contact away from others. The most satisfactory method of handling the early syphilitic in order to protect others is to hospitalize him at once. Ideally, he should be placed in a hospital as soon as the diagnosis is made. Here he is taught cleanliness and care. In addition, he is immediately placed under vigorous antisyphilitic treatment, consisting of arsphenamin and mercury. At the end of ten days or two weeks, in which period he has received three or more injec-

tions of arsphenamin and a certain amount of mercury, he is relatively sterile as far as the spread of the disease is concerned. At any rate, he is no longer the dangerous individual that he was. By remaining in the hospital he avoids chance contact. He is given more vigorous treatment than would be possible if he were about his ordinary business, and he is taught the principles of personal hygiene. He can then go out into the community with relative safety to others, and continue his treatment.

Early Treatment and a "Cure."—The cure of syphilis is never a rapid process. There are many who maintain that syphilis is incurable. However, there is much evidence indicating the probability that cures can be accomplished, or that, at least, the patient can remain free from symptoms and not endanger others. The earlier treatment is instituted, the better the outlook. In cases that receive adequate treatment beginning at a time before the Wassermann is positive, it is frequently possible to prevent this reaction from ever becoming positive. While this does not prove that the disease has been aborted, it does suggest that a long step has been taken in this direction. Some of the German authorities have stated that if treatment is started during the early primary period, a cure can be obtained by some six months of treatment. Most American authorities would insist upon a longer period of treatment, irrespective of signs or symptoms. However, the outlook is relatively very favorable if treatment is begun in the early stage and pushed with vigor. Hence, there is every reason from the point of view of the patient, his progeny, and society to further early diagnosis and treatment.

Treatment has a tendency to shorten the period of the chancre, that is, the chancre will disappear fairly rapidly under arsphenamin and mercury, and where the treatment has been pushed during the early period the symptoms of the so-called secondary period may be prevented. In the untreated case, the primary period lasts, on the average, from three to six weeks.

Secondary Period—Characteristics.—It must be borne in mind that there is no sharp line demarcating primary,

secondary, or tertiary periods, but that these divisions are made on a symptomatic basis as an aid in the discussion of the disease. The secondary period may be said to begin with the disappearance of the chancre or the appearance of certain other symptoms which are spoken of as characteristic of the secondary period. In the typical case, about the time that the chancre retrogresses, a rash presents itself on the trunk. This rash may be of the most varied type, from a slight blushing of the skin to severe skin lesions. One of the most frequent forms is the so-called roseola, beginning as a faint reddening and then appearing as small red blotches, which fade upon pressure of the finger. Occurring at the same time are many manifestations of the general invasion. The patient will frequently feel below par, have aching joints and muscles. Slight fever may occur. Headaches of considerable severity, frequently much worse at night, are common. Sore throats frequently lead the patient to seek medical advice. Falling out of the hair and eyebrows (alopecia) are characteristic symptoms.

The symptoms of the secondary stage may be of many different varieties, in some cases quite severe, in other cases so insignificant as to be unnoticed by the patient. The noteworthy feature of this period is the appearance for the first time of symptoms due to a generalized infection throughout the body. The virus, having circulated throughout the body during the primary period, now begins to cause a reaction, giving rise to symptoms, these symptoms being merely the indicators of a bodily reaction to the disease. They have a very real value to the patient in that they lead to treatment. Those cases in which the secondary symptoms are not at all marked or pass unnoticed, are likely to go untreated. Among the severe symptoms which may arise during the secondary period are marked skin and mucous membrane lesions. These rarely lead to any real damage except a certain scarring which may be unpleasant esthetically or cosmetically. However, the central nervous system itself may be definitely involved, and an occasional thrombus (plugging of a blood vessel) in the cerebral vessels may produce paralysis. Meningitis may also occur, leading to severe symptoms or even

death. The blood vessels are very frequently involved, and although the involvement may not be of sufficient degree to produce symptoms, it is the forerunner of future trouble. The secondary period of the disease may be looked upon as a period in which the foundation of later serious bodily disease is laid. Involvement of the eyes and ears is another not infrequent occurrence. Iritis, hemorrhagic retinitis, and opacity of the vitreus may lead to blindness. Involvement of the auditory nerve may lead to deafness.

Clinical and Laboratory Diagnosis in Secondary Period.—There are many features of the secondary period, particularly in its early stage, which point to the diagnosis of the disease from the clinical appearance. The rash, when at all typical, as it is in a large number of cases, offers a very satisfactory opportunity for diagnosis. The combination of the roseola with headache, malaise, falling of the hair and eyebrows, patches on the mucous membranes of the mouth, sore throat, and condylomata, or skin lesions around the anus or vagina, following a few weeks after the appearance of a primary lesion, are very definite proof of a syphilitic infection. When these symptoms occur, there can be little doubt about the correctness of the diagnosis without laboratory assistance. The laboratory findings are naturally of very great importance in conclusively checking up the evidence. During the secondary period of the disease, the Wassermann reaction is positive in about 100 per cent of the cases. Treponemata may be demonstrated from the mucous patches of the mouth and from the condylomata. The latter are particularly rich in treponemata. A caution may be given in regard to the demonstration of treponemata in the mouth: in normal health the mouth is frequently the abode of certain varieties of treponemata which are not associated with syphilis. It is the Treponema pallidum that is the organism of syphilis, and it takes a certain amount of knowledge to be able to distinguish this treponema from other organisms of related groups.

Contagiousness of Secondary Period; Importance of Treatment.—The secondary period, like the primary, is a period

of great contagiousness. Every patient in the secondary period of the disease may be considered a focus of infection and a definite carrier of a contagious disease. It becomes obvious that, if treponemata are readily demonstrable in the lesions of the mouth, considerable care must be taken in order that these organisms may not be spread to other persons. Kissing is likely to lead to infection in those cases in which there are active mucous membrane lesions, and it is from this source that many lip chancres are produced. Care of utensils which come in contact with syphilitic patients in the secondary period is essential. A comparatively small amount of treatment in this period will make the patient relatively harmless, certainly as far as ordinary social contact is concerned. This is not so true where intimate relations obtain. It should be strongly emphasized that there is a vast difference between sterilization in the sense of the ordinary relations of business and social contact and that required for the intimacies of family life. It should also be borne in mind that there is a similar difference between sterilization as far as the likelihood of infecting the casual contact is concerned, and a cure of the disease. It is likewise true that while a small amount of treatment gives this relative sterility it will not last over a long period of time if treatment is discontinued. It is essential that the treatment be continued faithfully for months or years, in order to produce a complete noncontagiousness. Treatment in the secondary period is very important from the standpoint of the patient's prognosis, as well as of his contagiousness to others. The ideal time to begin treatment, of course, is the very earliest period after the organism has reached the body. If this is not accomplished during the primary stage, then the earlier in the secondary stage treatment is begun, the better the prognosis of the patient.

One frequently sees the patient for the first time in the secondary period of the disease, when the rash or sore throat, mucous patches, malaise, and the like, lead him to consult a physician. This is especially true in the case of women, in whom the chancre may be intravaginal or uterine, and hence

not detectable. The same is true of the majority of cases of extragenital infections.

Tertiary Period; Possibility of Involvement of Many Organs of Body.—There is no definite demarcation between the secondary and tertiary periods of syphilis, and, as has already been mentioned, these terms are chiefly applicable for purposes of description. The differentiation of secondary and tertiary periods has been based largely upon the time of the appearance of skin lesions rather than upon any other characteristic of the disease. As one comes to regard syphilis more and more as a generalized infection and less as a skin disease, the arbitrary distinction between secondary and tertiary periods breaks down, and it is more logical to consider the early and late manifestations of the disease. However, it may be stated in a general way that the symptoms which have been described as occurring frequently in the secondary period tend to change their form or to disappear, somewhere around one to two years after the primary infection. The roseola and alopecia are likely to improve spontaneously, even if untreated, at the end of six months or thereabouts. Sometime during the second year of the disease lesions of a somewhat different type begin to make their appearance and hence about this time the disease is considered as having passed into the tertiary period.

As has been stated, the disease is always a generalized one, involving the various parts of the body. The treponemata, circulating as they do throughout the blood stream, may reach any portion of the body. During the early period the blood contains a great number of circulating organisms. As a result of the defense reactions of the patient a large proportion of them are killed. A residual number, however, remain implanted in the various organs of the body and it is from the activity of these organisms that the later manifestations are likely to result. One rather definite characteristic of the treponema is a tendency to involve the blood vessels, and it is chiefly through disease of the blood vessels that the later troubles become manifest. It is also true that the organisms

may make a habitat in any organ, where they remain apparently dormant for years, only to come later into definite activity. It may, therefore, be said that any organ or portion of the body may show late signs of syphilitic disease. The skin, the bones, the internal organs,—lungs, liver, kidneys,—the vascular system, blood vessels and heart,—the central nervous system—all may become affected by the treponemal toxins. As a result, syphilis may simulate almost any form of disease. Its late manifestations lie in the province of all specialists of medicine, the internist, the neurologist, the psychiatrist, the dermatologist, the aurist, the ophthalmologist; in fact, there is no specialty which is not concerned with its problems.

Apparent Latency of Disease.—One of the important characteristics of syphilis is the apparent latency or inactivity for years or decades. It is frequently the case that the patient, after his primary or secondary symptoms, or even when these have not been noted, has remained in what he considers the best of health, without any manifestation of illness related to syphilis, for a period of many years, ten, fifteen, twenty, thirty, or even forty years, and then has become the victim of a severe disorder caused entirely by syphilis. This period of so-called latency may, therefore, be considered apparent rather than real. Probably for a time the treponemata are relatively inactive, and then gradually becoming more and more active, lead to a destruction of tissue. This destruction of tissue may be very slow and be unaccompanied by symptoms until the damage is marked and severe. As an illustration, damage to the blood vessels may progress slowly for a period of years without the patient's being aware of the fact. The process continues progressively until some day the patient finds himself less capable of activity, short of breath, possibly with pain in the chest, and examination may then disclose a large aneurysm. This condition, a destruction of the aorta, is one which can hardly be improved by medical treatment, or at least, only very slightly. During all this period the patient is likely to consider himself cured or the disease inactive, whereas, on the contrary, it has been most active and wrought the utmost damage.

A similar story holds for the central nervous system, where the organism may be actively destroying the tissue for years before the symptoms arise which lead to its recognition. By the time such symptoms are noticed a great deal of destruction, irreparable in type, may have occurred. Such is the history of many cases of tabes dorsalis (locomotor ataxia) and general paresis of the insane. From the point of view of frequency and the severity of the damage done, syphilitic involvement of the cardiovascular system and that of the nervous system are the most important. All the other systems, as already stated, are liable to involvement and are frequently affected. In some instances, such as bone and skin lesions, the damage may be relatively less important because it does not affect life and usefulness to the same extent, and the lesions are much more satisfactorily treated.

Clinical Diagnosis of Tertiary Period; Therapeutic Test.—The diagnosis of late syphilis is often very difficult and obscure. Certain syndromes are recognized as usually, if not always syphilitic, and thus from the clinical picture a diagnosis may be made. Thus arteriosclerosis and angina pectoris, occurring in young people, are most often due to syphilis. In the majority of instances aortic aneurysms are considered as syphilitic. Tabes dorsalis and general paresis are always syphilitic diseases. Skin lesions are likely to be fairly characteristic, so that the diagnosis can be made upon their appearance. Often the conclusion that the patient has had syphilis is arrived at on the basis of his past history or of the finding of certain characteristic skin and mucous membrane lesions. Considerable clinical acumen is essential. In certain conditions such as ulcers, enlarged liver, etc., diagnosis is completed by the so-called therapeutic test. If antisyphilitic treatment leads to rapid improvement, it may be assumed that the condition was of syphilitic origin. The therapeutic test is valuable in certain cases. But it has the disadvantage of often wasting time before one can be sure. This is particularly unfortunate in cases which are not syphilitic. It also is of little value in those cases in which antisyphilitic remedies will not produce very rapid or satisfactory results.

Laboratory Aids to Diagnosis in Tertiary Period; Wassermann Test.[1]—The Wassermann test is of great value, though by no means a final criterion. Although a great number of late syphilitics have a positive Wassermann reaction, there are late syphilitics with active lesions who do not give a positive reaction. On the other hand, it does not follow that because the patient has syphilis the symptoms from which he is suffering are of syphilitic origin. A positive Wassermann may show the presence of a latent syphilitic process in a patient with symptoms of another disease.

Spinal Fluid Examination; Luetin Test.—In cases of syphilis of the central nervous system the spinal fluid examination is of great importance. In the overwhelming majority of these cases positive findings leading to the diagnosis will be present. There are several tests in addition to the Wassermann reaction which are positive in the spinal fluid in the cases of central nervous system disease. Noguchi's luetin test is another satisfactory test for syphilis. Unfortunately, few people are in a position to read correctly this skin reaction for syphilis.

It will be seen that the last fifteen years have given methods that enable a diagnosis of syphilis to be made with a high degree of accuracy. This is especially true of the primary and early secondary periods and of a large percentage of cases with central nervous system involvement. In the cases that are missed the responsibility for the omission must rest with either the patient or the physician. The importance of diagnosis transcends the mere interests of the individual. A correct diagnosis affects society from the standpoint of a contagious disease which may be spread, one which attacks the present or future mates and children of the infected individual and which in addition causes loss of service and efficiency. Treatment can do much to reduce the dangers, and the earlier the treatment is introduced the greater the chance of its efficacy. Thus, we must envisage syphilis in the individual as a matter of the greatest interest and importance to society.

[1] Somewhat similar or more ample discussions of the Wassermann reaction will be found in chap. 2, p. 32, chap. 3, pp. 50, 74, 104, chap. 4, pp. 141-144, 173, 176.

CHAPTER II

THE MATE

Syphilis Acquired Innocently.—It has been shown that syphilis is a contagious, infectious disease. It is frequently spread through sexual intercourse, and promiscuous sex relations expose an individual to it. Very often, however, it is acquired by individuals who have committed no indiscretions and thus one may well speak of *syphilis acquired innocently.* The person who marries and is infected by his or her mate must be considered an innocent victim of syphilis. The child who is born into the world with the germs of syphilis transmitted from the parents is an innocent sufferer. The acquisition of syphilis through ordinary social relations with an infected person, or from objects contaminated by the organism of the disease is still another instance of innocent infection.

Likelihood of Mates' Acquiring Disease.—Syphilis is spread in large part by personal contact. Propinquity to a syphilitic person exposes one to infection. In modern society husband and wife represent the closest relationship. This is true both for genital and extragenital contact. When one member of a married pair has syphilis, the other member runs a great risk of becoming infected. Thus, in dealing with the epidemiology of syphilis the mate of a syphilitic is always of major interest, and because of the close contact it would seem that the possibility of infection of the mate of every syphilitic person should be seriously considered. The innocently infected mate may be male or female. In the following pages we shall include under the term "innocent," syphilis contracted by either husband or wife in the marriage state.

Greater Prevalence Among Men.—Syphilis is more prevalent among men than among women. Without knowing the actual number of syphilitic persons in the community one

cannot give exact figures but only opinion based upon experience. The examination of various random groups of men and women points to the greater prevalence among men.

Evidence from Boston Psychopathic Hospital Study of General Paretics.—A statistical study was made of 755 consecutive cases of general paresis admitted to the Boston Psychopathic Hospital between 1912 and 1919. There were 638 males (84.5 per cent) and 117 females (15.5 per cent). This indicates that there are between five and six times as many male as female paretics in the hospital population.

Evidence from New York Study of General Paretics.—These figures corroborate the evidence given by Dr. Salmon[1] in 1914 when he showed that in New York State one in nine of the 6909 men and one in thirty of the 5299 women who died between 40 and 60 years in 1913 died from recognized general paresis. This ratio would indicate that between three and four times as many of the deaths in men as in women are caused by general paresis.

Evidence from Admissions to Michigan State Hospitals.—Syphilis is the direct cause of 17.5 per cent of the male and of 6.65 per cent of the female admissions to Michigan State Hospitals.[2] This means chiefly general paresis, cerebrospinal syphilis, and tabes, and would indicate that syphilitic mental disease is about three times as prevalent in males as in females.

Evidence from Royal Commission on Venereal Diseases Study of General Paretics.—The Royal Commission on Venereal Diseases, England,[3] examined the incidence of general paresis in the pauper admissions to the asylums for 1908-

1 Salmon, Thomas W., General Paralysis as a Public Health Problem. *Proceedings* of the American Medico-Psychological Association, Seventieth Annual Meeting, Baltimore, Maryland, May 26-29, 1914.

2 Report of the Commission to Investigate the Extent of Feeble-mindedness, Epilepsy, and Insanity and Other Conditions of Mental Defectiveness in Michigan, 1915, p. 31.

3 Royal Commission of Venereal Diseases. Final Report of the Commissioners, London, 1916, p. 124, Appendix X.

1912. They found the rate among males to be 3.07 and among females .55 per thousand. This is an incidence of between five and six times as great for males as for females.

It is fair to conclude that general paresis is at least four times as prevalent among men as among women. One cannot then say that syphilis is four times as frequent in men as in women, as there are other factors leading to the production of psychoses that are different in the two sexes, as childbearing, alcoholism, trauma, and the like. However, the figures indicate a preponderance of syphilis in men.

Evidence from Wassermann Surveys at Boston Psychopathic Hospital (Table 1).—Wassermann surveys on the same sort of patients bear out this point (Table 1). Of the 1730 admissions to the Psychopathic Hospital for 1919, 52.5 per cent were males and 47.5 per cent females. Of the syphilis found, 65.2 per cent was among the males and only 34.8 per cent among the females. Stated differently 14.85 per cent of the males and 8.77 per cent of the females were syphilitic. After allowing for the slight preponderance of males in the total group, there is almost twice as much syphilis among the men as among the women.

Greater Prevalence Among Males According to General Hospitals (Table 2).—Another method of comparing prevalence is a consideration of the number of male and female syphilitics in general hospitals and clinics. The total on Table 2 shows a slight preponderance of syphilis among males.

TABLE 1. PREVALENCE OF SYPHILIS AMONG INSANE MEN AND WOMEN

CLINIC	MALE			FEMALE		
	NUMBER OF INDIVIDUALS	POSITIVE WASSERMANN REACTION		NUMBER OF INDIVIDUALS	POSITIVE WASSERMANN REACTION	
		No.	P. C.		No.	P. C
Boston Psychopathic Hospital, Mass.	908	135	14.85	822	72	8.77
Michigan State Hospital, Mich.[1]	940	203	21.6	606	77	12.7
Warren State Hospital, Pa.[2]	...	...	22.3	...	...	18.5

1 Vedder, E. B., *Syphilis and Public Health*, Philadelphia and New York, Lea and Febiger, 1918, p. 52, quotes, Influence of Syphilis Upon Insanity and Marriage. From the Report of the Commission to Investigate the Extent of Feeblemindedness, Epilepsy, and Insanity and Other Conditions of Mental Defectiveness in Michigan, 1915.

2 Darling and Newcomb, A Comparison of the Wassermann Reaction Among the Acute and Chronic Insane, *Journal of Nervous and Mental Diseases*, xli, 1914, p. 575, quoted by Vedder, p. 50.

TABLE 2. ADMISSIONS TO HOSPITALS AND DISPENSARIES FOR MEDICAL AND SURGICAL CONDITIONS

CLINIC	NUMBER OF INDIVIDUALS	POSITIVE WASSERMANN REACTION		DOUBTFUL WASSERMANN REACTION		NEGATIVE WASSERMANN REACTION		NUMBER OF INDIVIDUALS	POSITIVE WASSERMANN REACTION		DOUBTFUL WASSERMANN REACTION		NEGATIVE WASSERMANN REACTION	
	Male	No.	P. C.	No.	P. C.	No.	P. C.	Female	No.	P. C.	No.	P. C.	No.	P. C.
Bellevue Hospital, N. Y. (routine).[1]	4085	1106	27.0	222	5.5	2753	67.4	1752	475	27.1	126	7.2	1151	65.7
Post Graduate Hospital, N. Y. (no selection).[2]	1168	332	28.4	108	9.3	728	62.3	746	205	27.5	85	11.4	456	61.1
Routine Wassermann reaction. Hospital and dispensary medical cases.[3]	853	256	30.0	...	...	...	...	924	148	16.0	...	...	...	...
London Hospital, London (came for other causes).[4]	616	64	10.3	...	...	...	...	389	20	5.1	...	...	...	...
George Washington Hospital, Wassermann test.[5]	256	31	12.1	...	...	...	...	193	16	8.3	...	...	...	...
St. Lukes Hospital, San Francisco. Wassermann test and clinical diagnosis (no selection).[6]	177	41	23.0	...	...	...	...	223	10	4.4	...	...	...	...
TOTAL	7155	1830	25.6	...	...	...	...	4227	874	20.7	...	...	...	...

1 Vedder, op. cit., p. 55, quotes statistics from Bellevue Hospital, New York, compiled by Miss Sarah Greenspan.
2 Vedder, p. 57, quotes Dr. F. C. Costen, Post Graduate Hospital of New York, 1916.
3 Day, A. B. and McNitt, W., Incidence of Syphilis as Manifested by Routine Wassermann Reactions on 2925 Hospital and Dispensary Medical Cases, *Transactions* of the Association of American Physicians, Philadelphia, xxxiv, 1919, pp. 345-352.
4 Royal Commission on Venereal Diseases, Final Report of the Commissioners, London, 1916, p. 16.
5 Vedder, p. 66, quotes statistics from the George Washington Hospital.
6 Knapp, The Wassermann Reaction in Four Hundred Cases Investigated by Group Study Methods, *American Journal of Syphilis*, vol. i, no. 4., Oct., 1917, p. 772, quoted by Vedder, p. 62.

The larger number of male syphilitics is due in part to the double standard of morality and to the more indiscriminate sexual relations of men. While one syphilitic man will probably not infect a great number of women, the victims of one syphilitic prostitute may be legion. If it were not for the relatively large number of women who acquire syphilis in marriage the proportion of male to female syphilitics would be even larger than it is.

Conjugal Syphilis.—The danger of contagion is directly proportional to the infectivity of the disease as it exists in the contaminated party. Syphilis may be acquired by an individual prior to or after marriage. In either case the mate is exposed to infection. When syphilis is transmitted from husband to wife or wife to husband it is called conjugal syphilis. We are not able to find the date when conjugal syphilis was first recorded, but the early literature on syphilis refers to the matter.

More Frequent among Women; Blaisdell's Study.—As men more often acquire syphilis before marriage the mate who acquires syphilis in marriage is more often the woman. Thus one finds more single than married syphilitic men and more married than single syphilitic women. This is shown by Blaisdell,[1] who has studied a series of 500 consecutive cases of adult syphilis. He reports the civil condition as follows: 236 single men, 98 married men, 35 single women, 131 married women. In the male group there were more than twice as many single as married men, while there were practically four times as many married as single women. The danger to wives as shown by this study is even greater than would appear. The syphilitic men were young. Seventy-two per cent had contracted syphilis before their thirtieth year. Sixty-three per cent had early or secondary syphilis. An average of 70 per cent made less than five visits to the clinic and hence had insufficient treatment. The danger to the wives and children of the married men can be visualized. Many of

1 Blaisdell, J. H., The Menace of Syphilis of To-day to the Family of To-morrow, *Boston Medical and Surgical Journal*, vol. clxxv, no. 1, July 6, 1916, pp. 18-19.

the unmarried will undoubtedly marry uncured and infect their wives.

Case 1.[1] George Swallow acquired syphilis one year before his marriage. He had a small amount of treatment, insufficient to protect his wife, who acquired syphilis from him.

It must always be remembered that not every case of syphilis in a married woman means an innocent infection.

Case 2. Norma Blaine acquired syphilis when about 17 years of age. Before her marriage she was sexually immoral and had had a miscarriage. At 35 she developed general paresis. Her husband to whom she had been married eleven years showed no clinical or laboratory evidence of syphilis.

Further Statistics on Syphilis in Women (Tables 3, 4, 5).— The accompanying tables (3, 4, and 5) give further statistics on how many women with syphilis are married or single, how many married women acquire the disease from their husbands, or otherwise.

TABLE 3. COMPARATIVE STATISTICS OF SYPHILIS IN MARRIED AND SINGLE WOMEN

CLINIC	TOTAL SYPHILITIC FEMALES	SINGLE		MARRIED		MARRIED, ACQUIRING SYPHILIS FROM HUSBAND		NO HISTORY OF SOURCE OF INFECTION	
	No.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
Fournier Cases, Paris[1]	842	366 (256 status unknown)	43.5	220	26.1	164	74.5	...	...
Bulkley Cases, New York[2]	131	23	17.6	108	82.4	54	50.0	...	...
Blaisdell Cases, Boston Dispensary, Boston[3]	166	35	21.0	131	79.0	...	...	...	...
Psychopathic Hospital, Boston	102	24	23.8	78	76.2	18 5 (probably)	23.1 6.47	35	44.8

1 Fournier, A., *Treatment and Prophylaxis of Syphilis*, English translation, New York, Rebman & Co., pp. 348-351.

2 Bulkley, L. D., *Syphilis in the Innocent*, New York, Bailey & Fairchild, 1898, p. 28.

3 Blaisdell, J. H., The Menace of Syphilis of To-day to the Family of To-morrow, p. 19.

1 The names assigned to the cases are fictitious and chosen to suggest race or descent.

TABLE 4. FURTHER ANALYSIS OF PSYCHOPATHIC HOSPITAL CASES AS TO SOURCES OF SYPHILIS AMONG MARRIED WOMEN

SYPHILITIC FEMALES		ACQUIRED INNOCENTLY		POSSIBLY ACQUIRED INNOCENTLY		ACQUIRED THROUGH IMMORALITY		PROBABLY ACQUIRED THROUGH IMMORALITY		NO DEFINITE HISTORY, APPARENTLY MORAL	
No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
Married 78	100	18	23.1	5	6.4	20	25.7	...	...	35	44.8
Single 24	100	1	4.2	3	12.4	16	66.7	4	16.7	...	...

TABLE 5. COMPARISON OF SYPHILIS IN THE MATE WHEN ORIGINAL PATIENT IS MALE OR FEMALE

	MATE, POSITIVE WASSERMANN REACTION		MATE, DOUBTFUL WASSERMANN REACTION		MATE, NEGATIVE WASSERMANN REACTION		TOTAL CASES
	No.	P. C.	No.	P. C.	No.	P. C.	No.
Original Patient, Male	6	14.2	3	7.1	33	78.7	42
Original Patient, Female	21	50.0	4	9.6	17	40.4	42
Total Mates	27	32.1	7	8.4	50	59.5	84

Number of Married Syphilitic Women.—Alfred Fournier made a careful study of his private cases. He showed that of 842 women who derived syphilis from sexual contact 366 belonged to the demimonde, 256 were of unknown social status, and 220 were married; that is, only 26 per cent were definitely known to be married. These figures are based upon Paris material and hence are probably not valid for the United States. Bulkley found in an analysis of the civil status of syphilitic women in New York that 82.4 per cent were married, while Blaisdell found 79 per cent of his Boston Dispensary cases were married. We have found that among 102 syphilitic women at the Psychopathic Hospital in Boston 78 or 76.2 per cent were married. It would seem fair to assume that in the United States about 75 per cent of syphilitic women are married.

Source of Infection in Married Women.—As has been stated above, it does not follow that because a woman who has syphilis is married that she was infected by her husband. Fournier's analysis shows that 74.5 per cent of his syphilitic

married women acquired the disease from their husbands, Bulkley could show this in 50 per cent of his cases, and we found that 23.1 per cent of our cases certainly, and 6.4 per cent additional probably, acquired syphilis in marriage, while in 44.8 per cent of our cases it was not possible to determine this point.

A further analysis of our 102 cases of syphilis in women (78 married, 24 single) showed that 25.7 per cent of the married women were immoral, as contrasted with 66.7 per cent of the single women, and that, whereas 23.1 per cent of the married women had acquired the disease innocently (from husbands or extragenitally) only 4.2 per cent of the single women were definitely innocent victims. The 44.8 per cent of the married women about whom we could not definitely determine the source of infection were apparently strictly moral and in some instances the husband was known to have syphilis. Consequently, the number of innocent infections among the married women must be much greater than the figure given (23.1 per cent) would indicate. We may, therefore, conclude that most married women with syphilis have contracted it innocently and *per contra* only a minority of the single women can be classed as examples of innocent infections.

High Percentage of Syphilitic Mates of Syphilitic Women.—Table 5 gives a comparison of the amount of syphilis in the mate considered from the standpoint of whether the original patient was male or female. Of the original group of 78 syphilitic women, it was possible to examine the husbands of 42. For purposes of comparison, therefore, a random group of 42 syphilitic men whose wives had been examined were chosen. It was found that whereas only 14 per cent of the wives of these male syphilitics gave evidence of syphilis, 50 per cent of the husbands of the women syphilitics were syphilitic. This difference in percentage lends weight to the ideas that syphilis is more frequently acquired by men outside of marriage than by women, and that much female syphilis is marital in origin. Assuming that a high percentage of female syphilitics have acquired syphilis from their husbands, one would expect a large percentage of the husbands of female

syphilitics to be syphilitic. In our group this was true of 50 per cent. On the other hand, assuming that most men acquire syphilis a considerable period before marriage, then a relatively small percentage will infect their wives. We find in the group of Table 5 that in this case 14 per cent of the wives were syphilitic. Thus it is seen that the figures are in accord with our two assumptions.

Approximate Percentage of Female Syphilis Acquired through Marriage.—On the basis of the preceding figures of Fournier, Bulkley, and the Psychopathic Hospital, calculations were made to determine what percentage of all syphilitic women (married and single) have acquired syphilis through marriage. Fournier found that one in every five syphilitic women acquired syphilis in marriage. The Psychopathic figures are identical with Fournier's, while from Bulkley's material it appears that one in every three women with syphilis was maritally infected.

Extramarital Infection Acquired by Men Before and After Marriage.—In considering syphilis among wives it is of interest to know whether the husband acquired syphilis before or after marriage. Fournier[1] shows by an examination of 312 cases that the first is much more frequent. In 218 cases the woman was contaminated by a man who acquired syphilis before marriage, in 94, after marriage. Stated differently, of 100 women contaminated in marriage 70 owe their infection to a syphilis acquired by their husbands before marriage, as against 30 infected by syphilis acquired by their husbands after marriage.

Undoubtedly more Frenchmen than Americans are unfaithful to their wives owing to Continental customs. Thus, probably 80 to 90 per cent of American husbands who contaminate their wives versus the 70 per cent of French husbands acquired the infection before marriage.

Thibierge[2] shows that the war conditions in France, neces-

1 Fournier, A., La Syphilis des Hônnetes Femmes, *Bulletin* de l'Académie de médecine (Séances du 2 et du 9 Octobre 1906) pp. 2-3.

2 Thibierge, G., *Syphilis and the Army*, London, University of London Press, Ltd. 1918, p. 280.

sitating the long absence from home, either in the army or in the munition works, resulted in a laxity of morals, so that there was considerable extramarital intercourse followed by an increase in the number of syphilitic infections. When the husband returned home on leave or permanently many wives were infected. Although the precautions taken by the American army made the rate of syphilitic infection very low, there is evidence[1] to show that many infected soldiers received only enough treatment to render them noncontagious for the time being and not enough sound advice on how to act when the delayed secondaries appeared so that they could receive treatment and their families be protected.

Syphilis and Marriage.—When syphilis is acquired by one of a married pair living in the married state, the chance of the mate escaping infection is very small. This follows from the general rule that the earlier stages of syphilis are the most contagious. Vedder[2] quotes M. Dechambre as stating that "syphilis is divided among husband and wife like the daily bread."

The question of when a syphilitic can marry without danger to the mate depends on three things: the age of the infection, the amount and sort of treatment, and the kind of lesions shown. A certain number of years must elapse before a syphilitic can safely marry, and this time factor is interwoven with that of the adequacy of his treatment. Fournier[3] found that of 142 women infected by their husbands, 37 husbands had been syphilitic for a period varying from a few weeks to a year, 31 from a year to two years, and 30 from two to three years. Hence 98, or two thirds of the total, had had syphilis less than three years when they married. As all these men infected their wives, the conclusion is that many syphilitics marry too soon after infection. There is a good deal of variance of opinion among authorities as to the exact time limit and just what constitutes good treatment.

1 Collins, H. G., Syphilis in the Innocent, *Journal* of the Kansas Medical Society, vol. xxi, no. 1, January, 1921, p. 7.

2 Vedder, op. cit., p. 137, quotes M. Dechambre.

3 Fournier, La Syphilis des Hônnetes Femmes, quoted by Vedder, p. 138.

It must be emphasized that even after having satisfied the first two prerequisites to marriage, there is still the third point to be considered, namely, the contagiousness of the type of lesion any given individual may develop. It may be stated that most conjugal syphilis is transmitted by the chancre or early secondary lesions. The consideration of a syphilitic's right to marriage will be discussed in more detail in the chapter called "The Family."

Marriage Soon After Infection as Cause of Conjugal Syphilis; No Treatment.—The most frequent cause of conjugal syphilis is marriage within the first year or so after a person has acquired syphilis. The chances of the mate's being infected are especially great in those cases where the syphilitic has not had treatment.

Case 3. Alice Shelley appeared at the hospital in the early secondary period of syphilis. A few weeks prior she had had a stillborn child. She had been married about ten months and a few months after her marriage developed a chancre and skin lesions. Her husband admitted that he had acquired syphilis a year before his marriage and had not been treated.

Though an early marriage without treatment is prone to cause conjugal infection, this is not an inevitable result. It is possible, though probably rare, for the mate to escape.

Case 4. Etta Prince acquired syphilis at eighteen and received no treatment. She married after one year and her husband when examined three years later was free from syphilis.

Inadequate Treatment.—Inadequate treatment is often taken by a syphilitic before marriage. This has the effect of giving false confidence to the patient. Where marriage takes place during the early stages, the mate is very likely to become infected.

Case 5. John Collins developed a chancre when a young man. He received local treatment for ten to fifteen days. This, of course, was entirely inadequate either as treatment of his syphilis or to make him noncontagious to others. He married a few months after the disappearance of the primary lesion. As was to be expected, the wife became infected and gave birth to a syphilitic child.

Marriage Long After Infection and Escape of the Mate.—As time goes on syphilis becomes less contagious. Thus, after several years a patient may no longer be a source of danger to others. This is true even when the patient receives no treatment. When syphilitics marry five to twenty years after the infection, their mates frequently remain entirely free from the disease.

Case 6. Frances Brown contracted syphilis at the age of 18. She was engaged at the time, and infected her fiancé. Almost immediately after, she became infatuated with another young man whom she married a week later. She lived with him for six months during which time he also contracted syphilis from her, and left her. A few months later she had a child which was born in a frightful condition and died immediately.

In a span of four years, this girl had contracted syphilis herself, infected both fiancé and husband, and had given birth to a dead syphilitic child.

In the fifth year after her infection with syphilis, she bore an illegitimate child. She then lived with the father of this child as his wife and had five other illegitimate children.

She appeared at the hospital at the age of 32. She had never been treated and showed a positive Wassermann. Her six illegitimate children were examined; none of them were syphilitic. There is no history of the father of the children having contracted syphilis from her, though the two men who had lived with her in the early stages of the disease both became syphilitic.

Importance of Treatment.—Early adequate treatment is of great importance from the standpoint of the spread of the disease. This is particularly true when arsphenamin is used. A few injections of arsphenamin can do a great deal to lessen contagiousness. Even though treatment is not sufficient to cure the patient, it may suffice to render his condition non-contagious to others. A patient who has received active anti-syphilitic treatment in the first few weeks of the disorder may even marry during the first year and not transmit the disease to his mate. This is taking an undue risk, however, and should never be advocated.

For our present purpose it might be stated that when a period of five years or more has elapsed since the date of the

primary stage the danger to the mate is minimal. This danger is further decreased by treatment. When treatment has been intensive and continued, the period may be lessened at the discretion of the doctor.

Marriage Long After Infection and Infection of Mate.—All rules concerning syphilis must be considered as general and not necessarily applicable to any particular case. Thus a person may be infected by a syphilitic who has acquired syphilis many years prior to marriage. The infections occurring late in the disease are largely dependent on the occurrence of superficial lesions containing treponemata. Such lesions may occur in a patient who has had considerable treatment but not enough to cure the disease, and the patient may then infect the mate.

Case 7. A case is reported from the clinic of Dr. Max Joseph [1] of a man who married eight years after acquiring syphilis. The wife was infected. The man, who was in the late stage of the disease, had mucous patches which probably explained the infection of the wife.

Case 8. Finger [2] reports a man who acquired syphilis in 1888. He married eight years later having had mercurial treatment in the meantime. Four months after the marriage the wife developed a chancre. The husband on examination was found to have papular syphilides of the glans and prepuce of the penis.

Variation in Probabilities of Conjugal Infection When Marriage Occurs 3-5 Years After Infection.—While marriage to a syphilitic many years after the disease is acquired, is relatively safe, and marriage early in the course of the disease is highly dangerous, it is not possible to give any definite statement as to the probability of conjugal infection in marriages contracted from three to five years from the date of the initial lesion. In this period, neither very late nor very early, the disease is transmitted in some cases, while in others, the mate escapes.

1 Buba, Die Contagiositätsdauer der Syphilis, Inaugural Dissertation, Leipzig, 1905, quoted by Vedder, p. 113.

2 Finger, Wann Dürfen Syphilitische heiraten, Heilkunde, Wien, 1897, vol. i, p. 351, quoted by Vedder, p. 113.

Case 9. George Carpenter was seen at the clinic at the age of 32. He acknowledged contracting syphilis when 16 years of age. He had treatment at that time for about three months and off and on ever since. Four years after the infection he married. The first pregnancy resulted in a stillbirth. He had two living children both of whom were syphilitic as was his wife. All three were under treatment.

Case 10. William Baldwin also married four years after he acquired syphilis. He had had treatment for seven or eight months following the appearance of his chancre, but this was chiefly in the form of mercury by mouth. This treatment was inefficient as far as he was concerned and he developed late symptoms. His wife, however, was not infected.

One must be on guard about viewing all cases of syphilis which occur in both husband and wife as instances of conjugal syphilis, and attempting to place the blame on one for the disease of the other. It is always quite possible for both husband and wife to have acquired syphilis outside of marriage.

Case 11. Three months after his marriage, Harry Coffin showed symptoms of general paresis. His wife was examined and found to be syphilitic. However, she did not have symptoms of early syphilis, such as would be expected if she had been infected during the three months of her marriage. Furthermore it is quite certain that a patient with paresis without superficial lesions is not contagious. On the other hand it was not possible for Harry to have acquired his syphilis from his wife. It is, therefore, obvious that in this case each acquired syphilis independently before marriage.

Probable Date of Conjugal Infection.—Having seen that conjugal infections occur, attention may be turned to the question of how long after marriage the infection is likely to take place. Fournier[1] shows that of 572 syphilitic women, 81 or over 14 per cent contracted syphilis from their husbands during the first days of marriage. In 153 cases Fournier gives the following dates for contagion:

The first month after marriage	10
The second month after marriage	26
The third month after marriage	20

[1] Fournier, A., *Syphilis et Mariage*, Paris, G. Masson, 1880, quoted by Vedder, p. 137.

The fourth and fifth months after marriage	7
The sixth month after marriage	1
During the first months of marriage (without more precision)	53
Second part of the first year	13
Second year	9
Third year	3
Fourth year	3
Fifth year	2
Sixth year	2
Seventh year	2
Eighth year	1
Ninth year	1
Total	153

Eighty-six per cent of the infections occurred in the first year after marriage, the vast majority (90 per cent) of these in the first six months. These figures seem to indicate that there is about one chance in seven of being infected after the first year.

Keyes[1] studied the records of private patients who married without taking any particular precautions although they were actively syphilitic. He drew the following conclusions:

Wife infected first year of disease, chances 12 to 1
Wife infected second year of disease, chances 5 to 2
Wife infected third year of disease, chances 1 to 4
Wife infected fourth year of disease, almost no chance
Wife infected fifth year of disease, 2 cases

Cause of Conjugal Contamination.—The reasons persons are contaminated in marriage are various. Some syphilitics are unaware that they have contracted syphilis. They may have a small and unnoticed chancre with no obvious secondary lesions and may marry in all innocence. Others know that they have had the disease but are not cognizant of the dangers to the mate. These are the ignorant and uninformed, who it is hoped will diminish in number when the various modern educational methods have been in vogue for some time. Though education will probably not prevent people from running the risks of acquiring syphilis it may arouse

1 Pusey, W. A., *Syphilis as a Modern Problem*, Chicago, American Medical Association, 1915, p. 99, quotes Keyes.

more caution in taking the risk of harming a mate and children. Many syphilitics are conscious of the general possibilities of infecting their mates but feel confident that they can run the risk with impunity. This confidence may be based on a superabundance of faith in someone's judgment, on permission granted by a doctor who does not know all the facts, on an indifferent attitude towards possible future dangers, or on pure callousness. This last attitude is fortunately rare. As an example one may quote the following paragraph from Fournier:[1]

A man came to me and asked me if he could marry. Recognizing his contagious state, I forbade it. Then naturally he married. Three months later he came to me repentant, asking my care for his wife whom he had infected. "At least," said I, "You will save yourself a new unhappiness and do everything you can to avoid having children." Naturally a few months later his wife was pregnant. "There remains only one more thing for you to do," I added, "and that is to give your child to a wet nurse if it comes into the world alive." Well, it was complete, because the wet nurse did not fail to be infected by him.

Importance of Examination of Mate of Syphilitic.—Syphilis acquired in marriage does not differ in its results from syphilis acquired outside of marriage. It is, however, more likely to go unnoticed. A person taking the risks of promiscuous sexual relations is likely to be on the lookout for symptoms of syphilis or gonorrhea. This is not true in the case of the married person. In women, especially, the symptoms of syphilis are likely to be overlooked. Many times a patient will go through a long period of life with latent syphilis without noticeable symptoms. In most cases, however, the disease shows itself later in the form of a serious disorder. Early recognition, or recognition during the latent period, offers the opportunity to apply therapy and thus prevent serious conditions. It is for this reason that the examination of the mate of every syphilitic is urged.

Types of Manifestation in Husband and Wife—Same.—The manifestations of syphilis may be the same in husband and

[1] Fournier, A., La Syphilis des Hônnetes Femmes, p. 13.

wife. Thus, in both, the disease may appear to be latent and only be recognized as the result of the Wassermann test.[1] Or both may have the same very serious manifestations such as involvement of the central nervous system.

Case 12. James Billings was brought to the hospital because of delirium tremens. A routine Wassermann test was positive. The wife was then examined and she also had a positive Wassermann reaction though neither showed any other signs of active syphilis.

Case 13. Edward Flint acquired syphilis after he was married, and infected his wife. Twelve years later he came to the hospital in an advanced stage of nervous system syphilis. His wife was examined and was also found to have syphilis of the central nervous system. It is pleasing to be able to report improvement of the wife under treatment.

Types of Manifestations in Husband and Wife—Different.—In many cases the disease manifestations may be quite different in husband and wife. When the effects are more serious in the person who originally acquired syphilis one is inclined to feel that there is more justice than when the innocent member of the pair suffers seriously while the one who was to blame escapes without grave results. Not infrequently a mate will develop heart disease, vascular disturbance, or central nervous system symptoms while the one who acquired syphilis originally remains without symptoms other than a positive Wassermann reaction.

Case 14. Howard Lincoln developed a hemiplegia due to syphilitic vascular disease during the first year of his syphilis. The wife was found to have been infected but was symptom-free. She was given antisyphilitic treatment and at the end of four years of treatment her Wassermann test became negative.

Case 15. Louis Morse after the death of his first wife acquired syphilis. He married again in a short time and his wife was infected by him. She developed general paresis and died from the disease. Mr. Morse developed no very grave results. After his wife's illness he received treatment and it is likely that he will not have any further trouble.

1 Throughout, when we speak of a positive or negative Wassermann reaction we do not, of course, refer to a single test, but to a repeated series giving a consistent result.

Frequency of Syphilis in Both Man and Wife; Psychopathic Hospital Study.—How frequently is syphilis found in both man and wife? To answer this and related questions a study was made of the families of 555 syphilitics who were in the late stages. This group included patients with visceral syphilis, latent syphilis, and involvement of the nervous system.

TABLE 6. AMOUNT OF CONJUGAL SYPHILIS BY WASSERMANN SURVEY OF MATES OF 555 SYPHILITICS

	Number	
Total mates examined.	336	
Wassermann reaction positive.	98	29.2
Wassermann reaction doubtful.	7	2.1
Wassermann reaction negative.	231	68.7

Of this group of 555 patients it was possible to get Wassermann tests on the mates of 336. Of these 336 mates, 98 or 29.2 per cent gave positive Wassermann reactions and 7 or 2.1 per cent gave doubtful reactions. It may therefore be stated that approximately 30 per cent of the mates were syphilitic.

A few words may be said in order to explain the use of the Wassermann reaction in this study as the criterion of the presence of syphilis. It is a comparatively definite standard. While recognizing that many cases of syphilis do not give positive Wassermann reactions, it seemed that for statistical purposes it would be more accurate than a diagnosis made from clinical evidence alone, where there is bound to be a variation due to the individual equation of different examiners. As some cases of syphilis may have been missed, it would seem quite justifiable to state that at least 30 per cent or almost one out of every three of the 336 mates of syphilitic patients examined had syphilis. Thus, the mates of syphilitics offer a fertile field for the discovery of syphilis.

How many of the syphilitic mates acquired syphilis in marriage and are therefore to be considered as cases of innocent syphilis, is not shown in this study. However, it may be assumed on the basis of our earlier analysis, that in the majority of the cases the husband acquired syphilis outside of marriage and infected his wife. *Per contra,* in a few cases the

wife was probably at fault and infected her husband; while in a very small percentage of cases each mate acquired syphilis independently outside of marriage. It is perfectly safe to assume, however, that the majority of the women considered in this study were infected by their husbands.

Mate Usually Unaware of Infection.—As already mentioned, one of the unfortunate aspects of syphilis acquired conjugally is that it is so often unrecognized until the late and serious manifestations have occurred. That most of the women in this group were unaware of having syphilis is shown by the following analysis: of the 98 syphilitic mates who had positive Wassermann reactions, 54 were women whom we were able to question as to their awareness of having syphilis. All knowledge was denied by 44 or 81.5 per cent of the women while only 10 or 18.5 per cent knew they had the disease.

Possible Methods of Preventing Conjugal Infection.—Premarriage examination of every applicant for a marriage license, if such an examination could be thorough instead of superficial, might prevent some syphilitic marriages. If it did not accomplish this, it would at least indicate to the infected person that he or she was still syphilitic and ought to have the future mate under a doctor's supervision so that if syphilis developed later it might be cared for immediately. The aim of all examinations is to get at the disease early, before it has made much headway. The only way to accomplish this in syphilis is to examine suspected cases even though symptom-free. This would mean that the mates of all syphilitics should be examined. Every doctor should make a strenuous effort to accomplish this examination, in private cases as well as in all syphilis clinics. All institutions such as hospitals, prisons, pauper institutions and the like should take a routine Wassermann test on all their inmates and when possible follow this up by an examination of the mates of the syphilitics. Unfortunately, such examinations are by no means routine throughout the country. Fresh evidence is constantly brought to light by the discovery of a syphilitic mate through the routine Wassermann test in one

hospital, while this same person has been at various other institutions previously without a suspicion of syphilis. Although the examination of the mate cannot prevent the acquiring of syphilis, by making early diagnosis possible and leading to treatment many of the later and more dreaded manifestations can probably be prevented. One's sense of proportion must not be lost. Sad as are the cases of innocent women who are infected in marriage, we must remember that all women who marry syphilitic men do not acquire syphilis. The reasons for their escape are the converse of the reasons why other women acquire syphilis. The husbands either had good treatment or waited a long time before marrying or were very careful if they developed any secondary lesions. Some of the women might even be immune to the disease. Of the mates quoted in Table 6, 70 per cent escaped infection either by pure luck or proper care. It is well not to count at all on the former. Even the latter cannot insure safety, although naturally favoring it.

Importance of the Conjugal Syphilis Problem.—From what has been said above it may be concluded that any campaign for the prevention of syphilis must take into consideration the matter of marriage. Whatever may be one's opinion about a syphilitic's right to marry or when he may do so, the fact remains that a large number of syphilitics do marry and in many instances the mate is infected. Whatever laws are invoked in the future to reduce the risk of marital infection, the problem of conjugal syphilis will be with us for a long time to come and it is our special duty to consider and help these innocent victims of syphilis.

Necessity of Examining Mates of Syphilitics.—In considering our figure of a rate of 30 per cent of infection among mates it should be emphasized that in practically every instance, the original patient when first seen by us was in a late stage of the disease. Thus, in the cases in which the mate was infected in marriage, the infection had taken place a long period prior to the time our diagnosis was made. It is also implied that most of these patients probably had some medical inspection

during this long period, but in very few instances had a diagnosis of syphilis been made or treatment instituted. Practically everyone recognizes the contagiousness of the early stages of syphilis, and if a married person appears for treatment at this period, attention will probably be directed also to the mate. This is by no means so frequently done when the patient comes under medical care at a time far removed from the date of infection. If one is to do justice to the problem and the individuals concerned, it is necessary to examine the mate whether syphilis was acquired a short or a long time prior to the date of examination.

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CHAPTER III

THE CHILD

Congenital Syphilis; Date of Recognition.—The saddest aspect of syphilis is that it is transmitted to the second generation. The child of a syphilitic may be born into the world with the Treponema pallidum in his body and thus be handicapped through life. Like the adult who acquired syphilis, he may suffer any of its results. The transmission of syphilis from syphilitic parents to their children was recognized very soon after syphilis was known in Europe. As early as 1498 Gaspard Torella[1] mentioned the existence of syphilis in newborn infants "propter mammas infectas." Paracelsus,[1] in 1529, was the first to note its hereditary character: "fit morbus hereditarius et transit a patre ad filium." In the last of the eighteenth century Stoll, Planck, Von Rosenstein, and Sanchez[2] described syphilis hereditaria and syphilis hereditaria tarda.

Connotation of Terms "Congenital" and "Inherited."—When a child has acquired syphilis before or at birth he is said to have congenital or hereditary syphilis. There is considerable confusion in the usage of these terms and not all authors apply them in the same sense. Nonne[3] says that scientifically the term congenital rather than inherited syphilis should be used. The difference lies in the fact that congenital syphilis is a condition in which the infection of the fetus occurs in utero through the agency of the treponema, while by the term inherited syphilis we would mean that in some way the germ-plasm of either parent had become affected

1 Diday, P., *A Treatise on Syphilis in New-born Children and Infants at the Breast*, translated by G. Whitley, London, New Sydenham Society, 1859, p. 8.

2 Pusey, W. A., *Syphilis as a Modern Problem*, Chicago, American Medical Association, 1915, p. 23.

3 Nonne, M., *Syphilis und Nervensystem*, Dritte Neubearbeitete Auflage, Berlin, Verlag von S. Karger, 1915, pp. 690-1.

by the treponemal toxins. That is, without direct infection of the offspring, changes would have been wrought in its development. There are two varieties of this so-called inheritance of the infection: The infection may be carried through the placenta, or the organism may be directly bound to the germ cell. These two modes of infection have been called placental and germinal.

We shall apply the term congenital syphilis to those cases in which the infection of the offspring occurred prior to or during birth. It will always mean in our usage that a direct transference of the treponema from parent to child took place at some period between conception and the child's existence independent of the body of the mother. The term hereditary syphilis will be used in a narrow and restricted sense referring to changes in the offspring due not to active and direct infection but to germinal defects caused by parental syphilis.

Effects of Syphilis on Childbearing.—The effects of syphilis on childbearing are several and vary in severity. Sterility, abortions, miscarriages, stillbirths, and syphilitic living progeny result from parental syphilis. As an illustration of what syphilis may do to the progeny the following case is given:

Case 16. Emil Lachine was a druggist by trade and on acquiring syphilis thought he could treat himself. That his treatment was inadequate was shown by the fact that he infected his wife. He again attempted therapy by giving her pills and nostrums. She was not cured, however, and many years later had syphilitic liver disease. The effect of syphilis on the next generation is quite significant. The first pregnancy was terminated by a miscarriage; the second one reached term but the child lived only five weeks. The third and fourth pregnancies were productive of boys who were seen by us at the respective ages of 19 and 15 years. Both showed numerous signs of congenital syphilis, were deficient mentally, and had defective vision. The younger child was also deaf. The fifth pregnancy resulted in a child who died at five weeks. The result of the sixth pregnancy was a child who was apparently normal and non-syphilitic when seen at 11 years of age. The seventh pregnancy produced a child who died at nine months. In this syphilitic family the fruition

of seven pregnancies was three children, two definitely feeble-minded, with defective vision and physical inferiority, and only one normal child.

Problem of Paternal Transmission.—Having recognized the existence of the problem of congenital syphilis, it is expedient to consider the part played by one or both parents in the transmission of the disease. There is a divergence of opinion amongst leading authorities as to whether a syphilitic child can be born of a non-syphilitic mother. Can the father transmit syphilis directly to his child without infecting the mother?

It should be explained that the placenta is commonly supposed to be a rather perfect filter which separates the fetus from the mother. On this supposition it would be possible for treponemata to circulate in the blood of either the mother or the fetus without infecting the other. To believe in the paternal transmission of syphilis without infection of the mother it must be supposed that the impregnating sperm carries a treponema into the uterus of the mother and attaches itself to the impregnated ovum, which is then sealed off, as it were, from the maternal organism. Treponemata arising from this original sperm-borne treponema would multiply in the fetus while the mother would remain free from syphilis. This view of the paternal transmission of syphilis was held quite generally until a comparatively few years ago. Diday[1] and Ricord,[2] writing in the middle of the nineteenth century, thought it quite possible for the mother of a syphilitic child to be non-syphilitic. Nonne,[3] at the beginning of the twentieth century, says that a woman can conceive a child by a syphilitic man without herself becoming infected by syphilis, and the fetus is then made syphilitic only by the father. More recent syphilologists tend to think that the mother must be infected in order that a child have true congenital syphilis. This matter has not been entirely settled.

Ideas concerning syphilis have been materially influenced

1 Diday, op. cit., p. 8.

2 Ricord, *Lectures on Venereal and Other Diseases*, translated by V. de Meric, Philadelphia, 1849.

3 Nonne, op. cit., p. 692.

by knowledge of the treponema and the Wassermann test obtained in the last sixteen years. Realizing that syphilis very frequently runs a latent course during many years, especially in women, it is seen that the mother of a syphilitic child may have syphilis herself, but be symptom-free. Jeans[1] took a Wassermann test on 85 mothers of syphilitic children. The Wassermann reaction was positive in 73 or 85.9 per cent. If a positive Wassermann reaction is to be accepted as denoting syphilis it would mean that at least 85.9 per cent of these mothers were syphilitic, although many of them showed no other signs or symptoms of the disease. But not every syphilitic will give a positive Wassermann reaction. Of the twelve mothers whose reactions were negative, several showed signs of having had syphilis.

This survey of Jeans therefore shows that the vast majority of syphilitic children have syphilitic mothers. It does not prove, however, that pure paternal transmission is impossible. Nonne[2] speaks of wives of paretics and tabetics (i.e. wives of syphilitics) giving birth to syphilitic children although they themselves were entirely free from evidence of syphilis including negative Wassermann tests. Dealing with this matter purely argumentatively it has been explained that such cases are instances of "burnt out syphilis" or "Wassermann negative syphilis."

Some modern authorities are so dogmatic in the feeling that every syphilitic child must have a syphilitic mother, that they advocate antisyphilitic treatment for such mothers although they show no clinical or serological signs of syphilis.

Our own experience agrees with the foregoing of Jeans; namely, that in most cases the mothers of syphilitic children, although frequently without obvious physical symptoms of syphilis, have positive Wassermann reactions.

Case 17. Ralph Jackson was a congenital syphilitic. His mother was apparently well but on examination showed a positive Wassermann reaction.

There are, however, a few instances where all signs and

1 Jeans, P. C., Familial Syphilis, *American Journal of Diseases of Children*, vol. xi, no. 1, Jan., 1916, pp. 11-19.

2 Nonne, op. cit., p. 693.

symptoms of syphilis including the Wassermann reaction, are absent. In a study of 33 mothers of 49 syphilitic children (see page 90) we were able to examine 25 (3 were dead, 5 not secured for examination). Twenty (80 per cent) had a positive Wassermann reaction, 1 (4 per cent) a doubtful Wassermann reaction, and 4 (16 per cent) a negative Wassermann reaction.

Case 18. Jacob Frank was an attractive lad of 10 years of age. His great drawback was stuttering. He stuttered so badly that he could hardly be understood. It interfered with his school work which was otherwise excellent. It was on this account that he sought help at the clinic. Physically, the boy was practically perfect. He had had no debilitating disease and had always enjoyed good health. He was the oldest of three children; there had been no further pregnancies. The father and mother were both reported to be in good health. There was nothing in the appearance or physical findings to make one suspect congenital syphilis, and yet the routine Wassermann reaction on Jacob was positive. This was true on numerous repetitions which were made while he was under treatment.

The father was interviewed and denied any syphilitic infection. However, his Wassermann was also positive. Upon learning this, he was ready and even overanxious to have treatment, which led to the suspicion that he knew of his infection. The mother was also examined. She showed no signs of a luetic infection nor did she give any history that was suggestive. A repetition of blood tests was entirely negative in her case. The second child in the family was 6 years old. Like Jacob, he was a fine healthy specimen. His Wassermann was reported as doubtful. The third child, 3 years old, was again a perfectly normal boy who was not tested.

Our conclusion on the question of the transmission of syphilis from father to child without the acquisition of syphilis by the mother is that it is a possibility but that if it occurs at all, it occurs but rarely. In a high percentage of cases the mother of a congenital syphilitic is herself syphilitic, therefore the question of treatment should be considered in each case. Further investigation, however, will be necessary before it is possible to give a categorical answer to the question.

From the practical standpoint of handling the disease it is necessary to suspect syphilis in both parents of a congenital

syphilitic. As shown by Jeans,[1] the chances of the mother's being syphilitic are more than 85 per cent. If the mother is syphilitic it is likely that the father is also, either having infected the mother or, what is less frequent, having been infected by her. Therefore, when confronted by a case of congenital syphilis it behooves the physician or clinic to make arrangements for the examination of the parents.

Apparent Immunity of Mother of Syphilitic Child; Colles' Law.—At the time when belief in the doctrine of paternal transmission was prevalent it was noted that after the mother had given birth to a syphilitic child she never became infected by the child whom she nursed and handled, although another person, a nurse, was likely to become contaminated. This led Colles in 1837 to formulate the dictum which is now known as Colles' law, to the effect that when a non-syphilitic woman gives birth to a syphilitic child she is immune from infection by the child, although the child may infect another person. In view of the evidence of the Wassermann findings we agree with most current opinion that the mother is not infected by the syphilitic child because she is already syphilitic.

Case 19. Merton Winship at the age of 10 had the definite markings of congenital syphilis. His father was dead, but his mother was living. She was in good health and said she had never been really ill. She disclaimed any symptoms past or present, suggestive of syphilis. Physical examination disclosed no signs indicating that she was or had been syphilitic. This mother would seem to exemplify the law of immunity that a healthy mother giving birth to a syphilitic child is not infected by the child. A positive Wassermann reaction on her blood led to the conclusion that she was really syphilitic but had manifested no other signs up to that time.

Although the vast majority of mothers who give birth to syphilitic children are apparently syphilitic, as demonstrated by physical signs or the Wassermann test, there are a few who show no evidence of syphilis. These mothers would better exemplify Colles' law, and it is upon evidence furnished by such cases that some authorities sponsor it.

1 Jeans, loc. cit., p. 11.

Case 20. Leon Shephard was 9 years of age when first seen by us. He was defective mentally, being classified as feeble-minded. He showed a moderate degree of hydrocephalus, and a strabismus which was said to date from the age of one year. At 3 he had had convulsions. His blood and spinal fluid Wassermann reactions were positive. There had been one pregnancy preceding the birth of Leon which eventuated in a child who died at 3 months. Later the mother had had a miscarriage. The mother herself was quite free of any physical or laboratory signs pointing towards syphilis.

Apparent Immunity of Healthy Offspring of Syphilitic Mother; Profeta's Law.—A rule of immunity relating to the child which is somewhat similar to Colles' law was set forth in 1805 by Giuseppe Profeta, namely, that an apparently healthy offspring of a syphilitic mother could be nursed by its mother or a syphilitic wet nurse and yet not be infected. Profeta's conception was that these children were non-syphilitic and immune to syphilis. There are two other explanations possible. First, the child may really be syphilitic though symptom-free. Many congenital syphilitics are symptom-free from birth until a number of years have elapsed when they are diagnosed by aid of the Wassermann reaction or later symptoms. These cases would not, of course, acquire syphilis from their mothers or from syphilitic wet nurses. Thus, although they may seem to bear out Profeta's law in fact, they do not support his theory of immunity.

Case 21. Amelia Borgesi was a healthy, bright girl of 14. Her past history was not significant, her development having been normal in every way. Her mother as well as her father was syphilitic. Amelia, in spite of her negative history and the absence of all symptoms or stigmata, had a consistently positive Wassermann reaction.

In the second place, the mother's syphilis may be of long standing and no longer contagious. There are those who hold that all children of syphilitic mothers should receive treatment. This seems to us an extreme view, but it may be justifiable if one recalls that cases of interstitial keratitis, for instance, may show their first symptoms in late adolescence in patients, until then, apparently non-syphilitic. In this connection we studied a group of 236 syphilitic women. Was-

sermann tests and clinical examinations were made on the children. Out of 142 children who were examined 39 or 27.5 per cent were syphilitic. The remaining 103 or 72.5 per cent showed no signs or symptoms of syphilis. In view of these findings we feel that it would be extreme to treat all the children of syphilitic mothers. Our conviction is that a syphilitic woman may, and frequently does, give birth to healthy non-syphilitic children. This usually occurs late in her disease.

Case 22. Mrs. Vogel had been unable to bring a child to term. She was found to be syphilitic, with the serology and the symptomatology of nervous system involvement. After having antisyphilitic treatment, she gave birth to a child who seemed normal in all ways and who had a negative Wassermann reaction. The mother, who still showed signs and symptoms of syphilis nursed and cared for the child without its becoming infected. Although the mother was suffering from syphilis she was noncontagious, both because a number of years had elapsed since she herself had been infected and because of antisyphilitic treatment.

Conditions Accounting for Congenital Syphilis.—If pure paternal transmission is left out of consideration because its possibility is not thoroughly established, it may be stated that there are three situations which account for congenital syphilis. (1) The mother may have contracted syphilis from the child's father before or at the time of conception. In this case the child is the offspring of two syphilitic parents. (2) The mother may have syphilis and transmit it to her child while the father remains syphilis-free. (3) The mother may become infected during pregnancy and infect the fetus during gestation or at the time of birth. Here the mother may have contracted syphilis from the father, from extramarital or from extragenital infection. In the second and third contingencies, the syphilis of the child is directly related only to the mother. However, as far as is known, the results are no different if both parents are syphilitic or if only one parent is so affected at the time of conception. In any case, the child's syphilis is innocently acquired.

The following cases illustrate the three methods of infection of the child:

Case 23.[1] ———————— married two years after he had contracted syphilis. He had had treatment for only a very short period at the beginning of his infection. Five years after the marriage both the man and his wife had strongly positive Wassermann reactions, although they showed no other symptoms of the disease. There were two children born of this marriage, a boy who at three years of age showed the signs of congenital syphilis, and a girl who had died at ten days of age, and is said to have had an exfoliation of the skin and to have turned black. She was probably syphilitic. The mother had been married previously and in her former marriage had five children, all of whom were living and well. In this family the syphilis acquired by the man was transmitted to his wife and then two syphilitic children were born.

Case 24. Richard Shoemaker was a congenital syphilitic whose syphilis was diagnosed a few weeks after his birth. The parents were not examined until nine years later, at which time the mother had a positive Wassermann reaction and the father had a negative reaction and showed no signs or symptoms of syphilis. It is not possible to state absolutely definitely that the father had not been syphilitic but there was no evidence that he had had syphilis. This would well illustrate the possibility of congenital syphilis acquired through the mother while the father remained uninfected.

Case 25. Jeans[2] reports two families in which the women were infected by their first husbands and married a second time without infecting their second husbands, although they continued to bear syphilitic children.

Case 26.[1] While ———————— was pregnant with her third child her husband contracted syphilis from a prostitute and infected her. The child when seen at six months of age was easily diagnosed congenital syphilitic. Two children born before the infection were entirely free of any signs of syphilis so that it may be concluded that the third child had acquired syphilis in utero, due to the infection of the mother while pregnant.

1 Blaisdell, J. H., The Menace of Syphilis of To-day to the Family of To-morrow, *Boston Medical and Surgical Journal,* vol. clxxv, no. 1, July 6, 1916, pp. 7-13.

2 Jeans, loc. cit., pp. 11-12.

Different Manifestations in Parents and Children.—The severity of parental syphilis has no relation to the severity of the congenital syphilis. One finds parents who have had very grave symptoms whose children have only slight manifestations or none at all; on the other hand, the children may be great sufferers while the parents show little besides a positive Wassermann reaction.

Case 27. Adelaide Price had general paresis, the severest form of syphilis. Her son was a healthy, stalwart lad of about 20 who had never suffered any symptoms suggestive of syphilis and who would have been considered free from the disease but for a positive Wassermann reaction.

Case 28. Jennie Bradford presents the opposite situation from the preceding family. The father and mother were well. The diagnosis of syphilis in the mother was reached because of a positive Wassermann reaction found after the discovery of the disease in her two children. Both daughters had juvenile paresis, with paralysis and dementia and were certain to eventuate in early death.

The Attenuation of the Virus with Time; Kassowitz's Law.—An important law concerning transmission of syphilis to the second generation was formulated by Kassowitz in 1876. According to this law, the more distant the date of the infection the more attenuated is the virus and the less evil are the effects on the children. For example, following the infection there may be a period of sterility. Pregnancies may then occur, which end in early abortion at from one to three months. Later pregnancies may lead to miscarriages at from four to seven months. Then a child may be born dead at term, followed by a living syphilitic child. The next child may show fewer manifestations of syphilis and after a time children may be born free of any sign of syphilis. This law is not likely to be fully exemplified in any given case, but represents a general tendency for the earlier pregnancies to show more syphilitic effects than the later ones. We have made a study of 50 families in which syphilis occurred. No single case ran the entire gamut of possibilities. It was rather frequent, however, to find the severer disasters occurring first and the later results to be less serious.

Case 29. Patrick O'Brien.
Father—syphilitic.
Mother—syphilitic.
1. Girl died at nine months of syphilis.
2. Stillbirth.
3. Boy, 16, congenital syphilis with interstitial keratitis.
4. Boy, 13, apparently normal with a negative Wassermann reaction.

Case 30. Mary Flynn. This family illustrates Kassowitz's law from the Wassermann standpoint. The father and mother were syphilitic. The four oldest children had positive blood Wassermann reactions. The next two children had doubtful Wassermann reactions, and the two youngest had negative Wassermann reactions.

Jeans[1] says that in 69 of the families studied in which the order of pregnancies was ascertained and all of the living children examined, 44 families followed the rule in a general way although they varied more or less. "In no case was there a complete reversal of the rule, but in one family there was first a non-syphilitic child, then a negative child with a positive Wassermann, followed by seven stillbirths and then a living birth in which the child was actively syphilitic. Non-syphilitic children were interspersed between syphilitic children in seven instances in five families. For the most part the variation from the rule consisted of abortions following living syphilitic children, so that in a large measure in these 25 irregular families Kassowitz's rule was followed."

An analysis of any large group of syphilitic families will show similar variations from Kassowitz's law. Among our own cases the following variations were noted among others: In several families there was one type of difficulty only, such as a series of four miscarriages, three children born alive but syphilitic. Frequently the syphilitic children preceded rather than followed the accidents to pregnancies. A long period of sterility was at times followed by the birth of a normal child. In one case the first children were syphilitic, and were followed by a nonsyphilitic child, an accident to pregnancy and another nonsyphilitic child. At times the entire order seemed to be reversed as in the following cases:

1 Jeans, loc. cit.

(1) Accident to pregnancy, non-syphilitic child, accident to pregnancy, syphilitic child, accident to pregnancy, syphilitic children.

(2) Syphilitic child, non-syphilitic children, syphilitic child, accident to pregnancy.

An interesting case was reported by the Boston Dispensary,[1] in which every other child of five was actively syphilitic beginning with the first. The intervening two children were thoroughly examined but showed no clinical or laboratory evidence of syphilis.

The question of twins is pertinent in this connection. One would expect both of the twins to be syphilitic or non-syphilitic. Post[2] reports two sets of twins, all syphilitic. Various cases have been reported in which one only was syphilitic. Still[3] reports a case of twins, one of whom died at the age of seven months of syphilis. The fellow twin was apparently healthy. Sir Herman Weber[4] notes an instance in which a syphilitic mother bore twin children, one of whom suffered with characteristic symptoms of congenital syphilis and died at the age of eleven weeks of diarrhea, while the other remained perfectly healthy. Goldenberg[5] reports one syphilitic and one non-syphilitic twin. DaCosta and Van der Valk[6] report triplets of syphilitic parentage, one of whom died at three weeks without any signs of syphilis, one at three years showed obvious signs, and the third child developed normally.

Results of Parental Syphilis—Sterility and Accidents to Pregnancies.—Irrespective of the order of syphilitic accidents to pregnancies, it is important to keep in mind the various difficulties which may be attributable to parental syphilis before the birth of a living syphilitic child. Sterility is common in syphilitic families, although it is impossible to show an

1 Boston Dispensary case reported at a meeting.

2 Jeans, P. C., A Review of the Literature of Syphilis in Infancy and Childhood, *American Journal Diseases of Children*, vol. 20, no. 1, July, 1920, p. 58, quotes Post, *American Journal Diseases of Children*, vol. 12, Oct., 1916, p. 364.

3 Still, G. F., *Congenital Syphilis.* (System of Syphilis, vol. I), 2nd edition, London, 1914, p. 287.

4 Still, loc. cit., quotes Sir Herman Weber, p. 287.

5 Jeans, loc. cit., p. 58, quotes Goldenberg in discussion of Wile, J., *Cutaneous Diseases*, vol. 34, Sept., 1916, p. 645.

6 Jeans, loc. cit., p. 58, quotes DaCosta and Van der Valk, *Urologic and Cutaneous Review*, vol. 23, March, 1919, p. 159.

absolute percentage due to syphilis alone. Although abortions, miscarriages, and stillbirths occur in non-syphilitic families from various causes, the number in syphilitic families exceeds the normal incidence. These two points will be taken up in detail in the chapter, "The Family," where the results of syphilis on the family as an entity will be shown by a recent study[1] of 555 syphilitic families at the Boston Psychopathic Hospital. It is sufficient here to note briefly that this study demonstrates that between one third and one fourth of the syphilitic parents never give birth to a living child. This is to be compared with the study of a similar group of New England families which gives only one tenth as being childless. More than one third of the families of syphilitics had accidents to pregnancies. One fifth of the pregnancies were abortions, miscarriages, and stillbirths, as compared with less than one tenth of the pregnancies in non-syphilitic families. Syphilis thus destroys children before they have a chance to compete with life.

Infant or Early Deaths.—Opinions differ as to the viability of children born alive in syphilitic families. It is generally supposed that syphilis is a frequent cause of infant deaths.

Jeans[2] found that 22.7 per cent of the children born alive in 100 families were dead at the time of examination. Post[3] in a small group of 30 families gives the percentage as 38.1. Julien[4] found that of 162 children born alive, 42.6 per cent died. In the families with congenital syphilitics or of known syphilitic mothers the percentage varies from 19.5 (Veeder[5]) and 27.6 (Harmon[6]) to 71.3 (Pileur[7]). We thus see a varia-

1 Solomon, H. C. and M. H., The Effects of Syphilis on the Family of Syphilitics Seen in the Late Stages, *Social Hygiene*, vol. vi, no. 4, Oct., 1920, pp. 469-487.

2 Jeans, P. C., Syphilis and Its Relation to Infant Mortality, *American Journal of Syphilis*, vol. iii, no. 1, Jan., 1919.

3 Jeans, loc. cit., quotes Commisky, *American Journal of Obstetrics*, lxxiii, 1916, p. 676, who quotes Post.

4 Jeans, loc. cit., quotes Holt: *Diseases of Infancy and Childhood*, D. Appleton and Co., 1916, p. 1126, who quotes Julien.

5 Veeder, B. S., Hereditary Syphilis in the Light of Recent Clinical Studies, *American Journal Medical Sciences*, clii, 1916, p. 25.

6 Harmon, Bishop, Final Report of the Commissioners: Report of the Commission on Venereal Diseases, London, 1916, p. 149.

7 Vedder, E. B., *Syphilis and Public Health*, Philadelphia and New York, Lea and Febiger, 1918, p. 144, quotes Pileur.

tion of from 19.5 to 71.3 per cent with a mean percentage between 27.6 and 38.1. It is not stated how many of these deaths were during infancy or later.

In our study of 555 families it is probable that many of the children who had died before examination were syphilitic, yet our figures for deaths are no greater than those found in non-syphilitic families. A review[1] of our statistics shows that at the time of examination approximately 20 per cent of the children who had been born alive had died. This agrees almost exactly with the figures given by the United States Life Table for 1910,[2] which shows that slightly more than 20 per cent of the children born into the world do not reach the age of 18. We were able to obtain the age of death of 44 children in our group. Of these, all but one died under the age of 18, and this one died at the age of 19, so that it may be stated that these figures are absolutely comparable. Considered from the standpoint of infant mortality, it is found that the infant mortality of the group born in our syphilitic families is less than that found in the Massachusetts Census (1915) which gave the infant mortality rate as 131 and 134 per thousand, respectively. The infant mortality rate in our group was 124 per thousand. These figures are of considerable interest in showing that the infant mortality rate and the deaths of children under 18 years of age do not vary greatly in the families of the late syphilitic as seen in the clinic, from the mortality as found in the community.

Wirz[3] on the other hand quotes Pfaundler as showing that only 43 per cent of the children born living of syphilitic parents reach the age of 10, while the normal percentage is 69 per cent. This would indicate that the death-rate from syphilis in the early years is greater than the normal rate. In spite of this we conclude from our findings that the infant death-rate from syphilis is not abnormally high except that, when added to the other effects of syphilis on the children of syphilitics, the deaths reduce the number of living and

1 Solomon, H. C. and M. H., loc. cit., p. 482.

2 Bureau of the Census, Department of Commerce, Washington, Government Printing Office, 1916, p. 16.

3 Jeans, *Amer. Jour. Dis. Children*, July, 1920, p. 56, quotes Wirz, *Ztschr. f. Kinderh.* 19:189 (July), 1919, who quotes Pfaundler.

healthy children below the norm for any family. Of course in any given case an infant death may well be ascribed to syphilis.

Case 31. Margaret Miles was a syphilitic woman of 37. She seemed unable to bear any children who could live. In addition to two miscarriages, she bore five children who died in their first year.

Congenital Syphilis—Incidence in General Child Population—Tables 7, 8, 9.—The last but probably most important aspect of the effect of syphilis on the offspring is the congenital syphilitic—the child who has weathered the very earliest consequences but is a syphilitic as surely as his parents. As in all statistics of general incidence, it is difficult to secure satisfactory figures for the number of children who are syphilitic. The incidence of congenital syphilis may be considered from two viewpoints: first, the incidence in the general child population, and second, among the offspring of syphilitic parents.

Some idea of the general incidence of congenital syphilis may be gained by a study of groups of children. Table 7 gives the incidence of syphilis as shown by Wassermann surveys in eight children's hospitals and clinics. These figures are open to some criticism. Clinic and hospital cases are, of course, selected material since they represent unhealthy children drawn largely from the poorer classes of the community. As mentioned before, the Wassermann survey is never an accurate method of determining syphilis, congenital or acquired, but has the value of being relatively standardized and is fairly satisfactory for statistical purposes, as the errors due to false positives and false negatives tend to cancel each other. In the surveys given in Table 7, 3185 children, divided among eight groups, were submitted to routine Wassermann tests and 5.2 per cent were found to have a positive reaction, indicating that syphilis was present in one out of 20 children. The percentages in these eight groups vary from 21.9 per cent at Bellevue Hospital in New York to 1.7 per cent at the New England Hospital for Women and Children in Boston.

The variation between the highest and lowest figures is a very good warning of the care that must be used in drawing general conclusions from specific investigations. This cannot be emphasized too much. The percentages obtained

by us in analyzing the figures of the two Boston hospitals, New England Hospital for Women and Children and the Boston Floating Hospital, are in point. These figures are 1.7 per cent and 10 per cent. The children at the New England Hospital for Women and Children are on the whole from a class of higher financial rating and are less severely ill than those making up the patients of the Floating Hospital. Further, in the New England Hospital for Women and Children group are some new born infants whose Wassermann reactions would not be positive. These factors undoubtedly explain in part the variation in percentages. We can only conclude from a consideration of the figures given in the table that it is impossible to give a figure on the incidence of congenital syphilis at this time. The best we can do is to state that in hospital groups the incidence of congenital syphilis as shown by the Wassermann reaction is greater than 1.7 per cent and less than 22 per cent, and that it is probably about 5 per cent.

The diagnosis of congenital syphilis based on clinical symptoms excluding the Wassermann reaction cannot be considered so accurate as when this test is the basis of the diagnosis. The only chance of correctly diagnosing congenital syphilis clinically is when the child has unmistakable stigmata or active symptoms at the moment of examination. In Table 8 figures are given from several sources on the incidence of congenital syphilis, based upon clinical diagnosis alone. The percentages in these studies vary from 0.6 per cent to 3.3 per cent, with an average of 0.9 per cent.

That the figures given in Table 8 vary from those of Table 7 merely adds to the difficulty of giving an adequate estimate of the incidence of congenital syphilis. If any further proof is needed to show how badly situated one is in this regard, it is given in Table 9, where the figures of a Wassermann survey of four groups of children vary from 0 per cent to 33.9 per cent positive reactions. To make matters worse, the investigators who made the study at the New Orleans Foundling Asylum found no children having a positive Wassermann reaction but made a diagnosis of syphilis in 83.9 per cent of the cases based upon the luetin reaction plus clinical findings. The futility of attempting to be explicit in the present stage of our information needs no comment.

TABLE 7. INCIDENCE OF CONGENITAL SYPHILIS AS SHOWN BY WASSERMANN SURVEYS OF CHILDREN'S CLINIC GROUP

CLINIC	NUMBER OF CHILDREN	POSITIVE WASSERMANN REACTION		DOUBTFUL WASSERMANN REACTION		NEGATIVE WASSERMANN REACTION	
		No.	P. C.	No.	P. C.	No.	P. C.
Bellevue Hospital, New York[1]	191	42	21.9	18	9.4	131	68.6
New England Hospital for Women and Children, Boston[2]	175	3	1.7	1	.6	171	97.7
Floating Hospital, Boston[3]	110	11	10.0	2	1.8	97	88.2
England[4 5]	331	33	10.0	14	4.0	284	86.0
Germany[6 7]	236	8	3.3	...	...	...	...
Brooklyn, N. Y.[8 9]	1074	34	3.2	...	...	...	...
University of California Hospital, California[10]	890	26	2.9	...	...	...	...
New York[11 12]	178	11	6.1	...	...	...	...
TOTAL	3185	168	5.2	...	...	...	...

1 Vedder, E. B., *Syphilis and Public Health*, Philadelphia and New York, Lea and Febiger, 1918, p. 55, quotes Dr. William F. Snow.

2 New England Hospital for Women and Children. Tests by Massachusetts State Department of Health. Compilation by H. C. Solomon, Boston, Mass.

3 Floating Hospital, Boston. Tests by Massachusetts State Department of Health. Compilation by H. C. Solomon, Boston, Mass.

4 Random cases.

5 Browning, Investigations on Syphilis as Affecting the Health of the Community, *British Medical Journal*, vol. i, 1914, p. 77, quoted by Vedder, p. 44.

6 Nursing children.

7 Epstein, Ueber die Bedeutung der Wassermannschen Reaktion in der Säuglingsfürsorge, *Praeger med. Wchnschr.*, vol. 38, 1913, p. 621, quoted by Vedder, p. 36.

8 Newborn babies. Many congenital syphilitics do not give a positive Wassermann reaction at birth.

9 Jeans, loc. cit., *American Journal of Syphilis*, vol. iii, no. 1, Jan., 1919, quotes Commisky, *American Journal of Obstetrics*, vol. 73, 1916, p. 676.

10 Whitney, A Statistical Study of Syphilis, *Journal* of the American Medical Association, vol. 65, 1915, 1896, quoted by Vedder, p. 61.

11 Children without signs of syphilis. Five proved to be syphilitic and two possibly. Random cases.

12 Holt, The Wassermann Reaction in Hereditary Syphilis in Congenital Deformities and in Various Other Conditions in Infancy, *American Journal Diseases of Children*, vol. 6, 1913, p. 168, quoted by Vedder, p. 72.

TABLE 8. INCIDENCE OF CONGENITAL SYPHILIS AS SHOWN BY CLINICAL FINDINGS IN CHILDREN'S CLINIC GROUP

CLINIC	NUMBER OF INDIVIDUALS	POSITIVE WASSERMANN REACTION	
		No.	P. C.
King's College, England[1]	4830	29	.6
Budapest, Children's Clinic[2]	106407	720	.66
Children's Polyklinik, Berlin[3]	28000	254	.9
Berlin[4] [5]	17282	186	1.07
Germany[6]	17448	207	1.18
Hospital for Sick Children, England[7]	12000	250	2.5
Children's Memorial Hospital, Chicago[8]	695	23	3.3
Southern Clinic[9] [10]	225	7	3.1
TOTAL	186887	1676	.89

1 Still, G. E., *Congenital Syphilis*, London, (System of Syphilis, vol. i), second edition, 1914, p. 290.

2 Pusey, op. cit., quotes Vas, p. 70.

3 Heller, Die Häufigkeit der Hereditären Syphilis in Berlin, *Berl. klin. Wchnschr.* xlvi, 1909, p. 1315, quoted by Vedder, p. 36.

4 Nursing children.

5 Griffith, J. P. C., *The Diseases of Infants and Children*, Philadelphia, Saunders, 1919, quotes Fruhinholz, p. 562, *Rev. d'Hyg. et de med. inf.*, vol. ii, no. 1, 1903.

6 Heller, quotes Von Cassel, quoted by Vedder, p. 36.

7 Still, G. F., op. cit., quotes R. J. Lee, vol. i, p. 290.

8 Churchill and Austin, Frequency of Hereditary Syphilis, *American Journal Diseases of Children*, vol. 12, 1916, p. 355, quoted by Vedder, p. 72.

9 White children only.

10 Moore, Hereditary Syphilis in the Negro Race, *Southern Medical Journal*, vol. 8, 1915, p. 946, quoted by Vedder, p. 91.

TABLE 9. INCIDENCE OF CONGENITAL SYPHILIS IN SPECIAL GROUPS OF CHILDREN

NAME OF GROUP	NUMBER OF CHILDREN	POSITIVE WASSERMANN REACTION		DOUBTFUL WASSERMANN REACTION		NEGATIVE WASSERMANN REACTION		INTERPRETATIVE DATA
		No.	P. C.	No.	P. C.	No.	P. C.	
Foundling Institution, New Orleans[1]	106	0	0	0	0	106	100	Routine Wassermann and luetin tests. 74.5% of cases showed positive luetin; 9.43% showed clinical findings. Conclusion is that 83.96% are syphilitic.
Foundling Asylum, France[2]	500	18	3.6	5	1.	477	95.4	Routine Wassermann test. All but seven under three months.
Open Air School, St. Louis[3]	224	76	33.9	50	22.3	98	43.8	Routine Wassermann test. Children suffering from malnutrition.
Poor or Unhealthy Group, Scotland[4]	130	14	10.8	...	...	...	...	Routine Wassermann test.

1 DeBuys, L. R. and Maude Loeber, Study in a Foundling Institution to Determine the Incidence of Congenital Syphilis, *Journal* American Medical Association, Oct. 4, 1919.

2 D'Astros and Teissonniere, La Reaction de Wassermann chez le Nouveau ne et le Nourisson, *Marseille Medical*, xlix, 1912, p. 713, quoted by Vedder, p. 39.

3 Johnson, Serological Examination of over 200 children from the Open-air Schools of St. Louis, *American Journal of Syphilis*, vol. i, 1917, p. 606, quoted by Vedder, p. 73.

4 Elliott, Some Observations on the Occurrence of the Wassermann Reaction in the Serum of Children of the Poorer Classes, *Glasgow Medical Journal*, vol. 81, 1914, p. 339, quoted by Vedder, p. 43.

Congenital Syphilis—Incidence in Syphilitic Families.—How many syphilitic parents pass on their syphilis to their children is a more pertinent question. Our study of 555 syphilitic families[1] demonstrated that the percentage of syphilis in the children, as shown by the Wassermann test, lay between 8.4 per cent (191 families) and 16.7 per cent (364 families), according to the method of selection. That is, between one in twelve and one in six of the children examined showed evidence of syphilitic disease. This is brought out in Table 10.

TABLE 10. THE AMOUNT OF SYPHILIS IN CHILDREN

CLASS	191 FAMILIES IN WHICH EVERY LIVING MEMBER WAS EXAMINED		364 FAMILIES IN WHICH ONE OR MORE MEMBERS BESIDES THE PATIENT WAS EXAMINED		555 FAMILIES TOTAL OF 191 AND 364	
	No.	P. C.	No.	P. C.	No.	P. C.
Total children examined	202	100	221	100.0	423	100.0
Total children negative	179	88.6	181	81.9	360	85.1
Total children doubtful	6	3.0	3	1.4	9	2.1
Total children positive	17	8.4	37	16.7	54	12.8

A review of the literature concerning the prevalence of congenital syphilis in syphilitic families gives figures varying greatly from the above. This variation is undoubtedly due to a different method of selection of syphilitic families. Post,[2] in a survey of 30 families based upon his clinical judgment, gives the incidence of syphilis in the living children of these families as 45.1 per cent. Hochsinger[3] in a similar survey of 134 families, gives the incidence of congenital syphilis as 83.2 per cent. Plaut and Göring[4] in a Wassermann survey of 54 families place the incidence of positive reactions at 26 per cent. Of these reports, only that of Plaut and Göring was made in a manner at all similar to ours, that is, by a Wasser-

1 Solomon, H. C. and M. H., op. cit., p. 479.

2 Jeans, op. cit., p. 676, quotes Post.

3 Hochsinger, Die Gesundheitlichen Lebenschicksale, *Wiener klinische Wochenschrift*, vol. 24, June 16, 1910, p. 882.

4 Plaut und Göring, Untersuchungen an Kindern und Ehegatten von Paralytiken, *Münchener medizinische Wochenschrift*, vol. 58, no. 37, Sept. 12, 1920, p. 1959.

mann survey, and their percentage runs considerably higher than ours. Of course, they studied a much smaller group, and it is not certain that the examinations were routine or made on unselected families. It is desirable to make perfectly clear that our figures are based on the examination of the children of families in which one parent was known to have syphilis. In many instances this was the father, and the mother was not infected so far as known. The figures which we offer give an accurate account, we believe, of the results of a Wassermann survey made in this fashion.

Many of the studies reported in the literature use the term "syphilitic family" without defining the method of selection. If families are selected in which the mother is known to be syphilitic, the results are quite different from those obtained from families in which either the mother or father is syphilitic. Thus, in our group of 555 families there were 236 women known to be syphilitic. A study of the families of these 236 syphilitic women gives somewhat different results from those based upon the study of 555 families, including families in which the mother was not syphilitic and only the father showed signs of syphilis. As mentioned above (page 43), 142 children born in this group of 236 families were examined, and 39, or 27.5 per cent gave positive Wassermann reactions. This figure is to be compared with 12.8 per cent which is the percentage of positive Wassermann reactions occurring in the children examined in the total group of families (555).

Incidence of Living Non-syphilitic Children in Syphilitic Families.—Having taken up accidents to pregnancies, infant deaths, and syphilitic children separately, it is of interest to note how many of the pregnancies resulted in living non-syphilitic children. Again our figures show a higher proportion of healthy children than other studies, owing to the unconscious selection of a "syphilitic family" as one in which the original patient was a congenital syphilitic or a syphilitic mother. One congenital syphilitic suggests the possibility of a second; the known syphilitic mother is apt to have syphilitic children. It is to be remembered that the children in our study were the children of an unselected group of adult late syphilitics, a group exclusive of congenital syphilitics as

original patients and in which the large majority of original patients were men who may or may not have infected their wives.

Post[1] gives the living and healthy children as only 23.2 per cent; Hochsinger,[2] 9.3 per cent; Julien,[3] 20.9 per cent; Veeder,[4] 11.4 per cent; and Harmon,[5] 20.9 per cent. The last two are for families of congenital syphilitics. Omitting these, the range is from 9.3 per cent to 23.2 per cent. We find that of 342 pregnancies in the 191 families in which every living member was examined, 179 or 52.3 per cent resulted in healthy children. Comparing our figures with non-syphilitic families we naturally find that there are many more living and healthy children in the latter. For instance, Jeans[6] gives 75.5 per cent, Harmon[5] 79.2 per cent, and a study of conditions in Johnstown, Pennsylvania,[7] 78.4 per cent, of healthy children in non-syphilitic families. We feel that the toll of syphilis, though not as heavy as some might say, is severe enough when it reaches practically 50 per cent of the pregnancies.

Symptoms of Congenital Syphilis.—The symptoms of congenital syphilis are so varied that only the most conspicuous are recognizable to the layman and many are ignored by the physician who has not specialized in syphilis. In the following table many of the symptoms described in the textbooks as symptoms of congenital syphilis are given, and the more characteristic are italicized:

1 Jeans, op. cit., quotes Commisky, *American Journal of Obstetrics*, vol. 5, no. 73, 1916, p. 676, who quotes Post.

2 Habermann, Hereditary Syphilis, *Journal* of the American Medical Association, vol. 64, no. 14, April 3, 1915, p. 1141, quotes Hochsinger.

3 Jeans, op. cit., quotes Holt, *Diseases of Infancy and Childhood*, D. Appleton and Co., 1916, p. 1126, who quotes Julien.

4 Veeder, Hereditary Syphilis in the Light of Clinical Studies, *American Journal Medical Sciences*, vol. 152, 1916, p. 522.

5 Harmon, op. cit., p. 149.

6 Jeans, P. C. and E. Butler, Hereditary Syphilis as a Social Problem, *American Journal of Diseases of Children*, Nov., 1914.

7 Infant Mortality Series No. 3, Children's Bureau Publication, no. 9, Washington, D. C., 1915.

Table 11. Symptoms of Congenital Syphilis

I. Integument.
1. Skin—rashes, pemphigus, *condyloma, gumma*, erythema, dry skin, *rhagades*, furunculosis, phagedenic ulcerations, *palmar* and *plantar syphilides*, thickening, pigmentations, leucoderma.
2. Hair—alopecia, excessive amount.
3. Teeth—imperfect primary, separation, notched, *Hutchinsonian*, abnormally placed and shaped, suppuration of tooth sac.
4. Nails—*inflammation of matrix*, onychia.

II. Eyes.
1. *Interstitial keratitis.*
2. Iritis.
3. *Retinitis.*
4. *Choroiditis.*
5. *Choroido-retinitis.*
6. Opacities in vitreous.
7. Nystagmus.
8. Optic atrophy.

III. Ears.
1. Otitis media.
2. Otitis interna.

IV. Respiratory tract.
1. *Snuffles.*
2. *Saddle nose.*
3. *Ozena.*
4. Tracheitis—hoarse voice.
5. Tracheal stenosis.
6. Pneumonia alba.
7. *Gumma.*

V. Gastro-intestinal tract.
1. Marasmus—disturbance of nutrition.
2. Glossitis.
3. Stomatitis.
4. Tonsillitis.
5. Pharyngitis.
6. Pyloric stenosis.
7. *Cirrhosis of liver*—jaundice—ascites.
8. *Gumma of liver.*
9. Cirrhosis of pancreas.
10. Enlargement of liver.

VI. Cardiovascular-lymphatic.
1. Myocarditis.
2. Congenital heart disease.
3. Endarteritis.
4. *Aneurysm.*
5. Anemia.
6. Splenic anemia.
7. *Adenitis*—enlargement of glands.
8. Hemorrhage of the new born.
9. Edema without albuminuria.
10. Splenitis.

VII. Genito-urinary.
1. Nephritis—albuminuria.
2. Hemoglobinuria.
3. Hydrocele.
4. Orchitis.
5. Epididymitis.

VIII. Nervous system.
1. Feeble-mindedness.
2. *Juvenile paresis.*
3. *Juvenile tabes.*
4. Microcephalus.
5. Hydrocephalus.
6. Cerebral aplasia and agenesia.
7. *Meningo-encephalitis.*
8. Spastic palsies—cerebral and spinal, hemiplegia, diplegia.
9. Epilepsy—convulsions.
10. *Gumma*—tumor.

IX. Endocrine system.
1. Infantilism—late puberty.
2. *Old man appearance.*
3. Stunted growth.

X. Bones and joints.
1. Osteitis.
2. Epiphysitis.
3. *Periostitis.*
4. Osteomalacia.
5. Cranio—tabes (Parrot's nodes).
6. *Bossing of skull.*
7. *Fragilitas ossium syphilitica.*
8. *Sabre tibia.*
9. *Pseudo-paralysis.*
10. Bony thickening — Heberden's nodes.
11. *Chronic synovitis with effusion.*
12. Suppuration into joints.
13. Synovitis.

Symptoms and Diagnosis—Date of Appearance.—It must be remembered that these symptoms are indicative of various forms of syphilis and that only a few are present in each case, depending on the type of syphilis. Many are symptomatic also of diseases other than congenital syphilis. Some, such as interstitial keratitis, early nerve deafness, and Hutchinsonian teeth, known as the Hutchinsonian triad, are very suggestive and, in combination, are definitely diagnostic of congenital syphilis. In addition, one might mention hydrops articulorum, saddle nose, olympic forehead and sabre tibiae. Many people erroneously feel that if a child has seemed to escape without early symptoms (often present but undiagnosed) the danger line has been passed. But the symptoms of congenital syphilis may appear at any age—in babyhood, childhood, early or late adolescence, or even in adult life.

Clinical Manifestations.—The clinical manifestations of congenital syphilis are as numerous and varied as in acquired adult syphilis except that congenital syphilitics do not pass through the primary stages as do children or adults who acquire syphilis. Some congenital syphilitics go through life with hardly a symptom or sign. Others are led to early death, while there are many children who live and develop all sorts of grave conditions.

Early Symptoms.—A syphilitic infant may show symptoms shortly after birth. The symptoms of this period correspond to those of the secondary period of the disease in the acquired form. Among the common early symptoms are snuffles, skin rashes, abnormalities of the nails and hair. The infant may be born with these manifestations or they may appear after an interval of a week or more. They may vary considerably in intensity from very insignificant redness of the skin to a pemphigus leading to death. When the reaction is marked the diagnosis is made with ease, but in many of the milder types it is hardly possible to base a diagnosis on the clinical appearance.

Marasmus or emaciation, dependent on poor assimilation of food, is a rather common result of congenital syphilis.

These cases prove very recalcitrant to ordinary feeding regulations and are likely to die if not saved by antisyphilitic treatment. The Wassermann reaction offers very little assistance in the diagnosis, as it is usually still negative in the early days of life. There is some evidence to show that the Wassermann reaction of the mother's blood is also likely to be negative shortly after delivery.

Changes in the enamel plate of the teeth date back to intrauterine life, or early infancy, although they are not seen until a number of years later when the permanent teeth are erupted. Bone changes also probably start very early but are noticed only much later in the form of changes in the long bones, as, for example, sabre tibiae; in the flat bones as bosses of the skull, epiphyses, and fontanelles.

Danger of Death in First Year.—The first year is the danger period for congenital syphilitics with severe early lesions. Death may occur from any one of several causes. The disturbance in the respiratory tract shown by snuffles may progress and lead to broncho-pneumonia. The lesions of the skin may be very serious and produce a fatal pemphigus. Inanition or marasmus may result in death. Hemorrhage of the newborn may be of syphilitic origin and prove fatal. The same is true of liver disease. Thus, the infant with an active syphilis has a terrible handicap in meeting the vicissitudes of early life.

Importance of Immediate Treatment.—Treatment has a great deal to offer in these cases, and the sooner it is instituted the better are the chances of therapeutic success. Even at the best, however, there are cases which cannot be saved by treatment.

Case 32. Paole and Maria Gallioni,[1] aged 24 and 22, respectively, were found to be syphilitic. They were examined as the parents of their six-months old son, who was a typical congenital syphilitic with an enlarged liver and spleen, rash on the face, palms of the hands, and soles of the feet. The woman had had two miscarriages followed

1 Children's Hospital, Boston.

by this syphilitic baby. The doctor who confined her did not suspect syphilis then or later when the baby had a rash. If this woman had had a Wassermann test during her pregnancy, adequate treatment might have saved the baby. As it was, the treatment was started at the age of six months. The baby improved for four months but died of broncho-pneumonia and encephalitis. The parents were very coöperative about the baby's treatment and their own.

Case 33. Sarkis Sculos. Preceded by three miscarriages, Sarkis was born at term but was very sickly, had snuffles and a rash. He was treated with mercury for some time and improved. At the age of 6 he developed interstitial keratitis and then developed a left-sided hemiplegia which persisted.

Case 34. Bertram Wood was a syphilitic who infected his wife. The first child was a blind syphilitic who died of marasmus at the age of five months. The second child was a living syphilitic. Although the original patient was aware that he had contracted syphilis he did not know that he had infected his wife, nor was syphilis diagnosed at the death of the baby.

Latent Congenital Syphilis.—The vast majority of congenital syphilitics do not show marked and easily recognizable symptoms in infancy. Many are born in perfect condition and develop normally through infancy and early childhood or even to adult life. Not only may no active symptoms be present, but there may be no suspicious stigmata. Nevertheless, many of these children will later show serious syphilitic disorders. The story is the same as in acquired syphilis; there is an apparently latent period during which no symptoms are manifest. The Wassermann test has been very helpful in picking out these cases of congenital syphilis.

Case 35. Esther Kroll was the daughter of syphilitic parents. Her mother was a patient in a hospital for the insane, suffering from general paresis. Her father had a positive Wassermann reaction, but no recent symptoms. Esther when first seen was 14 years of age and apparently in the best of health. She was a very attractive looking girl, well developed for her age, and the picture of health, with rosy cheeks and all the lightness of temperament and joy of living that is supposed to go with healthy youth. According to her history, she had always been entirely well, and developed normally. She was of rather superior intelligence. Physical examination showed

no evidence of syphilitic or other stigmata. Her blood Wassermann test, however, was strongly positive, and remained so on several subsequent tests. This Wassermann reaction and the history were the only evidence of syphilis.

Some children with congenital syphilis may not show any active *symptoms* of syphilis that would lead to considering them as sick and yet they may have *stigmata* allowing a diagnosis of congenital syphilis to be made at a glance. Characteristic Hutchinsonian teeth, frontal bosses, and saddle nose may give the unmistakable facies of a congenital syphilitic to a child who has been apparently healthy and has suffered no discomfort from syphilis. Such cases are much more likely to receive treatment than those which show no stigmata, and thus they have a better chance of escaping the late manifestations.

Case 36. Marcia Burns was 9 years of age when she was diagnosed a congenital syphilitic. She was easily recognizable as such. Among the signs marking her as a congenital syphilitic were prominent frontal bosses, serrated teeth, incisors of the crescent form, scaphoid scapulae, and defective vision. She had suffered no clinical symptoms diagnostic of congenital syphilis although she was known to be nervous. The Wassermann reaction was positive and treatment was instituted.

Lues Hereditaria Tarda.—Although a child may have escaped for many years without any symptoms of syphilis this is no indication that he has established an immunity or will not suffer later. Indeed, much of the symptomatology of congenital syphilis is seen during puberty and adolescence in children who have previously been apparently well. Nonne feels that the symptoms appear more frequently at the time of puberty. Fournier,[1] in an analysis of 212 cases, found that the date of appearance of symptoms varied in different patients between three and twenty-eight years, with an appearance at the average age of twelve years. Charcot[2] even saw one case in whom symptoms first appeared at thirty

1 Fournier, A., *La Syphilis Héréditaire Tardive*, Paris, G. Masson, 1896, p. 180.

2 Charcot, M., *Clinique des Maladies du Système Nerveus*, Paris, Veuve Babé et Cie, 1892, chap. xix.

years. These cases have been referred to in the literature as instances of *lues hereditaria tarda,* which may be translated as late symptoms of congenital syphilis. All the symptoms given on the symptom chart, with the exception of a very few, as snuffles, pemphigus, and marasmus, are seen in the late years of childhood. These late symptoms may occur in the children who have had no early symptoms as well as in those who have weathered early difficulties; apparently healthy children, free from stigmata, may suffer from the severest forms of late syphilis just as those who are markedly stigmatized or those who have shown symptoms throughout life.

Interstitial Keratitis.—The sensory organs are very frequently involved. Syphilis is a fairly common cause of eye trouble. Derby and Walker,[1] in an analysis of 77,000 new cases of eye disease at the Massachusetts Charitable Eye and Ear Infirmary, find that .4 per cent of the cases had interstitial keratitis. They quote Hoor's German statistics showing that in 475,000 cases of eye trouble, interstitial keratitis occurred 3026 times or .63 per cent. Thus it means that about one case of eye disease in every 200 is a result of congenital syphilis. In the late stages of congenital syphilis, interstitial keratitis is one of the most important of the symptoms. It is important both from the standpoint of diagnosis and of its effect on the patient. There is so much about it that is characteristic that it affords great assistance in making diagnoses. It is marked by an involvement of the cornea of the eye. The eye becomes much inflamed and ulcers are likely to appear. Frequently the ulcers, when healed, leave scars upon the cornea on that portion directly over the pupil. Interference with vision results. Interstitial keratitis occurs most frequently between the ages of eight and fifteen, although it may be seen from six to thirty. As a rule the activity is self-limited and healing with more or less scar formation occurs spontaneously in a period of from a few days to a number of months. A succession of attacks is frequent and both eyes are usually involved. Inter-

1 Derby, G. and C. B. Walker, Interstitial Keratitis of Luetic Origin, *Transactions* of the American Ophthalmological Society, 1913.

stitial keratitis may occur in individuals showing other signs of congenital syphilis. On the other hand, it occurs in cases that are quite free from any other syphilitic stigma. It is not infrequently associated with other syphilitic diseases of the eye, such as choroiditis and retinitis, while iritis is nearly always present.

Aside from possible blindness the condition is of considerable consequence on account of the discomfort of the patient during the attack. Photophobia, that is, pain when the eye is exposed to light, is practically always present, as well as profuse discharge. This means that the patient suffers considerably and needs special care.

Case 37. Susan Shea developed interstitial keratitis at the age of 14. Previous to this period she had been quite well. She was given antisyphilitic treatment at once and her eyes improved so that she recovered without blindness. Her father had acquired syphilis one year before her birth.

Case 38. Francis Defararri was first seen by us at the age of 15. He had been in an institution for the blind since he was about 7 years of age. The visual defect was caused by scars on the cornea over the pupillary opening which prevented light rays from reaching the retina. These scars were the result of an old interstitial keratitis. This boy was blind as a result of congenital syphilis. It is quite possible that had he received early treatment the blindness could have been prevented.

Case 39. Frederick Waters was 20 years of age at the time he first visited the clinic. He was referred by the ophthalmologist because of interstitial keratitis. As was to be expected, the Wassermann reaction of his blood was positive. There were no other symptoms of congenital syphilis. A careful examination did not bring forth any evidence of luetic symptoms such as might have been expected had the disease been acquired. Waters had been married for three years, his wife was free from syphilis and had given birth to two normal, healthy children. Therefore, it seems fair to assume that this is a case of congenital syphilis in which interstitial keratitis appeared as the first symptom of the disease when the patient was 20 years of age.

Other Forms of Involvement of the Eye.—Aside from interstitial keratitis there are various other types of congenital syphilitic involvement of the eyes. Choroidoretinitis is a form

that is fairly characteristic of congenital syphilis, and frequently offers the opportunity of making a diagnosis. In many instances this condition leads to blindness. Cataracts occurring in infants or young children are nearly always caused by congenital syphilis. Optic atrophy is found in cases of congenital syphilis as well as in the acquired form. The optic nerve is closely related with the central nervous system, and as a rule cases with optic atrophy will show other evidences of central nervous system invasion. The situation is similar to that seen in the acquired form when one speaks of optic tabes. When once optic atrophy has started it is practically always progressive, leading to complete blindness. Strabismus, nystagmus, and the like are also frequently present.

Case 40. Albert O'Connors became blind at the age of 5 years. At the same time he developed strabismus. The blindness proved to be due to an optic atrophy. He was placed in a school for the blind but was incapable of making progress and it was found that in addition to his blindness he was feeble-minded. The blindness was definitely caused by congenital syphilis as was probably the feeble-mindedness.

Case 41. Lucia Petrofski was brought to the hospital by her teacher because of headaches, pains in her back, and defective vision. Examination showed that she was a congenital syphilitic. Her visual difficulty was due to a syphilitic choroiditis.

Deafness.—Deafness is a fairly common symptom of late congenital syphilis. The combination of interstitial keratitis and nerve deafness is not unusual. Any part of the auditory apparatus may be involved. The important point is that the condition is progressive and quite resistent to any form of treatment.

Case 42. Louis Lachine was the second living child in a family which showed the ravages of syphilis to a very marked extent. The mother had syphilitic cirrhosis of the liver. The first pregnancy was a miscarriage, the second was a child who died at five weeks, the third was a boy who showed innumerable symptoms and stigmata of congenital syphilis including Hutchinsonian teeth and interstitial keratitis. Then came the patient who was followed by another child who died at five weeks. The sixth pregnancy gave rise to a boy who,

aside from being retarded mentally, showed no disorders. The last child died at nine months.

The patient under consideration was first seen by us at the age of 15, at which time he was completely deaf. He had a positive blood Wassermann reaction and was feeble-minded. He was partially blind as the result of an old interstitial keratitis which occurred at the age of 12. He had Hutchinsonian teeth and in addition to the deafness he gave evidence of involvement of the vestibular portion of the eighth nerve, staggering and swaying in his walking.

Involvement of the Bones.—Involvement of the bones occurs at times, but is not very characteristic of congenital syphilis. Rather than helping to make a diagnosis it usually offers difficulties and often leads to erroneous diagnoses. The form of bone involvement may vary in different cases. The type leading to the formation of the so-called sabre shin is, of course, quite easily recognized. Pain is frequently present, due as a rule to periostitis. At other times gummatous lesions of the bone occur which may end in osteomyelitis.

Case 43. Mary Mazzocca was the sixth child in a syphilitic family. The mother had had nine pregnancies. Besides Mary, there was one other living child who was a juvenile paretic. Mary was 17 years old when seen by us. She had had interstitial keratitis from which she had made a fairly good recovery. The history and examination showed that she had had a great many bone lesions. There were scars in various portions of the body where the skin had broken down as a result of an underlying bone lesion. These scars appeared on the frontal bone of the skull, on the arms and legs. A diagnosis of tubercular osteomyelitis had been made. The case seems to be one in which the congenital syphilis was the provocative agent in the production of the bone lesions as well as of the interstitial keratitis.

Hydrops articulorum, a form of swelling of the knees caused by suffusion with fluid, is another very characteristic symptom of congenital syphilis, oftentimes occurring in conjunction with interstitial keratitis. The condition is usually bilateral, self-limited, with a tendency to recur.

Congenital Syphilis and Feeble-mindedness.—The relation of syphilis to feeble-mindedness presents a question that is not

easily answered. It is obviously true that there are a certain number of congenital syphilitics who are feeble-minded because of destructive lesions or failure of development of the brain due to congenital syphilis. However, a congenital syphilitic may have a coexistent feeble-mindedness which is hereditary, that is due to the presence of feeble-mindedness in the family or caused by other conditions than syphilis. Most feeble-minded children are not syphilitic and most congenital syphilitics are not mentally retarded.

Incidence of Congenital Syphilis Among the Feeble-minded—Table 12.—The accompanying table gives the result of a number of Wassermann surveys of children in institutions for the feeble-minded:

TABLE 12. PREVALENCE OF SYPHILIS AMONG THE FEEBLE-MINDED

CLINIC	NUMBER OF INDIVIDUALS	POSITIVE WASSERMANN REACTION		INTERPRETATIVE DATA
		No.	P. C.	
Mass. School for Feeble-minded[1]	1565	70	4.5	Feeble-minded children
Institution for Feeble-minded, Columbus, Ohio[2]	1550	132	8.5	Presumably congenital feeble-minded cases. No history of infection
School for Feeble-minded, Minn.[3]	600	16	2.6	Feeble-minded boys. Weak antigen, so few positive
Institution for Feeble-minded, Baltimore, Md.[4]	480	14	less than 3.0	Feeble-minded boys and girls
Randall's Island, N. Y.[5]	204	30	14.7	Feeble-minded boys and girls, 140 under 20 years
TOTAL	4399	262	6.0	

1 Wassermann Tests (blood taken by H. C. Solomon) at the Massachusetts School for Feeble-minded.

2 McKay, Inherited Syphilis in Feeble-mindedness, *Illinois Medical Journal*, vol. 28, 1915, p. 281, quoted by Vedder, p. 75.

3 Moulton, Wassermann Test on 600 Cases of Feeble-minded at the Minnesota School for Feeble-minded and Colony of Epileptics, *Journal of Psychoasthenics*, vol. 18, 1914, p. 222, quoted by Vedder, p. 75.

4 Walker, Symposium on Syphilis, Congress of American Physicians and Surgeons, 1916, *Journal* American Medical Association, vol. 66, 1916, p. 1740, quoted by Vedder, p. 73.

5 Atwood, C. E., Idiocy and Hereditary Syphilis, *Journal* American Medical Association, vol. 55, August 6, 1910, pp. 464-465.

The average of the figures given in the table shows that the Wassermann reaction is positive in 6.0 per cent of the children surveyed in the institutions for the feeble-minded in America. It is to be compared with the average of syphilis among hospital children (see page 52), which came to about 5 per cent. The small difference between 6 per cent and 5 per cent allows for no very definite conclusions. Goddard has called attention to the fact that feeble-mindedness is often hereditary, that it frequently disposes persons to conduct which might lead to the acquisition of syphilis. Hence it is possible that the parents of many of the children in the feeble-minded schools are themselves syphilitic, and thus their children would have a higher percentage of syphilis than a normal group. In this case it would follow that there would be a higher percentage of congenital syphilis in the offspring of the feeble-minded than in the offspring of a normal group. Therefore, it is not possible to state, as is so often done, that congenital syphilis is a great element in the production of feeble-mindedness.

Case 44. The Johnson family illustrates the care that one must use in concluding that cases of congenital syphilis and feeble-mindedness are causally related or that one is definitely dependent upon the other. The mother and father in this family were syphilitic. There were five children ranging in age from 10 years to 6 months. The four older children had positive Wassermann reactions and signs of congenital syphilis. The fifth child was not examined. The three older children were definitely retarded mentally and could well be classified as feeble-minded. No decision was reached in the cases of the fourth and fifth children as they were quite young. There were then, at least three children suffering both from congenital syphilis and feeble-mindedness. However, both the father and mother were feeble-minded. The feeble-mindedness of these children was not caused by the syphilis. The feeble-mindedness of the parents existed prior to the acquisition of syphilis and it is more probable that their children were feeble-minded as a result of the feeble-minded rather than the syphilitic heredity. In other words, they were the feeble-minded offspring of feeble-minded stock.

On the other hand, there seems to be little chance for doubt that certain individual cases of feeble-mindedness owe their

origin to syphilis in the parent. Thus, where the heredity is free from mental disorder or feeble-mindedness, where there have been no prenatal or postnatal accidents, and yet the child is a congenital syphilitic with evidence of disordered development, one may often conclude that congenital syphilis is the etiological factor in the feeble-mindedness.

Case 45. Helen Paglia had had minor difficulties at school and was brought to the hospital by the S. P. C. C. She was 14 years old but her mental age was 11. She was diagnosed feeble-minded. Examination disclosed a positive Wassermann reaction. The family history showed a parental syphilis but no feeble-mindedness. It is, therefore, conceivable that there is some connection between the congenital syphilis and the lowered mentality.

Case 46. Julius Swartz was a very good-looking child of 6 years who was very definitely feeble-minded. His father was a tabetic, his mother quite well, with a negative Wassermann reaction. There was one older brother who was very bright but showed a number of peculiar dystrophies. Julius was born at full term with normal delivery. He is said to have had cholera infantum when 6 years of age associated with broncho-pneumonia. At 5 he had whooping cough, otherwise the past history was entirely negative. He presented a few signs suggestive of congenital syphilis as well as a positive Wassermann reaction in the blood serum. This family is entirely free from any history of mental disorder including feeble-mindedness. It therefore seems quite likely that the feeble-mindedness in the case of Julius is associated with the fact that he is suffering from congenital syphilis.

Incidence of Feeble-mindedness in Syphilitic Families.— Another way of determining the effect of congenital syphilis on the production of feeble-mindedness is to consider the frequency of feeble-mindedness in syphilitic families. Jeans and Butler[1] made a study of the families of 83 syphilitic children. They found that 20 per cent of the families had one or more defective children. For purposes of comparison, a study of the families of 100 children who were in the hospital because of infectious diseases was made. Defective mentality was found in only 4 per cent of these families.

1 Jeans and Butler, op. cit.

Still[1] found that 10 per cent of his cases of hereditary syphilis showed affected brains. In 148 consecutive cases of congenital syphilitics there were six congenital idiots and four cases of mental decline in childhood. Thus 7 per cent of his group of syphilitic children showed mental defects.

Dr. Lucas[2] made an intensive study of 60 cases of congenital syphilis at the Children's Hospital in Boston. He followed these children for a period of several years to see what became of them. He found that one third had died, that one third were apparently normal, and that one third were deficient in their school work. He concludes that this indicates that syphilis is one of the sources of backwardness in school children.

The above figures merely show that syphilis and feeble-mindedness occur in the same child and that syphilitics have feeble-minded children. The exact etiological relation on a percentage basis has not yet been established.

Syphilis as Cause of Two Types of Feeble-mindedness.—Two types of feeble-mindedness, however, may be considered as due to congenital syphilis:

1. That type in which, because of syphilitic defect in the germ plasm, the brain is laid down poorly. The defect in this case is a defect in the development of the brain.

2. That type in which the brain has been properly laid down in the embryonic state but becomes destroyed either during the intrauterine life or within the first few years of life.

Hydrocephalic idiocy has been thought to be caused by congenital syphilis in a high percentage of the cases. This is probably not true. Recent studies by us and others have failed to detect the presence of syphilis in cases of hydrocephalic idiocy, except in rare instances. Congenital syphilis has been found by us to be more frequent in cases of microcephalus than in hydrocephalus.

1 Pusey, op. cit., p. 66, quotes Still.

2 Lucas, W. P., Contributions to the Neurology of the Child. II. Note on the Mortality and Proportion of Backward Children in Cases of Congenital Syphilis Followed Subsequent to Hospital Treatment, *Boston Medical and Surgical Journal*, Feb. 29, 1912, Aug. 29, 1912, Sept. 4, 1913.

Precocious Congenital Syphilitics.—In contradistinction to feeble-mindedness caused by syphilis, occasional syphilitic children are unusually precocious, and have a high mental rating. This does not indicate that the syphilitic heredity is an asset nor that it is the cause of precociousness, but merely that the syphilis had no effect on the particular child's mentality.

Case 47. Wendall Morris was an orphan who showed certain stigmata of congenital syphilis and a positive Wassermann reaction. When first seen by us he was 8 years of age and was spoken of as "nervous," that is, he was very active and it was difficult for him to keep still. He was found to be a very bright, alert, and attractive child. He was ahead of his years in school and a psychometric examination showed that he had a mental age of over ten years. He was examined again when he was 10 years and 8 months old. At this time the psychometric rating was fourteen years. A third examination was made when he was 14 years and 8 months old and on this occasion he rated over 17. His school record each time corresponded with the psychometric tests in that he was a couple of years further advanced than the average child of his age. This boy who had congenital syphilis was the opposite of feeble-minded, that is, he was precocious.

Involvement of Central Nervous System.—The nervous system is involved in congenital syphilis in the same way as in the acquired form of the disease and certainly with no less frequency. Jeans[1] examined 214 syphilitic children ranging in age from infancy to fourteen years, basing his diagnosis of involvement of the central nervous system upon the pathological findings in the cerebrospinal fluid. He divided his cases into two groups: the first group containing the children under two years of age; the second, those from two to fourteen years: To quote Jeans:

. . . it is seen, then, that the nervous system was involved in 40 per cent of syphilitic infants, 31 per cent of older children having active infection and 20 per cent of older children having latent infection. Of the entire group of 214 infants and children, the nervous

1 Jeans, Cerebrospinal Involvement in Hereditary Syphilis, *American Journal of Diseases of Children*, vol. 18, Sept., 1919, pp. 173-178.

system was involved in 70, or 32.7 per cent. Of those having positive cerebrospinal fluids slightly more than one third of the infants and slightly more than two thirds of the older children had clinical manifestations of neurosyphilis at the time of observation.

One may conclude from Jeans' report that by doing early lumbar punctures one can make a diagnosis of central nervous system involvement prior to the appearance of symptoms depending upon destructive lesions. Kingery,[1] in a study of the spinal fluids of 52 cases of congenital syphilis, found that 28.8 per cent showed some deviation from the normal.

According to a study made by Veeder[2] in a series of 100 late cases of congenital syphilis, the nervous system was involved in 47 and, of these, at least 14 had cerebrospinal syphilis in one form or another.

TABLE 13. TYPES OF INVOLVEMENT IN 100 CASES OF CONGENITAL SYPHILIS (VEEDER)

BONES	
Periostitis tibia	4
Periostitis skull	1
Osteomyelitis	1
JOINTS	
Acute arthritis knee	8
Acute arthritis ankle	1
SKIN	
Macular eruption	1
Condyloma ani	3
Gummata	3
Alopecia	3
EYE	
Interstitial keratitis	24
Choroiditis	1
ULCERATIONS	
Nasal	2
Laryngeal	1
Pharyngeal	1
CENTRAL NERVOUS SYSTEM	
Mental deficiency	23
Cerebrospinal syphilis	14
Hemiplegia	6
Epilepsy	5
Spastic paraplegia	4
Chorea	2
Hydrocephalus	2
MISCELLANEOUS CONDITIONS	
Ozena	1
Enlarged spleen (only symptom)	1
Torticollis	1
Aortitis	1
Obscure abdominal pain	1
Obscure pain in legs	2
Endarteritis obliterans	1
Paroxysmal hemoglobinuria	1
Raynauds' Disease	1
Hutchinson's teeth	4

1 Kingery, L. B., A Study of the Spinal Fluid in Fifty-two Cases of Congenital Syphilis, *Journal* of the American Medical Association, vol. 76, Jan. 1, 1921, p. 12.

2 Veeder, op. cit.

The most important of the inflammatory conditions of the nervous system are juvenile paresis, cerebrospinal syphilis, juvenile tabes, and certain cases of epilepsy. As is true in acquired syphilis, so in congenital syphilis the severest type of reaction is that of paresis. Juvenile paresis was first described by Clouston in 1877. While not a condition that is met very frequently, it is by no means rare. The symptoms are similar to those of the acquired form. A child who may have appeared entirely well develops slowly increasing mental symptoms some time before or at the adolescent period. The patient deteriorates and finally dies several years after the beginning of the symptoms. Prognosis is entirely hopeless as far as we can tell to-day. Juvenile paresis is a progressive dementing psychosis leading to death. Cases of juvenile paresis very frequently develop in children who show no marked stigmata of congenital syphilis and who have had no symptoms prior to the onset of those of the nervous system. Juvenile paresis tends to cut short the lives of its victims at a period when they are just coming into their full heritage. The average age of the onset is about 14 years, but cases have been described in the literature as young as 8 years and as old as 23. Cases of juvenile paresis which begin quite early in life are frequently erroneously diagnosed as cases of feeble-mindedness.

Case 48. John Friedreich was a child of syphilitic parents who was recognized as a congenital syphilitic shortly after birth and was given antisyphilitic treatment almost immediately. He did not have a normal mental development and was considered feeble-minded. He had been slow in learning to walk and talk. At the age of 5 he began to show difficulty in walking. When seen at the clinic at the age of 7 he had deteriorated considerably. He was quite deaf, apparently was unable to talk coherently, walked with an ungainly gait, was subject to fainting spells, and was exceedingly difficult to care for. The examination showed symptoms of nervous system involvement, namely, deafness, Argyll-Robertson pupils, and a positive Wassermann reaction in the blood and spinal fluid. This case is of importance in indicating that cases treated from the very first weeks of life may go on without improvement and develop paresis.

Case 49. The Bradford family is indeed an unusual one in that there were two children both of whom had juvenile paresis. The

family consisted of the father and mother and two girls 16 and 14 years, respectively, at the time of their first appearance at our clinic. The older girl had been quite well until the age of 12 when she suffered a shock which left her paralyzed. Esther, the younger, had been perfectly healthy in her childhood and was considered a bright and active student until she reached the fourth grade in school. Then, at the age of 10, she began to show evidence of deterioration. She complained of headaches, trouble with her stomach, and drowsiness. Next difficulty with speech, gait, and coördination appeared. She deteriorated very rapidly and when seen at 14 was greatly demented. The whole picture including the laboratory tests of the blood and spinal fluid led to the diagnosis of juvenile paresis, with a prognosis of death in a period of months or not more than a few years. The older sister also had a positive blood and spinal fluid. The Wassermann reaction on the mother was positive and that of the father was negative. It may be mentioned that neither child was correctly diagnosed until the ages of 16 and 14 respectively. Juvenile paresis is a condition which is very frequently unrecognized until the very late stages.

Case 50. Philip Griffin had a variegated history. Always difficult to manage, he had been in a reformatory on several occasions and was finally sent to the hospital at the age of 24 because of threatening his sister with a loaded revolver. The examination disclosed teeth that were rather characteristic of congenital syphilis, a real dementia was present, and he had unequal, poorly reacting pupils. His spinal fluid gave all the signs of general paresis and he continued to deteriorate quite rapidly. It is interesting to note that this patient had a negative Wassermann reaction in the blood, emphasizing the point that in cases of congenital syphilis one must not rely too much on a negative blood test.

Cerebrospinal Syphilis.—Less serious as to prognosis are the cases of syphilitic involvement which are similar to those known in the acquired form as cerebrospinal syphilis. These cases show a variety of symptoms, including paralysis of the cranial nerves and conditions such as paraplegia, hemiplegia, or merely meningitis.

Case 51. Jo Weinberg was a young man of inferior mentality but he was sufficiently well endowed to get along in a labor battalion in the army. Shortly after his discharge he developed a hemiplegia. Examination showed that he was a congenital syphilitic with a positive

Wassermann reaction in the blood and spinal fluid. His case was of the type of cerebrospinal syphilis and under antisyphilitic treatment he made a very good recovery from this hemiplegia and regained his former status.

Juvenile Tabes.—Juvenile tabes or locomotor ataxia is quite rare and much less frequent than juvenile paresis or other forms of congenital neurosyphilis. The signs and symptoms are similar to those of tabes resulting from acquired syphilis.

Epilepsy.—The relation of congenital syphilis to epilepsy has been given a great deal of consideration by investigators. The situation resembles that of congenital syphilis and feeble-mindedness.

Convulsions may occur in any case of inflammatory involvement of the nervous system of syphilitic origin. Cases of juvenile paresis, cerebrospinal syphilis, etc., in which there is active inflammation, are somewhat different from the cases of syphilitic epilepsy in which there is no evidence of an active syphilitic inflammation of the brain or meninges. One has to differentiate between epilepsy occurring in the congenital syphilitic and epilepsy which is caused by syphilis. It is possible that the epilepsy may have an origin not at all related to the syphilis.

Case 52. The case of Peter Flynn brings up the question of the relationship between epilepsy and congenital syphilis. The family consists of the father and mother and six children of whom Peter is the oldest. The mother and father and four oldest children all have positive Wassermann reactions while the two youngest have negative Wassermann reactions. Peter had a convulsion at the age of 2 and then no more until the age of 15 when they occurred with great frequency. Aside from the congenital syphilis there is no suggestion of any cause for the epilepsy. The heredity is quite negative as far as epilepsy or like conditions are concerned.

Case 53. Laurence Balch was subject to epileptic attacks. Examination showed that he had a positive Wassermann reaction. Although Laurence was 20 years of age he gave no history of having acquired syphilis, his father was syphilitic and there was a basis for

the assumption that he was a congenital syphilitic. However, though this be true, it does not follow that the epilepsy was the result of congenital syphilis. This becomes particularly pertinent when it is found that the mother was herself epileptic. It seems quite probable, therefore, that Laurence's epilepsy could be traced to the epilepsy in his mother rather than to syphilis.

A Wassermann survey of Craig Colony, New York, an institution for epileptics, made by Shanahan, Shaw, and Munson, disclosed that among 4100 epileptics, most of whom were adults, less than 2 per cent gave a positive Wassermann test. At the Monson State Hospital in Massachusetts, of 535 epileptics a positive Wassermann was obtained in 3.34 per cent. However, the figures are considerably different when youthful epileptics are considered as in contrast to the figures for the adult epileptic. At the Monson State Hospital, Dr. M. B. Hodskin found that of 104 children with epilepsy, all of whom were under 15 years of age, 21 per cent gave positive Wassermanns. Jeans of St. Louis found that 20 per cent of his cases of epilepsy were congenital syphilitics.

The wide variation between the percentages of Wassermann positive cases among the adult and youthful epileptics demands explanation. There are two hypotheses at hand: one, that in the cases where epilepsy is caused by congenital syphilis, the epilepsy comes on early in life, and that epilepsy occurring somewhat later is less frequently of congenital syphilitic origin, or two, that many of the adult epileptics who gave negative Wassermann reactions are congenital syphilitics, who earlier in life did show positive Wassermann tests, but as they matured this finding became negative. At any rate, the high frequency of Wassermann reactions in youthful epileptics is highly suggestive that there may be a relationship between epilepsy and congenital syphilis. However, the present state of knowledge concerning this subject does not allow us to draw any definite conclusions. For the present it must be left an open question which needs considerable further study.

Relation of Other Psychopathies to Parental Syphilis—Instability.—In addition to the above effects of syphilis on

the child, one must consider several more mooted points. If a child of syphilitic parents has none of the above mentioned forms of syphilis is that child to be considered healthy? Stated differently, if a child has other difficulties than those given above, are these difficulties caused by the parental syphilis? From this point of view it is pertinent to think of general weakness, emotional disorders and the psychoneuroses, psychoses, and character defects. Some syphilologists, for instance Graves of St. Louis, and Browning and McKenzie of Glasgow, believe that the offspring of syphilitic parents are apt to show conditions of poor stability, and would suggest that even in the absence of definite symptoms of active syphilis such children be treated by antisyphilitic drugs. One not infrequently sees children of syphilitic parents who are nervous, fidgety, and who do not thrive any too well. Whether one can relate these conditions to the parental syphilis is a question that cannot be easily determined.

Case 54. Mrs. White was informed that she had syphilis when she was 23 years of age. However, she neglected to take treatment. She bore five children. According to the history the oldest had poliomyelitis at 2 years. The second child at the age of 19 was unable to walk in a normal manner. He was said to be sullen, morose and unwilling to work. The third boy at the age of 18 was weak and sickly. The fourth child had been under antisyphilitic treatment for five years but had not thriven. At the time of our acquaintance with her she was about 15 years of age. She was nervous, excited, moody, easily depressed, and given to fits of temper. The fifth child died immediately after birth. The relationship of syphilis in the parents and psychoneuroses in the children is interesting.

Tarnowsky[1] reports on three families born of syphilitic parents. There were 22 births. There was only one healthy adult man. Of 13 who survived some years, 8, having mental or physical defects, were incapable of self-support. Five were nervous and weak. Syphilis was given as the sole cause of the weakness of the offspring.

1 Bulkley, L. D., *Syphilis in the Innocent*, New York, Bailey and Fairchild, p. 198 quotes Tarnowsky, *Prostitution und Abolitionismus*, Hamburg, 1890.

Hysteria.—One undoubtedly finds a large number of cases of hysteria and other nervous conditions arising in the offspring of syphilitics. Nonne,[1] for instance, says:

. . . in such cases the so-called "nervousness" takes a hysteric or hysteriform character. This I have seen more than once in developing girls and women, whose fathers had died of paresis; the patients at times had a positive, at times a negative Wassermann reaction in the blood.

Freud[2] says in regard to the relation of syphilitic heredity to hysteria:

. . . in more than one half of the severe cases of hysteria, compulsion neuroses, etc., which I have treated by psychotherapy, I have succeeded in positively demonstrating that their fathers had gone through an attack of syphilis before marriage. They have either suffered from tabes or paresis, or there was a general history of lues. I expressly add that the children who were later neurotic showed absolutely no signs of hereditary lues, so that the abnormal sexual constitution was to be considered as the last offshoot of the luetic heredity.

Case 55. Pauline Thomson came under consideration at the age of 20 when she was diagnosed as having a compulsion neurosis of sufficient severity to necessitate hospital treatment. The family history showed that the father had been divorced some ten years before Pauline's breakdown. From the history it seems that he was a rather inferior individual. The mother was suffering from tabes. The family consisted of six children, the oldest, a girl of 27, was married and well. The second child died at 2 years of scarlet fever. The third was a boy of 22 who was living and well. The fourth was the patient. The fifth child was a girl who died at two years of scarlet fever and the sixth a boy of 12 years who was well. It can be seen at once that it is quite impossible to associate Pauline's neurotic condition with the syphilis of the mother. As plausible a possibility would be to blame her inferior constitution on her father's alcoholism or on his general mental and moral deficiencies.

1 Nonne, op. cit., p. 713.

2 Freud, *Three Contributions to the Sexual Theory* (Brill's translation), Washington, Nervous and Mental Disease Publishing Co., 1910, p. 80.

Psychoses.—The German authors especially have been interested in the question of psychoses in the children of syphilitics. Nonne[1] says "it has been astonishing to me to see in recent years how relatively frequently one finds lues in the ascendants of youthful individuals with dementia praecox." Pilcz,[2] in a study of 416 cases of dementia praecox, found tabes in the parents of 5 per cent, while in manic depressive insanity he found that only 0.6 per cent of the parents had tabes. In the parents of 44 patients with hebephrenic dementia praecox he found general paresis occurring 23 times. In the parents of 27 catatonic dementia praecox patients he found five instances of general paresis. It has been our experience that there is no close relationship between psychoses and syphilis in the progenitors. Although it is a possibility it does not seem to be sufficiently established at the present time to merit much consideration. With two conditions as frequent as syphilis and the various psychoses, it is, of course, inevitable that there should be cases of psychoses developing in the offspring of the syphilitic, but it is quite another matter to establish the fact that there is a relationship between the parental syphilis and the psychoses of the offspring. The following case is one in which the arguments may be used either way:

Case 56. Lucien Cattrell contracted syphilis and infected his wife who later developed general paresis. The children of this marriage were free from any definite symptoms of congenital syphilis and all had negative Wassermann reactions. At the age of 16 the oldest child developed a psychosis diagnosed as manic depressive insanity. As has been stated, he was free from signs or symptoms of congenital syphilis.

Character Defects and Delinquencies.—What has been stated above about the psychoneuroses and psychoses holds also for various character defects, delinquencies, and psychopathic inferiorities. In the literature one finds many references to their relationship to syphilis in the progenitors. Thus, Hochsinger says "there can be no doubt that the 'moral insanity' of the descendants of a luetic father depended upon

1 Nonne, op. cit., p. 776.

2 Kraepelin, E., *Psychiatrie*, eighth edition, Leipzig, vol. iii, 1913, p. 921 quotes Pilcz.

a psychic inferiority of a congenital nature which was related to the lues of the ascendant.'' Nonne, Fournier, and Barthelemy agreed with this doctrine. Their statements are based upon their impressions, rather than upon any definite statistical data which can be evaluated.

Haines,[1] in attempting to establish a causal relationship between syphilis and delinquency, studied 365 delinquent children. He found that 20.8 per cent of this group gave positive Wassermann reactions.

Bazeley and Anderson[2] made a study of our cases bearing on the relationship of congenital syphilis to delinquency from a slightly different point of view. They analyzed the forms of difficulties of two groups of 60 delinquents. In the first group they studied 60 delinquents who had congenital syphilis comparing them to the second group which consisted of 60 non-syphilitic delinquents. To quote them:

> The *delinquencies* were then treated under three groups—individual, property, and society. Individual delinquencies were considered to be those of truancy, stubbornness, incorrigibility, lying and sex. The property delinquencies were considered to be larceny, destruction, setting fires, and breaking and entering. The society delinquencies were considered to be disorderly conduct, contentiousness, fighting, carrying concealed weapons, assault with intent to do bodily harm, and minor offenses. The results of this treatment are represented in the following table:

TABLE 14. DELINQUENCIES

The three types:	Syphilitics	Non-syphilitics
Individual	32	21
Property	13	15
Society	3	3
Plural delinquencies in one individual		
None	24	32
One only	18	18
Two	8	3
Three	7	4
Four	3	2
Five	0	1
	60	60

1 Haines, T. H., Incidence of Syphilis Among Juvenile Delinquents, *Journal* of the American Medical Association, vol. 66, no. 2, 1916, p. 102.

2 Bazeley and Anderson, Mental Features of Congenital Syphilitics, *Boston Medical and Surgical Journal*, vol. 173, no. 26, Dec. 23, 1915, pp. 952-956.

The subject of the delinquency of the congenital syphilitic is one which cannot be readily resolved. There is certainly an indication that it is worth while to consider the possibility of congenital syphilis in all juvenile delinquents. If syphilis is found, the treatment of the case will include antisyphilitic therapy along with the social means of handling delinquency.

Case 57. Merton Winship was the only child of a syphilitic mother. He showed a number of stigmata of congenital syphilis as well as a positive Wassermann reaction in the blood. He was wilful, destructive, malicious, and unmanageable. He would not keep quiet at school and became a great problem because of his behavioristic difficulties. It was because of the difficulty of controlling him that he was brought to the hospital for examination. In this case it seems quite probable that congenital syphilis was in some way related to his restlessness and mischievousness. It may be added that during a period of several years' observation and antisyphilitic treatment there was a good deal of improvement in Merton. It was, of course, not possible to say how much depended upon training and the increase of stability with advancing years and how much was due to the antisyphilitic treatment.

Case 58. Jean Lebovitz was also a delinquent congenital syphilitic. From the time she was first known to the clinic at the age of 9 to her present age of 14 she has shown a marked wanderlust. The police frequently brought her home after unexplained disappearances of several days. Treatment has been given off and on for five years. The delinquencies still continue and we cannot tell whether or not they have any relation to the syphilis.

Transmission of Syphilis to Third Generation.—Substantial evidence is lacking to prove that syphilis is ever transmitted to the third generation. A great deal of study has been given to this subject, especially by Tarnowsky and the younger Fournier. A few cases have been reported indicating that the disease had been transmitted by a congenital syphilitic to the offspring but none of these cases have been accepted as free from error. It is always difficult to be sure that a non-congenitally syphilitic parent has not contracted syphilis and transmitted it to the offspring or that a congenital syphilitic has not had a super-infection and thus transmitted syphilis to the second generation rather than to the third. It may be

stated that while there is some divergence of opinion, the general tendency is to believe that syphilis is not transmissible beyond the second generation. This means, of course, that a congenital syphilitic is probably never contagious by the time the age of marriage has been reached. Thus, a male congenital syphilitic would not infect his wife nor, through her, their offspring. Likewise, a congenitally syphilitic woman and a non-syphilitic husband would not give birth to a syphilitic child.

Case 59. Katherine Burke was 23 years of age when she arrived at the clinic to which she had been referred by the ophthalmologist because of interstitial keratitis. Her Wassermann reaction was positive and a diagnosis of congenital syphilis was made. This patient was a subject of the late manifestations of congenital syphilis (syphilis hereditaria tarda). She was married and had one child; there had been no accidents to pregnancies. Her husband showed no signs or symptoms of syphilis and the child was free from the disease.

Case 60. Frederick Waters was a congenital syphilitic who had been married for three years. His wife had had two pregnancies resulting in normal, healthy children and she herself was free from any signs or symptoms of syphilis. Thus, this young man who developed active symptoms of congenital syphilis was not infective to his wife and did not transmit the disease to the third generation.

Case 61. In the case of Michael Wald's sister the diagnosis of congenital syphilis was made on the basis of a positive Wassermann reaction and the family history. The patient sought medical advice because of a gynecological disorder. Her father and mother were found to be syphilitic and her brother had juvenile paresis. The patient was married and although she had had several miscarriages she gave birth to two normal healthy children. In this case again we have an instance of the marriage of a congenital syphilitic without infection of the husband and resulting in the birth of nonsyphilitic children.

It has been stated that while the offspring of a congenital syphilitic may not show evidence of an active syphilitic infection, they may present abnormalities dependent upon the congenital syphilis of the parent. Thus Fournier believes that the third generation may show various dystrophies, peculiarities, or abnormalities of the anatomical structure, nervous-

ness, and weakness. Fournier[1] reports the following case from Tarnowsky's clinic: A healthy woman with a heredo-syphilitic husband had eleven pregnancies, of which eight were stillbirths. Of the three living children one was a hystero-epileptic, another tuberculous, and the third had an exophthalmic goiter. Stokes[2] says "it is generally conceded that a tendency to constitutional inferiority appears in the children of parents who have severe forms of hereditary syphilis. Those who have hereditary syphilis in mild form, however, may, if efficiently treated, give birth to healthy children."

Methods of Diagnosis of Congenital Syphilis.—Having seen the protean nature of the symptoms of congenital syphilis, it is proper that attention should be given to the diagnosis of congenital syphilis. For this purpose it is necessary to consider (1) the family history, (2) the medical history of the child, (3) the physical examination of the child, (4) the examination of other members of the family for evidence of syphilis.

Family History.—1. Under the family history, one searches for any evidence of syphilis in the parents or brothers and sisters of the patient. The parents are carefully questioned for any history of symptoms of syphilis in themselves. This includes the symptoms of the primary, secondary, and late stages of the disorder, as well as a history of the pregnancies. As has been seen, a series of abortions, miscarriages, and stillbirths is suggestive of syphilis if no other definite cause for such accidents to pregnancies is discovered. The history of the brothers and sisters of the child under investigation is gone into to learn if they have had any symptoms that are suggestive of congenital syphilis.

1 Fournier, A., *Treatment and Prophylaxis of Syphilis*, English translation of the second edition, revised and enlarged by C. F. Marshall. American edition, revised and corrected with an appendix by George Mackee, New York, Rebman, p. 478.

2 Stokes, J. H., *To-day's World Problem in Disease Prevention*, issued by the U. S. Public Health Service, Treasury Department, Washington, D. C., p. 85.

Medical History of Child.—2. The history of the patient is considered in detail to see if there occurred any of the symptoms which are highly suggestive or almost pathognomonic of congenital syphilis. The more important early symptoms are snuffles, skin disorders of early infancy, and marasmus; the later ones interstitial keratitis, nerve deafness, hydrops articulorum and the like.

Examination of Child.—3. The examination of the child is, of course, of the greatest importance. One must first look for the stigmata of congenital syphilis, which include such important factors as the Hutchinsonian triad, sabre tibiae, olympic forehead, and scars of old rhagades about the mouth. Then evidence of acute syphilitic manifestations, such as bone changes, effusion of the knees, syphilitic changes in the choroid of the eyes, skin lesions, etc., must be sought. Finally, the laboratory investigation has become a distinct factor in the determination of congenital as well as acquired syphilis. The Wassermann reaction of the blood is probably the test of most importance. The luetin test is also of value, although not so well standardized as the Wassermann test. The examination of the cerebrospinal fluid is also of great value.

Examination of Family.—4. The examination of the parents and siblings of the patient is another essential part of the investigation. Here the same process is brought into play as in the examination of the patient.

Evaluation of the Four Methods of Diagnosis.—Without all these factors it is impossible to feel that one is justified in giving a non-syphilitic diagnosis to a suspicious child. Of course, in obvious cases of congenital syphilis it is not necessary to go through all of this procedure for the purpose of making a diagnosis on the individual, but from the standpoint of real syphilology and of the service that should be rendered to every family such an examination is always indicated. The evaluation of the various factors mentioned for the diagnosis of congenital syphilis calls for the highest clinical acumen and knowledge. If one finds evidence from the his-

tory and the examination of the parents that they have had syphilis, although highly suggestive it does not follow that the child is syphilitic. On the other hand, the failure to discover any evidence of syphilis in the parents does not preclude the possibility of the child's being congenitally syphilitic. Similarly, the history of the child may indicate early suggestive symptoms which may have been of other etiology than syphilis. Or, in spite of the absence of any such early symptoms, the child may be a congenital syphilitic. Again, in the examination, stigmata may or may not be present. When present they are, of course, highly important, but it is very easy for a tyro to consider the results of rickets as stigmata of congenital syphilis.

Wassermann Reaction—Its Interpretation.—The Wassermann reaction offers a great deal of aid to diagnosis, but again its interpretation is something that must presuppose a good deal of knowledge. A consistently positive Wassermann reaction may be considered as definite evidence of syphilis. This does not mean, however, that the syphilis is congenital, as it may have been acquired early in life. A negative Wassermann reaction is quite frequent in cases of congenital syphilis, especially in the first weeks of life. This is particularly true in cases that have had early treatment, yet often when the Wassermann reaction is negative the child may be suffering from the activity of the treponema. There is considerable evidence that the Wassermann reaction in cases of congenital syphilis tends to become negative as time goes on. If one investigates a group of congenital syphilitics during the period of adolescence, the test will be negative in a fair percentage of the cases.

There are besides many possibilities of error in the performance of the test. The more sensitive the antigen used, the higher the percentage of cases of syphilis which will give a positive Wassermann reaction, but in addition to picking close to 100 per cent of the cases of syphilis, a certain number of non-syphilitic cases will unquestionably give a positive Wassermann reaction. An antigen which is weaker and which avoids to a large extent the production of positive reac-

tions in cases that are not syphilitic, will also miss many syphilitic ones. At the present time there is no method that will avoid this difficulty. In addition, errors in the technique may lead to erroneous results. It is, therefore, obvious that one must not depend upon the Wassermann test for a diagnosis of congenital syphilis. It is an important aid when properly evaluated.

An examination of the spinal fluid is often indicated in cases suspected of congenital syphilis. This examination will throw light upon the question of involvement of the central nervous system, and at times, when the Wassermann reaction is negative in the blood, it will be found positive in the cerebrospinal fluid.

In some cases all the four methods of diagnosing congenital syphilis will yield positive results, that is, upon *examination* of the child stigmata as well as active symptoms and a positive Wassermann reaction will be found; the *medical history* of the child will disclose previous suggestive syphilitic symptoms; the *family history* will include syphilitic symptoms with a history of accidents to pregnancies; and finally, the *parents* and *siblings* upon investigation will give evidence of syphilis.

All Four Factors Not Always Present in Given Case.—It is more frequent for only one or a combination of several of the four factors to be present in a given case. Thus, without a history of syphilis in the parents, their examination may disclose evidence of syphilis. A syphilitic offspring may or may not show marked stigmata or a history of early symptoms. The patient under consideration may have been the first child and the siblings be quite free of any signs or symptoms of syphilis.

Case 62. On examination, Elizabeth Stuart proved to be a congenital syphilitic. She had teeth Hutchinsonian in type and deficient in enamel, irregular pupils, scars of interstitial keratitis, and was underdeveloped. Her Wassermann reaction was positive.

Case 63. An examination of Robert Clairmont showed he had a positive Wassermann reaction with Hutchinsonian teeth and slight scars about the mouth. The history showed that he had had a skin

eruption after birth with sores on his mouth. The examination, confirmed by the history of the child, allowed a diagnosis of congenital syphilis. In addition, there was a history of three stillbirths before Robert's birth.

Case 64. Annette Baroni was brought to the clinic with a question of mental deficiency. She had just borne an illegitimate child. On examination she was found to be syphilitic but there was not enough to substantiate the diagnosis of congenital syphilis. However, family examination revealed that the mother was syphilitic as were the two children born after the patient. The examination of the relatives in this case helped to establish the diagnosis.

Case 65. William Rice at the age of 5 showed no symptoms or stigmata of congenital syphilis, nor was there any suggestive personal history. He was examined because he was the son of a general paretic and had a positive Wassermann. An examination of the mother showed that she was syphilitic. The two oldest children were non-syphilitic. There were a death and a miscarriage after William's birth. The history of parental syphilis here confirmed the diagnosis of congenital syphilis.

Diagnosis of Congenital or Acquired Syphilis in a Child.—After having made the diagnosis of syphilis on a child the question may arise whether the syphilis is congenital or acquired. It is often quite difficult to decide the source of infection. A child born of normal healthy parents may develop syphilis at a very early age. Very frequently the infection is not recognized at that time, so that the history does not throw light upon its origin. In dealing with children at the age of puberty and adolescence one has to consider the possibility of syphilis acquired by extragenital or genital methods as well as congenital syphilis. The assumption in a young person always is that the syphilis is congenital, but upon careful investigation this assumption may be proved incorrect.

Case 66. Rachael Miller. An infant was brought to the hospital at the age of seven weeks with a well-developed chancre in the region of the eyebrow. It was not known how the child acquired syphilis though presumably from some relative or friend who had kissed the infant. It is very easy to imagine how such a case could escape a

proper diagnosis and a few years later the obvious assumption would be that the case was one of congenital syphilis without signs.

Case 67. Harold Maguire was brought to the hospital at the age of 12 because of convulsions. Examination disclosed the fact that he was suffering from a syphilitic involvement of the nervous system. The history obtained from the family physician indicated that the father had acquired syphilis when Harold was a few weeks old and had infected the mother and son. The boy had acquired syphilis at the age of a few weeks and was not a congenital syphilitic.

Case 68. Ronald Neilson came to the hospital when he was 19 years of age with well marked symptoms of general paresis which had been developing for over a year. Paresis is a condition which usually develops from six to fifteen years after the primary infection, therefore, to have accepted the idea that Ronald had general paresis from acquired syphilis would have meant that he had acquired it when not older than thirteen or fourteen years of age. The history showed that he had been a boy of exemplary habits, a fine type of youth. It did not seem probable, therefore, that he acquired syphilis through any fault of his own, and the assumption was that the case was one of juvenile paresis. The family history, however, was negative so far as we could learn. There had been no accidents to pregnancies. Ronald was the fourth child, the other children were apparently healthy. The mother and father disclaimed any knowledge of syphilis, showed no symptoms and the Wassermann reaction was negative. Two older and one younger brother were examined and were free from any evidence of syphilis including the Wassermann reaction. It was only after a period of some months that we succeeded in examining the oldest brother who gave a history of having acquired syphilis about six or seven years prior and who had all the evidence of syphilitic infection. Just after the time that he had acquired syphilis he had been sleeping in the same bed as Ronald. This led to the conclusion that Ronald had acquired syphilis from his older brother by chance contact.

Case 69. Cora Meyer made the first visit to the hospital at the age of 21 because of conduct disorder. On examination it was discovered that she had a positive Wassermann reaction. She showed no definite stigmata of congenital syphilis. However, the mother also had a positive Wassermann reaction. Was Cora a congenital syphilitic as might be possible because of the fact that her mother was syphilitic, or had she acquired syphilis? She had been exposed to venereal infection.

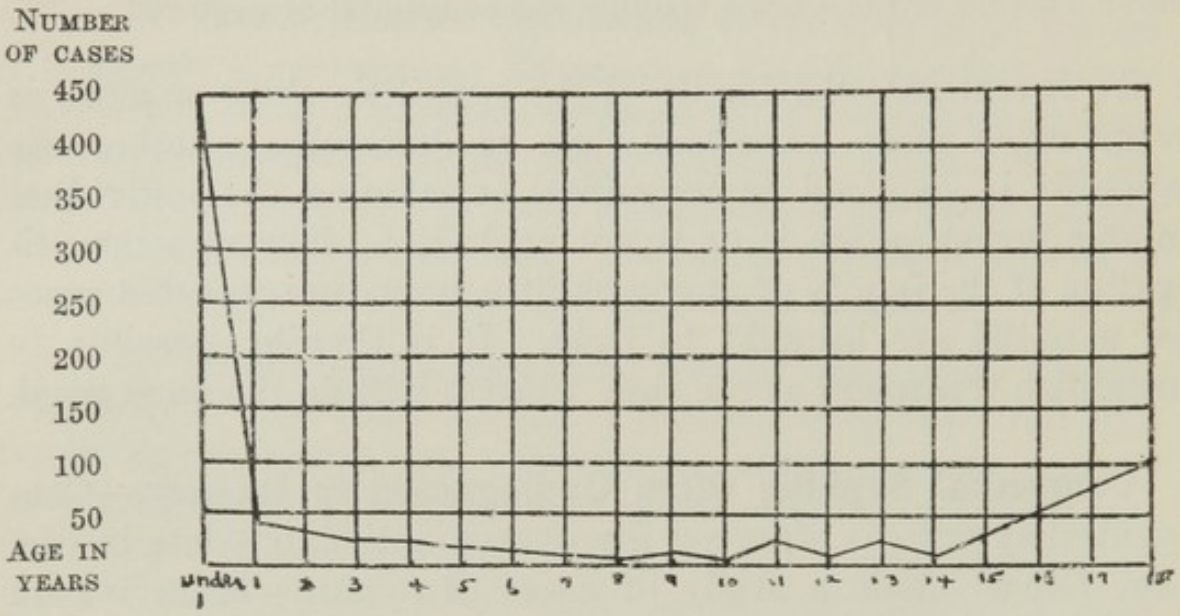
On the other hand, her younger brother was seen about this time and had a newly acquired syphilis. It is not possible in this case to determine whether or not Cora's syphilis was congenital or acquired.

To investigate the family of the syphilitic child or adult is very much more important than to determine whether the syphilis is acquired or congenital or whether the individual under investigation is or is not syphilitic. Through investigation of the family of any syphilitic, many unsuspected cases of syphilis are brought to light. It is thereby possible to establish treatment at the time when it will do the most good.

Congenital Syphilis Often Undiagnosed in Infancy.—Congenital syphilis is often not discovered until fairly late in life. Dr. Lucas[1] made a study of cases of syphilis occurring in children under 18 years of age in an investigation of hospitals and clinics for a ten year period, from 1902 to 1911. He found 885 cases of syphilis. Probably a few of these cases were acquired extragenitally or genitally. The large majority, however, were congenital syphilitics. Fifty per cent of these cases occurred in children one year of age or under, and the remaining 50 per cent were scattered through the later years. That is, in 50 per cent the diagnosis was made early because of active symptoms in the first year of life. The other 50 per cent escaped diagnosis at this period and remained undiagnosed for some time until some accidental symptom or another disease brought them under observation.

1 Lucas, W. P., Study for Massachusetts Society for Sex Education. Unpublished.

SPECIAL STUDY OF INCIDENCE OF CONGENITAL SYPHILIS IN A GROUP OF INSTITUTIONS, 1902-1911, BY AGES OF CHILDREN [1]



Children's Hospital
Infant's Hospital
Mass. General Hospital
Boston City Hospital
N. E. Hospital for Women and Children
Homeopathic Hospital
Boston Board of Health vaginal and gonorrheal records.
Boston Juvenile Court
Mass. S. P. C. C.

1 885 cases of syphilis.

We have made a study of 49 syphilitic children occurring in the families of 33 syphilitic patients who entered our hospital. These children were brought into the hospital for an examination on the ground that one parent had syphilis. The result of this study is given on the following page:

TABLE 15

	No.	P. C.	No.	P. C.
Total Children	...	...	49	100.
Total whose syphilis was discovered elsewhere	...	...	14	28.6
Previous Wassermann reaction	7	14.3	...	...
Previous treatment	7	14.3	...	...
Total discovered by routine family examination	...	...	35	71.4
Wassermann reaction	32	65.3	...	...
Clinical signs	1	2.0	...	...
Wassermann reaction and clinical signs	2	4.1	...	...
Total Discovered by Routine Family Examination	...	...	35	100.
Number with serious unknown involvements	...	...	4	11.4
Juvenile general paresis (treatment; not known if improved)	1	...	...	...
Epilepsy (treatment; not known if improved)	1	...	...	...
Juvenile general paresis (too late to treat)	1	...	...	...
Cerebrospinal syphilis (too late to treat)	1	...	...	...
Number with other difficulties	...	...	6	17.2
Iritis (improved under treatment)	1	16.6	...	...
Retarded (improved under treatment)	1	16.6	...	...
Feeble-mindedness, interstitial keratitis, blindness (too late to treat)	1	16.6	...	...
Feeble-minded (treatment; not known if improved)	1	16.6	...	...
Feeble-minded, spastic gait (treatment; not known if improved)	1	16.6	...	...
Feeble-minded (not treated)	1	16.6	...	...
Number with no other known difficulties	...	...	25	71.4
Total Discovered Elsewhere			14	100.
Number with other difficulties	...	...	4	28.6
Iritis (improved under treatment)	1	25.	...	...
Interstitial keratitis (improved under treatment)	1	25.	...	...
Feeble-minded, deaf, failing eyesight, staggers (improved under treatment)	1	25.	...	...
Feeble-minded (treatment not given)	1	25.	...	...
Number with no other known difficulties	...	...	10	71.4
Total Mothers of all 49 Children	...	...	33	100.
Mothers dead	...	...	3	9.1
Mothers not examined	...	...	5	15.2
Mothers examined	...	...	25	75.7
Mothers syphilitic	20	80.	...	...
Mothers non-syphilitic	4	16.	...	...
Mothers doubtful	1	4.	...	...

The above figures show:

1. That the parents of 35 or 71.4 per cent of these 49 syphilitic children were unaware that they had syphilis. Thus, unless these children had been examined as relatives of syphilitics, they could not have been treated as early as was made possible by our discovery of the existence of syphilis.

2. Of the 35 syphilitic children discovered by our family examination, 4 or 11.4 per cent had serious unrecognized involvements, such as nervous system syphilis. It was already too late to treat two of these cases, although the effort was made in one case without success. In the other two cases the effects of treatment were not known. An additional 6 or 17.2 per cent had other difficulties, some definitely syphilitic in character, such as interstitial keratitis, blindness or deafness,

and others coincident with or caused by syphilis, such as feeble-mindedness.

3. The median age at which syphilis was discovered by a routine family examination in the 35 cases found at this hospital was 9. In the majority of these cases syphilis was found by a Wassermann test. The median age of the eight children whose ages were known among those whose syphilis was discovered elsewhere was slightly less, being 7½ years. The ages vary in these groups from 2 to 22 and 2 to 18, respectively. These ages show that a great many congenital syphilitics are not being found very early in life. Obviously, the earlier they are discovered, the earlier they will be treated and the more chance they have to avoid symptoms.

The important lesson to be learned from this study is that many cases of congenital syphilis exist for years without being discovered, whereas an examination of the families of every syphilitic would bring much earlier recognition. Obviously, if we had not brought these children to the clinic for examination on the ground that a parent had syphilis they would have escaped recognition for a still longer period.

Social Difficulties Due to Congenital Syphilis—Contagiousness of Syphilitic Infant.—There are many social maladjustments which may be ascribed to congenital syphilis. An infant with contagious lesions is a source of danger to others who must be protected from the patient during the period of infectivity. It should be possible, of course, to give the child institutional care if for any reason it is necessary to remove it from the home, yet there are still many institutions, including hospitals, which will not take syphilitic infants. Fortunately, the attitude in this regard has become saner, but there is still much room for improvement.

Older Syphilitic Children Not Infectious.—While it is quite true that during the early period of life, when treatment has not been instituted, these children are a great danger to others, yet as the years go on this danger is lessened. It is hard for anyone who has contemplated the subject of syphilis without having learned all the facts to avoid being over-fearful in the

presence of a person with congenital syphilis. Because of this fear on the part of the public the child is likely to suffer a considerable handicap if the fact that he has congenital syphilis becomes known. Yet, in late childhood and after, there is really very little danger of infection by congenital syphilitics even though they may be suffering from such active manifestations of the disease as interstitial keratitis, deafness, bone lesions, paresis, etc. It is, therefore, safe for these children to mingle freely with others in school, in play, and in the pursuit of a career, and as has been seen, it is often possible for them to marry and have healthy children.

Question of Adoption of Congenital Syphilitics.—The matter of adoption of a congenital syphilitic is one that frequently comes to one's attention. A child who has been well treated, or who is past the first few years of life, might be adopted if one considered only contagiousness. It must be realized, however, in this connection that a congenital syphilitic is liable to the later disabling symptoms, and is on the whole a poor risk from the standpoint of health and development.

Symptoms as a Handicap—Interstitial Keratitis and Incapacity.—The symptoms themselves are a great handicap to many children who are likely to be of inferior physical constitution, retarded in their early development, and, after having passed the early years, to be subject to the late manifestations of congenital syphilis. Consider, for instance, the handicap of interstitial keratitis. Every case of interstitial keratitis means a loss of much time from school work, during which time the patient is entirely incapacitated, while in many cases, permanent disability results. Thus Pusey[1] quotes Iglesheimer's work, which shows that of 152 cases of interstitial keratitis, 40 per cent were partly or completely disabled, and 60 per cent recovered their eyesight. Almost one half of those who completely or partially lost their eyesight, lost their former capacity for earning a living.

Case 70. In Elizabeth Stuart, interstitial keratitis began when she was 8 years of age. It was so severe that she became practically blind

1 Pusey, op. cit., p. 65, quotes Iglesheimer.

and as a result she had to leave school. Being an orphan in the care of the city she did not remain in her foster home but was sent to a hospital for intramural treatment. She remained seven months receiving salvarsan treatment for syphilitic eye disease. During this entire period she could not go to school and thus lost a grade. Her eye trouble, however, cleared up so that she recovered practically normal vision.

In addition to interstitial keratitis there are a number of eye troubles which have already been mentioned as causing difficulty with vision and blindness, and which on the whole are even more serious in their results than interstitial keratitis.

Syphilitic Deafness as Handicap.—The social handicap of syphilitic deafness, due to congenital syphilis, whether the deafness is partial or total, is enormous. When deafness occurs in infancy the result is frequently deaf-mutism. The amount of deafness from this cause is actually very high, and many of the inmates of institutions for the deaf are there because of congenital syphilis. No adequate surveys have been made either of the amount of deafness due to congenital syphilis or the number of inmates of institutions for the deaf who have syphilis, so that we are unable to offer any American figures as to the actual amount of deafness or deaf-mutism caused by congenital syphilis.

Feeble-mindedness as Social Handicap.—Feeble-mindedness when caused by syphilis or any other defect is an obvious social misfortune. Most feeble-minded persons cannot function properly with the rest of the community and are led into crime, poverty, disease, etc., more frequently than their normal brothers. If the premise is accepted that congenital syphilitics are more unstable, have more general weakness and liability to disease, and are often delinquent, the social toll of syphilis in children is increased. Bazeley and Anderson,[1] in the study noted above, showed that among the 60 syphilitic and 60 non-syphilitic children considered both from the mental and social point of view, there were 20 instances of inferiority, 6 of equality and 6 where the syphilitics were more favored. The authors concluded:

1 Bazeley and Anderson, loc. cit.

. . . of children under 15 years constituting social problems, the congenital syphilitics constitute the more serious problems. Among them there are more cases of backwardness in school, there are more feeble-mindedness and retardation, there are more defects in the mental processes (with the one exception of affectivity), there are more delinquencies, there are more defects in vision, hearing, and speech. And if we consider the single individuals with one or more defects, then in the syphilitics there are more individuals with plural defects in the mental processes, there are more individuals with plural delinquencies, and there are more individuals with plural defects in the two main sense organs and in speech.

Nervous System Diseases as Social Handicap.—The more severe forms of congenital syphilis, paresis, cerebrospinal syphilis, and tabes incapacitate the child as they do the adult. The former cases are, of course, more appealing, as they occur in the innocent before they have a real start in life.

Importance of Early Treatment.—One of the saddest points about congenital syphilis is that it is so often unrecognized through the carelessness, indifference, or ignorance of parents, doctors, social workers, or institutions, and thus the beneficent results to be obtained by treatment are lost or delayed to the patient. The earlier the treatment is instituted, the better the chance of preventing disabling symptoms. We have already presented figures[1] showing that in our cases the median age for the discovery of congenital syphilis is 9 years. This indicates that congenital syphilis exists undiagnosed too long.

Treatment of Syphilitic Parents.—The more hopeful aspect of congenital syphilis is treatment. If one may be allowed a paradox, the most important factor concerning congenital syphilis is its prevention. Congenital syphilitics are the offspring of syphilitic parents. It is possible by adequate and well-timed treatment to do much to prevent syphilitic parents from giving birth to syphilitic children. Neglected or imperfectly treated syphilis in the husband or prospective father is dangerous to the wife and child, especially in the first few

1 See page 91.

years of the disease. Good treatment of syphilis in the original patient may forestall difficulties. As we have already seen, congenital syphilis usually means that the mother has had syphilis. Therefore it is more important that the father should not infect his wife. If a woman has not had syphilis we may assume that she will not give birth to syphilitic children. If, on the other hand, the mother has syphilis, it is quite probable that her children will have congenital syphilis. While it is true that some syphilitic women give birth to non-syphilitic children, for practical purposes we must assume that the children will be syphilitic. Adequate antisyphilitic treatment of a syphilitic couple will do much to reduce the chances of accidents to pregnancies or of the production of syphilitic children. Treatment before pregnancy is the best insurance for non-syphilitic children. In some instances treatment will overcome a potential sterility, and the woman who has not had children for many years may, after treatment, become pregnant and give birth to a healthy child. In a similar fashion, treatment may put an end to a series of accidents to pregnancies, stillbirths, or early deaths and allow the production of a living child.

Case 71.[1] Mrs. Dempsey was married at the age of 21. When seen at 25, she was found to have syphilis, as was her husband. The duration of the infection was unknown. During her married life she had been pregnant three times, the first two pregnancies resulting in stillbirths, and the third in a living child which lived only three months. Antisyphilitic treatment was administered. Soon after obtaining a negative Wassermann reaction the wife was again pregnant, and gave birth to a healthy normal child. The Wassermann reaction of the mother of the child at the time of the latter's birth was negative. When re-examined again at the age of eight months the child was normal. Apparently the result of treatment was the birth of the non-syphilitic child.

When a syphilitic woman is pregnant, treatment is absolutely demanded in order that the fetus may have a chance to develop properly and be born free of syphilis. It is therefore of the utmost importance to be sure that a pregnant woman is not syphilitic, and if she is, to place her under treat-

1 Private Case of Dr. Klauder.

ment. Kolmer,[1] in making a plea for the study and prevention of prenatal syphilis, says that an effort should be made to examine the blood of the prospective fathers as well as of any pregnant women. He believes that one should regard all children as probably syphilitic when one or both of the parents have positive Wassermann reactions.

J. W. Williams[2] found 302 fetal deaths occurring in 4000 deliveries at the Johns Hopkins Hospital. Syphilis was the cause of death in 12.12 per cent among the whites and 45.23 per cent among the Negroes. Among the 4000 women, a positive Wassermann reaction was present in 2.48 per cent of the white women and 16.29 per cent of the Negro women. Williams divided these cases of syphilis in the women into three groups according to the amount of treatment received before delivery. In the first group were those who had had no treatment. Fifty-two per cent of the children born to these women were born dead or presented some evidence of syphilis. The second group included those who had had insufficient treatment, and in this group 37 per cent of the children were born dead or were congenital syphilitics. The third group was comprised of the women who had what is ordinarily considered as adequate treatment and of this group only 7.4 per cent of the children showed syphilitic difficulties. These figures speak eloquently of the value of treatment. Newcomer[3] in a smaller series of cases presents concretely the value of treatment to the syphilitic pregnant woman. In a series of 12 women who were pregnant at the time of observation or became pregnant later, nine had had miscarriages. The evidence of syphilis was clear in all 12 cases. Six of these women were treated during pregnancy and six before they became pregnant. All 12 gave birth to full-term children who, when observed after birth, showed no signs of syphilis and had negative Wassermann reactions.

1 Kolmer, Prenatal Syphilis with a Plea for its Study and Prevention. *American Journal of Diseases of Children*, vol. 19, no. 5, May, 1920, pp. 344-348.

2 Williams, J. W., Significance of Syphilis in Prenatal Care and in the Causation of Fetal Death, *Bulletin*, Johns Hopkins Hospital, vol. 31, May, 1920, p. 144.

3 Newcomer, H. S. et al., One Aspect of Syphilis as a Community Problem, *American Journal of Medical Sciences*, vol. 158, Aug., 1919, p. 141.

John Adams[1] of England gives interesting results of treatment of syphilitic mothers, the majority of whom appeared at the clinic when six months pregnant and almost all in the secondary stage of the disease. Some had been treated with mercury and arsenic and hence showed no obvious lesions. Others had had no treatment. Dr. Adams believes that if the mother's Wassermann test can be made negative or doubtful at confinement, the baby will be negative and without signs of syphilis. If the mother still has a positive reaction, the baby will probably be syphilitic. None of the negative babies born of the women treated have become positive since birth nor developed signs of syphilis although many had no treatment except through the mother's milk. The following table shows the results of treatment over a three-year period and apparently justifies the conclusion that "a pregnant woman with syphilis, whether active or latent, if treated for three or four months before her confinement will probably be delivered of a healthy child at full term."

RESULTS OF TREATMENT OF WOMEN DURING PREGNANCY AND OF THE NEWLY BORN CHILDREN AT THAVIES INN VENEREAL CENTER (PREGNANT WOMEN)

YEARS SEPT. 1 AUG. 1	MOTHER ADMITTED WITH SYPHILIS	BABIES BORN ALIVE WASSERMANN REACTION		BABIES DYING OF SYPHILIS	FETUS STILLBORN FROM SYPHILIS
		Positive	Negative		
1917–18	28	17	6	3[1]	5
1918–19	30	8	21	1 (2 mos.)	1
1919–20	37	1	36	None	None

[1] Ages 3, 14, and 36 days, respectively.

An indication of the incidence of syphilis in pregnant women of a clinic group is given in Table 16. The incidence as shown by the positive Wassermann reaction in the total group of 13,331 pregnant women is 6.82 per cent which agrees rather closely with the incidence found in 4935 women in Boston, among whom 5.87 per cent showed positive Wassermann reactions.

[1] Adams, John, Pregnancy and Latent Syphilis Results of Three Years' Treatment of Syphilitic Mothers and Babies, *The Lancet*, vol. 2, Nov. 13, 1920, p. 990.

Table 16. Prevalence of Syphilis Among Pregnant Women *

Clinic	Number of Individuals	Positive Wassermann Reaction		Doubtful Wassermann Reaction		Negative Wassermann Reaction		Interpretative Data
		No.	P. C.	No.	P. C.	No.	P. C.	
Lying-In Hospital, Boston[1]	4935	290	5.87	284	5.75	4361	88.38	Poor women. Routine Wassermann test.
Obstetric cases at Sloane Hospital for Women, New York[2]	2488	227	9.9	78	2.4	2183	87.7	Wassermann Reaction 3 and 4—positive Wassermann Reaction 1 and 2—doubtful. Routine Wassermann test.
Obstetric cases at Clinic, Brooklyn[3]	1822	145	8.	26	1.4	1651	90.6	Routine Wassermann test.
Obstetric cases at Clinic, Washington, D. C.[4]	201	36	17.96	24	11.91	141	70.11	Poor white women. Routine Wassermann test.
Florence Crittenton Home, Boston[5]	192	11	5.72	14	7.29	167	86.99	First pregnancies of unmarried mothers. Routine Wassermann test.
Lying-In Hospital, New York[6]	2000	61	3.05	...	...	...	...	Routine Wassermann test.
Pregnancy Clinic, Brooklyn[7]	892	70	7.9	...	...	...	...	Married women.
Maternity Department, University of Michigan Hospital, Mich.[8]	381	18	4.7	...	...	...	...	Middle-class women. Physical examination plus routine Wassermann test.
Pregnancy Clinic, Chicago[9]	146	14	9.5	...	...	...	...	White women.
Maternity Hospital, Belfast[10]	171	22	12.8	...	...	...	...	Almost all married women of artisan class. Routine Wassermann test.
Maternity Clinic, Seclin[11]	103	16	15.5	...	...	...	...	Mostly respectable married women. Routine Wassermann test.
Total	13331	910	6.82	...	...	...	...	

* Footnotes on page 100.

1 Lying-In Hospital, Boston. Tests by Massachusetts State Department of Health, compilation by H. C. Solomon, Boston.

2 Dr. Reuben Ottenberg, Sloane Hospital for Women, New York, quoted by Vedder, p. 84.

3 Commisky, A Preliminary Report of the Routine Wassermann Reaction in Hospital Obstetrics, *American Journal Obstetrics,* vol. 73, 1916, p. 676, quoted by Vedder, p. 83.

4 Lawson and Columbia Hospital for Women, Washington, D. C., Vedder, E. B., op. cit., p. 85.
Boston.

5 Florence Crittenton Home, Boston. Tests by Massachusetts State Department of Health, compilation by H. C. Solomon.

6 Losee, New York Lying-In Hospital, Vedder, E. B., op. cit., p. 84.

7 Jeans, P. C., Syphilis and Its Relation to Infant Mortality, *American Journal of Syphilis,* vol. iii, no. 1, Jan., 1919, p. 115, quotes Judd.

8 Dr. Peterson, Observations on the Occurrence of Syphilis in the University of Michigan Obstetric and Gynaecological Clinic, *Surgery, Gynaecology, and Obstetrics,* vol. 23, 1916, p. 280, quoted by Vedder, p. 59.

9 Falls and Moore, The Value of the Wassermann Test in Pregnancy, *Journal,* American Medical Association, vol. 67, 1916, p. 574, quoted by Vedder, p. 83.

10 Darling, *Dublin Journal of Medical Sciences,* Sept., 1917, third series, no. 549, p. 147, quoted by Vedder, p. 45.

11 Calmette, Breton et Couveur, Application Pratique de Reaction de Wassermann diagnostic de la Syphilis chez les Nouveau-nés, *Comptes rendus des séances et memoires* de la Société de Biologie, 1911, vol. 1, p. 238, quoted by Vedder, p. 39.

It is seen that a syphilitic woman is a menace to her child and that treatment is of the utmost importance. If a woman is in an actively contagious stage of syphilis and is a menace to others besides her child, she can, in states which have compulsory treatment laws for contagious persons, be forced to take treatment. Unfortunately, there are no laws to compel a noncontagious syphilitic pregnant woman to take treatment although she is infective to the fetus, and although the child, if born syphilitic, will be contagious for a time to any who come in close association with it. At the present time moral suasion seems to be the only and often ineffectual means of meeting the situation.

Case 72. Patrick O'Brien's family (see Case 28) illustrates what may happen in syphilitic families when treatment is not given. In this typical syphilitic family only one member out of six escaped the infection. Syphilis was discovered in this family when the first child was born. *The mother was not put under treatment.* Had this been done the history of the family might have been entirely different. In such a family one has to consider not only the actual effect of syphilis as a disease but its social discomforts. The mother has had to take the syphilitic boy to hospitals for treatment over a period of sixteen years. This has been a difficult and costly precedure on her part as she has had to bear a large share of the burden of the family's support.

Case 73.[1] The history of the Charles family is very instructive. The father and mother both had "sores," probably chancres, which received local treatment only. Their first child was stillborn and the second child died of hemorrhage of the cord. Before the death of the second child, the parents reported to the hospital for treatment but refused to continue despite all the efforts made by the social worker. Two years later their fourth child was brought to the hospital and found to be syphilitic. The third child had died at the age of three weeks. When the diagnosis was made on the fourth child and treatment instituted, the parents agreed to undergo systemic treatment themselves. How much better if they had followed advice and had done this earlier. One always has to reckon with the individual equation of the parents. Education and a thoroughly good system of follow-up are necessary in these cases.

Case 74. Inadequate treatment of the mother may be of very little value as is shown by the history of the O'Rourke family. The hus-

1 Children's Hospital, Boston.

band acquired syphilis before marriage. Soon after marriage the mother became pregnant and during this pregnancy she showed signs of the secondary stage of syphilis but received no treatment. The child was born dead. For six months she took some treatment which consisted chiefly of mercury by mouth. She soon became pregnant again and discontinued her treatment. The child was born alive but lived only seven days. She again became pregnant and this time took treatment during the entire pregnancy. The child was born at full term and lived, although it had a positive Wassermann reaction. During the next pregnancy she again took some treatment and the child again was born at term but was actively syphilitic and developed nervous system involvement.

Case 75. Rose DeMarino was a young woman of 27 years of age when she came under observation. The husband acknowledged having had syphilis twelve years ago and two years prior to his marriage. Mrs. DeMarino had a positive Wassermann reaction. After four miscarriages she was treated by mercurial inunctions. She then gave birth to four living children, the oldest of whom, however, was a congenital syphilitic. The result of the untreated syphilis in the mother was four miscarriages. After treatment she gave birth to four living children and it is to be presumed that because of the inadequacy of the treatment the first child had congenital syphilis. Probably had treatment been more active this child would also have been free of signs of syphilis as were the three children born later.

Case 76. When Mrs. Smith was five months pregnant it was found that she had syphilis. Discovery was made through examining the families of syphilitic patients at the hospital, her husband being a patient with general paresis. She was immediately put under antisyphilitic treatment and the child when born was found to be quite healthy and showed no signs or symptoms of congenital syphilis. A second child born later was also free from evidence of syphilis.

Question of Treatment of Apparently Well Children of Syphilitic Parents.—We may now turn to the question of the treatment of a congenital syphilitic after birth. Should one consider the offspring of all syphilitic parents as syphilitic and treat them on this basis? Certainly one should suspect children of syphilitics of having syphilis and examine them with the utmost care. Attention has already been called to the point of view of some syphilologists who believe that the

children of syphilitic parents should be treated irrespective of whether they show definite signs or symptoms. Thus, Browning and McKenzie[1] say that "a positive Wassermann reaction in either parent of a seemingly healthy infant is an indication for the treatment of the child also, and this is especially the case if the mother reacts positively." This is an extreme point of view and is hardly in keeping with the advice of some of the older syphilologists, as Jonathan Hutchinson and Fournier, who, as a result of many years of experience, felt that many syphilitics give birth to perfectly normal healthy children. Observation over a period of years has shown that many offspring of syphilitic parents never develop any debilitating condition which may be related to an active spirochetosis. Thus we feel that treatment is not indicated for those offspring who show neither stigmata nor symptoms, but rather that they should be kept under close observation. It is, of course, possible, if one does not treat all the offspring of syphilitic parents, that a certain number of children who have apparently been free from the disease will develop late symptoms. That is, children who have shown no signs or symptoms during a period of years may later develop some syphilitic disorder. It is not probable, however, that this will occur with any great frequency, and for practical purposes it would seem safer not to treat children who show nothing either in the way of stigmata, symptoms, or laboratory findings suggestive of the disease.

Treatment in Infancy and Early Childhood; Prognosis.— If one does not hold to the view that all offspring of syphilitic parents, or particularly of syphilitic mothers, should be treated, then the basis for treatment must be stigmata or symptoms of the disease. It is obvious that a syphilitic infant should receive treatment from the earliest possible moment. The attempt should always be made to treat a syphilitic child before the appearance of symptoms such as interstitial keratitis, deafness, or other manifestations. This is quite possible in those cases in which symptoms appear late. When, how-

[1] Browning, C. H. and McKenzie, *Recent Methods in the Diagnosis and Treatment of Syphilis*, Philadelphia, Lea and Febiger, 1912, p. 111.

ever, the symptoms appear in the first weeks of life, all attention must be directed toward treating the symptoms. Where treatment is instituted early some very successful results may be obtained. The children who have severe early symptoms such as pemphigus and marasmus often improve very rapidly under antisyphilitic treatment.

Case 77. Helen Morrison was five weeks old when she was first seen. She was covered with a rash which made the diagnosis of congenital syphilis possible at first sight. She was a poor little undernourished baby. She was taken into the hospital and with good care and antisyphilitic treatment made marked improvement. After the open lesions were healed and the child no longer was considered contagious she was placed by a child-placing agency in a foster home, the foster parents understanding the conditions of the case. At the age of thirteen months this little lady was very precocious. She had a vocabulary of a number of words and was walking. She was a pretty little child, showing no stigmata. She was still small, weighing only fourteen pounds, but had gained considerably in the previous few months, and by the aid of proper hospital and medical treatment combined with good social service care she was showing every indication of good health and good mental development.

An early diagnosis of syphilis in children is, therefore, of very great importance. As has been seen, the diagnosis of congenital syphilis is based chiefly upon stigmata, symptoms, and history of the child, supplemented by family history and examination. It would seem fair to state that every child who shows either definite stigmata of congenital syphilis or symptoms of the disease or a combination of both, should have treatment. We would hold that every child with definite stigmata which make a diagnosis of congenital syphilis certain should have treatment whether or not symptoms are present. Thus, Hutchinsonian teeth in a child of syphilitic parentage is rather definite evidence that syphilis has caused some change in the organism and that the child should receive treatment, though he has shown no other signs of the activity of the disease. The Wassermann reaction is one of the most important symptoms of congenital syphilis, yet a negative Wassermann reaction is of no more significance than the absence of other signs or symptoms of syphilis. Where there

is evidence that congenital syphilis is present, a negative Wassermann reaction has no real bearing on the question of treatment. It must be thoroughly recognized that in congenital syphilis, as in the acquired form, there may be long periods of apparent latency in which no symptoms, with the possible exception of the Wassermann reaction, appear. When the Wassermann reaction is consistently positive, the evidence that syphilis is present in an active form is weighty enough to demand radical treatment. Both logic and experience seem to show that later manifestations may be prevented by the treatment of children who have a positive Wassermann reaction but no other symptoms of the disease. It is, of course, difficult to say this with great definiteness, as one is here dealing with the subject of preventive medicine. If no symptoms develop one is never able to say that they would have developed if treatment had not been given. Preventive therapy is never startling, as it offers no brilliant pictures. A vast amount of experience will be necessary to show just how much can be accomplished by the treatment of congenital syphilitics who are free from symptoms. The experience at hand, however, seems to justify the value of thorough treatment.

Often when congenital syphilitics are treated and relieved of present symptoms one cannot give an entirely good prognosis or the assurance that no later symptoms will develop. Cases of interstitial keratitis or other late manifestations may appear in children who have been well treated. In other words, we have no definite cure for all cases of congenital syphilis. Without much question, the number of symptoms may be very markedly decreased by treatment. The great difficulty in the amassing of facts concerning the value of treatment in congenital syphilis is due to the difficulty in following cases over a long period of years. The value of a well-run follow-up service is nowhere greater than in this field. All the evidence we have at the present time goes to show the great good that can be accomplished by the treatment of congenital syphilis. This is certainly obvious in the results that are obtained in the treatment of the earlier manifestations, and as one can remove symptoms it is most probable that one can be successful in preventing them. The most satisfactory

effect of treatment of a congenital syphilitic is seen in the general constitutional improvement. Children who are feeble, weak, and poorly developed, will often begin to show immediate improvement upon the administration of adequate early treatment. After many years have elapsed and the organism has secured a definite footing in the deeper structures of the body and has succeeded in thriving despite the resistance of the patient, results are often much more difficult to obtain. Thus, in interstitial keratitis, a condition in which relatively non-vascular regions of the eye are involved, the effects of treatment are not nearly so brilliant. Certainly one does not obtain the magical results that are shown in the treatment of many other types of lesion. There are some oculists who are not very enthusiastic about the systemic treatment and its results on the eye condition. Such treatment even in interstitial keratitis seems gradually to be winning more esteem. Thus Posey[1] says that the outcome of a case of interstitial keratitis in which the individual is given thorough antisyphilitic treatment should be better than in those which are not thus treated. Scarring, which interferes with vision, is apparently considerably reduced when treatment is thorough and adequate, and the tendency to recurrence of the difficulty is greatly reduced. In certain of the severe late nervous system manifestations, such as juvenile paresis and nerve deafness, the results are not good. In these conditions, however, we are dealing with a situation which is entirely identical with that found in acquired syphilis, and the treatment should not be considered any more discouraging than that of cases of acquired syphilis in adult life where treatment has been too long delayed.

Type of Treatment.—The type of treatment that a congenital syphilitic should receive is something that cannot be laid down in dogmatic fashion. This is also true in regard to treatment of syphilis in general. Individual conditions make different methods of treatment advisable, and the ideas of different syphilologists demand variations in the regimen of treatment. In the days before the introduction of arsphen-

1 Posey, *Hygiene of the Eye*, Philadelphia, Lippincott, 1918, pp. 164-168.

amin, fairly good results were obtained by the use of mercury over a period of a great many years. Mercury by mouth has its chief value in cases of congenital syphilis, and many excellent results have been obtained by the feeding of mercury and chalk to syphilitic infants. Hochsinger[1] gives some interesting figures on the chances of ultimate recovery in a series of cases of congenital syphilis treated before the days of arsphenamin. Of 263 cases under observation from four to twelve years, 79 died. One hundred and twelve had symptoms (not always syphilitic) and 72 were free from symptoms of any kind. Because of the good results that may be obtained by the use of mercury in the treatment of congenital syphilis it becomes obvious that one must use this drug in practically every case, although other forms of medication may be added. Arsphenamin produces some excellent results and may be used from the very early days of life. Clinical experience seems to show that lives of seriously ill syphilitic infants may be saved by the early administration of arsphenamin. The treatment of the nursing mother may also have some valuable therapeutic effects upon the child. This, however, does not seem to be nearly as effective as the introduction of the drugs directly into the system of the child. A combination of mercury and arsphenamin is probably the best method. Potassium iodide has its place in the treatment of congenital syphilis as well as in acquired syphilis. The treatment of congenital syphilis must be continued over a period of many years. It is doubtful if there is any exception to this statement. Certainly conservative judgment indicates that one must continue treatment for a long period if one wishes to be sure of results.

What has been said about the type of treatment of the infant holds equally for congenital syphilitics whose treatment begins later in life. The combination of arsphenamin and mercury is also indicated over a period of years. It should be emphasized that a negative Wassermann reaction obtained during treatment is not an indication that the child is cured of syphilis. Treatment should be persistent despite nega-

1 Griffith, op. cit., p. 578, quotes Hochsinger, *Ergebn. d. inn. Med. u. Kinderh.*, vol. 6, 1910, p. 125.

tive Wassermann reactions. It goes without saying that a positive Wassermann reaction is evidence that cure has not been effected. By a continuation of treatment over a period of years it is often possible to obtain a condition in which no symptoms of syphilis appear and in which the Wassermann reaction becomes and remains negative.

Advantages of Hospital Schools.—The necessary care and hygiene of syphilitic children, which is equal in importance to the administration of antisyphilitic remedies, often cannot be properly given if the child remains at home. It is also difficult to secure the parents' coöperation for a long continued period of out-patient treatment. When a child has active symptoms it is, at times, possible to obtain a place for him in the hospital where treatment can be carried out to better advantage; but when the active symptoms have disappeared this is no longer practical. Frequently the child is in such a condition that it is impossible for him to attend the ordinary schools. This is true of many children with interstitial keratitis and other eye conditions, deafness, difficulty with locomotion, and the like. Stokes[1] suggests that these difficulties could be remedied if the plan of Welander, the Scandinavian, were copied in America. Welander established hospital schools where children could secure antisyphilitic treatment, excellent care, and education, simultaneously. Balze[2] says that the child enters the hospital school early and receives regular treatment for at least three years. Under these conditions the child receives steady prolonged treatment as well as education, which is impossible in out-patient clinics or hospital wards. The hospital schools have a special medical personnel, with special methods of treatment adapted to children of different ages, proper hygiene, and educational courses for the children of school age. The *Journal* of the American Medical Association reviews Müller's and Singer's[3]

1 Stokes, J. H., *The Third Great Plague*, Philadelphia and London, W. B. Saunders, 1917, p. 108.

2 Balze, F., Asylums for Children with Inherited Syphilis, *Bulletin de l'Académie de Médecine*, Paris, vol. 81, June 17, 1919, p. 811.

3 Müller and Singer, Fate of Syphilitic Children, *Archiv für Kinderheilkunde*, Stuttgart, May 17, 1919, vol. 67, nos. 3 and 4 (reviewed in the American Medical Association *Journal*).

results from such hospital schools in Germany, where they were started in 1909. Eighty-four of the children had been in the schools from two to ten years. Better results apparently were obtained by their prolonged treatment under the hospital conditions than by any other means.

It must be remembered that the aim of treatment of early and late congenital syphilitics, those with little damage done and those in a serious condition, is to minimize the social handicap of the congenital syphilitic and to allow him to take his place in the everyday world. Time, only, can tell how far we have progressed towards accomplishing this end, but that we have gone a considerable distance in this direction is certain, and that we can go much further is probable.

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CHAPTER IV

THE FAMILY

Syphilis as a Family Disease.—It is important to remember that syphilis not only affects the mate and offspring as individuals but also as members of a family group. Syphilis threatens the stability of family life, whether it enters early or late, whether it strikes one member or all members. It is a disease which once having attacked a family affects its social and economic life as well as the health of the individual members. The entire family morale may be weakened by overfear of infection or callousness; by attaching too much or too little importance to future difficulties; by exaggerating or minimizing any changes in the home situation. The economic status of the family, its industrial level, and standard of living are often affected. The community, a network of families, then bears part of the economic burden.

Statistics on Incidence in Families.—In our study of 555 families of syphilitics[1] given in the preceding chapters, we have shown statistically the specific results on the mate and child. Further figures from the study give the effects of syphilis with the family rather than the individual as a unit. For purposes of comparison with our tables we have inserted wherever possible similar figures from other authors.

Families in Which Positive Wassermann Reaction Appeared.—The tables on familial syphilitic involvement include five tables from our study and two tables compiled from studies by other authors. Table 17 shows the number of families in which some member aside from the original patient had a positive Wassermann reaction. Of the 191 families in which all members were examined, a positive Wassermann reaction

1 Solomon, H. C. and M. H., The Effects of Syphilis on the Families of Syphilitics Seen in the Late Stages, *Social Hygiene*, vol. vi, no. 4, Oct., 1920.

occurred in 30 per cent, whereas, in the 364 families in which every member was not examined, it occurred in but about 19 per cent. The difference in percentage may be accounted for by the fact that in the group in which not all members were examined (364) a larger or smaller number of the unexamined might have shown a positive Wassermann reaction, while the all-examined group (191) was, of course, unconsciously selected according to the ease with which members could come in, size of families, etc. It follows however, that somewhere between 19 per cent and 30 per cent would be the correct figure if every member of the original group of 555 families had been examined; that is, it would undoubtedly be higher than 19 per cent and less than 30 per cent. In the larger group (555), a positive Wassermann reaction occurred in 22.8 per cent of the families. This figure of 22.8 per cent which would probably be close to the correct figure had all members been examined, is typical of what may be expected in any clinic dealing with late syphilitics when an effort is made to bring the spouse and children of syphilitic patients to the clinic for examination.

Families with no Children.—Table 18 is concerned with the percentage of families in which no living children were born. The families in which no successful pregnancies occurred may be divided into families which were entirely sterile, and those in which pregnancies occurred which never came to successful fruition. The tables dealing with the total 555 families may be considered as giving the correct percentage for this study, which is based upon history. It was found that 29.7 per cent of the families did not give birth to living children, 23 per cent being entirely sterile, and 6.7 per cent having unsuccessful pregnancies. It must be borne in mind that we are not here dealing with the question of accidents to pregnancies as such, but merely with the number of childless families. Not all of the sterile or childless marriages can be definitely traced to syphilis. Gonorrhea, pelvic deformities, mismating, and the like, may account for much of it. However, if we compare this figure of 29.7 per cent

TABLES SHOWING FAMILIAL

Class	A—191 Families in Which Every Living Member Was Examined							
	General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		Total	
TABLE 17	**FAMILIES IN WHICH**							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families*	150	100.0	9	100.0	32	100.0	191	100.0
Families with positive Wassermann in one member	37	25.1	4	50.0	8	28.5	49	26.7
Families with positive Wassermann in more than one member	2	1.4	0	...	4	14.3	6	3.3
Total families with positive Wassermann in one or more members	39	26.5	4	50.0	12	42.8	55	30.0
TABLE 18	**FAMILIES WITH**							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families	150	100.0	9	100.0	32	100.0	191	100.0
Families with no pregnancies	53	35.3	1	11.1	11	34.4	65	34.0
Families with no children, but with abortions, miscarriages, and stillbirths	9	6.0	1	11.1	6	18.7	16	8.4
Total families with no children	62	41.3	2	22.2	17	53.1	81	42.4
TABLE 19	**BIRTH-RATE AND**							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families	150	100.0	9	100.0	32	100.0	191	100.0
Families with living children	75	50.0	6	66.7	13	40.6	94	50.0
Birth-rate per family	1.33	...	1.89	...	1.29	...	1.35	...
Average number of living children per family	1.06	...	1.44	...	.94	...	1.06	...
TABLE 20	**FAMILIES WITH DEFECTS**							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families	150	100.0	9	100.0	32	100.0	191	100.0
Families with no pregnancies	53	35.3	1	11.1	11	34.4	65	34.0
Families with no children, but with abortions, miscarriages, or stillbirths	9	6.1	1	11.1	6	18.8	16	8.4
Families with positive Wassermann reaction in children	8	5.3	0	...	4	12.5	12	6.3
Families with non-syphilitic children, but accidents to pregnancies	24	16.0	2	22.3	3	9.3	29	15.2
Total families with defects as to children	94	62.7	4	44.5	24	75.0	122	63.9
Total families with no defects as to children	56	37.3	5	55.5	8	25.0	69	36.1
Total	150	100.0	9	100.0	32	100.0	191	100.0
Families with no defect as to children or Wassermann reaction in spouse†	43	28.6	3	33.3	8	25.0	54	28.2
TABLE 21	**FAMILIES WITH**							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families	150	100.0	9	100.0	32	100.0	191	100.0
Families with pregnancies	97	64.7	8	88.9	21	65.6	126	66.0
Families in which abortions, miscarriages, and stillbirths occurred‡	35	36.0	3	37.5	12	57.1	50	39.7

* There are a few families in which there was neither living spouse nor child. nancies is discussed (Table 18) but not in the Wassermann reaction percentages

† These percentages were taken on the total families although there were a few there was no living spouse to examine. The assumption was that the spouse was

‡ These percentages were taken on families with pregnancies.

SYPHILITIC INVOLVEMENT

B—364 Families in Which One or More Members Besides the Patient was Examined								C—555 Families, Total of A and B							
General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		Total		General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		Total	
POSITIVE WASSERMANN REACTION APPEARED															
No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
192	100.0	48	100.0	124	100.0	364	100.0	342	100.0	57	100.0	156	100.0	555	100.0
36	19.6	2	4.3	12	10.0	50	14.3	73	22.0	6	10.9	20	13.5	99	18.5
8	4.3	3	6.4	6	5.0	17	4.8	10	3.0	3	5.5	10	6.8	23	4.3
44	23.9	5	10.6	18	15.0	67	19.0	83	25.0	9	16.4	30	20.3	122	22.8
NO CHILDREN															
No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
192	100.0	48	100.0	124	100.0	364	100.0	342	100.0	57	100.0	156	100.0	555	100.0
34	17.7	8	16.7	21	16.9	63	17.3	87	25.4	9	15.8	32	20.5	128	23.0
8	4.2	4	8.3	9	7.3	21	5.7	17	5.0	5	8.8	15	9.6	37	6.7
42	21.9	12	25.0	30	24.2	84	23.0	104	30.4	14	24.6	47	30.1	165	29.7
AVERAGE NUMBER OF LIVING CHILDREN PER FAMILY															
No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
192	100.0	48	100.0	124	100.0	364	100.0	342	100.0	57	100.0	156	100.0	555	100.0
145	75.5	33	68.6	80	64.5	258	70.9	220	64.3	39	68.4	93	59.6	352	63.4
2.32	...	2.96	...	2.34	...	2.41	...	1.89	...	2.79	...	2.12	...	2.05	...
1.90	...	2.45	...	1.75	...	1.92	...	1.53	...	2.28	...	1.58	...	1.62	...
AS TO CHILDREN OR WASSERMANN REACTION IN SPOUSE															
No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
192	100.0	48	100.0	124	100.0	364	100.0	342	100.0	57	100.0	156	100.0	555	100.0
34	17.7	8	16.7	21	16.9	63	17.3	87	25.5	9	15.8	32	20.5	128	23.0
8	4.2	4	8.3	9	7.2	21	5.8	17	5.0	5	8.8	15	9.7	37	6.7
15	7.8	1	2.1	8	6.5	24	6.6	23	6.7	1	1.7	12	7.7	36	6.5
38	19.8	16	33.3	24	19.4	78	21.4	62	18.1	18	31.6	27	17.3	107	19.3
95	49.5	29	60.4	62	50.0	186	51.1	189	55.3	33	57.9	86	55.2	308	55.5
97	50.5	19	39.6	62	50.0	178	48.9	153	44.7	24	42.1	70	44.8	247	44.5
192	100.0	48	100.0	124	100.0	364	100.0	342	100.0	57	100.0	156	100.0	555	100.0
64	33.3	17	35.4	49	39.5	130	35.7	106	31.0	20	35.1	57	36.5	183	30.3
ACCIDENTS TO PREGNANCIES															
No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
192	100.0	48	100.0	124	100.0	364	100.0	342	100.0	57	100.0	156	100.0	555	100.0
158	82.3	40	83.3	103	83.1	301	82.7	255	74.6	48	84.2	124	79.5	427	76.9
50	31.6	19	47.5	37	35.9	106	35.2	85	33.3	22	46.0	49	39.5	156	36.5

These are included in the total number of families when the subject of preg-
(Table 17).

families in which the children were non-syphilitic as far as known but in which
non-syphilitic.

TABLE 22. FAMILIAL SYPHILITIC INVOLVEMENT AS SHOWN BY OTHER CLINICS [1]

CLINICS:	HASKELL[2]		JAMIESON[3]		STOKES[4]		POST[5]		NONNE[6]		HEUBNER[7]		KRAEPELIN[8]		REGIS[9]		VEEDER[10]		HARMON[11]	
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families	86	100	74	100	36	100	30	100	82	100	...	...	...	...	...	...	100	100	150	100
Families with no pregnancies	28	32.6	...	...	8	22.0	...	...	8	9.7	...	...	...	...	...	...	...	...	...	...
Families with no children but with abortions, miscarriages, and stillbirths	11	12.8	...	...	8	22.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total families with no children	39	45.4	3	4.1	16	44.0	...	...	8	9.7	...	45.7	...	18.0	...	75.0	...	...	...	...
Birth rate per family	...	...	...	...	...	...	3.83	...	...	...	...	...	...	...	...	...	2	...	5.53	...
Average number of living children per family	...	...	2.14	...	...	...	2.33	...	...	...	...	...	...	...	...	...	1.61	...	4.0	...

1 These figures are from the families of married syphilitics with the exception of Veeder and Harmon's figures which are from families of congenital syphilitics.

2 Haskell, R. H., Familial Syphilitic Infection in General Paresis, *Journal* of the American Medical Association, vol. 64, no. 11, March 13, 1915, p. 891.

3 Jamieson, R. C., Syphilis in Detroit as an Economic and Social Factor, *American Journal of Syphilis*, vol. ii, no. 3, 1918, p. 525.

4 Stokes, J. H., and H. E. Brehmer, Syphilis in Railroad Employees, *Journal of Industrial Hygiene*, vol. i, no. 9, Jan., 1920, p. 420.

5 Jeans, P. C., Syphilis and Its Relation to Infant Mortality, *American Journal of Syphilis*, vol. iii, no. 1, Jan., 1919, p. 119, quotes Commisky, *American Journal of Obstetrics*, 1916, lxxiii, p. 676, who quotes Post.

6 Nonne, M., Die heutige Standpunkt der Lues-Paralyse Frage, *Deut. Zeit. f. Nervenh.* xlix, 1913, p. 403.

7 Haskell, R. H., op. cit., quotes Heubner.

8 Kraepelin, E., *Psychiatrie*, eighth edition, vol. ii, Leipzig, Johann Ambrosius Barth, 1913, p. 488.

9 Haskell, R. H., op. cit., quotes Regis.

10 Veeder, B. S., Hereditary Syphilis in the Light of Recent Clinical Studies, *American Journal of Medical Sciences*, cli, 1916, p. 522.

11 Harmon, B., Final Report of the Commissioners, Report of the Commission on Venereal Diseases, London, 1916, p. 149.

TABLE 23. STERILITY, BIRTH-RATE, AND AVERAGE LIVING CHILDREN IN NON-SYPHILITIC FAMILIES

SOURCES	FAMILIES OF HARVARD AND YALE GRADUATES (1850–1890)[1]		CENSUS FIGURES of R. I. WOMEN MARRIED 10–19 YEARS, FOREIGN AND NATIVE BORN[2]		CHILDREN'S BUREAU FIGURES ON 1491 MARRIED MOTHERS OF BABIES BORN IN 1911 IN JOHNSTOWN, PA.[3]		JEANS' FAMILIES SHOWING NO OBVIOUS SYPHILIS[4]		HARMON; POOR FAMILIES, KNOWN CASES OF SYPHILIS, EXCLUDED[5]	
	No.	P.C.	No.	P.C.	No.	P. C.	No.	P. C.	No.	P. C.
Total families	...	...	...	...	1491	100.0	200	100.0	150	100.0
Families with no children	...	19–23	...	11.3	...	...	...	...	...	...
Birth-rate per family	2.6	...	3.8	...	3.59	...	3.99	...	4.98	...
Average number of living children per family	...	...	...	...	3.06	...	3.34	...	4.36	...

1 Solomon, H. C. and M. H., op. cit. p. 479.

2 Hill, J. A., Comparative Fecundity of Women of Native and American Parentage in the United States of America, American Statistical Association, Boston, Dec., 1913, p. 583.

3 Infant Mortality. Series no. 3, Children's Bureau Publication, no. 9, Washington, D. C., 1915.

4 Jeans, P. C. and E. Butler, Hereditary Syphilis as a Social Problem, *American Journal Diseases of Children*, vol. 8, Nov., 1914, p. 333.

5 Harmon, B., Report of the Commission on Venereal Diseases, Final Report of the Commissioners, London, 1916, p. 149.

representing the number of childless families in our group, with that found in a general survey,[1] (Table 23) it is clear that the figures obtained from a group of syphilitic families is very much higher. An analysis of native white Rhode Island women, 45 years of age, who had been married from ten to nineteen years, shows that 17.5 per cent were childless. Including the foreign-born women, 11.3 per cent were childless. This latter group is comparable to the patients at our clinic who represent the same races as the group on which the above census report is based.[2] A comparison of these figures (29.7 per cent and 11.3 per cent) leaves no doubt that syphilis is a very large factor in the production of sterility and childlessness. It must be remembered that in this discussion we are dealing with the family of the late

1 It must be remembered that all general surveys include a certain percentage (approximately 10 per cent) of syphilitic individuals hence the contrast between our figures and those of a non-syphilitic group is greater than is apparent.

2 Hill, loc. cit.

TABLES SHOWING ACCI

Class	A—191 Families in which Every Living Member was Examined							
	General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		Total	
TABLE 24	RELATION OF ABORTIONS,							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total pregnancies	263	100.0	23	100.0	56	100.0	342	100.0
Total abortions	7	24.0	0	26.0	1	26.8	8	24.5
Total miscarriages	50		3		12		65	
Total stillbirths	6		3		2		11	
Average pregnancies per family	1.76		2.55		1.75		1.79	
TABLE 25	PERCENTAGE OF							
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Live births	200	100.0	17	100.0	41	100.0	258	100.0
Stillbirths	6	...	3	...	2	...	11	...
Number of stillbirths per 100 live births	3.00	...	17.70	...	4.90	...	4.26	...

Table 26. Accidents to Pregnancies

Clinics:	Holt[1]		Jeans[2]		Veeder[3]		Haskell[4]		Jamieson[5]		Post[6]		Harmon[7]	
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families	193	...	100	...	100	...	86	...	74	...	30	...	150	...
Total pregnancies	427	100.0	453	100.0	331	100.0	167	100.0	253	100.0	168	100.0	1001	100.0
Total accidents to pregnancies	123	28.8	116	25.6	131	39.6	42	25.2	95	37.5	53	31.6	172	17.2
Average pregnancies per family	2.22	...	4.53	...	3.31	...	1.94	...	3.55	...	5.6	...	6.66	...

1 Bartlett, F. H., Effect of Venereal Disease on Infant Mortality, *American Journal of Syphilis*, vol. ii, no. 1, Jan., 1918, p. 160, quotes Holt.

2 Jeans, op. cit., p. 119.

3 Veeder, loc. cit.

4 Haskell, op. cit., p. 891.

5 Jamieson, op. cit., p. 525.

6 Post, op. cit., p. 119.

7 Harmon, B., op. cit., p. 149.

8 Habermann, J. V., Hereditary Syphilis, *Journal* of the American Medical Association, vol. lxiv, no. 14, 1915, p. 1141, quotes Hochsinger.

DENTS TO PREGNANCIES

B—364 Families in Which one or More Members Besides the Patient Was Examined				C—555 Families, Total of A and B			
General Paresis	Cerebro-spinal Syphilis	Nervous system not involved	Total	General Paresis	Cerebro-spinal Syphilis	Nervous system not involved	Total

MISCARRIAGES, AND STILLBIRTHS TO PREGNANCIES

No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
536	100.0	185	100.0	369	100.0	1090	100.0	799	100.0	208	100.0	425	100.0	1432	100.0
7 69 15	17.0	0 40 3	23.2	1 67 11	21.4	8 176 29	19.5	14 119 21	19.2	0 43 6	23.6	2 79 13	22.0	16 241 40	20.7
2.79		3.85		2.98		2.99		2.34		3.65		2.72		2.58	

LIVE BIRTHS AND STILLBIRTHS

No.	P.C.	No	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
445	100.0	142	100.0	290	100.0	877	100.0	645	100.0	159	100.0	331	100.0	1135	100.0
15	...	3	...	11	...	29	...	21	...	6	...	13	...	40	...
3.37	...	2.11	...	3.79	...	3.31	...	3.25	...	3.80	...	4.00	...	3.52	...

AS SHOWN BY OTHER CLINICS

Hoch-singer[8]		Fournier[9]		Raven[10]		Nonne[11]		Hoch-singer[12]		Tarnier[13]		Coutts[14]		Pileur[15]		Fournier[16]	
No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No	P.C.	No.	P.C.
134	...	100	...	90	...	82	...	67	...	42	...	...	...	...	...	...	...
569	100.0	200	100.0	350	100.0	319	100.0	266	100.0	90	100.0	1102	100.0	414	100.0	167	100.0
253	44.4	140	70.0	101	28.9	85	26.6	124	46.6	56	62.0	376	34.1	154	37.2	145	86.8
4.25	...	2.0	...	4.26	...	3.89	...	3.98	...	2.14	...	...	...	...	...	...	...

9 Gow, W. J., *Syphilis in Obstetrics*, System of Syphilis, second edition, London, Frowde, Hodder and Stoughton, vol. 2, 1914, pp. 354-5, quotes Fournier.

10 Habermann, op. cit., quotes study of Nonne material by Raven.

11 Nonne, op. cit., p. 403.

12 Hochsinger, K., Die gesundheitlichen Lebensschicksale erbsyphilitischer Kinder, *Wiener klinische Wochenschrift*, no. 24, June 16, 1910, p. 882.

13 Bartlett, op. cit., p. 159, quotes Tarnier.

14 Coutts, Infantile Syphilis, *Lancet*, vol. i, 1896, p. 971.

15 Vedder, E. B., *Syphilis and Public Health*, Philadelphia and New York, Lea and Febiger, 1918, p. 144, quotes Pileur.

16 Fournier, A., *Syphilis et Mariage*, Paris, G. Masson, 1880, p. 73.

syphilitic. Our figures are not entirely comparable with others that have been quoted which are often obtained in a gynecological or obstetrical clinic where only families of patients with evidence of syphilis are considered or where other methods of selection are used. Figures given in the literature (Table 22) as to the amount of sterility occurring in syphilitic families vary from 4.1 per cent[1] to 75 per cent[2] with many intermediate percentages.

Birth-rate.—In Table 19, we deal with the birth-rate and average number of living children per family. Here again this information is obtained from history, and therefore the percentages of the 555 families can be considered. Of these 555 families, 352 families, or 63.4 per cent had living children. The average birth-rate per family was 2.05, and the average number of living children per family at the time of the investigation was 1.62. For purposes of comparison, we give an average birth-rate of 3.8 for Rhode Island, taken from the United States Census report (Table 23) as typical for New England. This figure is almost twice that found in our group of syphilitic families. In other words, the number of children born in this group of syphilitic families is practically one half of that found in the same type of population taken at random. It is thus obvious that syphilis plays a large part in the matter of race suicide. Louis Dublin[3] states that it requires an average of nearly four children per family to make a new generation as large as the old. The average of 2.05 births per family in our group of syphilitic families means a loss in population.

Families Free from Syphilitic Defect.—Table 20 shows the number of families with syphilis in the spouse and defects as to children, and illustrates how few families among the syphilitic group are free from some defect or other which might be traced to syphilis. The compilation shows that only 44.5 per cent of these families gave no history of sterility, abortions, miscarriages, stillbirths, or syphilitic children. If dead children had been considered among the foregoing ill

1 Jamieson, loc. cit.

2 Haskell, op. cit., page 892.

3 Dublin, L., Birth Control, *Social Hygiene*, vol. vi, no. 1, Jan., 1920, p. 7.

results involving the second generation, the percentages of families free from defects as to children would be even lower. It is fair to assume that in some instances early pregnancies resulted in syphilitic children who died young. As we had no definite way of demonstrating this, we have left the possibility out of consideration entirely and assumed that the dead children were not syphilitic. Only 30.3 per cent of all the families were free both from defect in the production or nature of offspring and from syphilis in the spouse. In other words, less than one third of our entire group of 555 families should be considered as definitely free from syphilis or defect possibly due to syphilis.

Families with Accidents to Pregnancies.—The number of families with accidents to pregnancies is shown in Table 21. Of the 555 families, only 427 had any pregnancies. Of these 427 families, abortions, miscarriages, or stillbirths occurred in 156 families, or 36.5 per cent. This means that more than one third of the women who became pregnant had abortions, miscarriages, or stillbirths. The number of pregnancies which resulted unfortunately, irrespective of the number of families in which they occurred is also of interest.

TABLE 27. ACCIDENTS TO PREGNANCIES AND AVERAGE PREGNANCIES PER FAMILY IN NON-SYPHILITIC FAMILIES

SOURCES	CHILDREN'S BUREAU FIGURES ON 1491 MARRIED MOTHERS OF BABIES BORN IN 1911 IN JOHNSTOWN, PA.[1]		JEANS' FAMILIES SHOWING NO OBVIOUS SYPHILIS[2]		HARMON; POOR FAMILIES, KNOWN CASES OF SYPHILIS EXCLUDED[3]	
	No.	P. C.	No.	P. C.	No.	P. C.
Total families	1491	...	200	...	150	...
Total pregnancies	*5808	100.0	886	100.0	826	100.0
Total accidents to pregnancies	445	7.7	88	9.9	78	9.4
Average pregnancies per family	3.88	...	4.43	...	5.50	...

* There were 63 plural births, hence total pregnancies here represent total issue plus abortions, miscarriages, and stillbirths.

1 Infant Mortality Series, loc. cit.

2 Jeans and Butler, loc. cit.

3 Harmon, op. cit., p. 149.

TABLE 28

TABLE SHOWING PERCENTAGE OF SYPHILIS IN THE AMOUNT

CLASS	A—191 FAMILIES IN WHICH EVERY LIVING MEMBER WAS EXAMINED							
	General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		Total	
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total individuals examined	302	100.0	21	100.0	58	100.0	381	100.0
Total individuals negative	249	82.5	17	81.0	38	65.5	304	79.8
Total individuals doubtful	7	2.3	0	...	2	3.5	9	2.4
Total individuals positive	46	15.2	4	19.0	18	31.0	68	17.8

Percentage of Accidents to Pregnancies.—Table 24 presents the number of abortions, miscarriages, and stillbirths, compared to the total number of pregnancies. In the entire group of families (555) there were 1432 pregnancies. Two hundred and ninety-seven, or 20.7 per cent of these pregnancies resulted in abortions, miscarriages, or stillbirths. Of course, all the accidents to pregnancies in these families were not due to syphilis, as they occur not infrequently in non-syphilitic families. Jeans[1] (Table 27) in an analysis of 200 families showing no obvious signs of syphilis, found accidents to pregnancies occurring in 9.9 per cent of a total of 886 pregnancies. Harmon[2] states that in 150 poor families, exclusive of any known cases of syphilis, there were 826 pregnancies, with 78 or 9.4 per cent, resulting in a failure to produce a living child. In the Johnstown study 1491 married mothers had a total of 5808 pregnancies, which were unsuccessful in 7.7 per cent of the cases. This seems to indicate rather definitely that accidents to pregnancies are about twice as frequent in the known syphilitic families as in those which

1 Jeans and Butler, op. cit., p. 330.

2 Harmon, loc. cit.

SPOUSES AND CHILDREN BY WASSERMANN SURVEY

B—364 FAMILIES IN WHICH ONE OR MORE MEMBERS BESIDES THE PATIENT WAS EXAMINED				C—555 FAMILIES, TOTAL OF A AND B			
General Paresis	Cerebro-spinal Syphilis	Nervous system not involved	Total	General Paresis	Cerebro-spinal Syphilis	Nervous system not involved	Total
OF SYPHILIS IN ALL INDIVIDUALS EXAMINED							
No. P.C.	No. P.C.	No. P.C.	No. P.C.	No. P.C.	No. P.C.	No. P.C.	No. P.C.
217 100.0	59 100.0	101 100.0	377 100.0	519 100.0	80 100.0	159 100.0	758 100.0
161 74.2	52 88.1	73 72.3	286 75.9	410 79.0	69 86.3	111 69.8	590 77.8
4 1.8	2 3.4	1 1.0	7 1.9	11 2.1	2 2.5	3 1.9	16 2.1
52 24.0	5 8.5	27 26.7	84 22.3	98 19.0	9 11.2	45 28.3	152 20.1

are considered in a routine procedure. The average number of pregnancies per family in our group of 555 families was 2.58, which is distinctly lower than that given in the studies just mentioned. The average number of pregnancies per family in the study made by Jeans was 4.43; in that of Harmon, 5.5; and in the Johnstown study, 3.88.

Ratio of Stillbirths to Live Births.—Table 25 presents the ratio of stillbirths to live births. There were 40 stillbirths as compared with 1135 live births, giving a ratio of 3.52 stillbirths to 100 live births. This ratio does not differ greatly from that obtained in community surveys. Thus, the average number of stillbirths per 100 live births for Boston, Massachusetts, in the years 1891-1919 inclusive is 3.79. The figure given by Dempsey[1] for Brockton, Massachusetts, is 3 stillbirths per 100 live births; for Johnstown, Pennsylvania, 4.5;

1 Dempsey, Infant Mortality: Results of a Field Study in Brockton, Massachusetts, Children's Bureau, United States Department of Labor, series no. 8, Bureau Pub., no. 37, p. 19.

for Manchester, New Hampshire, 4.8; for Saginaw, Michigan, 3.3; for New Bedford, Massachusetts, 2.8; and the average for these five cities is 3.8. In other words, it would seem that there was no particular difference in the stillbirth ratio in the 555 syphilitic families from that found in the general community. We may therefore conclude that whereas the incidence of abortions and miscarriages is very much higher in our syphilitic group than in the general unselected groups of families, the incidence of stillbirths is approximately the same in both groups.

Percentage of Syphilitic Individuals.—The number of syphilitic individuals found in the families of these syphilitics has been shown for the mate and child separately. In Table 28 we give the figures for both combined.

The incidence of the positive Wassermann reaction is shown to vary between 17.8 per cent (191 families) and 22.3 per cent (364 families). Seven hundred and fifty-eight individuals in all were examined. Of these, 20.1 per cent gave a positive Wassermann reaction, whereas 2.1 per cent gave a doubtful reaction. This would seem to represent fairly accurately for general purposes, in a routine series of mates and children of the late syphilitic patient, the number of individuals who will give a positive or doubtful Wassermann reaction.

Comparison of Families of Syphilitics with Different Manifestations of the Disease.—In the discussion which has preceded, no consideration has been given to differences occurring in the three divisions of syphilitic cases which we have offered, namely, general paresis, cerebrospinal syphilis, and syphilitic cases in which the central nervous system is not involved. This comparison is given in Table 29.

TABLE 29. SUMMARY OF COMPARISON OF FAMILIES OF GENERAL PARETICS, CEREBROSPINAL SYPHILITICS, AND SYPHILITICS, NERVOUS SYSTEM NOT INVOLVED

CLASS	A—191 FAMILIES IN WHICH EVERY LIVING MEMBER WAS EXAMINED						B—364 FAMILIES IN WHICH ONE OR MORE MEMBERS BESIDES THE PATIENT WAS EXAMINED						C—555 FAMILIES, TOTAL OF A AND B					
	General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		General Paresis		Cerebro-spinal Syphilis		Nervous system not involved		General Paresis		Cerebro-spinal Syphilis		Nervous system not involved	
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
Total families with positive Wassermann in one or more members	...	26.5	...	50.0	...	42.8	...	23.9	...	10.6	...	15.0	...	25.0	...	16.4	...	20.3
Total families with no children	...	41.3	...	22.2	...	53.1	...	21.9	...	25.0	...	24.2	...	30.4	...	24.6	...	30.1
Families with living children	...	50.0	...	66.7	...	40.6	...	75.5	...	68.8	...	64.5	...	64.3	...	68.4	...	59.6
Birth-rate per family	1.33	...	1.89	...	1.29	...	2.32	...	2.96	...	2.34	...	1.89	...	2.79	...	21.2	...
Average living children per family	1.06	...	1.44	...	.94	...	1.90	...	2.45	...	1.75	...	1.53	...	2.28	...	1.58	...
Families with defects as to children	...	62.7	...	44.5	...	75.0	...	49.5	...	60.4	...	50.0	...	55.3	...	57.9	...	55.2
Families with no defects as to children	...	37.3	...	55.5	...	25.0	...	50.5	...	39.6	...	50.0	...	44.7	...	42.1	...	44.8
Families with no defects as to children or Wassermann in spouse	...	28.6	...	33.3	...	25.0	...	33.3	...	35.4	...	39.5	...	31.0	...	35.1	...	36.5
Families, in which abortions, miscarriages, and stillbirths occurred	...	36.0	...	37.5	...	57.1	...	31.6	...	47.5	...	35.9	...	33.3	...	46.0	...	39.5
Total individuals positive	...	15.2	...	19.0	...	31.0	...	24.0	...	8.5	...	26.7	...	19.0	...	11.2	...	28.3
Total spouses positive	...	25.2	...	50.0	...	39.3	...	33.3	...	14.3	...	30.0	...	28.4	...	24.1	...	33.8
Total children positive	...	6.3	...	...	...	23.3	...	16.6	...	5.1	...	24.6	...	10.7	...	4.0	...	24.1
Accidents to pregnancies	...	24.0	...	26.0	...	26.8	...	17.0	...	23.2	...	21.4	...	19.2	...	23.6	...	22.0
Average pregnancies per family	1.76	...	2.55	...	1.75	...	2.79	...	3.85	...	2.98	...	2.34	...	3.65	...	2.72	...
Number stillbirths per 100 live births	3.00	...	17.7	...	4.90	...	3.37	...	2.11	...	3.79	...	3.25	...	3.80	...	4.00	...

This table indicates that there is only a slight difference in the proportion of difficulties that may be found in the three groups. The number of cerebrospinal syphilitics occurring in the families in which all were examined (191) is so small that this group is not valuable for this particular aspect of the study. Considering the other two groups (364 and 555), there are a few facts which stand out conspicuously.

There is no one of these three types of syphilis that does not produce its effect upon the family. There is some difference in the percentage figures given under the three groups. In a general way the Wassermann survey shows a smaller number of positive Wassermann reactions in the mates and children of the patients who had cerebrospinal syphilis, while on the other hand, more families in this group showed accidents to pregnancies. There is very little difference in the percentages obtained in the families of patients who had general paresis and those without involvement of the nervous system. The variation that does occur is apparently within the ordinary limits of variation of a finite group. It may therefore be stated that in a general way the difference in the effect of syphilis upon the mates and offspring of persons suffering from syphilis of the nervous system and of those suffering from syphilis which does not involve the nervous system is not sufficient to be of any great importance; the same types of difficulty occur with a frequency that does not greatly vary. The problems of syphilis from the familial standpoint are practically the same whatever course the syphilis may take in the individual patient.

Importance of Methods of Selecting Families in Studies of Incidence.—Any marked difference between our figures and those reported in the literature is probably due to a conscious or unconscious selection in other studies. The discrepancies due to basing figures on a selected group are shown by a comparison of the data of our unselected 555 families with that found in the selected group of 236 syphilitic mothers (see Chap. 3, page 56). Thus, in the 236 families with syphilitic mothers, 95, or 40.2 per cent were childless, as compared with 29.7 per cent childless marriages in the entire 555 families. The amount of actual sterility did not vary greatly. Of the

236 mothers, 24.5 per cent were sterile, as compared with 23 per cent in the total group (555). On the other hand, 15.7 per cent of the syphilitic women had abortions, miscarriages, or stillbirths, and no children born alive, as compared to 6.7 per cent of the larger group (555). In the group composed of syphilitic mothers, the birth-rate was 1.84 and the average number of living children per family 1.33. In the entire group (555) the birth-rate was 2.05 and the average number of living children per family, 1.62. In the group of 236 families, 27.5 per cent of the children examined gave a positive Wassermann reaction as compared to the 12.8 per cent in the larger group of 555 families. The comparison throughout is given in tabular form:

TABLE 30

	236 FAMILIES IN WHICH THE MOTHER GAVE A POSITIVE WASSERMANN REACTION		TOTAL GROUP OF 555 FAMILIES IN WHICH ONE OR BOTH PARENTS GAVE A POSITIVE WASSERMANN REACTION (INCLUDES GROUP OF 236 FAMILIES)	
	No.	P. C.	No.	P. C.
Families with positive Wassermann reaction in children	23	9.7	36	6.5
Families with no pregnancies	58	24.5	128	23.0
Families with no children, but with abortions, miscarriages, and stillbirths	37	15.7	37	6.7
Families with no children	95	40.2	165	29.7
Families in which abortions, miscarriages and stillbirths occurred	93	52.2	156	36.5
Birth-rate	1.84	...	2.05	...
Average number of living children per family	1.33	...	1.62	...
Total pregnancies	632	100.0	1432	100.0
Accidents to pregnancies	198	31.3	297	20.7
Average number of pregnancie sper family	2.68	...	2.58	...
Children examined	142	100.0	423	100.0
Children positive	39	27.5	54	12.8

Summary of Familial Effects of Syphilis.—A summary of our findings in this study of a consecutive series of the families of late syphilitics shows:

1. The family of the late syphilitic abounds with evidence of syphilitic damage.

2. At least one fifth of the families of syphilitics have one or more syphilitic members in addition to the original patient.

3. Between one third and one fourth of the families of syphilitics have never given birth to a living child. This is much larger than the percentage obtained from the study of a large group of New England families taken at random. Here it is shown that only one tenth were childless.

4. More than one third of the families of syphilitics have accidents to pregnancies, namely, abortions, miscarriages, or stillbirths.

5. The birth-rate in syphilitic families is 2.05 per family; whereas the birth-rate in the New England families mentioned above is 3.8 per family or almost twice as high.

6. Over one half of the families show defects as to children (sterility, accidents to pregnancies, and syphilitic children).

7. Only one third of the families show no defect as to children or Wassermann reaction in spouse.

8. About one fifth of the individuals examined show a positive Wassermann reaction; more of these are spouses than children.

9. Between one fourth and one third of the spouses examined show syphilitic involvement.

10. Between one in twelve and one in six of the children examined show syphilitic involvement.

11. One fifth of all children born alive in syphilitic families were dead at the time the families were examined. This does not differ materially from the general average in the community.

12. One fifth of the pregnancies are abortions, miscarriages, or stillbirths, as compared with less than one tenth of the pregnancies in non-syphilitic families.

13. The average number of pregnancies per family is 2.58 compared with 3.88, 4.43, and 5.51 in non-syphilitic families.

14. There are 3.52 stillbirths per 100 live births in the syphilitic families, as compared with the 3.79 reported by the Massachusetts Census study of non-syphilitic families. This shows no very marked difference.

15. A syphilitic is a syphilitic, whether his disease is general paresis, cerebrospinal syphilis, or visceral syphilis without involvement of the central nervous system, and the problems affecting his family are the same in any case.

Severe Effects of Familial Involvement.—The whole story of the effect of syphilis on the family cannot be told by statistics, although these indicate the great frequency with which syphilis acquired by an individual permeates his family. The toll of syphilis is enormous in some families; in others the amount of damage may be very slight. In fact, as has already been shown, in many instances a syphilitic does not infect his family. There are all gradations in the amount of involvement that may occur, from the families in which there is no familial infection to those in which every member shows definite syphilitic disease.

Case 78. Sally McNutt.
Father, Wassermann reaction negative.
Mother, Wassermann reaction positive.

Pregnancies.
1. Miscarriage, 2 months.
2. Mary, juvenile paretic.
3. Miscarriage, 3 months.
4. Congenital syphilitic.
5. Congenital syphilitic.
6, 7, 8. Miscarriages.

In this family both the father and mother denied venereal infection but the examination of the mother gave definite evidence that she was syphilitic. There were eight pregnancies resulting in five miscarriages and three syphilitic children, the oldest of whom at the age of 12 was in an advanced stage of juvenile paresis. The other two children were congenital syphilitics who may have serious difficulties later in life.

Case 79. Syphilis was discovered in the Flynn family when the father of the family was in the forties. He had syphilis of the throat which led to his death. An examination of the family showed the following:

Father, 40—Syphilitic throat.
Mother, 42—Syphilis (Wassermann positive).

Pregnancies.
1. Son, 18—Syphilis (Wassermann positive), epilepsy.
2. Son, 16—Syphilis (Wassermann positive).
3. Son, 15—Syphilis (Wassermann positive).
4. Daughter, 10—Syphilis (Wassermann positive).

5. Daughter, 8—Wassermann doubtful.
6. Son, 7—Wassermann doubtful.
7. Daughter, 5—Wassermann negative.
8. Daughter, 3—Wassermann negative.

Case 80. Mazzocca family.
Father, alcoholic, dead.
Mother, poor health, Wassermann positive.

Pregnancies.
1. Boy, dead, (11 months) diphtheria.
2. Boy, dead, (18 months) scarlet fever.
3. Boy, dead, (22 years) tuberculosis.
4. Boy, dead, (20 years) pneumonia.
5. Patient 18, juvenile paresis.
6. Girl 16, syphilitic bone disease; interstitial keratitis.
7. Stillbirth (8 months).
8. Girl, dead, (14 months) meningitis.
9. Miscarriage (3 months).

The toll of syphilis in the Mazzocca family was a syphilitic mother whose nine pregnancies resulted in two living syphilitic children and seven who never came to term or who died after birth.

Case 81. The history of the Jones family shows the destructive effects of syphilis on the progeny. The mother when about 41 years of age was put under treatment for syphilis. It was not possible to induce the father to have an examination. The results of the pregnancies are as follows:

1. Stillbirth.
2. Girl, 17, congenital syphilis, epilepsy, and feeble-mindedness.
3. Boy, dead, (4 months).
4. Boy, dead, (6 months) convulsions.
5. Boy, dead, 2 days.
6. Boy, 14, mental retardation, not examined for syphilis.
7. Boy, 6, physical examination and Wassermann reaction negative.
8. Boy, dead, (4 months).
9. Girl, (8 months). Marked malnutrition; under treatment for congenital syphilis.

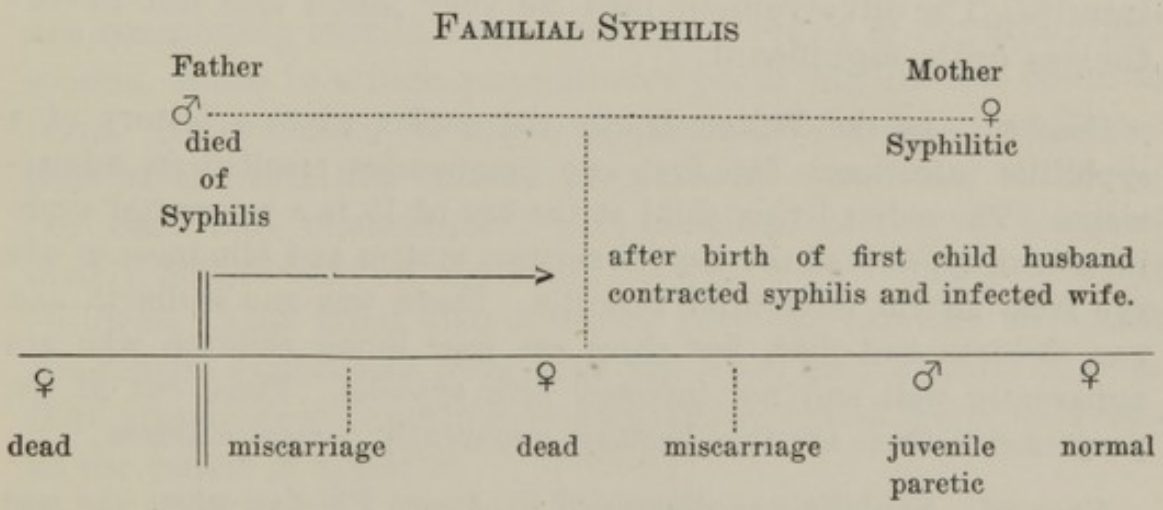
The mother is again pregnant.

Thus out of nine pregnancies there is only one child who is normal as far as known.

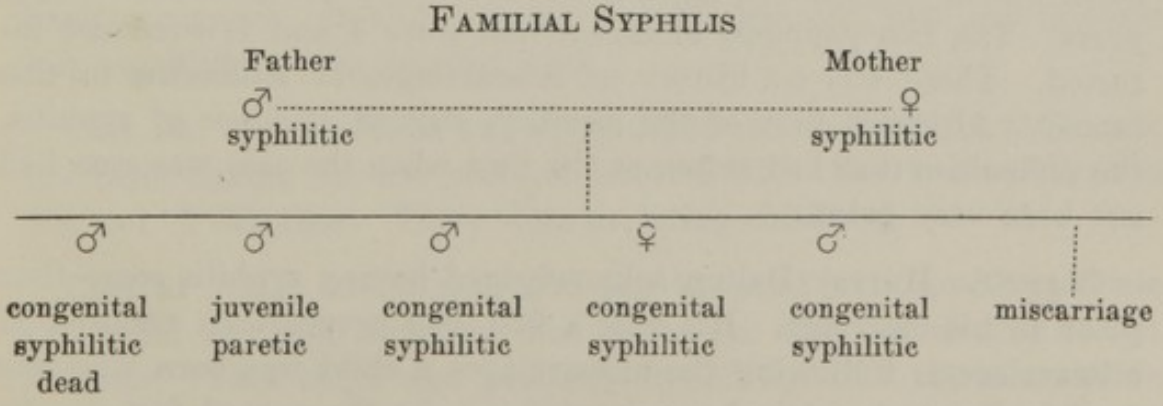
Case 82. Moses Bornstein.
Father, ——Syphilitic.
Mother, 43—Cerebrospinal syphilis. Died at 45.

Pregnancies.
1. Son, 19—Juvenile paresis. Died at 23.
2. Son, 17—Ruptured aneurysm. Died at 20.
3. Son, 16—Achondroplasia.
4. Son, 14—Caries of the spine.
5. Son, 11—Stigmata of congenital syphilis.
6. Infant, died shortly after birth.
7, 8. Stillbirths.

Case 83. John Friedreich.



Case 84. Fred Klein.



Blaisdell[1] has studied 30 families selected to show the ravages of syphilis. "There were 132 definite pregnancies in these 30 families. These resulted in only 23 healthy chil-

[1] Blaisdell, J. H., The Menace of Syphilis of To-day to the Family of To-morrow, *Boston Medical and Surgical Journal*, vol. clxxv, no. 1, July 6, 1916, pp. 7-13.

dren, the large majority of whom were born before infection entered the family. Of the 53 living children syphilis claims at least 24, or 45 per cent. In the cases of the 79 deaths syphilis may be credited as the probable causative factor in at least 59, or 74 per cent. Totaling, syphilis scores in 83 out of 132 pregnancies, or 62 per cent." These figures cannot be used as indicative of the percentage of syphilitics in any random group of families but simply represent the possibilities in a selected group.

Cases of Milder Involvement.—The cases we have just presented illustrate how severely syphilis may involve the family. The involvement may be very much less but nevertheless quite significant.

Case 85. In the Wilton family the mother gives a history of a syphilitic infection. The first two pregnancies resulted in miscarriages. The oldest living child at the age of 15 is a congenital syphilitic with syphilis of the central nervous system and blindness in one eye from an old interstitial keratitis. There was one stillbirth and two children had died, but there are four living children who are apparently well and not infected with syphilis. Thus, out of ten pregnancies, there are four healthy, apparently normal children.

Case 86. Syphilis was diagnosed in Agnes Fairfax when she was 33 years of age. An examination of the family showed that the husband was also syphilitic, as were the two oldest children of 8 and 6 years. The two youngest children, who were 4 and 1, were not infected. There was no history of miscarriages or stillbirths in this family. Although four of the members showed evidence of syphilis, the difficulties that had arisen at the time when the case was seen had not been very great.

Case 87. Murray Dalton acknowledged having syphilis some time prior to his marriage. His wife's first two pregnancies resulted in miscarriages. Following the miscarriages a child was born who was frail in infancy and had a spina bifida. At the age of five she developed iritis. At 18 it was found that the Wassermann reaction was positive in her blood. The next child was hydrocephalic and mentally deficient. When examined at the age of 16 his Wassermann reaction was negative in the blood. The next three children aged 12, 10, and 5, respectively, at the time of their examination were apparently

perfectly healthy. The wife at this time showed no evidence of syphilis. In this family there were two miscarriages, a syphilitic child with a spina bifida, a feeble-minded child with hydrocephalus, and three normal healthy children.

Case 88. John Corelli was a syphilitic who infected his wife. The infection did not seem to go further in this family, for there were three pregnancies which resulted in three children who were apparently quite free of syphilis. The amount of syphilitic involvement in this family considered as a unit of five members, is relatively small.

Sterility.—One must consider as examples of rather severe familial involvement the families in which no children are born alive. These fall into two groups: first, the families which are completely sterile, apparently as a result of syphilis; and second, those in which pregnancies occur but do not come to term. Reference to the tables on pages 114-5 shows that 23 per cent of the families had no pregnancies whatever, while 6.7 per cent had unsuccessful pregnancies, making a total of nearly 30 per cent of the families who were entirely without children. One must also consider here the families in which congenital syphilitics were born but lived only a short time so that after a few years the family again found itself childless as the result of syphilis.

Case 89. Anna McIntosh married when 19 years of age and acquired syphilis from her husband. Before marriage she was a strong healthy woman. During her married life she had four miscarriages but no children who reached term.

Case 90. Tessie Gould was a syphilitic woman who had three miscarriages during her five years of married life. Her husband died at the end of this time. There were no living children.

Case 91. May McPherson and her husband were both syphilitic. One child was born alive but died at the age of a few months of convulsions. This child was probably syphilitic. At the time of its birth the mother had copper colored marks on her body and she and her husband were started on antisyphilitic treatment. Following the death of this infant she had four miscarriages with no living children.

Case 92. Leo Guimazes was diagnosed as a case of general paresis at the age of 29. His wife, who was 27, was found to be syphilitic. The pregnancies were as follows: 1, premature stillbirth at 8 months; 2, miscarriage at 7 months; 3, child born alive who died at 15 months;

4, miscarriage at 3 months. Although there was one child born alive, at the time the family was broken up because of the commitment of the husband there were no living children.

Not All Accidents to Pregnancies Caused by Syphilis.—It must always be borne in mind that there are various causes besides syphilis for abortions, miscarriages, and stillbirths. In many instances, a series of miscarriages or other accidents to pregnancies have occurred in families in which there was not the slightest evidence of syphilis. Prolapse of the uterus, congenital deformity, systemic diseases, acute infections, trauma, voluntary acts, and the like may cause one or a series of accidents to pregnancies.

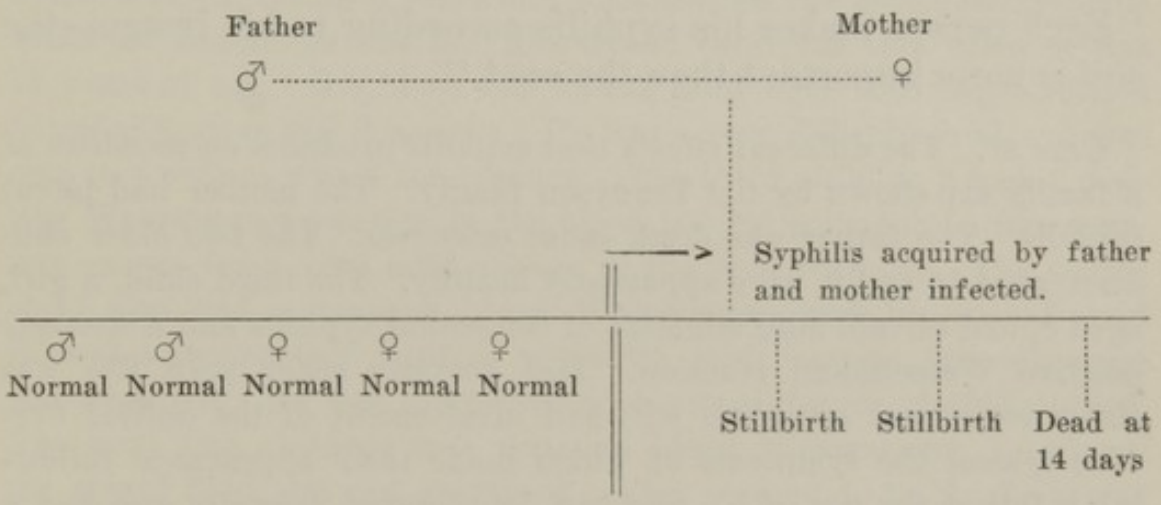
Case 93. Grace Truell was a woman of 45 who came to the hospital because of mental disease. There was no evidence of syphilis, either in herself or her husband. She had four miscarriages and one child who died at ten years of age. The history of the pregnancies is very similar to what one finds in syphilitic families but there is no evidence of syphilis in this family and it is in no way the cause of the miscarriages.

Case 94. Mrs. Short was a neurasthenic woman who showed no evidence of syphilitic disease. She had two living children and had had four miscarriages, two of which were induced.

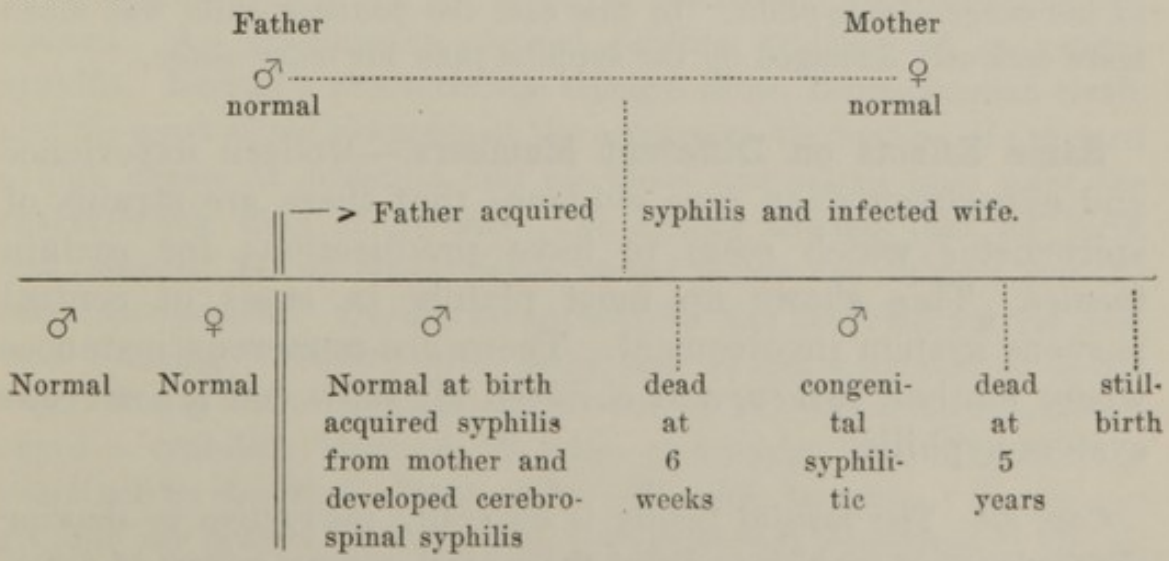
No Familial Involvement.—It is always possible in a family in which only one of the parents is syphilitic that the disease has not been passed on to any of the other members. This occurs very frequently in those cases in which the male parent acquired his syphilis some years before marriage. When the female parent has had syphilis it is much more probable, as we have seen, that she will transmit syphilis to the children.

Date of Entry of Syphilis.—Syphilis may enter the family at any time. Where the infection occurs after the birth of perfectly normal children the effects of syphilis are, by contrast, all the more evident. Those children born before the parental infection, unless they happen to acquire syphilis by chance contact will be quite free of syphilis, whereas those born after the infection will probably be congenital syphilitics or else such pregnancies as occur will never reach term.

Case 95. In the Flint family there were five normal healthy children ranging in age from 20 to 12. Directly after the birth of the last child, Mr. Flint acquired syphilis which he promptly transmitted to his wife. There were three pregnancies after the syphilitic infection had entered the family, two resulting in stillbirths and one in a child who died at the end of 14 days. Thus, we see a couple whose fecundity was proved by the birth of five strong healthy children, but as soon as syphilis entered the family this fertility was destroyed and no healthy children were born.



Case 96. In the Maguire family there were three healthy children. The father then acquired syphilis which he transmitted to the mother, who in turn infected the youngest child. The next pregnancy resulted in a child who lived but 6 weeks, the succeeding pregnancy in a child who showed signs of congenital syphilis, the next in a child who died at 5 years, and the final pregnancy in a stillbirth. The result of the entrance of syphilis in the family may be tabulated as follows:



Different Effects of Syphilis on Different Members of Family.—When syphilis has entered and spread through the family its effects on the various members may be quite similar or quite different. We have already called attention to the Kassowitz law which states that there is a tendency for the virus to become weaker with time and that the children born later are likely to have milder forms of involvement than those born earlier, or indeed, may escape the infection entirely. There is, of course, no definite rule and as Fournier puts it, "Each person makes his syphilis according to his image—the soil is more important than the seed."

Case 97. The different effects that syphilis produces on members of a family are shown by the Tennyson family. The mother had latent syphilis. The father was dead, cause unknown. The two older children, aged 16 and 9, were apparently healthy. The third child, a girl, aged 8, had certain mild stigmata of congenital syphilis and a strongly positive Wassermann reaction. Her younger sister aged 6½ was also a congenital syphilitic who had involvement of the central nervous system the symptoms of which made their appearance following a fall at the age of 5. She had deteriorated mentally and had a spastic paraplegia. A younger brother aged 4 was apparently well and had a negative Wassermann reaction, and the youngest child died at the age of 9 weeks.

Case 98. There were two children in the Sanzi family. The elder was a girl of six who showed a positive Wassermann reaction as the only symptom of her syphilis. A young brother aged 4 was a restless whining idiot, whose condition was very probably the result of his congenital syphilis. In this case the younger child was much more seriously damaged by the syphilis than his older sister.

Same Effects on Different Members.—Modern experience and experimentation give evidence that there are strains of spirochetes which seem to have predilections for certain tissues. This shows up most plainly in cases of central nervous system involvement. There are numerous instances where mother, father, and children all show central nervous system syphilis.

Case 99. The Rossini family is especially instructive in showing the tendency of syphilis to infect the central nervous system of differ-

ent individuals in the same family. The fact that Mr. Rossini developed the symptoms of general paresis at the age of 33, first brought this family into consideration as syphilitic. His wife, who was 29 years of age, had definite evidence of syphilis of the central nervous system as shown by the physical symptoms and laboratory tests. There had been seven pregnancies and there were seven living children. The oldest, Mary, was 13 years of age at the time that syphilis was discovered in the family. She had a positive blood and spinal fluid showing an involvement of the central nervous system. She was feeble-minded, rating 6 years and 8 months on the psychometric scale while her actual age was 12. The second child was seen when he was 10 years of age. His blood and spinal fluid were both negative and he rated 8 years and 8 months. He was a very difficult child and was sent to a reform school for truancy. The third child at 8 had a positive Wassermann reaction in the blood but his spinal fluid was negative except for a very mild change in the gold reaction. The fourth child also had a positive blood Wassermann and his spinal fluid showed a moderately positive syphilitic gold reaction but otherwise was negative. He was committed to a school for the feeble-minded. The next two children had negative blood Wassermann reactions; the spinal fluid was not examined. They seemed to be fairly bright children. The last child was a baby of 8 months who was not examined. In this family both the father and mother had definite neurosyphilis. The oldest child showed involvement of the central nervous system, the following child apparently escaped involvement while the next two children showed some evidence of involvement of the nervous system as far as could be proved by the colloidal gold test.

Case 100. Gridley Ringer was brought to the clinic at the age of 15 because he could not get along in school and was obviously demented. An examination showed definite evidence of congenital syphilis. He had a characteristic olympic brow, Hutchinsonian teeth, and the scars of old rhagades at the corners of his mouth. He showed a high degree of dementia and his blood and spinal fluid gave the characteristic tests of paresis. The history showed that his birth was preceded by two miscarriages, one of which was induced and the other spontaneous. During his infancy he was troubled a great deal with "eczema." Shortly after being seen he had a number of shocks which finally led to his death at the age of 15. The father acknowledged a syphilitic infection 26 years previously, that is, about ten years before the birth of the child. He said, however, "It did not get into my system. I have been perfectly well ever since." Questioning, however, disclosed the fact that he had been suffering with

"rheumatism" for the past six months. A physical examination confirmed by the laboratory tests brought to light that he had locomotor ataxia. His wife, the mother of Gridley, said she was in perfectly good health. Her one complaint was deafness. An examination showed that she was suffering from a disease of the auditory nerve. It was almost certain that this was the result of the syphilitic infection. In this family, then, we have three members, all of whom showed disorder of the nervous system as a result of syphilis.

Necessity of Familial Examination.—The damage done to the families of syphilitics has been demonstrated above statistically and by illustrative cases. The only way of finding whether syphilis is present is to examine the various members of the family for evidence of acquired or congenital syphilis. This means that when a syphilitic patient is discovered, whether he is in an early or late stage, the examination of all the other members of the family—husband and wife, and in the case of a congenital syphilitic, brothers and sisters—is indicated.

Examination Discloses Active Syphilis.—The chief reason for examining the family is to find out if anyone else besides the patient is suffering from active syphilis and is in urgent need of treatment for his own sake as well as for others. Not only when the parent has a recent syphilis is there danger of familial infection by intercourse or contact, but also when a mature son or daughter living in close family communion acquires syphilis. Here family examination is advisable to discover cases of infection spread by accidental contact such as is likely to occur in family life. A typical case of such spread is Case 68 (Chap. 3, page 87), where the younger brother was probably infected by sleeping in the same bed with his syphilitic older brother. The brother was treated but no family examination was made and the young brother's infection was not discovered until he had developed a fatal syphilitic disease.

Examination Discloses Latent Syphilis.—Next in importance in the family examination is the discovery of latent unsuspected syphilis. The syphilitic arrives at a clinic anywhere

from a few days to many years after infection, and often members of the family are syphilitic although they are not aware of it. Examination affords the opportunity of giving warning of future dangers and of instituting immediate treatment.

Case 101. Giuseppe Nigro, aged 75, thought he was worth a million dollars, threatened the life of his wife and children, and caused difficulty in a general hospital where he was brought for treatment. He was found to be suffering from tabo-paresis and was committed to a state hospital where he died in a short time. He acknowledged syphilis of many years duration for which he had had no treatment. On account of language difficulty and his mental condition, he gave very little family history. At this period there was no follow-up of syphilitic cases at the hospital and no examination of the family was made. Three years later, the patient's daughter was admitted to the hospital in a confused and deluded state, a condition precipitated by influenza, but which probably occurred on the basis of congenital syphilis. She showed very characteristic features, including Hutchinsonian teeth, on which a definite diagnosis of congenital syphilis could be made. Her blood Wassermann reaction was positive. Examination of the mother showed that she likewise was syphilitic. Treatment of both mother and daughter was instituted. In the course of a few months the girl had recovered as far as her mental symptoms were concerned and she was able to take up her work in the community. After a short time she married and became pregnant. If the family had been followed up and examined three years previously when the father was found to have syphilis, treatment could have been undertaken at that time, and it is quite possible that the daughter's difficulty might have been avoided.

Case 102. Patrick O'Halloran came to the hospital because of an alcoholic debauch ending in delirium tremens. In a routine examination it was found that he was syphilitic and for this reason his family was brought into the hospital for examination. The wife showed no evidence of syphilis, but the oldest son, 17 years of age, had a positive Wassermann reaction and there was a history that he had had some eye difficulty when he was a youngster which it seemed probable was interstitial keratitis. Under the circumstances, treatment was urged for Patrick, Jr. but the idea was scouted by the parents as well as by himself. It was insisted that he was quite well and that there could be nothing the matter with him, so the case was lost by default. Six years later we again ran across Patrick at the age of 23. He was

almost completely deaf, due to bilateral lesions of the auditory nerve. This condition had been progressive for the past four years and only at the time when he became almost completely deaf was the much needed antisyphilitic therapy begun. It is quite probable that had treatment been instituted six years previously, that is before the beginning of the changes in his auditory nerves, his deafness might have been prevented. The family examination disclosed the problem but lack of the patient's coöperation prevented anything from being done. A case of this sort shows the value of treating congenital syphilities even though symptom-free. It further indicates the value of making strenuous efforts to overcome the uncoöperative attitude of some individuals.

Incidence of Unsuspected Syphilis Disclosed by Examination.—The value of examining families of known syphilitics to discover the unsuspected cases is shown by the following study of 100 families in which at least one other member besides the original patient was syphilitic.

		No.	P. C.
Relatives with syphilis diagnosed at Psychopathic Hospital through family examination		112	72.7
Relatives with syphilis diagnosed elsewhere		42	27.3
Total syphilitic relatives		154	100.0
Of the 112 diagnosed at the Psychopathic Hospital		112	100.0
Fathers			
Symptom free	18		
Tabetics	2		
Neurosyphilitics	2		
		22	19.6
Mothers			
Symptom free	47		
General paretics	1		
Neurosyphilitics (not tabetics)	3		
Other symptoms	2		
		53	47.4
Children			
Symptom free	28		
Neurosyphilitics	1		
Defect in sight	3		
Defect in hearing	1		
Other symptoms	4		
		37	33.0

		No.	P. C.
Of those diagnosed elsewhere		42	100.0
Fathers			
Symptom free		8	19.0
Mothers			
Symptom free	11		
General paretics	1		
		12	28.6
Children			
Symptom free	20		
Defect in sight	2		
		22	52.4

It is especially significant to note that of the 154 who were found to be syphilitic, 72.7 per cent had no idea of their syphilis until it was discovered as a result of the family examination. The greater percentage of these patients (83 per cent) were in a stage of syphilis in which they were not suffering from any definite symptoms, which of course, is a favorable time to make a diagnosis.

A complete examination of the entire family has the advantage of giving a clean bill of health to the uninfected. Often the wife of a syphilitic patient is cognizant of the possibility of infection and it is only fair to her to confirm or disprove this idea as soon as possible. Moreover in the case of some future disease it will be a great aid to the physician to have this information at hand.

Methods of Examination; History.—The methods of discovery of familial syphilis are the same as those employed in the detection of the infection in the individual, discussed in the previous chapter. The examination is incomplete without a history of the individual and the family, physical examinations, and tests on the blood and spinal fluid. In spite of the value and importance of a history one must be very cautious of drawing any very far-reaching conclusions from some histories given by the patient or relative who may be consciously prevaricating or may not know the true facts.

Case 103. An example of the inaccuracy of histories is given by the case of Mrs. Price who developed general paresis at the age of 40. The husband gave a history that the patient's father had contracted syphilis and infected his wife. We might draw the conclusion that the patient was a congenital syphilitic. The husband denied any his-

tory of syphilis on his own part. The examination showed that he had a positive Wassermann reaction as did the only living son. As a matter of fact, the mother was not a congenital syphilitic and the husband's history was in no way reliable.

Clinical Examination and Wassermann Test.—The clinical examination is of the utmost importance and cannot be superseded by the Wassermann test alone. The Wassermann test, however, is of the greatest service and if properly performed, controlled, and interpreted, is an essential. When the Wassermann test is performed routinely in hospitals, prisons, reform schools, other institutions, and private practice, it aids in picking out cases that might otherwise be unsuspected and thus makes for early and preventive treatment.

A knowledge of the limitations of the Wassermann reaction is most important if one is going to do justice to the test. It must be recognized in the first place that many syphilitics give negative Wassermann reactions. For example, early syphilitics often have negative Wassermann reactions. About 40 per cent of the cases of tabes have negative Wassermann reactions in the blood. It follows, therefore, that one must not rule out syphilis merely upon a negative result of a Wassermann test. Before accepting a positive Wassermann reaction as evidence of syphilis it should be confirmed either by definite clinical findings or by a repetition of the test with similar results. Statistics based upon the Wassermann test are accurate within the limits of the test. As we have noted, the false negatives and false positives tend to correct each other, and often where these corrections are not absolute, the relative results are sufficiently correct for purposes of comparison. However, in dealing with an individual the matter is entirely different because in this case any error means an error of 100 per cent for the particular person. If the clinical evidence is sufficiently strong, one may make the diagnosis of syphilis in spite of a negative reaction.

Case 104.[1] The value of the routine Wassermann both for the patient and for the discovery of familial syphilis is well illustrated in the case of Janet Gibbons. At the age of 6 she developed a syphilitic

1 Children's Hospital, Boston.

nasopharyngitis and interstitial keratitis. At this time the mother was examined and also found to be syphilitic. Delving into the history of the case it was found that the child had been at the hospital five years previously when a diagnosis of osseous tuberculosis had been made. At that time a routine Wassermann test was not the rule and as she had no definite evidence of syphilis this diagnosis had not been made. If her condition had been discovered at that time by means of the Wassermann reaction, as it undoubtedly would have been, had routine Wassermann tests been in force, treatment might then have been instituted and the later difficulties perhaps prevented.

Case 105. A negative Wassermann test on the blood must often be supplemented by a test of the spinal fluid. Mrs. Gulesian was the wife of a syphilitic. The routine Wassermann test was negative but she complained of a loss of memory, feeling weak, etc. A lumbar puncture resulting in positive findings showed that she was suffering from an unsuspected syphilis of the nervous system.

Case 106. One may be led astray if he depends upon the results of the Wassermann reaction. Harry Congiano was a deaf-mute boy 4½ years of age. His Wassermann reaction was reported as positive. There were no other signs or symptoms that were definitely syphilitic. An examination of the cerebrospinal fluid showed that it was entirely negative. The Wassermann reaction was repeated on several instances and always found to be negative. The mother was also examined. She showed no signs or symptoms of syphilis and her Wassermann reaction was negative on two occasions. It seems that there can be very little doubt that the report of a positive Wassermann reaction on Harry was a mistake.

Case 107. A similar false positive Wassermann reaction is shown in the case of Mrs. Davis's child. Mrs. Davis was brought to the hospital because of fainting spells. Her Wassermann reaction was reported as doubtful. Almost simultaneously her fourth child, a girl of 12, came to the out-patient department. She was a poorly nourished child who had never been very healthy. Her Wassermann reaction on the blood was positive. The doubtful reaction in the case of the mother and the positive reaction in the case of the child, along with the other symptoms, led one to suspect syphilitic involvement. It should be noted, however, that none of the other symptoms were definitely syphilitic or sufficiently suggestive in themselves to allow a diagnosis of syphilis to be made. The history of this case was entirely negative as far as syphilis was concerned. There had been six pregnancies, all terminating successfully, the last one resulting

in twins. All the children were living and ranged in age from 19 years to one year. With the exception of the oldest boy, who was living away from home, they were all examined. They showed nothing suggestive of syphilis and had negative Wassermann reactions. The same was true of the father. The examination of the mother's cerebrospinal fluid was entirely negative as was the Wassermann reaction in the blood on repetition. Several further Wassermann tests on Anna were also negative. We must assume that the positive Wassermann reaction originally obtained was due to some error.

All doubtful tests should be repeated, as the following case indicates:

Case 108. Three-year-old Pierre Nevers was examined as one of the children of a syphilitic. He was symptom-free except for a doubtful Wassermann reaction. The oldest child had a negative reaction and the second child was doubtful. Although the effort was made to repeat the tests the mother proved uncoöperative and the case was dropped. Five years later the mother brought Pierre in for antisyphilitic treatment, a positive Wassermann reaction having been obtained at another hospital. Thus five years of possibly valuable treatment were lost through the delay in diagnosis.

At times it is very difficult to get a consistent result with the Wassermann test.

Case 109. The following series of tests on husband and wife show how difficult it may be to draw any conclusions. (Angelo family.)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Woman aged 27	?	*	—	—	—	?	?	+	+	—	+	—	—
Husband, aged 34	?	?	?	?	?	—	—	?	—	—	—		

* Unsatisfactory.

Case 110. Julia Wilson was 6 years of age when first examined. Her father was a general paretic. Examination of the mother showed no signs of syphilis. Her Wassermann reaction was negative. Julia was not a very strong healthy child but did not show any definite syphilitic symptoms. The first Wassermann test was negative and the second one was positive. Several others in the following two years were negative. She had a sister, Ethel, one year her junior, who again showed no definite symptoms of syphilis. Her first Wassermann reaction was positive, a repetition was doubtful, and the succeeding tests were negative.

Provocative Treatment.—At times a syphilitic patient who gives a negative Wassermann reaction may show a positive reaction after treatment with arsphenamin. Treatment given for this purpose is known as provocative treatment and the reaction is spoken of as a provoked reaction.

Case 111. Florence Jones developed interstitial keratitis at the age of 8 and had a positive Wassermann reaction. Her mother was examined and showed no definite evidence of syphilis and had a negative Wassermann reaction. Nevertheless, it was felt that she probably was syphilitic. She was given a provocative treatment and her Wassermann reaction became positive.

Objections to Familial Examination—Technique of Securing Examination.—One of the objections that is often offered to the examination of other members of the family is that the discovery of syphilis in the family is likely to lead to marital discord. The remark is made over and over again that it is very dangerous because if a woman learns that her husband has syphilis the family will be broken up. In our seven years of experience we have found that this is not true. In many instances it is not even necessary to make it entirely clear what the trouble is in which one is interested. If syphilis is not found in the relative it is perfectly reasonable not to discuss the matter further. If syphilis is found, of course, it is essential to come out clearly and distinctly with the facts. However, by putting the discussion upon a medical basis and giving the individuals a proper understanding of the facts, family discord can be avoided. The only situation where there need be any worry in this regard is in those families in which the mate is on the point of separation and is only looking for some excuse to take the case to court. In such instances silence and avoidance of the possibility of becoming involved in the family difficulties is probably the part of discretion.

When the family must be told that one is looking for syphilis or the patient must be notified that he is syphilitic, the question that constantly recurs is whether or not the social worker should break the news. It is our feeling that only in exceptional cases should anyone but the doctor actually

in charge of the case take this upon himself. It is the doctor's privilege and duty to inform a patient about his disease whether it be tuberculosis, nephritis, or syphilis, and in most cases no one can do this as well as the doctor whom the patient considers especially versed in the handling of disease. On the other hand, there are many instances where the contact between the social worker and the patient is so close and the latter has so much confidence and regard for the worker that it can best be discussed by the patient and social worker. It may be advisable for the social worker to give this information when a syphilitic patient or relative refuses to come to the clinic and talk with the doctor. This, however, should not be the general rule, but should apply only to those exceptional cases in which, in the opinion of both the doctor and social worker, it is advisable. In many cases, after the doctor has explained the condition to the patient and family, the social worker can be of the utmost assistance in completing the understanding of what the doctor has already said. Such a service on the part of the social worker is often more effective than would be the unaided effort of the doctor.

Experience has proved that in family examination the assistance of a well-organized social service department is essential. Any deviation from absolute systematic endeavor is almost valueless, and haphazard methods will result in failure to discover a large number of syphilitics.

Typical Machinery for Examination at Boston Psychopathic Hospital—Difficulties and their Solutions.—The proper facilities and machinery for family examination are offered by many clinics and hospitals to-day. At our clinic at the Boston Psychopathic Hospital, the members of the family of every syphilitic patient who comes to the hospital or to the out-patient department are asked to report for examination, and if it is considered necessary, for treatment. It makes no difference whether the original patient is in a contagious state or not, whether he is in the early or late phases of the disease, or whether he is a congenital syphilitic. Of course, the examination of the families of syphilitics should be made immediately after the infection. Unfortunately this

is done all too infrequently so that even though a patient is seen many years after his infection and in a state which is no longer contagious, it must be remembered that he may have been married at the time when he was very contagious. The work in coöperative cases is simple. Many clinic patients, however, are ignorant and poorly informed. Neither they nor their relatives understand the significance of the disease or see any relation between the disease of the patient and the examination of his family. The task of educating the family to the point of allowing the examination is often hampered by language difficulties. If the difficulty is due to lack of information it is important that the family be told why the examination is desired. Other individuals are irresponsible and though well understanding the significance of the examination do not care to know whether they are infected or not.

Very often those families who offer the most difficulty at the start, with a sufficient amount of persistence become the most coöperative.

Case 112. Robert Clairmont came to the out-patient department when he was 13 years of age, because he was nervous, unmanageable, irritable, and was not getting along well in school. Examination showed that he was a congenital syphilitic. Treatment was prescribed for Robert and the mother coöperated with this suggestion. When it came to the examination of herself and the other children she refused. She said that they were healthy and that there was no need to examine them. Unfortunately she was not only ignorant but was also bad-tempered and pugnacious. On account of her ignorance it was not possible to go into frank detail as to the real situation. Syphilis would have meant only a reflection on the morality of herself and her husband, and as we found out later, argument with her would have had little avail. It was therefore necessary to compromise and get Robert well started on treatment; finally, after sufficient time, it became possible to induce the mother to be examined.

A rather interesting experiment was made in St. Louis as early as 1914 by Dr. Jeans[1] of the Children's Hospital, in an endeavor to examine uncoöperative families. The support of

1 Jeans and Butler, op. cit., p. 329.

the juvenile court was enlisted to such a degree that in the uncoöperative cases, if one child was a congenital syphilitic, the family was brought before the court who urged the parents to have the rest of the children examined. The court had no legal power to enforce examination, but this was rarely understood by the family. This procedure seems to have worked well in this one locality but it could hardly be recommended to other districts, for when a person is symptom-free and not in a contagious state he is likely to realize the lack of power of any court to enforce an examination. Of course, the influence of the court is likely to be more effective than that of the social worker and doctor in showing a recalcitrant person that an examination is really considered important.

Circumstances in the family may make it very difficult for members to report to the clinic for examination. They may live a great distance and be unwilling to take the time or go to the expense of reporting. The family may be large and a mother may be unable to bring children or have no one with whom to leave them at home. A man or woman may be unable to leave work in order to come to the clinic.

There are various ways in which most of these difficulties may be overcome. Where the doctor is interested and uses his authority and persuasive powers and where the social worker is willing to put effort and ingenuity into urging her cases to report, results are usually fairly good. An early morning clinic or an evening clinic for working people helps solve the difficulty that arises from the loss of time as does the more modern attitude of employers who show a willingness to allow their employees to take time off for medical care.

The following table shows the success at the Psychopathic Hospital in following for examination the family of every syphilitic. It is seen that in 74.3 per cent of the families some member reported. Of the total relatives desired for examination 78 per cent reported to the clinic.

TABLE 31. FAMILIES—1916 TO 1919

	No.	P. C.
Families desired for examination	460	100.0
Reported	342	74.3
Failed to report	118	25.7
RELATIVES		
Relatives desired for examination	935	100.0
Examined	632	67.6
Came but examination not advised	99	10.6
Unable to report, good reason	90	9.6
Refused examination	23	2.5
Not located	91	9.7

Comparison of Difficulties of Family Examination by Private Doctor or Clinic.—The difficulty of family examination is probably much greater for the private than for the clinic physician. The doctor often fears that if he presses the point of family examination against the wishes of his patient the latter will be so antagonized that he himself stops his much needed treatment. Further, there is the feeling that to a certain extent the private patient's relationship to the doctor is a business one. He pays the doctor to render certain service which does not include treating the family and because he does pay he feels that he has certain rights and privileges. On the other hand, the clinic patient pays little or nothing and the doctor need have no compunction about going into the family to find more patients for whose treatment he is to receive no recompense. In addition, the private doctor rarely has the facilities for follow-up such as are offered in a hospital clinic and social service department.

And the most important deterrent of all is the question of medical secrecy. That information obtained by a physician in his professional capacity is a secret not to be divulged is shown in the oath of Hippocrates, formerly administered to all physicians:

> Whatever in connection with my professional practice or not in connection with it I see or hear in the life of men which ought not to be spoken of abroad, I will not divulge as reckoning that all such should be kept secret. While I continue to keep this oath unviolated, may it be granted to me to enjoy life and the practice of the art respected by all men in all times, but should I trespass and violate this oath, may the reverse be my lot.

These difficulties of the private doctor seem to be a recommendation in favor of state medicine so that the well-to-do may get as good service as the poor.

Necessity of "Follow-Up" for Treatment Cases.—After a person is brought to the clinic for examination and found to be syphilitic, results can be obtained only after a considerable course of treatment. Many years of experience have shown that syphilitic patients are usually prone to discontinue treatment before they are cured unless steps are taken to insist on their return to the clinic. Here again, the efforts of the social worker through a follow-up system are invaluable. The past inadequacy of treatment without such a system is shown by Blaisdell's study[1] at the Boston Dispensary before a follow-up system was established. Four hundred and fifty-one new cases (July 1913–June 1914) were studied. One hundred and sixty-four were primary or early secondary cases, 136 secondary, 107 late, and 44 congenital. Twenty-eight per cent came but once; 70 per cent came less than five times, an insufficient number of times to relieve even the presenting symptoms; only 9 per cent came more than eight times. The attendance of these 451 patients was analyzed to see how many visits would have been required for good treatment. It was found that as a group they actually paid only 29.4 per cent of the necessary visits for minimum good treatment.

A study[2] of the Boston City Hospital Clinic in 1919 before and after a follow-up system was instituted is self-explanatory:

> A small preliminary study was made of the records of the patients with a diagnosis of syphilis who attended the clinic from March, 1918, to September, 1918, with a view of determining the regularity of attendance. It was found that 116 patients in all attended the clinic during this time, 24 reportable (first and second stages) and 92 non-reportable (tertiary) cases; that 20 per cent had made only one visit, and that 80 per cent had not received adequate treatment, having dropped out after the fifth visit.

1 Blaisdell, J. H. The Menace of Syphilis to the Clean Living Public. *Boston Medical and Surgical Journal*, vol. clxxii, no. 4, April 1, 1915, pp. 476-483.

2 Department of Medical Social Work, Boston City Hospital, Feb. 1, 1918-Jan. 31, 1919, Boston.

A simple follow-up system was then started by means of which every syphilis patient was kept track of. At the end of five months, a second study was made of the group attending the clinic from September 1, 1918, to January 30, 1919, with the following results:

Number of Syphilis Patients in Clinic	181
Reportable Cases (Infectious)	59
Non-reportable (Non-infectious)	122

Of these 13, or 7 per cent had made one visit only; 32, or 18 per cent had dropped out after making five visits. The remaining 135, or 75 per cent were under treatment, while 14 per cent had been transferred to night clinics or other state clinics, and were reported as under treatment.

The contrast of the 75 per cent under active treatment as against the 80 per cent who failed to receive adequate treatment sufficiently demonstrates the value of a medical social follow-up system.

A more recent investigation[1] in New York City of 14 institutions treating venereal diseases shows that the follow-up of patients for treatment is still inadequate in spite of its well-known necessity. The sanitary code in New York requires a follow-up system. However, five of the 14 clinics had no follow-up at all, six used postal cards to some extent, and only three institutions were assisted by social workers in finding the cases who failed to respond to letter. As a result of this inadequate follow-up, the duration of treatment is shortened. In over 57 per cent of the records chosen at random, the patients had been under treatment less than six months and only 19.8 per cent had had treatment for more than a year. Half of the patients had made less than 14 visits to the clinic. A further indication of inadequacy of attendance is in the records. There was no mention of patients discharged. All patients, even Wassermann negative cases had left before a formal discharge.

At the meeting of the All-America Conference on Venereal Diseases, in Washington, December, 1920, it was definitely stated that a follow-up system and social worker were essentials of every modern, well-run, syphilitic clinic.

1 Lewinski-Corwin, E. H., Venereal Disease Clinics, *Social Hygiene*, vol. 6, no. 3, July, 1920, p. 341.

Difficulties of "Follow-up" for Treatment—Solutions.—There are attendant difficulties in a follow-up system for treatment, similar to those mentioned under family examination. Often there seems to be a likelihood that a contagious case will not receive treatment. Here the social worker can often be the means of forcing treatment, thereby reducing the chances of innocent familial syphilis.

Case 113. The Massachusetts General Hospital[1] reports the case of a 9-year old girl who comes to the hospital with an accidental primary lesion of syphilis on the lip, the source of infection being unknown. The family had previously been known to the clinic when a boy of 13 had interstitial keratitis, and the mother a positive blood Wassermann. At the time an effort was made to treat these two members of the family, but there was absolutely no coöperation. The little girl had not then acquired syphilis. In view of the past experience with the family and because the mother failed to carry out her part, the case was taken to court and the child was forced to report to the clinic. Without the medical social worker this child would probably never have received adequate treatment.

A contagious patient often gives the wrong address. The Boston Dispensary has devised an immediate method of meeting such a situation for gonorrhea patients. The day the patient makes his first visit a letter is sent out to the address given. The clinic has taken a mail box so that if the patient is not at the address it is returned to the box and to the social worker without delay. In this way before the patient returns for the next visit the clinic has a check-up on his address.

When a contagious case drops treatment before he is noncontagious, in communities with a reporting law he can be reported by name to the board of health, which urges treatment. The Boston Department of Health[2] reports much difficulty in following the cases whose treatment has lapsed

. . . either because of the deliberate efforts on the part of such patients to conceal their identity or because of carelessness on the

1 Lewis, Ora M., Medical Social Service as a Factor in Protective Work, National Conference of Social Work, New Orleans, April, 1920.

2 Monthly *Bulletin* of the Boston Health Department, Boston, Oct., 1919, pp. 127-128.

part of such patients or of the various agencies charged with the duty of making and transmitting records and reports with respect to them. The most important obstacles that serve to defeat the efforts of the local health department are: the fictitious names given by patients; fictitious addresses; fictitious names and addresses; the assuming by the patient of the name or address, or both of some other person; changes in the addresses of patients, denials by persons visited of identity with the patients, and claims that the patients have merely assumed the names of the persons interviewed; claims that the patients are at the time of the inspector's call at work elsewhere than at the addresses reported; and claims by patients that they have either never suffered from the diseases charged against them or that they have been cured.

Some idea of the difficulties encountered in this work may be gathered from the fact that out of 196 cases under investigation by the department in October, 1919, only 44 cases were located. Eighty cases could not be found after diligent effort, and further search was abandoned. Three, it was definitely learned, had moved out of the city. At the close of the month 69 cases were still under investigation.

A full-time investigator was then appointed to devote his entire time to the search for such patients. He was able to find many patients who had escaped discovery by the routine medical inspection.

. . . Of 175 men referred to him . . . 66 were found and proper action taken. All of these patients, but for the availability of the investigator for this special duty, would have escaped discovery, and in the absence of such information and advice as the investigator was able to give them, and such pressure as he was able to bring upon them, would presumably have continued as lapsed cases, with grave likelihood of disaster to themselves, to their families, and to the public generally.

Unfortunately in many localities the health department has no real power of enforcement. In St. Louis[1] however, the health department has the actual power to compel these cases to take treatment. Although by law only the clinic number is given to the board of health, the board of health and social

1 Weiss, R. S. and A. H. Conrad, The Medical and Social Care of Syphilis at the Washington University Dispensary, *American Journal of Syphilis*, vol. iv, no. 2, April, 1920, p. 253.

worker coöperate so that all contagious cases sent to the municipal clinic are reported directly by name and address. If these patients do not appear, the board of health notifies the police department which brings them to the clinic.

Many parents are not sufficiently interested to have their children treated and at times all efforts to persuade them fail. St. Louis[1] again meets this difficulty in a rather unusual manner. The court took the stand that parents must give satisfactory evidence that a luetic child was being treated somewhere. An officer of the juvenile court at the suggestion of the hospital worker visited the home saying that unless the child were treated the parents would be brought into court. The bare statement that the child was being treated elsewhere was not considered and the juvenile court took the responsibility of placing the burden of proof on the parents. The parents saw that treatment would be enforced and preferred to acquiesce than to have the nature of the child's disease brought before the court. It is interesting that this method was used in cases in which the Wassermann reaction was the only symptom, as well as in contagious cases. A case is given by the authors in which a young mother refused treatment for an apparently well twenty-seven months' old baby. It was made a court case and the judge forced the mother to continue treatment for the baby in spite of the fact that there were no apparent symptoms.

Oftentimes treatment is refused on account of its cost. The situation still remains unsolved in many states. The question of payment for treatment was formerly acute in Massachusetts when salvarsan was expensive and the clinics had only a small supply for free distribution. At the present time the Massachusetts State Department of Health is manufacturing arsphenamin (salvarsan) for free distribution to authorized clinics. It is thus possible to treat a great many persons either without cost or at a very low rate. The decision on payment for treatment really should rest in the hands of the social worker. She should investigate the financial condition when necessary and should have the privilege of deciding who should pay nothing, who should pay on the instalment plan,

1 Jeans, and Butler, op. cit.

who should be aided by any of the outside agencies, and who should entirely pay for his own treatments.

The treatment of the neurosyphilitic is a difficult question on account of the necessity for steady treatment over a period of years. It is practically true that once a patient, a patient almost for life. Moreover, many of these patients are below the normal in mental capacity and do not understand the situation thoroughly. They must constantly be persuaded of the value of treatment and the oftentimes impatient family must be inculcated with a sympathetic attitude towards the prolonged treatment. Coöperation with outside agencies which have well established relations with the patient often helps to keep him faithful to treatment. An examination of current treatment cases at the Psychopathic Hospital clinic showed that 40 per cent reported regularly without any special reminder other than general urging at the clinic. Thirty per cent needed letters and special clinic interviews. Thus 70 per cent reported regularly, leaving 30 per cent who reported irregularly in spite of letters and interviews. These recalcitrant active treatment cases as well as the cases whose treatment lapsed because they left town, moved, or refused more treatment were studied to see, first, what efforts were actually made by the social worker to avoid the irregularity or the loss to the clinic; and second, what might have been done. All patients were written to, telephoned, or visited. Often relatives were urged to coöperate and at times different visitors were tried on the same case. It was found that arguments often successful with other cases failed in these. The following points were made:

1. The bad effects (physical and mental) of cessation of treatment.
2. The good effects of continuous treatment (a start in life to a child, the possibility of a wife's bearing healthy children, the more rapid ending of the patient's treatment).
3. The death of a relative from the same disease, as a warning.
4. No job was worth giving up treatment.
5. Lack of symptoms not indicative of health. Decision of when cured ought to remain with the doctor.
6. The doctor's and social worker's time was wasted if the patient did not coöperate until the end of treatment.
7. If treatment was discontinued, return to state hospital probable.

Suggestions as to what might have been done in any given case follow:

1. More visits, fewer letters.
2. Home interviews with patient, not messages through relative.
3. Immediate follow-up when a new worker comes.
4. More frequent telling the family of the nature of the disease (in the case of children).
5. Closer contact with the home, relatives, and employer (question of intensive investigation).
6. More rapid follow-up of lapsing cases.
7. Frequent demand for change of address.
8. More frequent and earlier efforts to locate lost cases.
9. Securing transportation for cripples and children.

Difficulty of "Follow-up" of Private Patient.—Here again, as in the family follow-up, the follow-up of the private patient for treatment is a difficult problem.

Case 114. Mr. Farrar was a man of education and large financial success. He was rather a high type of individual. He was sent in consultation by his doctor for skin lesions and mucous patches. A history of syphilis in youth was obtained from him. The lesions were typical and the Wassermann reaction was positive. As usual in such cases, the disappearance of the lesions was almost miraculous under treatment. While under treatment, he stated that his daughter, a girl of 8, had recently had a mastoid operation, and that the bone was not healing well. This preyed upon his mind until finally he told the doctor who did the operation that he had had syphilis and wondered if that had any relation to the difficulty with healing the bone lesion. The aurist was of the opinion that it might, and suggested that the little girl be examined. Mr. Farrar then began to worry that his wife would find out that there was something the matter with the girl, and finally decided that he would not have her examined for syphilis, but took her to another aurist. Finally the bone did heal, and nothing was done about the daughter. Shortly, thereafter, he also discontinued his treatment, although warned by his physician that he was not cured. His family physician, who was also a friend, tells the story that he knew him when he acquired his syphilis. At that time he took a very small amount of treatment from a quack, and refused to receive any other treatment. A couple of years later, he decided to get married. When his family doctor and friend heard of this he went to him and told him that he had no right to marry,

at least until a longer period had elapsed, and he had received more efficient treatment. The physician adds that the patient became quite indignant, and their relations became somewhat strained. The patient proceeded to get married. Everything apparently went well, until the skin and mucous lesions appeared, and the patient went back to his old and true doctor friend who then sent him for proper treatment. Had this situation obtained with a clinic patient, the social service department would have put in a considerable amount of effort and probably would have succeeded in getting the child examined as well as the wife, and there is good reason to believe that the patient would not have been allowed to discontinue treatment when he was not cured.

This case also shows: first, that it is the intelligent as well as the ignorant, who refuse to take the advice of conscientious and efficient physicians; and second, the mental torture that a man may suffer for years.

To do such work and to do it satisfactorily and successfully, an efficient social worker is essential. A mere clinic clerk cannot accomplish all that is required. The social worker must have a good knowledge of case work technique, and an understanding of the problems of syphilis. Above all this, she must be level headed and must be able to handle people and situations with tact and judgment. Especially important is the correct mental attitude towards syphilis. No worker with a trace of the moralistic point of view can be successful in handling either the syphilitic or his family. An impersonal attitude towards the sensational features often present in syphilitic cases is essential. A third requisite is lack of fear of acquiring the disease. No person who is constitutionally timid or apprehensive should attempt to deal with contagious syphilis.

Effects of Syphilis on Social and Mental Life—Atmosphere of the Home.—For a complete understanding of the part played by syphilis in the family one must not only consider its physical effect on patients and their families, and the importance of early diagnosis and continuous treatment, but one must also view the disease from the standpoint of the effect that it has upon the ideas, emotions, and the social life of the individuals concerned. The atmosphere of the family life may be markedly tainted through the ideas that are

engendered concerning the possible effects of syphilis. Late attacks of conscience are extremely frequent, and as a result of the brooding of the man or woman the whole surroundings may become poisoned. Probably there is no disease which is more likely to lead to phobias than is syphilis. Thoughts of infecting the spouse and of transmitting the disease to the children are likely to keep cropping up again and again. Each time a child is ill, the possibility that the disorder is due to syphilis may enter the parent's mind. Many persons become exceedingly morbid just because they know they have the disease. In those cases where the fear has not developed into a form of pathological phobia, a thorough examination of the family or the individual will often be quite sufficient to straighten out the patient's ideas, but when the phobia has become deep-set and harassing, the situation is much more difficult and will usually need a considerable amount of psychotherapy to alleviate it.

Case 115. Alice Shelley came to the hospital after a hysterical attack. She was very much depressed and said, "The doctors say my blood is bad, I have a germ in me, it killed my baby boy, they say the poison is in my blood, they say I got it from my husband." The patient was a girl of 19 and had been married about a year. A few months before coming to the hospital she had been delivered of a stillborn child. When she was six months pregnant she had developed a chancre, followed by a skin eruption, but she received no treatment. Her husband admitted having acquired syphilis one year previous to marriage. He had never been treated and claimed that no physician had told him that he could not marry. The patient had always been perfectly well until acquiring syphilis. There is every reason to suppose that if she had not become syphilitic she would have remained perfectly healthy and would have borne normal children. However, following the birth of a dead child and the psychic trauma which resulted from this and from the recognition of what was wrong with her, she changed from being a happy, easy-going person to one full of fears, doubts and worries. She felt that she was unable to work, and was afraid to leave the house for fear she would collapse. Upon examination it was found that she had a mild involvement of the central nervous system. Her syphilitic symptoms rapidly cleared up under treatment but she continued to suffer with psychasthenic symptoms which stand a good chance of influencing the remainder of her life.

Different Reactions of Different Patients.—It is thus necessary to evaluate the individual equation of each patient. Some patients are more unfavorably influenced by insistence on the severity of the disease and the necessity of prolonged treatment than by the disease itself. Care must be exercised in dealing with sensitive individuals to prevent them from developing the feeling that the situation is entirely hopeless and that they will never be well again.

Case 116. When seen in the clinic, Mrs. Flower was a pathetic picture. Tears were in her eyes every few seconds. Physically, she was quite an attractive woman of twenty-seven years of age, who gave the following story: Some seven years previously, she claims to have been raped. As a result, she developed both gonorrhea and syphilis. She immediately underwent treatment, but apparently developed a salpingitis necessitating operative intervention, since which she had never felt quite comfortable. She had received good antisyphilitic treatment from the time of her secondary symptoms. After a couple of years she married. She did not tell her husband of the condition until after marriage, when she found that it was impossible to keep her secret longer. As far as can be learned from the patient, this caused no marital difficulty. The husband was examined, and showed no evidence of syphilis. However, the patient continued to worry about herself, and after a year or two applied to the clinic for examination as to her own condition. It was found that her Wassermann reaction was positive. She was put under treatment, and in a short time the Wassermann test was negative. However, she was kept under observation and just previous to the visit recorded above, the test had come back weakly positive. This entirely upset her. She was unable to sleep nights, her appetite was poor, she worried about herself and cried a great deal. Her husband at the same time was launching out into new financial endeavors and having some difficulties. She felt that she ought to do some work to assist, but was incapable of it on account of her various worries, pains, and aches. There was no question but that the patient had allowed herself to fall into a neurasthenic condition. As far as the disease itself was concerned, the chief sequel was sterility and this was probably the result of gonorrhea rather than of syphilis. However, the other factor of importance was her poor mental condition. She stated that the greatest blow of all was when the latest test was reported as weakly positive. It would seem that more harm was done the patient in this case by retesting and following her so carefully than would have been

done had she been allowed to continue through life without as adequate medical attention. It is probable that with the amount of treatment already received, no further symptoms would have occurred, and she would have been a much more useful member of society. This is a very difficult condition to discuss. Every individual case has to be considered according to the mental attitude of the patient. Not only was her mental condition an affliction to the patient, but equally so to her husband who not only was deprived of the assistance that he might have received from a well wife, but furthermore, had a wife who was constantly worried, unhappy, and an unpleasant companion.

Effect on Mental Life of Wife and Mother.—The mental life of the wife and mother is especially likely to become affected by syphilis either in herself or in any member of the family. If she herself is syphilitic she runs a chance of repeated accidents to pregnancies, which not only means an unnecessary and fruitless physical strain but may lead to mental depression, and is very likely to produce the unhappiness of childlessness. Her mental condition may be lowered by the keen realization of the meaning of the infection of husband or children even though she be free of worry about herself. She may imagine that one or all of the possible future horrors of syphilis are to descend on her family. The worry about a congenitally syphilitic child may be terrific, and there is nothing more pathetic than the vain hope for improvement of a defective congenital syphilitic. This constant wear and tear is hardly calculated to make a satisfactory home environment.

Case 117. A diagnosis of congenital syphilis was made on Richard Shoemaker when he was a few weeks old and treatment was at once started. He was backward in development both physically and mentally. Despite treatment he did poorly and at the age of 8 became unable to walk and began to deteriorate mentally. At 10 he presented a picture of juvenile paresis. For ten years the mother had been caring for the child whom she knew to be syphilitic. In early years she was hopeful of his mental and physical development and it was not until he was 8 years old that she really lost all hope.

When there is not a complete understanding between the husband and wife or when the situation is not well handled, knowledge of syphilis may lead to estrangement. This is especially true in those cases where a great deal of suffering has been caused by a group of miscarriages or the birth of

frail congenitally syphilitic children. The trouble likely to result from a knowledge of syphilis can be very much minimized when the matter is told in a careful and scientific manner. When the knowledge is accidental, difficulties are more prone to arise from the many prejudices that are commonly held by laymen to-day.

Nursing Care as Disturbance to Family Life.—The actual physical care demanded by the members of a syphilitic family may cause a disturbance in the normal routine of family life. One syphilitic child may be such a burden that the other children suffer in care and attention. Constant visits for the treatment of a congenital syphilitic may mean that other children in the family are neglected. This becomes an important matter in poor families. The problem of the care of a congenital syphilitic is not limited to early childhood. It may extend from the days of adolescence to manhood. Interstitial keratitis, effusions of the knee, and other acute manifestations may necessitate a great deal of care. Feeble-mindedness, blindness, deafness, and the like may make children dependent for all time upon their parents and relatives. A paralyzed or bedridden man, a tabetic who not only cannot go about without assistance but who may suffer untold pain, an irritable or unreasonable paretic, add materially to the nervous tension in a family as well as increase the burden of care.

Effect of Financial Difficulties on Home Life—Temporary Incapacitation.—The financial situation of the family may be seriously affected by syphilis. Temporary incapacitation of the wage earner in the early stages of syphilis leads to financial loss in families of border-line economic status. Contagious patients rarely take time from work for hospital care, but ideally, hospitalization should be insisted on both for the rapid cure of the patient and his sterilization as a focus of infection. If it is carried out there is a chance that employers might object and discharge the employee. Miss Lewis[1]

[1] Lewis, O. M., et al., A Clinic Studies Itself, *Hospital Social Service*, vol. iii, no. 1, Jan., 1921, p. 75.

cites the case of a girl who lost her job after hospitalization. The store doctor was willing to accept her as noncontagious, but the employment manager felt that anyone with a diagnosis of syphilis was socially a danger. The girl happened to have an extragenital, innocent infection.

Industrial Decline.—The patient who has been temporarily absent from a job soon returns after treatment. Whether he is to have later financial loss depends on the adequacy of his treatment and his individual reaction to the disease. If the disease is uncured, it will probably appear again in later life in a more incapacitating form. Industrial decline is often a concomitant to a long-standing syphilis.

Case 118. A striking example of industrial decline is that of Theodore Clarke. From a mining engineer who earned $300 per month and maintenance, he became a beggar who secured his subsistence from garbage cans. The entire cause of his decline in economic ability was a poorly treated syphilis the effects of which became manifest ten years after the disease was acquired.

Case 119. George Powers had acquired syphilis five years previously. His work record for these five years showed that he was a plumber by trade, earning a good wage, and considered an efficient workman by all his employers. Four years after his infection, however, symptoms of nervous system syphilis appeared. The quality of his work markedly declined. Instead of high-grade mechanical work, he did odd laboring jobs and finally no work at all.

Permanent Incapacitation.—Late manifestations of the disease may entirely handicap the bread winner. Many a man who is incapacitated in the prime of his life by cardiovascular disease, by cirrhosis of the liver, by tabes, or by general paresis, becomes incapable of self-support and a serious drag upon his family. The expenses incidental to care may entirely ruin the family. The savings of many years may be used up and the family left destitute. Unless the family is well-to-do, someone—children, relatives, private or public charities—must aid in the care of the family.

Case 120. Ernest Bloomfield was a tabetic of 42 who suffered severe pains. He was subject to gastric crises, attacks which made regular

employment impossible, and reduced him to a state of irritability which made the family life extremely unpleasant. He was unable to ply his trade, that of a baker, and held odd jobs when he felt well enough. The family's support was the son-in-law's wage supplemented by charitable aid.

Case 121. James Pratt had always been a hard-working artisan, thoroughly competent and able to keep himself and family in fair circumstances in addition to putting aside a little money. When shortly past 50 he began to be bothered with shortness of breath to such an extent that he had to give up work. Examination showed that he had a very much enlarged heart with aortic insufficiency. This was of syphilitic etiology. Under antisyphilitic treatment and cardiac stimulants, the patient was kept quite comfortable but was unable to return to his work. At the end of some months he came to the clinic much distressed, saying that he had used up practically all of his savings, that he no longer had funds on which to live, and that he would have to go to work to support himself and his family. It was obvious, however, that his condition was such that he could not take up any arduous occupation and he was practically incapacitated as a money earner. The solution of the problem lay between depending upon the work of the wife and charity of the relatives, or residence in a public institution for the chronically ill.

Financial Difficulties of Paretics.—Probably no one of the late manifestations of syphilis causes more varied financial difficulties than general paresis, which is the most frequent mental disorder due to syphilis and which is the late manifestation of between 2 and 3 per cent of all patients infected with syphilis. The general paretic, particularly in the early stages of his disorder, is likely to commit many indiscretions of conduct. The grandiose paretic is apt to contract many debts which he is incapable of meeting or which may tax his competency, large or small, to the limit. His family or relatives may then have to struggle to make good his promises and may be left destitute.

Case 122. Edward Smith was a traveling salesman in the late twenties. He was married and had just established a good home. He was making a fair salary and had managed to save a few hundred dollars. At this time mental symptoms of general paresis made their appearance and Mr. Smith became quite convinced that he was very

wealthy. He began to live as though his dreams were reality and in a couple of weeks he had not only spent all the money that he had accumulated in the course of years, but had acquired a number of debts which he was unable to meet, and by the time he was placed in a hospital his wife was left penniless.

The actions of a paretic may be such as to lead to much embarrassment or even disgrace to the family. A hitherto respected member of the community may begin to drink and carouse and acquire anything but an honorable name. A man who has always been noted for his honesty may start pilfering and become entangled in the meshes of the law.

Case 123. Laurence Gardina was arrested by the detective of the firm where he had worked for many years. He was accused of breaking windows in the store and appropriating money. It seemed that when customers paid for their purchases he had the checks made out to him instead of to the company, and deposited a hundred dollar check to his own account. He also made mistakes in his work, sending orders to wrong addresses and selling food at too low a price. After his arrest he was sent to jail, where it was found that he had mental trouble. The hospital diagnosis was a typical case of general paresis.

Poor judgment is one of the very early symptoms of general paresis. It may show itself in a great variety of ways. The personal and family life may disclose this factor or it may be particularly evident in business affairs, where lack of acumen brings disaster not only upon the sufferer but upon his family and business associates.

Case 124. Thomas Walpole had never been a very prosperous man, but had supported his wife and been engaged in various moderately successful business deals. About 15 years previous to admission to the hospital he went into the real estate business which consisted largely of leasing and selling hotel property. He was particularly interested during the last few years in exploiting a beach hotel. He spent all his time in rebuilding the hotel and getting it ready to start business. The hotel had been open only a few weeks when it burned down. No insurance had been placed on the hotel and a fairly large amount of money was lost. After this, the patient was not able to reëstablish himself in the real estate business. He was badly discouraged and worried about his property.

His wife at the time when the patient's business started to decline, supported the family by doing decorating for undertakers. When the patient entered the hospital with a diagnosis of syphilis, she was the main support of the household. After several months as an out-patient, Mr. Walpole was committed to a state hospital leaving his wife to support herself.

Broken Home.—Closely bound up with the financial situation is the problem of the broken home. Only too often the incapacity of the wage earner or his mate leads to a dissolution of family life. The most unfortunate aspect is that this result of syphilis is no respecter of good homes or bad homes, happy marriages or unhappy marriages.

The early death of a wife or husband may lead to the ruin of the home. Again paresis, one of the most virulent of the forms of late syphilis, is a frequent cause of early death. Its morbidity and mortality rate are almost equal. Dr. Salmon[1] has shown that one in nine of the 6909 men and one in thirty of the 5099 women who died between the ages of 40 and 60 in New York in 1913 died from general paresis. These men and women in the best years of their lives drop out as providers and also as active influences in the family for home or character building.

An only too common occurrence is that the wife must carry the burden of supporting the home after the husband's death. Of interest here is the fact that life insurance companies to-day refuse to insure a known syphilitic on the ground that he is a poor risk and likely to die early. It is to be noted that the records of the Gotha Life Insurance Company, England,[2] show that the mortality among syphilitics between the ages of 36 and 50 is well-nigh double the average rate, and other insurance records show the mortality at all ages to be at present about 30 per cent in excess of the average. Because of this, the families need even more protection. In many states, as in Massachusetts, there is public provision for aid to women who are widowed or whose husbands are public

1 Salmon, T. W., General Paralysis as a Public Health Problem, *Proceedings* of the American Medico-Psychological Association, 70th Annual Meeting, Baltimore, Md., May 26-29, 1914, p. 180.

2 Harmon, op. cit., p. 155.

charges, yet there are many cases in which a woman prefers to work and support her children in a home of her own choosing. Sometimes she boards them with relatives, other times she sends them to a school. The point is that because of her work she cannot keep them at home.

A state hospital commitment, especially of a woman, often means the breaking up of a home. This again occurs in the prime of life, when both parents are especially needed. An examination of the ages of the first admissions of 755 paretics at the Psychopathic Hospital showed that the largest percentage, 40 per cent of the total number, occurred between the ages of 31 and 40.

Case 125. Giuseppe Frascati infected his wife. Six years afterwards she developed neurosyphilis which rendered her ineffective both as a housekeeper and homemaker. She was committed to a state hospital with the result that her husband who was unable to supervise his child of 9 in the home, placed him out through the agency of a children's society.

Case 126. Luigi Sylvestri entered the out-patient department of the Massachusetts General Hospital when he was 41 years of age. He had been a concrete construction worker for a number of years but of late had been unable to do his work because of shortness of breath and pain in his chest. Examination disclosed the fact that he had a cardiac aneurysm and aortic insufficiency. His general condition resulting from these disorders was such that it was quite impossible for him to do any work whatever and it was not even good for him to be up and about. A very frequent cause of a condition such as the patient had is syphilis, and this proved to be so in his case. The patient was married and had three children aged five, three, and two years respectively. Examination disclosed that all were infected with syphilis, and it became necessary for the entire family to undergo treatment. The patient, being a laborer and out of work, had no funds on which to keep the family. It became necessary therefore, to apply to Mothers' Aid for financial assistance but the amount allowed by the State for such purposes was insufficient to keep the family and offer bed care to the patient so that hospitalization became necessary for him. As such hospitalization meant a state institution and separation from his family the patient objected. An attempt was made to supply extra funds from other charities in order to keep the family together and give the patient the care which was needed. This was

only a temporary makeshift, however, and the final solution had to be hospitalization for the patient, breaking up of the family unit, and charitable aid to the family.

Statistical Studies of Social Difficulties in Patients with Syphilitic Mental Disease.—We recently reviewed 32 cases of syphilitic mental disease worked on intensively by the social service of the Psychopathic Hospital, with the aim of finding out which of these social difficulties were paramount in cases of syphilis of the nervous system requiring social care. Half of the married cases had some kind of family or marital difficulty varying from assault, threats, and jealous suspicions to definite estrangement, desertion, and non-support. Fifty per cent of these disorders affected the mate only and might be summed up under various degrees of marital discord. In the other 50 per cent the family unit was broken by desertion of wife, separation or estrangement from wife or children or both.

The economic difficulties of the late syphilitic might well account for these discords in familial life. A decline in industrial capacity arising from a chronic inefficiency was manifest in some cases studied, others were temporarily incapacitated. On the one hand, these disorders led to inability to support a family; on the other, to employment difficulties. Thus, we found dependence on wife, relatives, and charity for support due to insufficient or lack of any income and a growing number of debts. Considered statistically, we found that in the 32 cases, 23 failed to adjust themselves to a competitive industrial world.

Recognizing the special frequency with which these economic difficulties arise in the families in which the bread-winner develops paresis, a more intensive study was made of the economic status of 41 married male paretics, the details of which are published elsewhere.[1] The conclusions, however, may be considered here. It was found that in a normal self-supporting group of families, the entrance of paresis produces the following effects:

1 Solomon, H. C. and M. H. A Study of the Economic Status of Forty-One Paretic Patients and Their Families, *Mental Hygiene*, vol. v, no. 3, July, 1921, pp. 556-565.

1. Over one half of the patients were receiving normal salaries at the time of admission to a state hospital.

2. Two thirds, however, showed a decline in working capacity.

3. The duration of this decline varied from one month to two years.

4. In spite of this decline most of the patients were not discharged, especially by firms with whom they had worked for years.

5. About one half were irregular at work or changed jobs frequently but only a few changed to less skilled labor.

6. About one half gave a medical cause for finally leaving work while one half gave an industrial cause.

7. Very few were out of work for a long time before admission.

8. Although the wages were not markedly decreased nor the patient out of work for a long time before admission, the eating up of savings followed by the sudden cutting off of the income shows that almost one half of the wives went to work because of the patients' illness, three fourths of them working outside the home.

9. Of 39 children whose mothers worked outside the home, 30 were under 14 and had to be cared for by other relatives.

10. There was no increase in the number of children working, though some children already working had to assume heavier burdens than normally.

11. Only a few families were forced to place out children.

12. Two thirds of the families received permanent aid because of the commitment of the patient. This aid was from public and private agencies and relatives.

13. At the time of the investigation, three fourths of the families had less income than when the patient left work.

Syphilis and Marriage.—In view of the effect of syphilis on the physical, mental, and social life of the family, further consideration of a syphilitic's right to marry is important. The question is one that has produced much difference of opinion. For those who believe that syphilis is always an incurable disease, and that the offspring of any individual who has had syphilis are likely to be tainted, it follows, of course, that a syphilitic can never marry. Although there are a number of syphilologists who hold this point of view, we agree with the majority, who feel that under certain circumstances a syphilitic may marry with safety to his mate and children. The point to decide is when a syphilitic is no longer contagious.

Opinions of Various Authorities as to Marriage of a Syphilitic.—The discovery of the Wassermann reaction in 1906 and the introduction of arsphenamin treatment in 1909 have modified the ideas of many regarding the question of marriage, so that one must consider the opinions antedating and succeeding these diagnostic and therapeutic discoveries. Dr. Edward B. Vedder[1] has quoted Finger's conclusions, which were written in 1896 and which may be taken as representative of late nineteenth century German opinion:

1. While untreated syphilis may lose its contagiousness and power of hereditary transmission, yet in numerous cases these powers may be retained for years.
2. Systemic treatment shortens the contagious period so that at the end of four or five years the danger to the 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 14 or 15 years, or even longer.
4. It follows, therefore, that no definite rule can be deduced that will always be satisfactory.

The minimal conditions for marriage as outlined by Finger are given 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 the wife and children, and afford prompt treatment should it become necessary.

1 Vedder, op. cit., p. 206.

French opinion of this period is best represented by Fournier,[1] who formulated the rules which have influenced the entire world:

1. Absence of actual specific lesions.
2. Advanced age of the infection.
3. Certain period of absolute immunity following the last specific manifestations.
4. Non-menacing character of the disease.
5. Sufficient specific treatment.

Pusey[2] gives the following views as among the representative opinions at the beginning of the twentieth century:

> Taylor: If the treatment is thorough, marriage is safe for a syphilitic man two and a half years after infection.
>
> Keyes: If during the last two years there has been no treatment and no symptoms, marriage is safe after five years.
>
> Morrow: If the treatment has been sufficient, if the patient has been without symptoms for 18 months, and if four years have elapsed since the infection, marriage is safe.

Pusey quotes Gennerich and Hoffman as representative of present-day conservative opinions. Gennerich believes marriage may be permitted after two years of vigorous treatment if the Wassermann reaction is negative and there have been no relapses. Hoffman believes in the old rule that if a patient has had good treatment and has been symptom-free for two years he may safely marry three to five years after infection.

Dr. Vedder[3] gives a modified form of Finger's views as his opinion:

1. A mild 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.

1 Fournier, op. cit., p. 91.

2 Pusey, W. A. *Syphilis as a Modern Problem*, Chicago, American Medical Association, 1915, p. 99.

3 Vedder, op. cit., p. 209.

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.

Browning and Watson[1] feel that marriage should not take place until after two years of vigorous treatment, and then only if there are no lesions six months after the end of treatment. If the Wassermann reaction is positive after the two years, more treatment must be given. Marriage can then take place even if the Wassermann reaction is still positive, but both husband and wife should be treated.

Typical of modern French opinion is the report of a 1920 commission appointed to study the question of the marriage of syphilitics.[2] The conclusion was that if the patient were seen and treated before the reaction became positive or before he manifested any secondary reactions and he remained free from positive serology and secondary manifestations during the first year, it was safe for him to marry at the end of two years. On the other hand, if he were seen after the serological reaction became positive or he showed secondary symptoms, intensive treatment was necessary for two years, but if at the end of that time all the tests were negative it would be safe for him to marry, two years having passed since his infection. If, in the latter case, the serological reaction remained positive it was considered safe for the patient to marry if he were a man and if his spinal fluid were normal. On the other hand, if in spite of treatment the spinal fluid were positive, the physician was urged to exercise great care in advising marriage. Marriage was considered safe if, after treatment, the spinal fluid became negative and remained so for several years. Obvious signs of nervous system syphilis were considered a definite bar to marriage and physicians were

1 Browning, C. H. and D. Watson. *Venereal Diseases; a Practical Handbook for Students.* With an introduction by Sir John Bland-Sutton. New York, Oxford University Press, 1919, p. 120.

2 Report of a Commission for the Study of the Question of the Marriage of Syphilitics. *Bulletin* Société française de dermatologie et de syphilologie, 1920, p. 233, translated in *Venereal Diseases,* by Ormsby and Mitchell, Practical Medicine Series, Chicago, vol. vii, 1920, p. 169.

warned to be careful about advising marriage if the patient was an old syphilitic who could not give a good account of the date of infection or the amount of treatment.

Stokes[1] believes that contagious patients should be governed by the Hoffman five-year rule, which is almost "identical with the standard of cure in the fully developed case of secondary syphilis." He does not feel that conservative syphilologists should shorten the period because of modern treatment by salvarsan.

Pusey[2] points out that the time when it is safe for a man to marry without danger of infecting his wife, and hence his children, depends on the duration and frequency of the relapses in secondary syphilis. He considers tertiary syphilis practically noncontagious. In cases which are poorly treated or not treated at all relapses are more frequent. He quotes Sperk, who in 1518 cases of secondary syphilis among prostitutes found relapses in all but 10. Lewin, in 6000 cases treated with sublimate injections, found 40 to 45 per cent relapses; Linden, in cases treated with calomel injections, had relapses in 30 per cent of his cases. Gennerich, in treating army men with mercury and salvarsan, reduced the number of relapses to 5 per cent. Thus, the matter of relapses seems to depend on adequate, early treatment. Pusey thinks that contagious lesions are rarely found after three years, and almost never after five. Fournier[3] observed 643 late secondaries in 19,000 cases.

Statistics[4] have been compiled showing the duration of the secondary period. In 1000 cases from Tarnowski's clinic observed for ten years, the last 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; and within the fourth five years in 5 persons. Thus the older the infection, the less frequent are secondary lesions.

1 Stokes, J. H. *To-day's World Problem in Disease Prevention*, Washington, D. C., United States Public Health Service, Treasury Department, p. 98.

2 Pusey, op. cit., p. 95.

3 Fournier, A. La Syphilis des Honnêtes Femmes, extrait du *Bulletin* de l'Académie de médecine, Séances du 2 et du 9 Oct. 1906.

4 Tschistjakow, Die Condylomatöse Periode der Syphilis, *Inaugural Dissertation*, St. Petersburg, 1894, quoted by Vedder, p. 113.

The final word from America to date is given in the conclusions of the All-America Conference on Venereal Diseases, December, 1920:[1]

> *Resolved*, That with reference to the eligibility for marriage of the individual who has or has had syphilis the following medical considerations apply:
>
> 1. The eligibility for marriage of the person who has or has had syphilis depends in the main upon the possibility of his transmitting the disease.
>
> 2. The impossibility of absolutely determining by arbitrary rule the limits of infectivity in all cases has been admitted.
>
> 3. The problem may be more difficult of solution in women than in men, owing to the paucity of clinical and laboratory evidence of the disease in the former.
>
> 4. The clinical experience of many years has justified, as reasonably safe, the following fundamental requirements:
>
> (a) Three years of effective treatment.
>
> (b) Two additional years of freedom from all signs and symptoms of the disease, under medical observation.
>
> 5. It is recognized that special types of cases may call for special interpretation, which, however, in all cases should be founded on the basic principles of effective treatment and prolonged painstaking observation for signs of recurrent or active syphilis.
>
> 6. In view of the inevitable element of uncertainty, however small, the prospective marital partner of a person who has or has had syphilis should be informed before marriage of the status of the case.
>
> 7. Medical examination to establish the presence or absence of syphilis before marriage should include not merely a blood Wassermann test but an examination, clinical and serologic, of the entire body. If evidence of a previous or probable syphilitic infection presents, such examination should be especially searching, may include a period of observation, and should be interpreted by an expert.

It is evident that all these opinions allow a great latitude in the interpretation of the term "noncontagious." It is also clear that the time element is brought in as a more important

1 Resolutions of All-America Conference on Venereal Diseases, *Public Health Reports*, vol. 36, no. 28, July 15, 1921, p. 1063.

factor than a negative Wassermann reaction. There are many cases which, despite the most intensive treatment, continue to have positive Wassermann reactions in the blood. Despite this fact, many of these patients may be considered as probably noncontagious, and from that standpoint, fair risks for marriage. Unfortunately, many lawmakers feel that a negative Wassermann reaction is the most important point in an examination for syphilis. Besides the difference which personal interpretation and technique make in evaluating any Wassermann reaction, there is the danger that satisfaction with a negative Wassermann reaction will mean that some early cases of syphilis as well as some cases of neurosyphilis will escape the doctor's notice.

Case 127. What may result from relying on a negative Wassermann reaction is shown by the case of Max Goldstein. As the husband of a general paretic he was examined and found to have an early neurosyphilis for which he underwent treatment. He was anxious to remarry shortly after the death of his wife. He was urged against this by the hospital physicians on the ground that he was a poor risk for marriage. He had had a great many positive Wassermann reactions as well as some negative Wassermanns. In view of his desire to marry he went to a physician who sent a sample of his blood to a laboratory for a Wassermann test which was reported negative. On this ground he felt justified in marrying and refused to return to the clinic for treatment. The Wassermann test on the blood was of absolutely no value in this case as the patient was a neurosyphilitic. Although there was no danger of familial infection the patient was a poor economic risk.

Legislation Regarding Syphilis and Marriage.—In recent years there has been considerable advance in legislation in the United States regarding syphilis and marriage, due, no doubt, to the increased publicity given to the question. These laws are interesting: first, from the point of view of syphilis as a bar to marriage, and second, as the means of making the marriages void. The following 17 states have provisions relating to venereal disease as a bar to marriage:[1]

1 Office of the Surgeon General, Division of Venereal Diseases.

Alabama	North Carolina	Vermont
Indiana	North Dakota	Virginia
Maine	Oklahoma	Washington
Michigan	Oregon	Wisconsin
New Jersey	Pennsylvania	Wyoming
New York	Utah	

The general aim of the laws is to prevent the marriage of infected persons. How this purpose is carried out can best be shown by an examination of some of the laws. Some states merely prohibit the marriage of persons who know they have a venereal disease. For instance, Michigan forbids the marriage of a person with a venereal disease, but does not offer any provisions for enforcement or penalties for disregarding the law.

In other states nothing further is demanded than a statement from both applicants under oath that they are free from a venereal disease or that they have no transmissible, uncured, or contagious disease. For example:

> The New York law makes it the duty of the town or city clerk, before issuing a marriage license, to secure a statement from each of the parties to the marriage in the following words: "I have not to my knowledge been infected with any venereal disease, or if I have been so infected within five years I have had a laboratory test within that period which shows that I am now free from infection from any such disease."[1]

In Pennsylvania one need only state that one is free from any "communicable" disease, while in Washington this is only required for the male applicant.[2]

Alabama, North Dakota, Wisconsin, and Oregon provide for a medical certificate. Alabama's law of 1919 reads:

> No license may be issued to a person who fails to present to the issuer a certificate by a licensed physician setting forth freedom from venereal diseases so nearly as can be determined by a thorough examination and by the application of the recognized clinical and laboratory tests of scientific research, when in the discretion of the examin-

1 Venereal Disease Legislation, *Public Health Reports*, Jan. 18, 1918.

2 Social Hygiene Legislation Manual, 1921, Publication 312, American Social Hygiene Association.

ing physician such clinical and laboratory tests are necessary. All males within 15 days prior to application for a license shall be examined. No marriage shall be entered into in any manner whatsoever without the male party shall have first submitted to the ante-nuptial examination referred to . . . and having with him a certificate from such physician of his freedom from such diseases.[1]

Wisconsin's statute of 1917 reads:

. . . within 15 days prior to the application all male applicants must be examined for venereal disease by a physician licensed to practice in Wisconsin or in the state in which the applicant resides, and must file with the clerk the physician's certificate showing that the applicant is free from such disease. Any person who has been afflicted with gonorrhea or syphilis must file a certificate from the designated state laboratory showing that such person has been examined and is not in a communicable stage of the disease.

Although a licensed physician must state that every applicant is free from venereal disease, there is, unfortunately, no mechanism provided to avoid the certificate of the ignorant doctor who is satisfied with a negative Wassermann reaction as evidence of freedom from syphilis. Nor when there is a suspicion of syphilis is there any means of securing a thorough medical examination consisting of a history of the patient and family, thorough physical examination, repeated blood tests, and examination of the spinal fluid.

Indiana, Maine, Michigan, New Jersey, Vermont, and Oklahoma go further. It is a misdemeanor (in the case of Oklahoma, a felony) for persons with a venereal disease to marry, while in Maine it is a misdemeanor for persons with syphilis to marry. The New Jersey law, March 14, 1917, reads:

1. Any person, who knowing himself or herself to be infected with a venereal disease, such as chancroid, gonorrhea, syphilis, or any of the varieties or stages of such diseases has sexual intercourse, shall be guilty of a misdemeanor.

1 Hall, F. S. and E. W. Brooke, *American Marriage Laws in Their Social Aspects,* New York, Russell Sage Foundation, 1919.

An interesting point here is that "any variety or stage" is considered in the law, irrespective of whether it is contagious or not. This is an example of how an otherwise good law can go too far by being too inclusive. The law might be used to include noncontagious, symptom-free, latent syphilis which "varieties" are not dangerous through intercourse.

Provision is often made for penalties if the marriage is consummated in spite of the existence of the contagion. Thus Oklahoma, in senate bill No. 43, Section 3, demands:

> . . . any person who shall, after becoming an infected person and before being discharged and pronounced cured by a reputable physician in writing, marry any other person, or expose any other person by the act of copulation or sexual intercourse to such venereal disease or to liability to contract the same, shall be guilty of a felony and upon conviction shall be punished by confinement in the penitentiary for not less than one year or not more than five years.

Michigan, Vermont, and Maine laws apply this to syphilis specifically. Michigan's penalty in 1915 reads:

> Marriage by a person with syphilis or gonorrhea is deemed a felony and is punishable by a fine of from $500 to $1000, or imprisonment for not more than five years, or both, and it is provided that in such prosecution, the husband or wife may be examined as witness against each other, whether they consent or not, and that any physician who attended the defendant shall be compelled to testify.[1]

Vermont, 1915, provides:

> A person who, having been told by a physician that he or she was infected with gonorrhea or syphilis, marries, without assurance and certification from a legally qualified practitioner of medicine and surgery that he or she is free from gonorrhea or syphilis, shall be fined not more than $500 or imprisoned not more than two years.[1]

Maine passed in 1919 an act relating to the marriage of persons having syphilis:

> Sec. 1. No person having syphilis shall marry until he has a certificate from the attending physician or physicians that he is cured

1 Hall and Brooke, loc. cit.

of syphilis. The state board of health is hereby empowered to make regulations prescribing the methods to be employed in diagnosticating said disease.

Sec. 2. Every physician shall keep a record of all cases of syphilis that come under his observation and care, and shall use reasonable means to ascertain the intentions of syphilitic patients as to marriage. The physician shall warn said patient of the legal, moral, and physical evils of marriage contracted by them. If the physician learns that a patient as aforesaid has filed intentions of marriage as required by law, or if the physician believes that the patient as aforesaid intends to marry, the physician shall notify the local board of health or the health officer in the town or city in which the patient resides, who are hereby empowered to notify the other party to the intended marriage.

Sec. 3. Any person failing to comply with the provisions of sections one and two and any physician making a certificate as aforesaid falsely shall be punished by imprisonment for not less than three months nor more than one year or by a fine of not more than five hundred dollars or less than two hundred dollars, or both. Municipal and police courts and trial justices shall have jurisdiction of the above concurrently with superior and supreme judicial courts. . . .

The following states make the marriage of persons with venereal disease void:[1]

Connecticut	Maine	Rhode Island
District of Columbia	Massachusetts	South Carolina
Georgia	Michigan	Utah
Illinois	Minnesota	West Virginia
Kentucky	Nebraska	

Other states have recently passed statutes making venereal disease a ground for annulment as for instance, Indiana, North Dakota, Pennsylvania, and Washington.

States which do not have specific laws have recently annulled marriages, granted separations or specific damages, on other grounds.

The marriage of a syphilitic has been annulled recently in the United States on the basis of fraud. In a recent Kansas case, the wife discovered the day after marriage that her husband was syphilitic. She was unable to obtain a divorce for a year but the marriage was annulled on the ground that the

1 Social Hygiene Legislation Manual, loc. cit.

husband was not physically fit to enter into marriage relations and that the marriage was fraudulent.[1]

The case is also cited where a separation was granted on the ground of cruel treatment. In this case the wife acquired gonorrhea and syphilis from her husband. (Louisiana, 1912.)

In a New Jersey case, 1914, the admission of a defendant in a divorce proceeding to members of his family that he had given his wife the disease if sustained by corroborating circumstances was sufficient ground for granting the decree.

> The Supreme Court of North Carolina,[2] recently affirmed . . . a judgment in favor of a wife who asked for actual and punitive damages because . . . her husband contracted a venereal disease and "took advantage of his marital relation with said plaintiff and infected her with said vile and loathsome disease." . . . The jury assessed the plaintiff's damages at $10,000. . . . It was held that no principle of justice can maintain . . . that a debauchee can marry a virtuous girl . . . keep up his intercourse with lewd women, contract . . . venereal disease, communicate it to his wife . . . and ruin her physically for life . . . yet be exempted from all liability by the assertion that he and his wife are one, and that he being that one, he owes no duty to her of making reparation to her for the gross wrong that he has done her.

The value of these laws might be questioned as they do not entirely cover the ground in content or means of carrying them out. Their fallacies have been pointed out by a recent survey of some "eugenic" marriage laws.[3] Here the Wisconsin law is taken as an example of the most effective modern legislative effort. The writer believes that although the direct effect of the law has been wholesome its value is mostly moral and educational. The weaknesses in the practice of the law are given as follows:

1 *Mimeogram*, Aug., 1920, U. S. Interdepartmental Social Hygiene Board, pp. 7-9.

2 *Journal* of the American Medical Association, vol. 76, no. 4, Jan. 22, 1921, p. 265.

3 Roloff, B. C., The "Eugenic" Marriage Laws of Wisconsin, Michigan, and Indiana, *Social Hygiene*, vol. vi, no. 2, April, 1920, pp. 230-238.

1. The tendency, which thus far has not been successfully checked, of couples who desire to evade the provisions of the Wisconsin law, to be married in neighboring states. These states either have no "evasion" act to prevent this practice (e. g., Michigan) or their officials, reaping a harvest of fees by reason of the exodus, wink at the evasion (e. g., Illinois).

2. The failure to include in the "eugenic" section the requirement that a medical certificate shall be furnished by the female as well as the male.

3. The likelihood that the present simple requirement of an examination by a licensed physician is in no wise a guarantee that the applicant is free from venereal disease, a fact admitted by leading physicians within and without the state.

4. The ease with which (owing to the 15 days' grace between the application for a license and the 30 days' grace between the issuance of the license and the solemnization of the marriage) the purpose of the act may be avoided by the young man who goes out for "one last celebration" before the wedding, and acquires syphilis or gonorrhea subsequent to the medical examination.

The following suggestions have been made as a method of improving these laws:

1. The adoption and enforcement by all states concerned of the standard "Marriage Evasion Act" recommended by the Conference of Commissioners on Uniform State Laws. Illinois and Wisconsin already have substantially this act. But . . . there is a difference of opinion among legal authorities in Wisconsin, and definite decision and interpretation are needed to validate the law. Michigan needs such a law. And a strict holding to account of the officials of these states by the local district or prosecuting attorneys is essential.

2. A "eugenic" certificate should be required of the female as well as the male. The difficulty of developing the details of such a provision is admitted, as well as the need to guard against its abuse. That such examination for women should be performed by women physicians is believed by many to be essential to the success of such an act.

3. The difficulties in the way of obtaining a reliable cure for women afflicted with gonorrhea are well known to medical men. Although the refinement of laboratory tests for syphilis and gonorrhea is by no means complete, yet in the hands of experts

they are the best available means of diagnosis, and without them the whole issue remains vague and uncertain. Laboratory tests were originally part of the Wisconsin law, but the requirement was repealed because of the apparent hardship to applicants. I cannot help but voice the opinion that laboratory tests should be restored as part of the examination.

4. The obvious remedy for the situation outlined in paragraph 4 under defects would be to require the examination to take place within a shorter time previous to the solemnization of the marriage—say five days. This would not solve the problem entirely, but would at least serve to reduce the number of premarital infections.

In spite of the inadequacy of even the best laws it would seem that the efforts of all individual states must be of value. Just as prohibition and woman suffrage became national amendments, due partially to the local interest in wet and dry states and in suffrage and anti-suffrage states, so it is possible that these unrelated so-called "eugenic" marriage laws may lead to uniform national laws.

Importance of Physician's Influence Regarding Marrying of Syphilitics.—In considering the law as a means of preventing family infection one cannot ignore the important personal influence of the physician upon the whole situation. A man or woman who has had syphilis deserves a thorough examination by a competent physician before marriage. It is the duty of the family physician to make such an examination himself or if there is any question of the diagnosis to send the patient to a syphilologist for final decision.

It is not only essential for the physician to establish the degree of safety with which a patient can marry but if the patient insists on marriage and there is any danger the physician should inform the other party. Here again the oath of Hippocrates is often invoked. It seems clear to us, however, that the physician has a greater duty to the community—represented by the future mate and children—than he has to the individual. A warning of future possibilities is the due of every person who is to marry a syphilitic as well as of every syphilitic who intends to marry a non-syphilitic per-

son. Not only generalities but definite points must be brought out, such as: the danger of moist and open lesions; the possible infection of the fetus by the wife even though she is without obvious lesions; the fact that symptom-free does not mean disease-free; the necessity of long and regular treatment, and the chances of involvement of the visceral, vascular, and nervous systems and of resulting incapacity.

Case 128. The social complication appeared in this case when we received a letter from Mark Cochrane's fiancée, asking us what was the matter with him and whether she could marry him. She said that he told her he had a "nervous breakdown." The patient, a young man of 28, had had a chancre six years previous. Although he had been treated and had been under care for a year, he had developed an early paresis with considerable mental deterioration. He could marry without danger of infecting his wife, but he could in no way make an adequate husband. He had not been earning a living for over a year, and could not support a family. He needed oversight on account of his spells of unconsciousness and would undoubtedly deteriorate more and more during the next few years. We felt entirely justified, after urging the patient to tell his fiancée the truth, in going over the situation thoroughly with her, so that she might have all the facts on which to base a judgment.

Legal Attitude Towards Physicians and Medical Secrecy.— An indication that the legal attitude towards physicians is changing, is given in the above marriage laws which demand a health certificate. The implication of such laws is that the doctor, by refusing to sign a certificate, discloses syphilis and stops the marriage. However, most of the existing laws as to libel and professional confidence do not give much freedom to the physician. Wigmore[1] says "protection is not extended to medical persons in regard to information which they have acquired confidentially by attending in their professional character." Wigmore, however, does not believe that medical testimony should be a privileged communication as it is too important and decisive. More and more in recent years jurisdictions have revoked this privilege. For example,

1 Wigmore, J. H., *Treatise on the Law of Evidence*, by Simon Greenleaf, revised by J. H. Wigmore, Boston, Wile and Brown, 1899.

Ohio[1] in 1915 made a certain provision for physicians to expose facts to interested persons.

Section 1275. The State Medical Board may refuse to grant a certificate to a person guilty of . . . grossly unprofessional or dishonest conduct. . . . The words "grossly unprofessional or dishonest conduct" as used in this section are hereby declared to mean:

. . . . . .

Second, The willful betrayal of a professional secret. But a physician, knowing that one of the parties to a contemplated marriage has a venereal disease, and so informing the other party to such contemplated marriage, or the parent, brother, or guardian of such other party, shall not be held to answer for betrayal of a professional secret, nor shall such physician be liable in damages for truthfully giving such information to such other party, or the parent, brother, or guardian of such other party.

Other state laws support this position even more positively:

The Maine act requires physicians, under penalty, to notify the local health officer if an infected patient intends to marry, and the health officer is empowered to notify the other party. In the public interest the physician is not only permitted to disregard what had hitherto been considered a professional secret, but it is made his duty to do so.[2]

The English situation has been summed up by the Royal Commission on Venereal Diseases:[3]

The difficulty of communicating with or warning the future bride, or her parents or other persons in a position to influence her action, is twofold. We are informed by many witnesses that it might be regarded as a breach of professional confidence. There is also the possibility of the medical practitioner being sued or prosecuted. There is no doubt that to assert to a third person that any one is suffering from a venereal disease is, if in writing, a libel, or if by word of mouth, a slander. The witnesses who have dealt with the difficulty thus created have somewhat magnified its extent; for in a civil action against a medical practitioner, proof of the truth of the defamatory

1 Worthington, G. E., Developments in Social Hygiene Legislation, from 1917 to September 1, 1920, American Social Hygiene Association, Publication No. 313, p. 569.

2 Venereal Disease Legislation, *Public Health Reports*, loc. cit.

3 Royal Commission on Venereal Diseases, op. cit., pp. 56-7.

words affords a complete defence; and in criminal proceedings, if the jury should find that the defamatory words were true in substance and in fact, and also that it was for the public benefit that the matters charged should be published, the defendant would be entitled under Lord Campbell's Act to judgment in his favour. In a case, therefore, where there can be no reasonable doubt as to the accuracy of the diagnosis, a medical practitioner would be in a secure position so far as the result of the trial is concerned, though it must be admitted that the award of costs to him would usually be a very inadequate compensation for the loss of time and for the trouble caused even by a successful defence. But in some cases, e. g., where he has simply expressed his opinion that the intending husband is "not cured" or "is not yet in a condition to make it safe for him to marry," it might be dangerous for him to take on himself the burden of justifying, since a doubtful or speculative issue would then be raised.

This point of medical secrecy arose in London recently[1] when a physician was called in a divorce case to give evidence that he had treated the wife for syphilis. Adultery had been proved but cruelty had also to be proved by the woman. The physician brought a letter from his hospital saying that absolute secrecy was enjoined on the physician. The judge ruled that evidence should be given on the ground of justice. This is an advanced and not entirely universal point of view. Many English physicians objected to "giving away" their patients and felt that such a policy would lower the attendance at venereal clinics.

In this chapter an attempt has been made to show how syphilis affects the family unit. Syphilis acquired by the unmarried tends to lower the marriage rate, as many a syphilitic feels he has no right to marry. If syphilis does not preclude the right to marriage, it should postpone the date considerably. When a syphilitic marries or a married person acquires syphilis the whole family becomes implicated. The possibilities of marital infection, sterility, accidents to pregnancies, stillbirths, and congenitally syphilized children are to be considered. The whole structure of family life may be changed. Illness of the individual members of the family

1 *Journal* of the American Medical Association, vol. 74, no. 9, Foreign Correspondence, Feb. 28, 1920, p. 614.

affects the other members. Disabilities, frequent in middle life at a time when efficient parents are most necessary, lead to much hardship for the entire family. The frequency of the disease as a family problem is so great that it may be thought of as the general rule. This would lead to the practical plan of considering the family of every syphilitic and make for a thoroughgoing medical and social investigation.

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CHAPTER V.

THE COMMUNITY.

Extragenital Infection.—The social effects of syphilis discussed in the chapter on the family also have a bearing on the life of the larger unit, the community. The community is only a network or mass of families, all interrelated by mutual work or play, by necessity, or by desire. One of the outstanding aspects of syphilis from a community point of view is its contagiousness by extragenital methods. An extragenital chancre is one which is acquired outside of sexual intercourse either by chance contact or by a sexual relation other than coitus.

When First Discovered.—When was it first found out that syphilis could be transmitted extragenitally and by chance contact? Vedder[1] claims that transmission between nurse and suckling was established in 1504. In 1509 Seitz showed that surgical instruments and cupping glasses were mediums of infection. Cases of professional exposure were recognized very early. William Clowes[2] in the first treatise on "Lues Venerea," published in the English language, 1596, says "I have known, not many years past, three good and honest midwives infected with this disease . . . by bringing abed three infected women of three infected children, which infection was chiefly fixed upon the midwives' fingers and hands."

The first known outbreak of innocent syphilis in America occurred in New England in 1646 and is described in the diary of John Winthrop.[3] A woman is delivered of a child. She has a sore breast. Women and children "drew" from it

1 Vedder, E. B., *Syphilis and Public Health*, Philadelphia and New York, Lea and Febiger, 1918, p. 147.

2 Bulkley, L. D., *Syphilis in the Innocent*, New York, Bailey and Fairchild, p. 175, quotes H. Lee, *Lectures on Syphilis*, Philadelphia, 1875, p. 35, who quotes Clowes.

3 Lane, J. E., A Few Early Notes on Syphilis in the English Colonies of North America, *Archives of Dermatology and Syphilis*, vol. 2, no. 2, Aug., 1920.

and 16 persons were infected with "lues venerea." The husband was thought to have infected his wife. "Though many did eat and drink and lodge in bed with those who were infected . . . none took it of them but by copulation or sucking."

Incidence of Extragenital Infection.—The seriousness of extragenital infection from a community aspect lies in its incidence in comparison with genital infections. Bulkley[1] made a complete study of such cases and submitted the following table:

TABLE 32. PROPORTION OF EXTRAGENITAL TO GENITAL CHANCRES

VENEREAL CLINICS	Bassereau, Robert, Fournier and Lefort, Hôpital du Midi, Paris	Clerc, Hôp. St. Lazare; Martineau, Lourcine, Paris	Carrière, Burlet, Nodet, Hôp. Antiquaille, Lyons	Sigmund, Mraçek, Zeissl, Allg. K. K. Krankenhaus, Vienna; Lang, Innsbruck	Pellizzari, R. Arcesped. d. S. Maria Nuova, Florence; Breda, Padua; and Di-Lorenzo, Naples	Petersen, St. Petersburg; Boglioboff, Kronstadt; Grédunier, Riga	TOTAL
TOTAL CASES	1513	633	248	1860	602	2267	7123
GENITAL	1445	596	219	1732	548	2230	6770
EXTRAGENITAL	68	37	29	128	54	37	353
LIPS	38	20	16	76	19	15	184
BREAST	...	1	9	7	22	2	41
HAND	3	...	...	29	...	1	33
TONGUE	8	2	...	5	2	...	17
THROAT	...	3	...	8	3	2	16
NOSE	1	3	3	1	...	...	8
CHIN	6	...	...	1	...	...	7
EYELIDS	2	1	1	1	1	1	7
CHEEK	2	...	...	...	3	1	6
BUCCAL CAVITY	1	4	...	...	1	...	6
NECK	...	1	...	...	3	...	4
FOREHEAD	1	2	...	...	...	...	3
UNCLASSED	6	...	...	...	...	15	21

1 Bulkley, op. cit., p. 25.

Thus of a total of 7123 cases, 353 or 5 per cent were extragenital. As these figures are taken from clinics where most people go for syphilis acquired by intercourse and as the many cases which appear at special eye, throat, skin clinics, etc., are not included, Bulkley feels that 10 per cent is a fairer estimate.

Dr. H. W. Porter[1] made a statistical study of extragenital chancres among the patients at the Washington University Dispensary. One hundred and six cases of chancre were found from September, 1916, to August, 1919. Thirteen or 11.3 per cent of the total primary sores were extragenital. He also gives the following table from Montgomery:

TABLE 33. CASES OF EXTRAGENITAL CHANCRE

PHYSICIANS MAKING REPORT	PER CENT
Krefting (Christiania)	15.6
Fournier (Paris)	9.0
Von Broich, Bonn (Germany)	9.0
Van Walsen (Amsterdam)	8.5
Mraçek (Vienna)	7.5
Bulkley (New York)	5.5
Montgomery (California)	5.5
Finger (Vienna)	1.3

Pusey[2] quotes Nichols as giving the amount of extragenital infections for the army as 6 to 7 per cent. Dr. C. M. Smith[3] estimates that at least 10 per cent of the primaries seen at the Massachusetts General Hospital syphilis clinic are extragenital. He considers 12 per cent a conservative estimate and feels that 15 per cent would be even more correct. The large majority of these chancres were innocently acquired. Dr. Smith is thoroughly convinced that lip and mouth chancres resulting from perversions are extremely rare. Practically all lip and mouth chancres are from kissing. Dr. Smith's estimate is thus larger than most of the percentages worked out in the above tables.

1 Porter, H. W., Statistical Study of Extragenital Chancres, *Archives of Dermatology and Syphilology*, vol. 38, N. S., vol. 1, no. 1, pp. 15-24.

2 Pusey, W. A., *Syphilis as a Modern Problem*, Chicago, American Medical Association, 1915, p. 112.

3 Personal communication.

One can safely say that 10 per cent of the chancres are extragenital. It is impossible to get closer to the real incidence of extragenital innocent chancres. Patients often refuse to tell how the chancres were acquired. All the cases in the literature have been analyzed by Bulkley[1] up to 1892; by Münchheimer from 1892-1896 and by Scheuer[2] from 1896-1909 but as we have no norm of the total number of syphilitic cases of all kinds, this does not aid much in determining the incidence. Extragenital chancres are more common in women than in men as the former are more exposed as midwives, attendants, wet nurses, and mothers of babies who have acquired syphilis accidentally.

Less Extragenital Syphilis Than Formerly—Early Epidemics.—There is less syphilis transmitted extragenitally than formerly. The following quotations from Bulkley[1] of epidemics of syphilis among the innocent in the early days of the disease are typical and interesting:

In 1599 in Nüremberg, Germany, according to the records in the town archives, over 70 people were infected by the carelessness of the town cupper.

In 1727, in Euphemia, France, a midwife, first herself infected digitally, transmitted syphilis to 50 parturient women together with 30 of their families.

In 1826, in Prussia, a strange nursling, the bastard of a soldier, was brought to the village by its mother who could not nurse it. A nursing mother suckled it and 23 more were infected.

In 1861, in Italy, 80 were directly infected by vaccination, of which 40 were children and 26 nursing women.

In 1866, in South Carolina, Jones and Foster reported that 150 people of all ages, who were vaccinated from a syphilitic woman, presented a vaccine chancre.

In 1878, in Philadelphia, Maury and Dulles reported 15 soldiers infected by a syphilitic tattooer.

1 Bulkley, op. cit., pp. 115-122.

2 Scheuer, *Die Syphilis der Unschuldigen*, Berlin, Urban and Schwarzenberg, 1910, quoted by Vedder, p. 148.

Methods of Extragenital Transmission.—Bulkley[1] gives the following table demonstrating the possible transmission of innocent syphilis in epidemic form as shown above, through domestic and social relations, industrial contacts, the nutrition of or attendance on infants, and the care of the sick by surgeons, dentists, attendants, etc.

TABLE 34

- A Syphilis Pandemica
  - I *Syphilis Epidemica*
    - From cupping
    - From breast drawing
    - From hand raising of infants
    - From lactation
    - From accouchement
    - From circumcision
    - From vaccination
    - From eating and drinking and domestic propagation
    - From tattooing
    - From glass blowing
    - From eustachian catheterization
    - From application of tongue to eye
- B Syphilis Sporadica
  - I *Syphilis Economica*
    - 1. Domestic and social transmission
      - 1. Eating and drinking, and use of tobacco
        - 1. Implements and vessels
        - 2. Tobacco, troches etc.
      - 2. Personal and household effects
        - 1. Wearing apparel, etc.
        - 2. Bedding
        - 3. Toilet articles
        - 4. Miscellaneous articles
      - 3. Active and temporary contact
        - 1. Buccal
          - 1. Kissing
          - 2. Biting
        - 2. Digital
          - 1. By contact
          - 2. By nail wounds
      - 4. Passive contact
        - 1. In sleep
        - 2. In carrying
    - 2. Industrial transmission
      - 1. Buccal
        - 1. By occupation requiring use of mouth
          - 1. Glassblowers (pipes)
          - 2. Musicians (wind instruments) etc.
        - 2. By necessary or unnecessary use of lips
          - 1. Cooks (tasting spoons)
          - 2. Flowermakers (needles) etc.
      - 2. Digital
        - By substances infecting fingers
          - 1. Laundresses etc.

1 Bulkley, op. cit., p. 17.

- B Syphilis Sporadica (*Continued*)
  - II *Syphilis Brephotrophica*
    - 1. Acquired through nutrition of infants
      - 1. By lactation
        - 1. Nurse infected by nursling
        - 2. Nursling infected by nurse or by another nursling
      - 2. By hand-feeding of infants
        - 1. Adults infected
        - 2. Infants infected
    - 2. Acquired through attendance on infants
      - 1. Mediate contact with soiled articles (infant alone infected)
        - 1. Toilet articles
        - 2. Covering
      - 2. Direct contact
        - 1. Active limited contact
          - 1. Buccal
          - 2. Digital
          - 3. Aerial
        - 2. Passive contact
          - 1. Parturition
          - 2. During slumber in bed
          - 3. By contact in arms
  - III *Syphilis Technica*
    - 1. Operator victim
      - 1. Unnecessary exposure
      - 2. Necessary exposure
        - 1. Manual
          - 1. Surgeons
          - 2. Accoucheurs
          - 3. Dentists
          - 4. Attendants
        - 2. Cephalic
          - 1. Buccal
          - 2. Facial
    - 2. Operator syphilifer
      - 1. Direct contact
        - 1. Digital contact
          - 1. Infecting finger seat of chancre
            - 1. Chirurgical manipulations
            - 2. Obstetrical manipulations
          - 2. Infecting finger soiled by saliva, etc.
        - 2. Buccal contact
          - 1. With a wound
          - 2. Without a wound
      - 2. Instrumental contact
        - Instruments soiled with operator's saliva
    - 3. Operator medium
      - 1. By transplantation and inoculation
        - 1. Solid substances
        - 2. Liquid substances
      - 2. By unclean instruments
        - 1. Cutting instruments
          - 1. Wound accidental
          - 2. Wound intentional
        - 2. Blunt instruments
      - 3. By unclean substances
        - 1. In suspension
        - 2. On bandages

We would support Vedder's criticism of this table that many of the methods of transmission there given are now so

rare and infrequent that they no longer materially affect the public health. However they are indicative of the possible virulence of this phase of the spread of syphilis before the days of proper control.

Scheuer[1] has tabulated the method of transmission in 14,590 extragenital chancres occurring from January 1, 1896 to January, 1909, including all cases in which the method of transmission was known. Vedder subdivided this table into groups as follows:

TABLE 35

GROUP 1. BUCCAL CONTACT	No.	PER CENT
Kissing	192	
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		
Vaccination	272	
Infected instruments	46	
Total	318	21.93
GROUP 3. ACQUIRED THROUGH MEDICAL ATTENTION TO PATIENTS		
Physicians	168	
Midwives	64	
Nurses	17	
Unlicensed physicians	8	
Volunteer nurses	6	
Total	263	18.13
GROUP 4. ACQUIRED THROUGH CARE OF SYPHILITIC CHILDREN		
Nursing	169	
General care and handling	91	
Total	260	17.93

1 Scheuer, *Die Syphilis der Unschuldigen*, Berlin, Urban and Schwarzenberg, 1910, quoted by Vedder, pp. 150-157.

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

	No.	Per Cent
Personal contact. . . .	36	
Common use of toilet articles, medicine, etc.	32	
Handling of clothing, wash, etc.	17	
Sleeping with syphilitic	11	
Play, games, etc	5	
Total	101	6.96

GROUP 6. MINOR OPERATIONS PERFORMED BY NON-MEDICAL MEN

	No.	Per Cent
Barbers and shaving utensils. . . .	44	
Tattooing	18	
Circumcision	7	
Total	69	4.75

GROUP 7. MISCELLANEOUS

Contact with finger	45	
Biting	41	
Insect bite (?)	1	
Total	87	6.00

GROUP 8. UNNATURAL SEXUAL PRACTICES

Total. . . .	32	2.20

Consideration of this table . . . shows that immediate or mediate buccal contact with syphilitics is the most frequent method of extragenital transmission. . . . The great danger of kissing is . . . emphasized by the fact that 192 infections, or 13.24 per cent of the total, were definitely known to be transmitted in this way, . . . this is certain to be an underestimate.

Group 2 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.

Reasons Why Extragenital Syphilis Is Not More Frequent —Wet Nurse Directories.—The question arises why more persons do not acquire syphilis in any one of these ways. Syphilis is no longer so commonly spread through chance contact. The stage of dirty medical instruments, careless vaccination, etc., has passed. The earlier writers greatly emphasized the danger of infection through midwives and wet nurses. We now, in 1922, have laws controlling the practice of midwives. Women no longer act as wet nurses to chance children nor are wet nurses accepted in a family without thorough examination. The Infants' Hospital Registry for Wet Nurses, Boston, is an example of the new system.

The effort was first made in Boston to run a registry similar to an employment agency. This was found to be unsatisfactory as a registry must be affiliated with charitable and social organizations in order to maintain the supply and with some hospital in order to secure adequate medical examination. At the present time the Boston registry is under the auspices of the Peter Bent Brigham and the Infants' Hospitals. Complete laboratory examinations are made on all women irrespective of whether such examinations have previously been made elsewhere. Careful physical examinations are also made. This wet nurse directory has supplanted other means of obtaining wet nurses in the city. Thorough medical examination obviates the chance of a syphilitic woman acting as a wet nurse.[1]

Short Life of Treponema.—Another fact which makes chance infection more uncommon than one might expect is the short span of life of the germ of syphilis on inanimate objects, and the necessity for the correct soil in the human body. The chief method of spread is direct contact with a moist open lesion. Most authorities feel that an abrasion of the skin is necessary for a person to become infected, although

1 *Monthly Bulletin* of the City of Boston Health Department, Sept., 1919.

Vedder thinks that the germ may penetrate the unbroken mucous membrane.

Numerous experiments have been made to show the span of life of the treponema on dry material such as razors, combs, drinking and eating utensils, toilet seats, and the like. Gaston and Comandon[1] allowed patients with lip chancres or mucous patches containing treponemata to drink from water glasses. These were then rinsed and examined for the organisms, which were found alive until the saliva containing them had dried, which was about one-half hour. Hertmanni[2] found that it took small drops of saliva containing treponemata 15 to 45 minutes, and larger drops one to one and one-half hours to dry, at the end of which time the organisms were dead.

Treponemata can live only a relatively short time exposed to the air as they are anaerobic organisms, and, as the foregoing references indicate, they need moisture. Browning and Watson[3] report that towels contaminated by a culture of treponemata and kept moist but exposed to diffuse daylight remained alive for 11½ hours. They are very easily killed by changes of temperature. Neisser[4] found that they lost power of infection after three hours at 10° C (50° F) and one-half hour at 48° C (118.4° F) while Mucha and Landsteiner[5] state that they die in 5 to 6 hours at 20° to 27° C (68° to 80.6° F) and in fifteen minutes at 45° C (113° F).

The treponemata are readily killed by antiseptics. From the practical standpoint Pusey[6] states that the limit of life for the treponema on an inanimate object is 8 to 10 hours, and that material from chancres, even when kept moist, is virulent

1 Gaston and Comandon, Preuve donné par l'ultra microscope de la contagion possible de la syphilis par les verres à boire, *Bulletin* de la Société Française de Dermatologie et Syphilologie, 19, 1908, p. 292, quoted by Vedder, p. 122.

2 Hertmanni, Beiträge zur Lebensdauer der Spirocheta Pallida, *Dermatologische* Zeitschrift, xvi, 1909, 633, quoted by Vedder, p. 122.

3 Browning, C. H., and D. Watson, *Venereal Diseases, A Practical Handbook for Students,* with an introduction by Sir John Bland-Sutton, New York, Oxford University Press, 1919, p. 9.

4 Vedder, op. cit., p. 123, quotes Neisser.

5 Mucha and Landsteiner, Zur Technik der Spirochaetersuchung, *Wiener klinische Wochenschrift,* vol. xix, 1906, p. 1349, quoted by Vedder, p. 123.

6 Pusey, op. cit., p. 110.

for 6 to 10 hours only. Stokes[1] thinks the germs are capable of infecting for not more than 6 to 7 hours when on ordinary objects and then only when they are moist.

Most Bodily Fluids Not Infectious.—Saliva and sputum are the bodily juices that are most important from the standpoint of the mediate transfer of the treponema through the agency of objects. Sweat, milk, urine, spinal fluid, and the like have little practical bearing as sources of infection. Blood, however, may be the medium of transfer of accidental infections. This is especially true in relation to physicians, dentists, nurses, and midwives. A needle prick received during surgical procedures is the most to be feared.

How to Avoid Infections—Greater Cleanliness.—Increased care may still be advised to doctors, medical attendants, and nurses. All articles used by them should be sterilized and their hands should be protected. All those working as midwives, tattooers, barbers, should be thoroughly examined and licensed.

Less Kissing.—As the most frequent location for the extragenital chancre is the mouth, prophylaxis is directed towards it. Promiscuous kissing should be avoided as far as possible. Kissing is the most common way of infecting the innocent friend, fiancée, wife, or child. A mother who allows any newcomer to kiss her baby, a girl who "flirts" very freely, runs serious risks of infection. Stokes[2] is particularly emphatic on this point:

> Syphilis in particular does not wait for sexual intercourse in order to attack the lax and careless. Those who permit liberties to be taken with their persons in the form of kissing and caresses which do not go to the point of actual sexual relations, are subject to a risk of infection which is larger than is generally realized. This risk is doubled by the mistaken belief of both parties that by indulging in mild offenses they escape the dangers of an outright breach of decency.

1 Stokes, J. H., *The Third Great Plague*, Philadelphia and London, W. B. Saunders Co., 1917, p. 113.

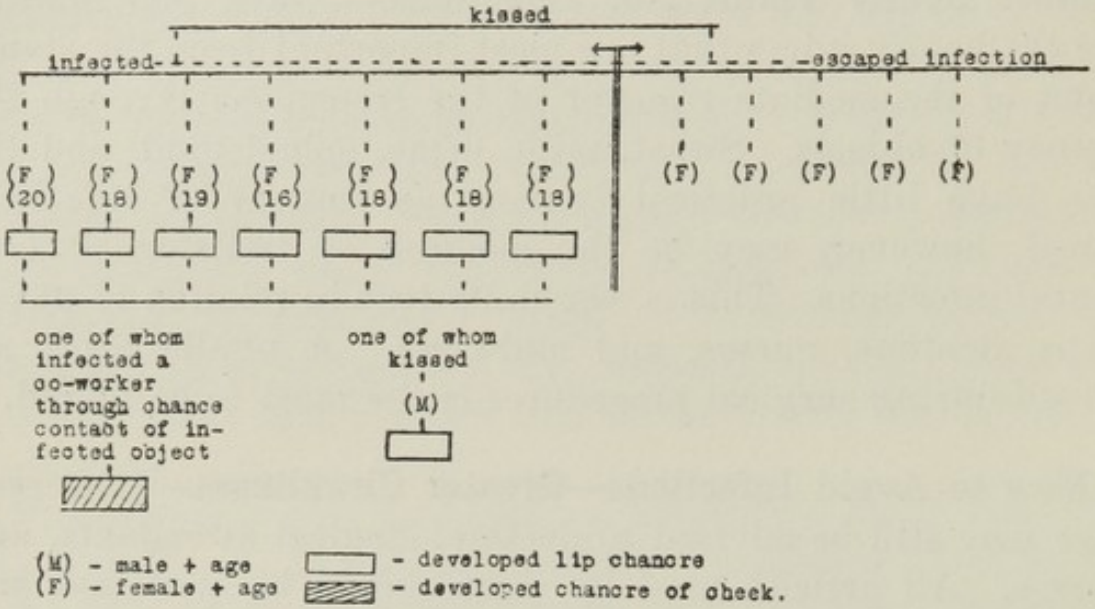
2 Stokes, J. H., *To-day's World Problem in Disease Prevention*, Washington, D. C., issued by the U. S. Public Health Service, Treasury Department, 1919, p. 119.

SCHAMBERG'S FAMOUS CASE OF AN EPIDEMIC FROM A KISSING GAME

(M)

(22)

with lip chancre



Avoidance of Articles Used by Syphilitics.—Contagious sores often come to syphilitics who smoke a great deal. People must be trained never to put in their mouths articles used by others. This applies to pipes, cigars, spoons, cups, musical instruments, workmen's tools, etc. The public-health approach to this has been the establishment of public spouting drinking fountains, the general use of paper cups and towels in offices, hospitals, schools, etc.

The possibility of exchange of syphilis between wet nurse and child can be prevented by the establishment of more adequate wet nurse directories as mentioned before and by care that a syphilitic child should be suckled not by a healthy but by a syphilitic nurse. The families who employ wet nurses must not only demand a healthy woman for their healthy children but must insure protection to such a woman if there is the slightest question of syphilis.

Treatment as Preventive Measure.—Increased effort must be made to locate the source of each new infection so that treatment may prevent further accidental contact.

Of course the important preventive measure of extragenital as well as genital syphilis is treatment of the syphilitic with active lesions. Every effort must be made to in-

sure enough treatment to render a person noncontagious to the public. It is again evident that the follow-up of patients is important as are the efforts of all state boards of health to whom contagious cases not under treatment are reported by name.

The question of the homeless young man with a contagious sore on the lip, hands, face, etc., has not been met. For instance, if a patient reports to the clinic with a contagious chancre of the lip and is admittedly of the wandering type, one cannot be sure that he will observe necessary care to avoid infecting others. He may sleep at one lodging house one night and at another the next night. He may refuse to observe necessary caution in the matter of eating and drinking at different restaurants. If he does not report to the clinic for the next treatment, the worker only too often finds that he has departed from his last address leaving no trail behind him.

Control of Travel.—There is legal authority to control the travel of known contagious patients, it being stated in the Chamberlain-Kahn Bill[1] that one of the duties of the Division of Venereal Diseases of the Public Health Service is "to control and prevent the spread of these diseases in interstate traffic." Amendment 7 of the interstate quarantine regulations prohibits the travel of persons with venereal diseases, and state boards of health in 47 states have agreed that they should have definite regulations—conforming to interstate regulations—controlling travel within the state. Unfortunately, these laws are rarely evoked.

Examples of Extragenital Infection.—Bulkley[2] gives a series of interesting cases of extragenital infections, of which we will quote some of the most striking:

I. Infection in Domestic Life.

1. From eating out of the same utensils.

A workman shared his drinking glass with a comrade who had a chancre on the lip and got a lip chancre (Pellizzari, Pisa, 1879).

1 Pierce, C. C., and H. F. White, Lessons Taught by Measures for Control of Venereal Diseases, *Journal* of the American Medical Association, vol. 75, no. 17, Oct. 23, 1920.

2 Bulkley, op. cit., pp. 144-155.

A lady got a chancre of the lip from carrying in her mouth a spoon used by a syphilitic cook (Rollet, 1861).

2. From wearing apparel.

A patient had itching and fissure between the nates. He went bathing in a strange suit of bathing clothes and scratched through the bathing suit. An ulcer formed a few weeks later.

II. Infection in Industrial Relations.

1. The entire family of a weaver in Berlin became infected by all the members using the same tube in the mouth for sprinkling cloth (F. J. Behrend, Syphilidologie, Leipzig, 1839-46).

2. A servant girl contracted syphilis through a speaking tube in a hotel. (Guignard, Paris, Thèse de Paris, 1882, No. 97, Contribution à l'étude des chancres syph. extragen. Case of Martineau).

III. Case of Innocent Infection by Child.

Infant syphilitic nursling (died of disease)
infects
Madame X (who aborts)
infects

Infant P infected	Infant M infected	Infant Y infected	Her Husband
Mme. P. (who aborts) infected	Mme. M. (who aborts) infected	Mme. Y. (who has stillborn child) infected	
Husband (chancre on penis)	Husband	Husband	

Mme. X's child had died of syphilis and she nursed these children to ease her breast (Dron, Achille, 1879).

Similar cases may be given from other authorities.

A healthy woman nursed a healthy child. Then she nursed a syphilitic child, acquired syphilis, and bore a syphilitic child (Bertherand[1]).

1 Diday, P., *Treatise on Syphilis in Newborn Children and Infants at the Breast*, translated by D. Whitley with notes by F. R. Sturgis, New York, Wm. Wood and Co., 1883, quotes Bertherand, p. 25.

A girl of 16 had general syphilitic roseola and sore throat. She denied intercourse and was found to be a virgin. She had a small cicatrix on the right forearm. She had been carrying a baby without a napkin on her bare right arm. The baby had mucous patches on the anus (Van Buren and Keyes, 1877[1]).

A man gave a history of slipping on the street twenty years previous. He grazed the back of his hand and a bystander, anxious to aid, applied to the open wound a piece of sticking plaster which he had moistened with his saliva. Three or four weeks later a chancre developed at the site of injury.[1]

Some of the recent cases under observation show similar infections in home, social, and industrial life.

Case 129. Philip Neilson undoubtedly infected his brother by sleeping in the same bed with him when he was in a contagious stage of syphilis.

Case 130. Frances Newton had a lip chancre as a result of kissing her fiancé.

Case 131. Jack Forman, a three-months baby, had a chancre on the eyebrow. The mother and father were perfectly healthy. It was thought that the child was infected by some syphilitic relative who kissed it.

Case 132.[2] A nursing baby was infected by an infant relative. The baby in turn infected the mother, who appeared at the clinic with a breast infection which was diagnosed syphilis.

Examples of Escape of Infection.—Obviously the above series of cases do not indicate that whenever there is a possibility offered in the home or at work for syphilis to be transmitted extragenitally, an infection actually takes place. Often when it seems most likely that infection will occur, the family or co-workers escape.

Case 133. Mr. Bryant arrived at the clinic with secondary manifestations of syphilis. He had had a swelling and soreness of his

1 Shillitoe, A., *The Primary Lesions and Early Secondary Symptoms as Seen in the Female,* (*A System of Syphilis,* vol. 1), London, Frowde, Hodder and Stoughton, 1914, second edition, p. 245, quotes Van Buren and Keyes, 1877.

2 Department of Medical Social Work, Boston City Hospital Report, Feb. 1, 1919.

tongue for about eight weeks which had been recalcitrant to the treatment applied. Having no intimation of the syphilitic condition he had used no precautions. Although he was at the height of the most contagious period, with all the conditions in this case seeming to favor the transmission to one or both, neither the mother nor child showed any evidence of infection.

Case 134. Stanley Bliss was an attractive boy of four years who was brought to the clinic because of an eruption on his body which was found to be a symptom of secondary syphilis. The remains of a chancre were on his chin. Although it was not possible actually to trace the origin of the chancre, it seemed probable that he obtained it from one of his relatives with whom he was staying for a time. Neither parent acquired the infection from the child, although they cared for him after the development of symptoms and during the most contagious stage.

Case 135. On the death of James Dolan's[1] mother a friendly neighbor undertook to care for him. She brought him to the clinic at two months of age. He was found to be in a contagious stage of syphilis. The woman, although she had had the closest contact with the child, escaped infection.

Case 136. Helen Laforce had an active contagious syphilis discovered through the illness of her two-months old syphilitic child. She was working in a restaurant. As far as known, she had not infected anybody. As soon as the diagnosis was made she was immediately discharged from work.

A good group of cases exemplifying the possibility of extragenital contamination in the home and industrial life is given by Blaisdell.[2] Although the conditions were excellent for further contamination, in only one of the cases was there known extragenital infection. Of course it may be that if there had been a more complete follow-up of all possible contacts, more cases would have turned up. The group illustrates, however, the above point, that a possibility of extragenital infection by no means indicates an actual infection.

1 Children's Hospital, Boston.

2 Blaisdell, J. H., The Menace of Syphilis to the Clean-Living Public, *Boston Medical and Surgical Journal*, vol. clxxii, no. 4, April 1, 1915, pp. 476-483.

TABLE 36. CASES OF DANGER OF INNOCENT INFECTION THROUGH NON-GENITAL INFECTIONS[1]

	SEX	AGE	CIVIL CONDITION	WORK	DURATION IN WEEKS	SYMPTOMS	METHOD OF LIVING	EATING	COITUS	FAMILY BOARDERS	CO-WORKERS	KNOWN INFECTIONS
1	F	39	M	Home	10	Rash, mucous patches, condylomata	Home	Home	20	5	0	0
	5 childre	n from 6–20	at home. E	xtra money by im	morality.							
2	F	19	S	Waitress	20	Rash, mucous patches, condylomata	Rooming	Boarding house or restaurant	0	5	40	0
	Syphilis	active and i	nfectious.									
3	F	37	W	Candy	24	Rash, mucous patches	Home	Home	0	4	...	0
	Active m	outh lesions	—2 small	children, husband	and lover.							
4	M	16	S	Actor	12	Primary of lip, mucous patches	Home	Home	0	2	0	0
	Actor in	habit of ki	ssing choru	s girls frequently.								
5	F	24	S	Nurse	6	Rash, mucous patches	Family	Family	0	7	...	0
	Nurse in room,	doctor's fa	mily. Activ	e secondary lesions	before disco	vered. Complete charg	e of two sm	all children, tr	eated as	one of the fam	ily, used sa	me bath
6	F	42	M	Home	26	Mucous patches, rash, condylomata	Home	Home	4	4	0	1
	Active sy	philitic, sev	eral "friend	s," infected two-ye	ar old child	with primary on foreh	ead, presu	mably by kiss	ing.			
7	M	22	S	Cook in dairy lun	ch 26	Primary of finger, rash mucous patches	Rooming	Restaurant	0	12	...	0
	Primary	of finger an	d old active	secondaries. Hand	led food, dishe	s, etc. Probably got in	fection from	some dish of	a syphili	tic.		
8	M	18	S	Drug clerk	3	Primary	Home	Home	3	6	2	0
	Active le	sions, serve	d sodas.									
9	F	35	S	Laborer	14	Rash, mucous patches	Rooming	Restaurant	3	20	...	0
	Active m	outh lesions	but eats in	local Y. W. C. A.	dining room.							

1 Blaisdell, J. H., loc. cit.

Often, of course, cases of syphilis are apparently contagious while there is really no danger. This is especially true in various industrial pursuits.

Case 137. Mr. Frank was a syphilitic baker. There was, however, no danger of infection to others. In the first place, the infection was in a chronic stage. Furthermore, he had no open lesions and according to the history had never had any. Thirdly, the time that elapses between the baking of breads and cakes and the eating is so long that there is no reasonable fear of the treponema living long enough to infect the consumer.

Case 138. Etta Prince was a syphilitic of 22 who had been infected five years previously. Her employer was aware of her infection and when an eruption appeared on her hands at once feared that she might be a menace to her fellow employees. Examination showed that although the girl was a syphilitic she was not contagious in any way and the rash was of an eczematous character.

Case 139. Boston Dispensary Case.[1] A young syphilitic girl secured a position in a restaurant folding linens. She feared that her occupation might endanger others. She had recently acquired syphilis but was no longer contagious as she had received adequate treatment, as far as the present stage of the disease was concerned. Permission was given her to retain her position.

If people who might be the source of innocent infections were 100 per cent contagious very many more individuals would be infected by contact with the many syphilitics in occupations bringing them into close association with others. It is impossible to decide what factors determine the spread of innocent syphilis in industry. We cannot put the danger on a percentage basis. However, it is apparent that the danger is not quite as great as many people would think or undoubtedly more extragenital cases would appear at hospital clinics with a history of infection acquired through occupation. The Lakeside Hospital, Cleveland, investigated 285 syphilitic cases, including many contagious ones and listed the occupations as nearly as possible in order of their danger to the public from the standpoint of infections innocently acquired. Practically one fourth were employed at work involving close contact with people, food, clothes, etc.

1 Reported at a meeting.

In this connection we made a study of 755 paretics to find out how many of them were in occupations usually supposed to be dangerous to the community. The following groups were selected, and it was found that 154, or 20.3 per cent of the paretics were working in these occupations. The number and per cent in each group were as follows:

	No.	P. C.
People handling food	67	43.50
Domestics	47	30.51
Laundry Workers	3	1.94
Clothing Workers	15	9.74
Barbers	9	5.84
Physicians and Dentists	5	3.24
Musicians	6	3.89
Druggists	2	1.29

If the idea that all syphilitics are contagious were true the fact that 20 per cent of a random group of late syphilitics were working in occupations which brought them into close touch with others would be indicative of many other infected cases. As a matter of fact, paretics and most other syphilitics in the late stages are not contagious to others and therefore the general public need not be aroused at the idea of so many syphilitics in the above occupations. On the other hand, many of these patients were in all likelihood employed in the same occupations at the time they acquired syphilis and were in the most contagious period of the disease. Thus, the important point is not whether the person is syphilitic but whether he is in a contagious state.

Incidence of Syphilis and its Financial Results.—One of the most outstanding effects of syphilis on the community is the direct financial cost in dollars and cents. In every community there is a certain definite yearly outlay of money for the care of syphilitics. Very few estimates of the exact cost have been computed. In order to know what the actual cost is, one should know something about the prevalence of the disease. Frequent estimates based largely on Wassermann surveys have been made indicating that somewhere between 10 and 15 per cent of the community at large are infected with

syphilis. A consideration of these figures does not clearly show the amount of syphilis in the community because of the great variation to be found in different groups. The accompanying table illustrates the difference in the percentages, which vary from a fraction of 1 per cent in a group of healthy young American men who were applicants for commissions in the Aviation Corps to 97 per cent in a group of prostitutes, with intermediate figures of approximately 4 per cent for some groups of pregnant women to 35 per cent in criminal groups.

TABLE 37. VARIATION IN ESTIMATES OF PREVALENCE OF SYPHILIS IN THE COMMUNITY

CLINIC	GROUP	INDIVIDUALS	POSITIVE WASSERMANN REACTION	
			No.	P.C.
Mass. State Department of Health[1]	Aviation Corps	3701	21	0.56
New England Hospital for Women and Children, Boston[2]	Special Hospitals or Clinics for Women	2090	52	2.48
Women's Diseases, Private Cases, Washington[3]	Special Hospitals or Clinics for Women	417	17	4.07
Women's Clinic, Washington[4]	Special Hospitals or Clinics for Women	150	13	8.66
Columbia Hospital for Women, Washington[5]	Special Hospitals or Clinics for Women	188	21	11.17
Gynecological Clinic, Philadelphia[6]	Special Hospitals or Clinics for Women	300	36	12.
Dr. Huron W. Lawson, Washington[7]	Candidates for Police Force	856	54	6.3
Lying-In Hospital, New York[8]	Pregnant Women	2000	61	3.05
Maternity Department, University of Michigan Hospital, Michigan[9]	Pregnant Women	381	18	4.7

1 Hinton, W. A., Specific Inhibitory Reaction of Cholestrinized Antigens in The Wassermann Test, *American Journal of Syphilis*, St. Louis, vol. 5, no. 1, Jan., 1921, p. 7.

2 New England Hospital for Women and Children. Tests by Massachusetts State Department of Health, compilation by H. C. Solomon, Boston, Mass.

3 Vedder, op. cit., p. 67. Private Cases.

4 Vedder, op. cit., p. 67 gives statistics from Women's Clinic, Washington.

5 Vedder, op. cit., p. 67 gives statistics from the Columbia Hospital, Washington.

6 Williams and Kolmer, The Wassermann Reaction in Gynaecology, *American Journal of Obstetrics*, lxxiv, 1916, p. 639, quoted by Vedder, p. 66.

7 Vedder, op. cit., p. 81, quotes Dr. Huron W. Lawson, Washington, D. C.

8 Dr. Losee, Syphilis in Mother and Infant, *Bulletin* of the Lying-In Hospital of New York, June, 1916, quoted by Vedder, p. 84.

9 Dr. Peterson, Observations on the Occurrence of Syphilis in the University of Michigan Obstetric and Gynaecologic Clinic, *Surgery, Gynaecology, and Obstetrics*, 1916, p. 280, quoted by Vedder, p. 59.

TABLE 37—Continued

CLINIC	GROUP	INDIVIDUALS	POSITIVE WASSERMANN REACTION	
			No.	P.C.
Mass. State Dept. of Health tests on pregnant women[10]	Pregnant Women	172	8	4.7
Florence Crittenton Home, Boston[11]	Pregnant Women	192	11	5.72
Lying-In Hospital, Boston[12]	Pregnant Women	4935	290	5.87
Pregnancy Clinic, Brooklyn[13]	Pregnant Women	892	70	7.9
Obstetric Cases at Clinic, Brooklyn[14]	Pregnant Women	1822	145	8.
Pregnancy Clinic, Chicago[15]	Pregnant Women	146	14	9.5
Obstetric Cases at Sloane Hospital for Women, New York[16]	Pregnant Women	2488	227	9.1
Maternity Hospital, Belfast[17]	Pregnant Women	171	22	12.8
Maternity Clinic, Seclin[18]	Pregnant Women	103	16	15.5
Obstetric Cases, Washington, D. C.[19]	Pregnant Women	201	36	17.06
East Louisiana Hospital for Insane, Louisiana[20]	Insane Women	516	20	4.
Pennsylvania Hospital for Insane, Philadelphia[21]	Insane Women	...	...	6.5
State Hospitals, Michigan[22]	Insane Women	...	...	6.65

10 Vedder, op. cit., p. 61, quotes Massachusetts State Department of Health for 1915.

11 Florence Crittenton Home, Boston. Tests by Massachusetts State Department of Health, compiled by H. C. Solomon, Boston.

12 Lying-In Hospital, Boston, Tests by Massachusetts State Department of Health, compilation by H. C. Solomon, Boston.

13 Jeans, P. C., Syphilis and Its Relation to Infant Mortality, *American Journal of Syphilis*, vol. iii, no. 1, Jan., 1919, p. 115, quotes Judd, *American Journal of Medical Sciences*, cli, 1916, p. 836.

14 Commisky, L. J. J., A Preliminary Report of the Routine Wassermann Reaction in Hospital Obstetrics, *American Journal of Medical Sciences*, 1916, p. 676, quoted by Vedder, p. 83.

15 Falles and Moore, The Value of the Wassermann Test in Pregnancy, *Journal* of the American Medical Association, vol. lxvii, 1916, p. 574, quoted by Vedder, p. 83.

16 Vedder, op. cit., p. 84, quotes Dr. Reuben Ottenberg, Sloane Hospital for Women, New York.

17 Darling, *Dublin Journal of Medical Sciences*, third series, no. 549, Sept., 1917, p. 147, quoted by Vedder, p. 45.

18 Calmette, Breton et Couveur, Application pratique de la Reaction de Wassermann diagnosis de la Syphilis chez les Nouveau-nés, *Comptes* rendus des séances et mémoires de la Société de Biologie, 1, 1911, 238, quoted by Vedder, p. 39.

19 Vedder, op. cit., p. 85, quotes Dr. Lawson and Columbia Hospital for Women, Washington, D. C.

20 Holbrook, Syphilis in the East Louisiana Hospital for the Insane, *American Journal of Insanity*, lxxiii, 1916, p. 261, quoted by Vedder, p. 52.

21 Newcomer, H. S. et al., One Aspect of Syphilis as a Community Problem, *American Journal Medical Sciences*, vol. 158, Aug., 1919, p. 141, quotes Orton, Pennsylvania Hospital for Insane, Philadelphia.

22 Commission to Investigate the Extent of Feeble-mindedness, Epilepsy, and Insanity and Other Conditions of Mental Defect in Michigan (1915).

TABLE 37—Continued

CLINIC	GROUP	INDIVIDUALS	POSITIVE WASSERMANN REACTION	
			No.	P.C.
Michigan State Hospital, Michigan [23]	Insane Women	606	77	12.7
Warren State Hospital, Pennsylvania[24]	Insane Women	...	...	18.5
Dr. Collie, London[25]	Apparently healthy workmen	491	46	9.36
St. Luke's Hospital, San Francisco[26]	Female Adult Admissions to Hospitals and Dispensaries for Medical and Surgical Conditions	223	10	4.4
London Hospital, London [27]	Female Adult Admissions to Hospitals and Dispensaries for Medical and Surgical Conditions	389	20	5.1
Infirmary, England[28]	Female Adult Admissions to Hospitals and Dispensaries for Medical and Surgical Conditions	288	40	17.5
Bellevue Hospital, New York[29]	Female Adult Admissions to Hospitals and Dispensaries for Medical and Surgical Conditions	1752	475	27.1
Post Graduate Hospital, New York[30]	Female Adult Admissions to Hospitals and Dispensaries for Medical and Surgical Conditions	746	205	27.4
Health Department of New York [31]	Criminals	3809	1353	35.5
Reformatory for Women[32]	Criminals	864	349	40.1
Prostitutes, Germany [33]	Prostitutes	260	102	39.2

23 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, quoted by Vedder, p. 52.

24 Mitchell, General Paralysis of the Insane, *New York Medical Journal*, vol. 100, 1914, p. 605, quoted by Vedder, p. 51.

25 Final Report of the Commissioners, Royal Commission on Venereal Diseases quotes Sir John Collie, p. 16.

26 Knapp, The Wassermann Reaction in Four Hundred Cases Investigated by Group Study Methods, *American Journal of Syphilis*, vol. 1, 1917, p. 772, quoted by Vedder, p. 62.

27 Final Report of the Commissioners, Royal Commission on Venereal Diseases, London, 1916, p. 16.

28 Assinder, Syphilis in the Poorer Classes: Its Diagnosis by the Wassermann Test and Its Incidence as Demonstrated Thereby, *Birmingham Medical Review*, vol. lxxvi, 1914, p. 137, quoted by Vedder, p. 44.

29 Vedder, op. cit., p. 55, gives statistics from Bellevue Hospital, New York, compiled by Miss Sarah Greenspan.

30 Vedder, op. cit., p. 57, quotes F. C. Costen, Post Graduate Hospital of New York, 1916.

31 Pollitzer, Syphilis in Relation to Some Social Problems, *American Journal of Obstetrics*, vol. lxxiii, 1916, p. 857, quoted by Vedder, p. 71.

32 Hinton, loc. cit.

33 Hecht, Die Serodiagnose in Rahmen der Prostituierten-Kontrolle, *Deutscher medizinische Wochenschrift*, vol. xxxvi, 1916, p. 317, quoted by Vedder, p. 48.

TABLE 37—Continued

CLINIC	GROUP	INDIVIDUALS	POSITIVE WASSERMANN REACTION	
			No.	P.C.
Bedford Reformatory for Girls, New York[34]	Prostitutes	467	224	48.0
Prostitutes, Baltimore[35]	Prostitutes	327	219	67.0
Prostitutes, Berlin[36]	Prostitutes	230	180	78.2
Prostitutes, San Francisco[37]	Prostitutes	320	310	97.0

34 Kneeland, *Commercialized Prostitution in New York*, New York, The Century Company, 1913 p. 188, quoted by Vedder, p. 47.

35 Walker, Symposium on Syphilis, Congress of American Physicians and Surgeons, 1916, *Journal* of the American Medical Association, vol. lxvi, 1916, p. 1740, quoted by Vedder, p. 48.

36 Pinkus, Beiträge zur Kenntnis der Berliner Prostitution; die Syphilis der Prostituierten, *Archiv für Dermatologie und Syphilis*, vol. cxiii, 1912, p. 805, quoted by Vedder, p. 49.

37 Ball, Jau Don, and Haywood G. Thomas, A Sociological, Neurological, Serological, and Psychiatrical Study of a Group of Prostitutes, *American Journal of Insanity*, April, 1918.

Expense of Late Syphilis.—It is clear that we can say very little about prevalence except as regards certain groups. Any estimates of the real cost of syphilis must necessarily be somewhat fragmentary. There are, however, some interesting studies which give some indication of the cost. In 1917 Dr. Williams[1] made a study of late syphilis as a cause of economic disturbance. He took 100 random cases of men who died with syphilitic mental disease at the Boston State Hospital. The cost to the Commonwealth of Massachusetts in hospital care alone, was $39,312 for 100 men who actually spent an aggregate of 126 years or over one year apiece in the state institutions at a per capita cost of $6 per week. Dr. Williams, basing his estimate on the average admission rate to Massachusetts hospitals, concluded by showing that there were 1500 men and women in Massachusetts who in the course of the next five years, would be committed to state hospitals because of syphilitic mental disease.

1 Williams, F. E., Relation of Alcohol and Syphilis to Mental Hygiene, *American Journal of Public Health*, vol. 6, 1916, p. 1277.

Dr. Pollock[1] estimated the economic loss to the state of New York on account of syphilitic mental disease for one year. He found the total patient population with syphilitic mental disease under treatment in institutions during the fiscal year of 1917 to be 1554, the per capita cost of support of patients in these hospitals being $303.68 a year. The total cost of maintenance for this group of patients during one year was estimated at $471,918.72.

A report of the California State Board of Health for 1919 may be quoted in this connection: "For the past two years the state of California has tested all admissions to insane hospitals. Fourteen and five tenths per cent showed positive evidence of syphilis, 8 per cent were paretics. On the basis of 8 per cent it was found to cost the state of California $160,000 yearly to support the syphilitic insane."

Similarly the Royal Commission on Venereal Diseases in England[2] estimated that England and Wales spent 90,000 pounds per year on the committed insane suffering from general paresis plus 60,000 pounds for other forms of mental disease due to syphilis.

Estimate of Cost of Syphilis in Massachusetts.—We have endeavored to arrive at an estimate of the cost of syphilis to the public in the Commonwealth of Massachusetts, that is, the expense incurred by the citizens of the Commonwealth as a result of syphilis. Any such attempt must, of course, be very inadequate at the present time as it is quite impossible to get complete figures. However, it seemed worth while to make a beginning in this direction, such as might indicate not only something of the cost but also the lack of information in various institutions. It was found, for instance, that many hospitals treating syphilis have no idea as to the expense incurred because of this disease. Many charitable agencies are spending considerable unknown sums of money because of the damage done to various individuals by syphilis. Our experience

1 Pollock, Horatio, The Economic Loss to the State of New York on Account of Syphilitic Mental Diseases during the Fiscal Year Ending June 30, 1917, *Mental Hygiene*, vol. ii, no. 2, April, 1918, p. 278.

2 Royal Commission on Venereal Diseases, op. cit., p. 34.

in the not distant past has been that many of these societies were unwilling to give money for the treatment of syphilis or the prevention of syphilis, whereas they stood the expense of supporting the families which had been damaged or left destitute because of syphilis. It seems likely that with a presentation of some actual cost figures, a different attitude might be engendered. The following data explain the result of our attempt to get information on this subject. Considering the actual cost of the problem to the State Department of Health, and the Boston City Department of Health, the cost of committing syphilitic insane patients, that of the care and treatment of syphilitic patients at the State Infirmary, at the City Hospital for Chronic Diseases, and at three Boston Hospitals, a figure of practically a quarter of a million dollars per year was reached. This quarter of a million represents only a very small fraction of the total cost. It does not take into consideration the care of patients in private institutions or public hospitals outside of the metropolitan district of the state, only a small number of which hospitals are included. The greater part of this money is expended for the care of the patients after they are beyond the condition where assistance might be offered them through treatment. In other words, less than 10 per cent of the total amount ($225,000) is expended for prevention and treatment, while 90 per cent is used for the maintenance of patients who have passed the stage in which help is available.

The following table is a resumé of our estimate of the yearly cost as borne by the above mentioned institutions and departments. These estimates were based upon information obtained as to the number of patients cared for, the per capita cost in each case, and the amount of work done by the different departments. The details of this study will be published elsewhere.

TABLE 38

Massachusetts State Department of Health	$12067.97
Massachusetts State Infirmary	41857.28
Massachusetts State Commission on Mental Diseases	4184.40
Commitment to Massachusetts State Insane Hospitals	10220.00
Massachusetts State Insane Hospitals	96732.81
Boston Psychopathic Hospital	14065.89
Boston City Board of Health	6374.56
City Hospital for Chronic Diseases and Paupers	20721.48
Massachusetts Homeopathic Hospital	8013.48
Massachusetts Charitable Eye and Ear Infirmary	1063.96
Boston Dispensary	9382.02
	$224683.85

Cost of Syphilis to Private Charities Not Estimated.—In addition to the expense defrayed by the taxpayers as actual taxes there must be considered all the private endowments to take care of various invalids, defectives, and minor indigent individuals whose difficulties are directly related to syphilis. The work done by various charitable organizations, children's societies, and the like, has never been analyzed from the point of view of the cost placed upon them as the result of syphilis. A solicitation of a number of these societies in Boston has shown that they have no idea how much of their expense is to be laid to this source. Our experience, however, has indicated to us that it is fairly large. These and other expenses of a similar type must be considered as direct taxes upon the community levied by syphilis and paid by the innocent.

Cost in Maintenance of Institutions.—One must always consider among the items of community expense the part played by syphilis in filling our deaf, dumb, blind, and feeble-minded institutions. To estimate this in dollars and cents we should know the exact percentage of deafness, dumbness, blindness, and feeble-mindedness caused by syphilis. These figures are not to be secured in America at the present time. The examinations of children in schools for the deaf, dumb, and blind are not thorough enough to include an exact enumeration of the percentage of syphilitics or the relationship between the existing syphilis and the physical handicap. Much has been done to establish percentages for gonorrhea

as a cause of blindness. Something should be initiated to discover the relationship between syphilis and deafness, dumbness, and blindness.

In 1913 a reliable investigation was made in England by Mr. Bishop Harmon[1] who found of 1100 children in London Blind Schools 31.2 per cent were certainly and 2.8 per cent were probably syphilitic. It is to be noted that in 1904, 18.8 was the percentage of all blindness which could be attributed to syphilis. The increase in percentage in 1913 is partly due to the efforts made to prevent ophthalmia neonatorum (gonorrheal infection) as a cause of blindness so that there are actually fewer cases of gonorrheal blindness in the schools; and partly to the better methods of diagnosing syphilitic eye infections. Thus, though one cannot say that syphilitic eye infections are actually increasing as these figures might indicate, yet they are increasing relatively to gonorrhea and the interest of the public must be broadened to include syphilis as a cause of blindness.

A similar investigation of 845 children suffering from acquired deafness in the London County Council Deaf Schools, showed that 7.21 per cent were congenital syphilitics. The percentage of deafness associated with syphilis was about twice as great in girls as in boys. This study indicates what might be done in other schools in an attempt to estimate the relation between syphilis and deafness, dumbness, and blindness.

Cost of Syphilis in Aid to Destitute Families.—Another direct loss in addition to the cost of institutions for the diagnosis, treatment, and custodial care of the syphilitic is the cost to the community of families made destitute by syphilis in some wage-earning member. As indicated in the chapter on the family, in the early stages of syphilis temporary aid is sometimes necessary in families who can just get along with a certain income. If this is cut down by hospitalization of the wage-earner, by a considerable loss of time from work by out-patient treatment, or by loss of a job through fear of

1 Harmon, op. cit., pp. 30, 152.

infection of others, or what not, aid must be given either by public or private charity. There are no figures on this as far as known.

In the later more incapacitating stages of syphilis permanent aid must often be given to the patient and to the family. Indication of what this means has been given (see page 167, Chapter IV). As an example of the cost to the public we may again consider the Rossini family already cited on page 136, Chapter IV. As a result of syphilitic mental disease the father was committed to a state hospital. The mother who also had syphilitic disease of the central nervous system received treatment, the expense of which was defrayed by the state. Her condition required a certain amount of hospitalization from time to time. The oldest son was sent to an industrial school. The two youngest children were congenital syphilitics and had to be cared for in a school for the feeble-minded. Four other children were left at home and a large part of the expense of their care fell upon the state. The oldest of these children at home was syphilitic and required treatment. It is probable that the mother will be permanently incapacitated in which contingency the entire care of the children will fall upon the state or private charities.

Indirect Financial Loss—Diminished Earning Capacity and Productivity.—In addition there is what might be termed an indirect financial loss represented by a diminution of existing productive power due to a gradual or sudden decline in earning capacity. Temporary or permanent absence from work is only too often seen in late syphilis, and even in the beginning of the disease this loss of productivity is at times quite striking. For the best protection of the individual and the community, a patient acquiring syphilis should be hospitalized for a period at the beginning of his disorder. This means time off and lessened productivity. Patterson,[1] in a study of three Chicago hospitals for 1912 to 1913, found that the average time out of work because of syphilis was three weeks for each patient. The following figures present this point:

1 Patterson, J., An Economic View of Venereal Infections, *Journal* of the American Medical Association, vol. lxii, no. 9, Feb. 28, 1914, p. 670.

	Number of Cases	Days Lost
Michael Reese Hospital.....	107	1562
Wesley Hospital.....	52	593
Cook County Hospital.....	917	19389
Total	1076	21544

Loss of time through hospitalization in the early or late stages of syphilis was shown in a grim manner during the late war. While syphilitics were hospitalized and kept out of action their places at the front were filled by other men. It was reported that this became such a serious matter in the Austrian army where men consciously attempted to acquire venereal disease that they might be hospitalized and removed from the front that a rule was made that any man acquiring venereal disease would be sent to the front line trenches. What the actual loss may mean to military forces is shown in the accompanying figures from the British navy.[1] For the year 1912, with an average strength of 119,540 men, there was a loss of 107,145 days because of syphilis. This was without very adequate hospitalization such as would be prescribed today.

Year 1912—Average Strength, 119,540

	Number of Cases	Total Number of Days Lost	Average Number Sick Daily	Ratio per 1,000	
				Cases	Sick daily
Syphilis I	715	15,439	42.18	5.98	.35
Syphilis II	2744	91,706	250.56	22.95	2.09
	.....	107,145	...	...	...

American figures on the average number of soldiers of each one thousand incapacitated each day follow:

Noneffective Rates per 1000 for Syphilis[2]

Year	White	Colored
1917.	0.86	2.63
1918.	0.96	2.52
1919.	1.18	3.80

1 Royal Commission on Venereal Diseases, Report of the Commission, London, 1916, p. 90.

2 From the War Department, Office of the Surgeon General.

In spite of the loss of time, the hospitalization of syphilitics is urged in the early stages of the disease when the person is most contagious and a community menace. It is more economical in the long run as it offers means for intensive treatment and proper training of individuals as to prophylaxis. The more beds a community can provide for early cases the better the treatment and the smaller chance of later incapacitating syphilitic diseases which in their turn require intramural hospital care. Tarnowsky[1] tells of an unrestricted syphilitic woman who contaminated 300 men in ten months. One cannot even compute the effects of this on the innocent members of their families and the community.

An obvious difficulty in hospitalization is the unwillingness of the patient to give up work. Experience at the Massachusetts General Hospital[2] indicates that most jobs do not have to be given up. Employers are more willing to make adjustments for a patient sick enough to be in bed than for one who must take time off to report to an out-patient department. After hospital care they take more kindly to the idea of out-patient treatment. In the period of out-patient care the amount of time taken out of working hours may be diminished by night clinics. These are to be urged particularly for non-hospitalized contagious cases, neglect of whose treatment for one reason or another directly affects the community.

Pollock[3] in his computation of the economic loss on account of syphilitic mental diseases for the state of New York during 1917 showed that the loss in earnings alone was almost $5,000,000.

Williams[4] in his study of 100 cases of syphilitic mental disease shows the financial loss based on what the patients would have earned if they had lived out their normal span of life. The earning power of ten was known and this multiplied by the average expectation of life as estimated by the life insurance companies showed a financial loss of $212,248 for the group of ten.

1 Bulkley, op. cit., p. 204 quotes Tarnowsky, *N. Y. Medical Record*, March 9, 1889, p. 279.

2 Report of the Massachusetts General Hospital, 1918-19, p. 27.

3 Pollock, op. cit., p. 279.

4 Williams, loc. cit.

It is evident that the indirect loss of productive power materially increases the cost of syphilis to society. Of the 100 men investigated by Williams, 78 were married and left dependent wives and children. One cannot definitely assume that the financial problem of these families will be as typical of the families of all committed late syphilitics who die in a hospital. It is indicated, however, in our study of 41 committed paretics (see page 167, Chapter IV), 65 per cent of whose families received permanent financial aid.

Community Effects of Actions of Paretics.—In studying the effect of the late stages of syphilis on the community one must take cognizance of the disordered judgment of the paretic patient and his acts. Paretics are occasionally responsible for minor financial losses to the community, such as the failure of public institutions through their bad business ventures. One can only wonder how many financial fiascos, how many inflated concerns floated on the market, are the creations of the general paretic in one of his grandiose moods.

Dr. Mercier[1] has pointed out some of the medico-legal aspects of general paresis. Instability of mind may result in sudden violent outbreaks such as a fight on the street or unwarranted anger at the disobedience of a child. The exalted type has no idea of property or values, and will purchase beyond his means, make contracts he cannot fulfill, and enter into speculations. The increased sexuality of the patient may lead to immorality and the divorce court. The validity of a will may be questioned. By early recognition of the disease and care for the patient, expense to the family and the community may be prevented in reducing the cases brought before:

(1) the Criminal Court (stealing)
(2) the Property Court (litigation about validity of will)
(3) the Divorce Court (immorality due to increased sexuality)
(4) the Equity Court (speculations, breaking contracts).

1 Mercier, C., *Clinical Aspect of General Paresis.* (*System of Syphilis,* 1914, vol. iii), sec. ed., London, Frowde, Hodder and Stoughton, p. 81.

Social Losses—Decreased Marriage Rate. Another of the more important community losses is the lessened marriage rate. Many syphilitics, aware of their disease and its probable consequences, do not care to contract marriage. In others the unfortunate results of syphilis occur early in life before marriage is feasible.

Reduced Number of Children.—An even greater loss is the reduced number of children in the families of married syphilitics. We have shown in the family statistics the enormous human wastage in accidents to pregnancies. Syphilis is a destroyer of potential man power. In these post-war days anything which increases infant mortality is of extreme moment, especially abroad where the birth-rate for the last years has been dangerously low and the death-rate due to the loss of male adults in the prime of life has been extraordinarily high. Superimpose on this the additional toll of abortions, miscarriages, stillbirths, polymortality of infants, and sterile marriages, due to the increased amount of syphilis as a result of war, and one has a large problem. In Germany[1] the spread of venereal diseases has been so great that contagious cases abound everywhere. There are not enough hospitals in which to keep them. The effect on the families and the next generation can be conjectured. It is estimated that in France's army[2] so many men of the procreative age are syphilitic that for each syphilitic infection France is deprived of one soldier and one mother of a family during the period of 1936-1945. That the ex-soldiers all over the world are not going to take the necessary precautions or receive enough treatment to enable them to have healthy children is to be feared. Dr. Rhys[3] declares that in two English brigades in which every facility for treatment was provided, no one availed himself of the privilege. If men took no trouble while away from home

1 *Nederlandsch Tijdschrift* quotes the *Medizinische Klinik* of Berlin (American Medical Association, December, 1919).

2 Thibierge, G., *Syphilis and the Army*, London, University of London Press, Ltd., 1918, p. 32.

3 Rhys, O., Analysis of 1500 Cases of Venereal Diseases, All Male, at the King Edward VII Hospital-Clinic at Cardiff, Wales, *Social Hygiene Bulletin*, vol. vii, no. 1, Jan., 1921.

they are not likely to visit disinfecting stations near home. Hence their wives and children will suffer.

Collins[1] rightly advises that a list of syphilitic ex-service men be obtained from Washington and an attempt made to get these former soldiers to report to the Public Health Service for examination and further treatment if indicated.

Syphilis and Divorce.—Syphilis is rarely the sole cause of divorce. When acquired early or late after marriage it may be a cause of separation or divorce but it is usually associated with other social difficulties such as alcoholism, cruelty, non-support, and it is, of course, *prima facie* evidence of adultery. The disclosure after marriage that syphilis has been acquired before marriage rarely disrupts the home. A possible reason is that the discovery is often made after a considerable period of satisfactory marital relations. An indication of the comparative infrequency of divorce among syphilitics is shown by statistics of 515 married paretics admitted to the Psychopathic Hospital. Only 2.3 per cent were divorced.

Standards of Living Lowered.—General standards of living are lowered by syphilis through its power to affect the finances of a family. The families who drop below the line of self-support because of late syphilis in any member, increase the group who cannot keep to an adequate standard of life and happiness.

Loss of Life Through Inefficiency of Neurosyphilitics.—There is a certain definite yearly loss of life through the inefficiency of neurosyphilitics who, although mentally or physically incapacitated, still hold responsible positions. Many paretics are locomotive engineers or chauffeurs and if no trouble results from sudden attacks of confusion it is largely due to pure luck. At a conference[2] in January, 1920, of officials of the United States Public Health Service, United States Railroad Administration, and the American Social

1 Collins, H. G., Syphilis in the Innocent, *Journal* of the Kansas Medical Society, vol. 21, no. 7, Jan., 1921.

2 *Social Hygiene Bulletin*, vol. 7, no. 2, Feb., 1920, p. 4.

Hygiene Association, it was demonstrated that there was a definite relationship between venereal disease and impaired efficiency, accidents, and casualty costs. Several examples were cited showing that men in both the early and advanced stages of paresis were frequently found in charge of trains or in other positions endangering the lives of the public.

Stokes[1] has made a rather intensive analysis of the situation as regards railroad employees. In collaboration with Brehmer he writes that the investigation was undertaken because of the "impression that syphilis is an exceptionally common disease among railroad employees and that it constitutes a grave and unrecognized menace to their personal welfare and industrial efficiency, and to the safety of the traveling public. It impairs efficiency and brings discredit on railroad administration." In a survey of 50 syphilitic railroad employees they found that three fourths were engaged in the operation of trains, one third being on the engines. Nearly one half of the cases were not diagnosed prior to coming to the clinic although a high percentage showed gross neurological findings and mental symptoms. Of the men examined, practically 80 per cent had syphilis of the nervous system. Definite mental symptoms were determined in nearly 40 per cent. They conclude that the routine railroad medical examination is insufficient to protect the public and make three suggestions to correct this:

1. Routine Wassermann on all employees 17-25 repeated when age of 32. (By 32nd year 91 per cent were infected.) (By 25th year 60 per cent were infected.)
2. Effective annual examination of men 25 to 40 rather than men over 50. More attention to neurological examination. (71 per cent of late symptoms occur 6 to 20 years after infection, hence should examine neurologically men 23 to 45.)
3. Educational propaganda by railroad medical departments for employees and medical staff to show importance of syphilis in industrial efficiency and hygiene.

Case 140. Stokes[1] reports a case of a locomotive engineer 36 years of age who was suffering from tabo-paresis. He had been treated at

1 Stokes, J. H. and H. E. Brehmer, Syphilis in Railroad Employees, *Journal of Industrial Hygiene,* vol. 1, no. 9, Jan., 1920, p. 420.

the clinic for a year and a half and had a remission of six months' duration, during which time he carried his usual run. He suddenly appeared at the clinic having been sentenced for 90 days because of his share in a freight-passenger wreck. He had had a lapse of memory and passed a siding where he was to meet another train. The railroad had not tried to find out if there was a medical factor responsible for his share in the wreck.

Case 141. Joseph Griffin, a man of 50 years, was a railroad conductor. He had been in the employ of the company for 33 years. His position was a responsible one, as it is the conductor who gives the train orders. While on duty he had an attack and became unconscious in the baggage car. When the train reached its destination he was found in a state of coma which lasted for several days. His diagnosis was general paresis. It was mere good luck that on this particular trip he was not needed at the time the attack occurred.

A study of occupations of 755 paretics who have been patients at the Psychopathic Hospital showed that 61, or 8.07 per cent held positions involving the lives of others. The number in each type of occupation was as follows:

Engineers	11	Boat Captain	1
Brakemen	4	Sailors	6
Trainman	1	Life-guard	1
Switchman	1	"Lighthouse Co."	1
Conductors	4	Policemen	3
Motormen	4	Firemen	5
Yardmaster	1	Chauffeurs	12
Stationary Engineers	2	Coachmen	2
Naval Officers	2		

Engineers and chauffeurs seem to be the most frequent occupations, although conductors, motormen, and brakemen are not far behind. We must, then, look to our transportation systems,—railroads, electric cars, ships, automobiles—for our "dangerous paretics." More careful medical examinations and licensing are indicated as preventive measures.

Syphilis and Industry.—Oliver[1] brings out the importance of syphilis in industry. He takes up industrial inefficiency

1 Oliver, E. A., Syphilis, An Inestimable Factor in Industrial Inefficiency, *Journal of Industrial Hygiene*, vol. 1, no. 5, Sept., 1919, p. 247.

from the point of view of the employer rather than of the employee or family. He points out the danger of employing syphilitic people in the following cases:

Case 142. (Oliver's case 1) had sustained an injury while working at his job. A box fell on his back. Earlier in his life he had had a fractured spine. He recovered and returned to work, where he was a satisfactory employee for several years. Then he began to have pains in his back and legs and was sure that these pains were caused by his previous injury. He was found to be a tabetic and improved markedly under treatment at the industrial clinic.

Case 143. (Oliver's case 2) was a foreman who became markedly inefficient. He had had several attacks of unconsciousness and from an energetic foreman became a careless and absent-minded workman. He was found to have nervous system syphilis, and under treatment the standard of his work has been raised.

Case 144. (Oliver's case 3) scratched the back of her hand with a piece of wire while working in a millinery department. After local treatment for a few weeks the trouble disappeared. The girl was found to be a congenital syphilitic and improved under treatment. However, she was away from work off and on for two years before she was well enough to be an efficient employee. This was a rather expensive case for the industry.

Oliver advises that all employees and all applicants be given a Wassermann test. He does not believe that those with a positive Wassermann should be discharged or not employed but rather that they should be treated. He advises pay clinics for all industrial centers so that the men who cannot afford to pay private fees can have efficient treatment. He also recommends the discovery of the source of infection and all contacts as a public-health attitude for industry. A less advanced point of view is that of the ——— shipping firm which refused to employ William Carter, who had a luetic hemiplegia, on the ground that they never employed persons with a known positive Wassermann reaction. The fact that the patient had a nervous system involvement might well be a reason for refusing to risk future incapacitation, but employment was refused entirely because of the serum reaction.

Syphilis and Industrial Compensation.—Syphilis often acts as a factor in the prolongation of convalescence of various diseases and thus puts upon industry a burden of expense in the form of compensation. Frequently insurance companies suffer considerable financial loss through the increased increment of expense due to this prolongation of convalescence.

Everett[1] has called attention to this matter and gives the following illustrations:

Case 145. (Everett's case 1) sprained his ankle. Ordinary recovery would have taken place in 4 to 6 weeks, at a compensation of $72.15. Owing to a latent syphilis which was stirred up, complications arose and the compensation was $336 for seven months.

Case 146. (Everett's case 2) sustained a fracture of the thigh bone. After a year's compensation or $260 plus two weeks' medical service, the company would ordinarily have been able to stop payments as the injury would have healed. But owing to syphilitic complications, the thigh had not healed, the chances were against the man's ever returning to work, and the insurance company would probably have to continue payments indefinitely.

Mistakes in Attitude Towards Syphilis—Moralistic Point of View.—The entire question of the contagiousness of syphilis and public welfare as well as the financial and social losses caused by syphilis is, in the last analysis, bound up with the general attitude of the public towards the disease. A glance at the negative side brings to light the most frequent mistakes in the usual approach to syphilis. The moral attitude, the feeling that all syphilitics are renegades, does a tremendous amount of harm. It pays no heed to the large number of innocent syphilitics whom we have been studying, it brands the man who has transgressed once in early youth together with the habitual roué. It makes no distinctions, it sweeps all syphilitics into the group of outcasts. True, many God-fearing persons have been rigid moralists and have felt that they were aiding in stamping out venereal diseases. But no real progress will ever be made until syphilis is freed of the idea of moral taint and just punishment for sin, and is put

1 Everett, R. H., The Cost of Venereal Disease to Industry, *Journal of Industrial Hygiene*, vol. ii, no. 5, Sept., 1920, pp. 178-181.

on a plane with other diseases. The church can probably aid in this as much as any other organization. Doctors, lawyers, teachers, social workers, all must do their share.

False Idea of Fear as Deterrent to Sex Appetite.—Unfortunately, the old idea that fear of consequences will curb the sex appetite and so avoid syphilitic infection has not proved true. Year after year medical students and others who know all that may happen to them, appear at the clinics for treatment. The value of propaganda for knowledge is not so much that individuals may remain continent outside of marriage but that men may do what they do with their eyes open, so that the innocent may be protected by proper preventive and post-infection measures.

Case 147. James Foster, who had had adequate treatment for his syphilis, proved his cure by acquiring a new syphilitic infection. While under treatment he said, "Doctor, I have sure learned my lesson this time." On being asked what he meant, he replied: "When I am cured again I am going to use precautions!"

It seems well to emphasize here the difference between propaganda for the dissemination of knowledge and the duty one owes to the patient as an individual. While all are definitely agreed upon the value of education to the end that the public will come to recognize venereal diseases as infectious diseases that should be cared for as are other contagious and infectious conditions, yet the individual must never be lost from sight. He has certain rights that are just as inviolate as those of any other patient who seeks medical advice. For propaganda purposes one should not hold up any given individual as an example or do anything that would lead to his definite discomfort. As long as the individual is not in a contagious state, it is not logical nor reasonable to expose him to the difficulties that would arise if various members of the community knew of his condition. While one must work for the time when it will be possible to speak of syphilis as an affliction unconnected with the thought of shame, until such a time arrives, one must do all one can to protect the individual if he is in no sense a community menace.

Over or Under Emphasis on Syphilis.—There is always the danger of taking syphilis too seriously or not seriously enough. There are persons who smile at the possibility of acquiring syphilis, who shrug their shoulders when they have acquired it, scoff at the idea of prolonged treatment, and are incredulous years later when told that syphilis is causing all their recent difficulties. Others live in terror of acquiring syphilis, shudder for the future when they are syphilitic, and are skeptical of a promised cure with faithful treatment. These extremes of mental carelessness and caution apply equally to a consideration of syphilis acquired by intercourse or chance contact. Sanity and balance must be maintained and a rational public attitude established. Syphilis is probably not an incurable disease if treated early and adequately. Treatment somewhat later will hold the disease in check. Treatment many years after infection when some damage has been done may give a remission and prevent future illness. Syphilis is a serious disease but not a hopeless one.

All Syphilitics Not Contagious.—Allied with the above is the idea that all cases of syphilis are always contagious. If this were true few would escape, as all meet syphilitics in daily life at one time or another. Stokes[1] gives a rather amusing picture of fearful persons:

> I have known eminent medical gentlemen to wash their hands with almost hysterical eagerness after touching my door knob, or after the presentation of one of my cases in a clinic; and nurses and office assistants joining my staff to be the recipients of condolences from friends and tearful protests from relatives; the supposedly well-informed heads of training schools to refuse me nurses when, without their realizing it, I had identified for them repeatedly the dangerously contagious syphilis which they were unconsciously nursing in their wards and in their finest private rooms. Of the uninformed, we, of course, expect such blunders. That similar types of thinking are still prevalent among the flower of the profession is only a tribute to the super-darkness that surrounds us.

1 Stokes, J. H., *To-day's World Problem in Disease Prevention*, Washington, U. S. Public Health Service, Treasury Department, p. 106.

Early untreated syphilis is contagious under the conditions already mentioned. Late syphilitics are practically never contagious. Although syphilitic babies are most contagious, late congenital syphilitics are not. Thus, great care must be taken in the placing out of syphilitic babies so that other children shall not be infected. All children offered for adoption should be pronounced syphilis-free by a competent doctor. As a symptom-free congenital syphilitic child of school age is quite safe from the point of view of contagiousness he can go to school, be placed out in a family, and play with children. However, it is wisest for a family not to adopt legally such a latent syphilitic child even though noncontagious, as he is likely to have later incapacitating diseases. The burden of care of such children should rest with the state.

Case 148. The case of the Guardino[1] baby typifies the dangers oftentimes run in the poorer families. Since its birth the mother had boarded her 6 months old illegitimate baby with a woman who had no permit for keeping children. Then desiring to get rid of it permanently, the mother left it with a neighbor, telling her to bring it to the hospital, as she was leaving town. The neighbor, a pregnant woman with three children, brought the baby to the clinic, realizing that it was sick and undernourished. The child was obviously a congenital syphilitic and was covered with an actively contagious syphilitic rash. As luck would have it, no one of the two families with whom the baby had lived was infected. The baby was given syphilitic treatment in a hospital and the mother was prevented from abandoning it.

Case 149. Mr. and Mrs. McCarthy[1] brought a 6 weeks old baby to the hospital because of a rash. This was not their own child but had been taken for adoption two weeks previously. They had received the child from an infant asylum and it had been perfectly well. The "home" had received the baby two days before. No questions had been asked of the woman who brought it, and it had been placed out without examination merely because it appeared well. A few days later a skin rash and a cold developed. As the baby did not improve in two weeks the foster parents thought it wise to bring it to the hospital. The child had a syphilitic rash, snuffles, desquamation, and exudate in the corners of the mouth. It was in a highly

1 Children's Hospital, Boston.

contagious state. Inquiries showed that there were two children living in the McCarthy family at this time, one of whom was only four years old. Luckily the foster mother and her sister had cared for the child, not allowing the child to touch it, as they thought its "cold" might be catching. Neither one of them had kissed the child on the mouth and had no abrasion so far as known. The baby was returned to the asylum and was placed in a hospital where it was not expected to live. This case is an indictment against placing out agencies which do not thoroughly examine all children in their care.

Case 150.[1] Massachusetts General Hospital case. A young delinquent girl with a contagious case of syphilis was treated until all danger of contagion was over. A plan was then made whereby the child was to change her home environment and to live with a relative in another part of the city. In this home there was a child of 10. Before the hospital worker could make arrangements with the relative, the probation officer had gone to the woman and told her that the girl had syphilis and that she should not be allowed to live in the family lest the little girl should become infected.

All efforts of the medical social worker to show the relative that her own child was not in any danger were of no avail and the girl remained under the same bad home influence as before. As a result she ran away again, and when next arrested was sent to prison. If it had not been for the misinterpretation of the medical situation this girl might have been saved.

Case 151. Samuel Cohen became a state ward at the age of 9. Although he was not contagious, he was a congenital syphilitic. Hence he was placed out but never adopted.

Case 152. The 5 and 6 year old boys of Agnes Mazzarello were under treatment at the clinic, one having a positive Wassermann reaction and the other specific condylomata. They were found to need a vacation, but the agency made no attempt to place them on account of the contagiousness of the second child. The proper technic was used, the children were treated, examined again when there were no longer any specific lesions, and were then sent away for their vacation. A short time after this the mother died of influenza and an examination was made again with the idea of placing them out permanently.

1 Lewis, O. M., Medical Social Service as a Factor in Protective Work, National Conference of Social Work, New Orleans, April, 1920, p. 313.

Mistakes in Interpretation of Stigmata or Symptoms.—The layman who knows a few of the common stigmata of syphilis is only too apt to confuse them with similar non-syphilitic difficulties. All skin lesions are not syphilitic. Most youths with rashes on their faces are not suffering from syphilis but from acne. Syphilitic skin lesions are almost always on the trunk and not on the exposed part of the body. Many people think rachitic children or those with decayed teeth are syphilitic. It is an injustice for a layman to make a diagnosis on such evidence. Late congenital symptoms are often considered as acquired and a juvenile general paretic branded as having acquired syphilis.

Ignorance of Syphilis as Family Disease.—Another common error is forgetting that the families of syphilitics are potential syphilitics. Even after realization, many people hesitate to take active steps towards examining the family for fear of causing marital discord. This subject has been covered under examination of the family.

Over-Emphasis of Possible Causal Relation With Social Difficulties.—Workers with syphilitics must not take the disease so seriously as to find a causal relation between all the social problems of syphilitics and the disease itself. Syphilis may cause certain social abnormalities and merely be coincident with others.

Remedial Measures Against Infection.—The popular mistakes in regard to syphilis, above noted, should gradually disappear as the remedial measures against infection become more stabilized. In a study of innocent syphilis one must first consider the direct measures, both those which will minimize the possibility of acquiring *innocent genital* syphilis and those which diminish the likelihood of acquiring *innocent extragenital* syphilis.

Legal Approach to Eradication of Innocent Genital and Extragenital Syphilis.—The direct measures towards the eradication of innocent genital syphilis are mostly legal and

have already been discussed in the chapter on the family. The physician may be released from the bonds of professional confidence, so that he may prevent the marriage of a contagious syphilitic; health certificates may be insisted on for all applicants for a marriage license; marriages may be annulled when syphilis is discovered. Outside the power of the law in most cases is the insistence on the early examination of the members of the families of all syphilitics. Marriages before the period when most men acquire syphilis would cut off a large percentage of marital infections. Unfortunately such marriages depend so largely on finances that one can only hope that the economic situation in the years to come may permit young men to marry earlier.

Again the remedial measures against the spread of innocent extragenital infections are mostly legal. Small operations such as circumcision and tatooing, must be performed only by licensed persons; midwives must be licensed; public places such as barber shops and soda fountains must be inspected by the boards of health, and regulations as to the boiling of articles, use of paper cups, etc., must be enforced. Judicious publicity about the contagiousness of objects and persons is advisable. By this means contagious syphilitics can be urged to observe hygienic rules in the home and special attention can be called to the care of syphilitic infants.

Value of General Preventive Measures.—In the long run any measures directed towards the eradication of syphilis, whether innocently or venereally acquired, will tend to diminish the amount of innocent syphilis. We will not go into detail regarding the many efforts of general prevention but will merely refer to a summary of some of the more frequent prophylactic measures, including the more direct as well as the indirect measures bearing on innocent syphilis.[1]

1 See Programme of Medical Education and Law Enforcement Measures issued by Treasury Department, United States Public Health Service, chapter xvi, *Public Effort vs. Syphilis*, also Dr. J. H. Stokes, *The Third Great Plague*, Washington, D. C., and *Social Hygiene Bulletin*, Nov., 1919, for further discussion and suggestions.

TABLE 39

I. Public Grants for Study and Prevention.
   1. Federal appropriations to state to aid in combating venereal diseases.
   2. Establishment of bureaus of venereal disease by many state boards of health and United States Public Health Service.
   3. Appropriations by Interdepartmental Social Hygiene Board to universities, schools, for study of venereal disease, and teaching of sex hygiene.

II. Education Efforts and Publicity.

1. Lectures 2. Pamphlets, journals, books 3. Posters and placards 4. Exhibits 5. Movies	For doctors, social workers, teachers, heads of families. By social and mental hygiene associations, boards of health.

III. Legal Attack: Laws and Their Enforcement.
   A. *General.*
      1. Adequate examination before marriage.
      2. Doing away with professional confidence.
      3. Annulment of marriage because of venereal disease.
      4. Enforcement of treatment of all contagious cases in institutions, prisons, etc.
      5. Legal follow-up of all untreated contagious cases by boards of health through notification laws.
      6. Suppression of quack advertising, practice, etc.
      7. Legalizing personal prophylaxis.
   B. *Suppression of Prostitution.*
      1. Workable law prohibiting prostitution with provision for probation. indeterminate sentence, industrial rehabilitation, etc.
      2. Abolition of segregated districts.
      3. Injunction and abatement laws.
      4. Licensing of amusement places, taxicabs.
      5. Enforcement of penalties against white slavery.
      6. Isolation and treatment of infected prostitutes.

IV. Efforts for Diagnosis.
   1. Hospitals and dispensaries, sufficient in number and equipment.
   2. Free laboratories for serum tests.
   3. Follow-up family and contacts of syphilitics.
   4. Examination (including routine Wassermann reaction) of all people in public institutions of all kinds such as child-caring, deaf, dumb, and blind, feeble-minded institutions, hospitals, and prisons.
   5. Examination of employees in industrial establishments, railroads, etc.

V. Efforts for Treatment.
   1. Treatment of all infected persons in institutions whether contagious or not.
   2. Rigid follow-up of all early and late hospital cases for continuous treatment.
   3. More public out-patient clinics (evening and day) and hospital beds for syphilitics.
   4. Standardizing of hospitals.

5. Detention hospitals for contagious uncoöperative cases.
6. Free expert treatment and free drugs (state or privately paid) for the poor.
7. Pay clinics for persons of moderate means.
8. Locating source of infection and establishing treatment.

Infectious, contagious diseases are always matters of importance to the whole community. The effects of syphilis are even more far-reaching than of acute diseases such as typhoid fever or smallpox and do not end with the spread of the disease. However, the matter of contagiousness is very pertinent. Accidental extragenital infections are by no means infrequent and if one numbers among the innocent victims the mates and children of the syphilitic, the extent of this phase of the problem is quite stupendous, and comes within the purview of the public-health departments, municipal, state and national.

But syphilis is of greater interest to society than in its aspect of accidental contagiousness. It causes much loss of economic efficiency, it disables men and women in their prime, it leads to various defects in children, who either die early or go through life handicapped. It is a considerable factor in race suicide through its part in lessening the marriage rate and producing sterility, unsuccessful pregnancies, and infant deaths. The apparent cost to the community, great as it is, does not give more than a small fraction of the total cost.

Whether viewed from the standpoint of its effect on the individual, his mate, and children, the family group, or of the dangers of contagion, the cost to society for medical and social care, the loss of economic productivity in industry, the difficulties of the mentally deranged, syphilis is always a community problem. In all its manifestations the social structure is involved. Any problem implicating the community at large to such a degree deserves the intelligent attention of the members of the community, and *per contra* the members of the community are entitled to a knowledge of a subject of such major importance to them individually and collectively.

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