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Part I.—Original Articles.

THE INCIDENCE OF CONJUGAL NEUROSYPHILIS.

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As syphilis is a contagious disease it is a matter for surprise that so few investigations have been made into the conjugal histories of patients suffering from general paralysis of the insane.

Until quite recent years the figures of O. Fischer (1913) have largely been quoted when the incidence of conjugal neurosyphilis has been brought into question. Among the husbands of 86 female paralytics he found 8 cases of conjugal neurosyphilis. More recent inquiries have been made by Moore, the Solomons and Kemp, and their results have been summarized by Moore (1933).

Before any conclusions can be drawn from published figures as to the incidence of conjugal syphilis among patients suffering from neurosyphilis there are several points to be considered.

(1) Although syphilis is a contagious disease the contagion lasts only for a limited period of time. Harrison writes: "It is generally agreed that the risk of infection by sexual intercourse becomes very considerably reduced by the end of the second year of infection, and is very slight after five years, though exceptional cases of much longer sexual infectivity have been recorded." It is possible that the contagious period is longer in men than in women, the infection being conveyed *via* the seminal fluid for some time after the primary and secondary manifestations have disappeared. Moore considers that although it is probably true that in most instances the disease is infectious with diminishing frequency for not more than five years, the danger to the marital partner from symptomless and latent infection is considerable. Our findings do not seem to confirm this view of Moore's. The general impression

gained from our investigations was that conjugal syphilis only occurred if conjugal relations were established within a limited period after the acquisition of syphilis by one of the conjugal partners; if the man acquired the disease first the period rarely, if ever, exceeded two or three years; if the woman, one or two years. The relatively small number of cases of conjugal syphilis recorded here is thus in part due to the fact that quite a large number of conjugal relationships were instituted outside the contagious period.

(2) Fournier (1) was the first to draw attention to the fact that in patients who develop G.P.I. or tabes the primary lesion is often extremely small, secondary symptoms are usually slight or absent altogether, and tertiary lesions are very rare. Many neurosyphilitics, therefore, are unaware that they have contracted syphilis, and are genuinely surprised when informed that this disease is the cause of their illness. It is not improbable that this "*symptomarmes lues*" also occurs in persons infecting or infected by neurosyphilitics, and that these also will have no knowledge and no evidence (other than serological) of having contracted syphilis. Should these persons die during the latent period the existence of this syphilitic infection would never be suspected. It is highly probable, therefore, that a percentage of those consorts who died or were killed prior to or within a few years after the onset of neurosyphilitic symptoms in their partner were suffering from latent asymptomatic syphilis, and that many if not all of those so infected were potential neurosyphilitics. This surmise is obviously incapable of verification.

(3) After divorce, separation or desertion the two parties frequently lose contact with one another and the consorts' subsequent history becomes ascertainable. In a few cases the available history offers definite evidence for or against a conjugal infection; in the others the only possible inference is that some will be free from syphilis and some infected; of these latter some may have recovered spontaneously or following treatment, some may have died during the latent period, some may have developed neurosyphilis, and some may be potential neurosyphilitics in the asymptomatic phase.

(4) Errors in diagnosis, or diagnostic euphemisms engendered by professional discretion, are undoubtedly responsible for the concealment of some syphilitic infections.

(5) The demonstration of syphilis in conjugal partners is not proof of a conjugal infection.

(6) As tertiary syphilitic lesions occur as relatively early manifestations, it is probable that all such lesions will have been manifested before the onset of neurosyphilitic symptoms in the conjugal partner, whereas neurosyphilitic symptoms may not manifest themselves until after this. Moreover, as the numbers of deaths or separations naturally increase as time goes on, it is obvious that this will produce a more apparent diminution in the number of neurosyphilitics than in the number of cases with tertiary syphilis, owing to the difference in the length of the latent period. This, however, may be offset

by the fact that tertiary lesions are more easily concealed than are the later forms of syphilis.

Having paid due regard to all these factors, the results here published are indeed striking.

Although evidence of syphilis was obtained in only 78 consorts in a series of investigations dealing with 492 women patients and with a total of more than 600 men, yet this figure is higher than that of the 76 men who were found to be free from infection. It is therefore highly probable that the actual number of conjugal infections is considerably higher than the recorded figure, and also that the number of conjugal partners who are non-syphilitic is greater than is commonly supposed.

The most striking feature is the rarity of tertiary syphilis: only 11 such cases are recorded, and of these seven had cardio-vascular lesions and one leucoplakia. In contrast with this is the incidence of neurosyphilis—namely, 38 recorded cases, together with two cases of latent asymptomatic neurosyphilis, and two with probable neurosyphilitic syndromes.

The percentage of syphilitic patients who develop neurosyphilis has been estimated by Blaschko (1912), and Weygandt and Jakob (1914) to be between 10–15 per cent. Here the ratio is 38 : 78 (possibly even 42 : 80), giving a percentage of 48·6—a figure considerably in excess of those quoted above. A somewhat similar high frequency of neurosyphilis in the marital partners of patients with parenchymatous neurosyphilis has also been found by Moore (1933), who writes: "The marital partners—husband or wife—of patients with parenchymatous neurosyphilis (tabes or paresis) have been found to be infected with syphilis with great frequency, and when infected more than twice as liable to suffer from neurosyphilis as an unselected group of syphilitics." These figures undoubtedly lend considerable support to the theory of the neurotropic strain.

An even more important conclusion to be drawn from these statistics relates to practical considerations. It is rare in conjugal neurosyphilis for the onset of symptoms to occur in both partners simultaneously: usually one succumbs to the disease several months or even years before the other. Systematic inquiries and routine examinations of the blood, and if necessary of the C.S.F., of the conjugal partners of all patients with neurosyphilis would reveal the existence of these potential neurosyphilitics and enable prophylactic treatment to be undertaken. This has already been done at Horton with very gratifying results.

The present paper deals with investigations undertaken at the Horton Malaria Therapy Centre, the first results having been given in a paper by Nicol and Hutton in 1937.

Whereas the earlier inquiries were mainly confined to the relatives of male patients, the present paper is concerned solely with the conjugal partners of female paralytics treated by malaria between 1925 and 1939 (definite cases

of congenital neurosyphilis are excluded, as it is proposed to deal with these in a separate paper). The total number of women treated during this time was 492 ; but as this systematic inquiry was not instituted until 1936, it was found impossible in many cases to get into touch with the relatives of those patients who had died or been discharged during the intervening eleven years. In other cases the relatives, when interviewed, did not always prove co-operative and refused to give accurate histories or to undergo the necessary serological tests. Moreover, even when patients and relatives were friendly and anxious to help, poor memory or low-grade intelligence often defeated our purpose.

The scope of the inquiry included the date of the patients' primary syphilitic infection, the date of the marriage or cohabitation (and of any pre-marital sexual relationship either with the marital partner or with any other person or persons), obstetrical details, including miscarriages, stillbirths, surviving children, and finally any data relating to illness in the patient or in the consorts and children (in some cases also in parents and siblings). Details were sought concerning the nature of the illness, its date, and the name of any doctor or hospital responsible for treatment. As far as possible any statements made concerning illness were confirmed by direct inquiry of the doctor or hospital concerned ; but even so the information obtained was often disappointing, as many hospitals destroy their out-patient records after a relatively short period of time, some patients, when attending V.D. clinics, give false names, and subsequently fail to remember their *alias* ; and finally, as the diagnosis of syphilis is not always easy, it is not improbable that in some of the pathological conditions which occurred among the spouses and offspring of our patients the syphilitic aetiology was not recognized.

In order to present the material as clearly as possible, it has been arranged in the form of tables ; to do this it has been necessary to make certain arbitrary divisions—but it is hoped that the reasons for this will be self-evident. The term " consort " has been chosen, as in research work of this nature no distinction can be drawn between legally married partners and cohabitants.

Table I gives a brief summary of the arbitrary divisions here adopted, while Table II relates to those cases where evidence for or against syphilis was obtainable ; it will be seen that this was only possible with regard to 154 men, 76 of whom were found to have a negative W.R. in the blood, while 78 offered some evidence of having contracted the disease.

Table III gives very scrappy details obtained concerning those 61 women who were living apart from their consorts and had lost touch with them ; three are said to have acquired the infection from their husband, while in one the infection was extra-marital.

Table IV supplies data concerning those patients who were widows at the time of their admission. In 15 of these consorts we were unable to ascertain the cause of death, but it is recorded in the other 34. It is possible that

TABLE I.—*Summary of Findings.*

Total number of patients included in this investigation, 492.

10 women : No information available.
40 ,, : Single.
61 ,, : Living apart from their consorts, whose whereabouts are unknown.
49 ,, : Widows at the time of admission } As the result of non-
8 ,, : Widowed after admission } syphilitic diseases.
36 ,, : Known to be prostitutes or definitely promiscuous.
90 ,, : Cohabited with two or more consorts.
198 ,, : One consort only. This group has been subdivided as follows :
- 92 consorts alive and apparently healthy at time of patient's admission to hospital.
- 53 consorts had negative W.R. in the blood.
- 53 consorts suffered from syphilis.
  - 30 from neurosyphilis.
  - 23 from primary, secondary, tertiary or latent syphilis.

TABLE II.—*Summary of the Findings where Evidence was Obtained for or against Syphilis in Conjugal Partners.*

Total number of men offering some evidence of syphilis, 78.

Men with a history of having acquired syphilis		16
Details given in Table III	3	
,, ,, ,, IV	3	
,, ,, ,, VII	3	
,, ,, ,, X	4	
,, ,, ,, XII	3	
Men known to have had primary or secondary syphilis		4
Details given in Table IX	2	
,, ,, ,, XII	2	
Men known to have had tertiary syphilis		11
Details given in Table IX	9	
,, ,, ,, XII	2	
Men known to have latent syphilis		10
Details given in Table IX	8	
,, ,, ,, XII	2	
Men known to have had neurosyphilis		37
Details given in Table IX	28	
,, ,, ,, XIII	9	

Total number of men found to have a negative W.R. in the blood, 76.

Details given in Table IV	1
,, ,, ,, VII	5
(One of these probably an arrested tabes.)	
Details given in Table VIII	53
,, ,, ,, XII	17
(One of these has a history of syphilis 44 years previously.)	

TABLE III.

Women who are living apart, 61.

Present whereabouts of consort unknown.
Three of these are said to have acquired syphilis from their husbands.
One ,, is ,, ,, ,, extra-maritally.

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syphilis may have been an aetiological factor in those who died from cardiac disease or who committed suicide. The average interval between the date of the consort's death and the onset of the patient's symptoms is 5·3 years, the longest interval being 26 years and the shortest 1 month. A history of syphilis was obtained for only 3 men, but it is probable that the incidence of infection in this group was considerably higher.

As somatic syphilitic lesions generally appear within the first few years after the infection, the complete absence of any information concerning such lesions suggests that they either occurred very infrequently, or were of so mild a character as to attract little or no attention. The long latency of neurosyphilis, on the other hand, makes it possible that at least some of these men died before this particular form of disease had had time to manifest itself.

TABLE IV.

Widows, 49.

Consorts killed in Great War	6
One of these men said to have acquired syphilis in Boer War; married 1905.	
Cause of death unknown	15
Two of these men said to have infected their wives with syphilis.	
Suicides	4
2 by drowning.	
1 by gas-oven.	
1 mode of suicide unknown.	
Mental disease	1
[Melancholia, tuberculosis, attempted suicide.]	
Cancer	4
2 of tongue.	
1 of prostate.	
1 site of cancer unknown.	
Other diseases	4
1 influenza.	
1 Bright's disease.	
2 perforated gastric ulcer.	
Lung diseases	8
4 pneumonia.	
3 tuberculosis.	
1 bronchitis and emphysema.	
Cardiac diseases	5
1 myocardial degeneration and acute bronchitis.	
1 mitral and aortic lesions.	
1 auricular fibrillation and myocardial degeneration.	
1 heart failure.	
1 hyperpiesis. W.R. negative.	
Sudden death (date of consort's death known in 37 cases)	2
Shortest interval between consort's death and onset of patient's symptoms	1 month
Longest interval between consort's death and onset of patient's symptoms	26 years.
Average interval between consort's death and onset of patient's symptoms	5·3 ,,

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In Table V are recorded eight cases where the patient's consort died after her admission to hospital with general paralysis; two of these had cardiac disease which might have been due to syphilis, and in two the cause was unknown; one committed suicide, and one who was admitted to a mental hospital with cerebral softening and arterio-sclerosis had a negative W.R. in the blood.

TABLE V.

Women whose consorts died after their admission, 8.

	Date of marriage.	Date of woman's admission.	Date and cause of consort's death.
(1)	Before 1901	1923	1934. Cardiac failure and myocardial degeneration.
(2)	1916	1927	1937. Phthisis.
(3)	1902	1928	1931. Cerebral softening and arterio-sclerosis. Hemiplegia 1928. Attempted cut-throat 1929. admitted mental hospital. Blood W.R. negative.
(4)	1919	1928	1931. Committed suicide.
(5)	1913	1931	1934. Carcinoma right bronchus.
(6)	1895	1931	1935. Cause unknown.
(7)	1925	1931	1937. ,, ,,
(8)	1896	1934	1935. Chronic bronchitis and auricular fibrillation. There is a history of the patient having acquired " a disease " as a result of having been raped at the age of 11 or 12.

Table VI presents all the data which could be obtained concerning 92 consorts alive at the time of the inquiry and with nothing suggestive of syphilis in such history as we were able to obtain about them, but the majority of these histories were extremely inadequate. As far as we know none of these men has ever had a blood test taken. Of the 92 patients five are known to have been infected from some source other than their conjugal partner; in three of them the infection occurred several years before marriage, and it is therefore likely that they were no longer contagious when they married. Two women were infected after marriage, but in both cases the infection occurred during the last war—about 1916—while their husbands were on active service, and it is again possible that the contagious period was passed before they resumed marital relations. In two women there was a history (unconfirmed) that the infection had been acquired pre-marriage; both had undoubtedly had a pre-marital pregnancy, and the fact that in one case the child was still-born certainly lends colour to the suspicion that the patient acquired her infection at that time. Three other women were known to have had pre-marital experience, and in one of these the death of her child at 13 days, from jaundice, suggests it may have died from congenital syphilis. In the above cases, therefore, it seems unlikely that the consorts were involved in the patients' infection. In eight women the history suggests that they may have been

suffering from congenital, not acquired, neurosyphilis, and one may surmise that here too, their consorts were not implicated. One woman had been parted from her consort for many years and may have acquired her primary infection after the separation. Of the remaining 76 women, 22 were aged 25 or more at the time when cohabitation began, the eldest being 51, and the average age on marriage or cohabitation 30. It is possible that in many of these cases the infection was acquired pre-maritally when the patient was in her teens or early twenties, the contagious period being passed when cohabitation began. Fifteen women had been cohabiting for less than ten years; in one case the woman had cohabited for only one year prior to her admission to hospital, and the average period of cohabitation for this group was only 4–6 years. Having regard to the fact that the latent period of G.P.I. is usually ten years or longer, it may be presumed that the consorts of these women were not connected with their syphilitic infection. Of the remaining men it is possible that there is quite a considerable number with unsuspected syphilis, some of whom are liable to develop neurosyphilis at a later date.

TABLE VI.

Consorts alive but have not had blood-tests, 92.

Women known to have been infected by some other person	5
3 women, the syphilitic infection occurred several years pre-marriage.	
2 women, the syphilitic infection occured after marriage, in both cases during the last war, about 1916.	
Women said to have been infected by some other person .	2
1 woman had a pre-marital stillbirth.	
1 woman ,, ,, child.	
Women who may have been infected by some other person .	3
1 woman had a child 2 years before marriage which died aged 13 days (jaundice).	
1 woman had a pre-marital pregnancy.	
1 woman ,, ,, *affaire*.	
Women possibly suffering from congenital neurosyphilis .	5
1 woman's eyesight began to be affected at the age of 15.	
Women with other relatives suffering from neurosyphilis .	3
2 women had fathers who died of G.P.I.	
1 woman had a sister ,, ,,	
Woman separated from the consort for many years . .	1
Of the remaining 76 women—	
22 were aged 25 or more at the time when cohabitation began, oldest being 51.	
Average age of this group when cohabitation was instituted, was 30.	
15 had been cohabiting for less than 10 years.	
Shortest period of cohabitation, 1 year.	
Average ,, ,, for this group 4·6 years.	

Table VII deals with women who were either prostitutes or definitely known to be promiscuous. In most of these cases no information could be obtained concerning the source of their infection, or of any person or persons

infected by them. There are three exceptions : one patient is said to have been infected by her husband, but his fate could not be ascertained as the patient had lost touch with him since they had separated. Similarly, two men are said to have been infected by their wives, but of these one died a few years after marriage from carcinoma of the colon ; the other was deserted by our patient shortly after marriage, and his subsequent history is unknown. Three men were found to have negative blood W.R.'s ; in one case the patient was almost certainly suffering from congenital syphilis, as she had Hutchinson's teeth, and in any case the marriage took place only three years before her admission to hospital ; in the second the marriage antedated the patient's admission by only five years ; while in the third, although the cohabitation had lasted for 25 years the patient had had an illegitimate child three years previously, and was also very promiscuous while her cohabitant was away in Palestine. In two cases the history suggests the possibility of neurosyphilis in the man ; one with Argyll Robertson pupils, a positive Romberg sign, together with mental symptoms and a negative blood W.R. indicates an arrested tabes ; whilst the other, who went blind four years before his death from pneumonia, may have been suffering from optic atrophy. Of the two women who were married twice, one had secondary syphilis in 1916—three years before her first marriage and six years before her second, and it is therefore unlikely that she transmitted syphilis to either of her husbands ; the second woman, who married in 1895, was found to have syphilis in 1914 ; as the date of the primary infection is not known, her first husband may have been implicated, but his fate could not be ascertained ; it is highly improbable that she was contagious at the time of her second marriage in 1926.

Table VIII records the data concerning those women whose husbands had had their blood W.R's. tested and found to be negative. A negative blood W.R. is not an infallible indication of freedom from syphilis, since it can co-exist with a positive C.S.F. and active neurosyphilis, and it is certainly no proof that the infection has never been contracted, for it may have become negative following treatment or a spontaneous recovery. In many cases, however, the available evidence suggests that no conjugal infection had occurred. Of four women known to have acquired syphilis from some other source before marriage, two had acquired the infection only one year previously ; as no history was obtainable suggestive of any infection in the consort, it may be that the contagious period in a woman is sometimes at least shorter than 12 months. Eleven women were known to have had extramarital relationships, and of these, two had definitely acquired their infection in this way, and it is possible that all may have done so. In three cases the history of the patient suggested that the infection was congenital rather than acquired. In eight cases the marriage had taken place less than ten years before the onset of the patient's symptoms, while in some of longer duration the recorded facts hint at a non-conjugal infection. This group is important because it demonstrates

TABLE VII.

Women known to be prostitutes or definitely promiscuous, 36.

Single 16

Married once 14

2 said to have infected their husbands with syphilis.
1 husband died a few years after with cancer of the colon.
1 husband's whereabouts unknown; patient left him soon after marriage.

1 husband said to have infected patient with syphilis; present whereabouts unknown.

4 whereabouts of husband unknown.

1 husband died 1921 with pneumonia, but he was blind in 1917.

3 husbands alive, not tested.

2 husbands with W.R. negative (blood).
1 patient, ? congenital; Hutchinson's teeth. Married 1927, admitted 1930.
1 married 1934; admitted 1939.

1 husband ? an arrested case of neurosyphilis.
A.R. pupils, Romberg positive, depressed, hallucinated, W.R. negative (blood).

Married twice 2

1 patient had secondary syphilis 1916; married (1) 1919; husband's whereabouts unknown. (2) 1922; husband not tested.

1 patient known to have syphilis in 1914; married (1) 1895; husband's whereabouts unknown. (2) 1926; husband not tested.

Cohabiting 4

1 cohabited from 1926–1934; consort's whereabouts unknown; patient admitted 1936.

1 married 1931, separated after 2 months; cohabiting 1933; cohabitant not tested.

1 cohabiting about 25 years; cohabitant W.R. negative (blood). Patient had an illegitimate child about 28 years ago, and is said to have been very promiscuous while cohabitant was in Palestine.

1 known to have cohabited with 6 men; last cohabitant W.R. negative.

that a man is not necessarily syphilitic because he cohabits with a syphilitic woman, and any estimation of the incidence of conjugal syphilis and neurosyphilis must take cognizance of this fact.

In Table IX are given the data relating to those consorts with definite evidence of a syphilitic infection (neurosyphilitic syndromes excluded). In five cases the date of the man's primary infection is known; in two it occurred respectively three and four years before marriage, but in the latter, where the man subsequently developed cirrhosis of the liver, there is a vague history that his wife acquired her infection extra-maritally eight years after marriage, and the fact that she had previously given birth to two healthy children lends

TABLE VIII.

Women whose consorts have W.R. negative (blood), 53.

Women known to have syphilis before cohabitation 4
2 syphilis 1 year before marriage.
1 ,, 3 years ,,
1 ,, several years ,,
Women said to have acquired syphilis extra-maritally . . . 2
Women known to have had extra-marital relationships . . . 9
Women who may possibly be suffering from congenital neurosyphilis . 3
Women with no history of any syphilitic infection 35
1 woman separated from consort 21 years before her admission.
8 women, the date of marriage is unknown.
26 women, average age on marriage 26·5 ; youngest 21, oldest 47.

Duration of marriage where known, 37.

Excluding the 6 women with a definite history of syphilis and the woman who was separated for 21 years.
Duration of marriage less than 10 years. 8
Average duration 6 years ; shortest 1 year.
2 women are probably congenital cases.
1 woman was aged 47 on marriage.
1 ,, ,, 30 ,,
1 ,, ,, 25 ,,
2 women were aged 21 ,,
1 probably a prostitute before marriage ; aged 28 on admission.
1 a congenital mental defective ; aged 28 on admission.
1 woman was aged 17 on marriage ; said to have been promiscuous from the age of 14 ; aged 25 on admission.
Duration of marriage more than 10 years 29
Average duration 16·7 years; longest 35 years.
1 woman probably congenital ; Hutchinson's teeth ; duration 12 years ; aged 32 on admission.
1 ,, vague history pre-marital syphilis during the war ; duration 11 years.
1 ,, ,, ,, syphilis 1918 ; duration 35 years.
1 ,, had 2 miscarriages while husband was away in the army during the war ; child born 1918, syphilitic ; duration 33 years.
1 ,, history of abortion 5 years pre-marriage ; duration 16 years.
Average duration of marriage for the total 37 : 13·1 years.

further confirmation. In only one case is there a record of a simultaneous infection in the two conjugal partners.

Although these syphilitic and neurosyphilitic infections are recorded in separate tables, it should be pointed out that Fournier (2) and Milian ascribe leucoplakia to a neurosyphilitic lesion, whilst syphilitic aortitis and leucoplakia are among the commonest tertiary lesions recorded in neurosyphilitics. Witte (1924) claims that the anatomical picture in the aorta in cases of G.P.I. is different from the usual aortitis syphilitica, and rather a non-specific inflammatory process similar to the changes in the C.N.S. It is therefore arguable that at least six of these 19 cases should be included in the table recording neurosyphilitic lesions and should not be in this table at all.

Further, of the eight men known to have latent syphilis only three are known to have negative C.S.F's., and it is not inconceivable that among the other five there may be one or more cases of latent asymptomatic neurosyphilis meriting inclusion in the other table. The number of conjugal partners known to have had tertiary syphilitic lesions is thus surprisingly small, namely, two with gummata and one with cirrhosis of the liver, and of these three it is possible that in one case the infection was not conjugal, but acquired independently.

TABLE IX.

Women whose consorts are known to be syphilitic, 19.

Consorts known to have had primary syphilis 2
- 1 husband had primary syphilis 3 years before marriage.
- 1 while husband had primary syphilis (W.R.++) his wife simultaneously had a labial chancre (W.R.++).

Consorts known to have had gummata 2
- 1 gummata neck and arms, W.R. ++. Primary syphilis 5 years after marriage.
- 1 gummata of cheek and glossitis. Primary syphilis 18 months before marriage; inadequately treated.

Consorts known to have had other syphilitic lesions 2
- 1 cirrhosis of liver, W.R. positive. Primary syphilis 4 years before marriage; his wife gave birth to 2 healthy children, and there is a vague history that she acquired syphilis 8 years after marriage.
- 1 leucoplakia, W.R. ++. Date of infection not known.

Consorts known to have syphilitic cardio-vascular lesions . . . 5
- 3 men had an aortic aneurysm, 2 W.R. +, 1 W.R. not tested.
- 1 coronary thrombosis and aortic regurgitation; W.R. ++.
- 1 aortic regurgitation.

Consorts known to have latent syphilis 8
- 5 blood only tested, lumbar puncture refused.
  - 1 husband and wife had primary syphilis simultaneously.
  - 1 wife suffering from asymptomatic neurosyphilis and schizophrenia.
- 3 men, blood W.R. positive. C.S.F. negative.

Table X deals with four women whose husbands were said to be syphilitic, but we could obtain only the meagre information which is recorded.

TABLE X.

Women whose consorts are said to be syphilitic, but confirmation has not been obtainable, 4.

(1)	Married 1906;	patient admitted	1926	Husband doubtful history of syphilis 30 years previously. 5–6 years ago treated with injections.
(2)	,, 1903;	,,	1926	Said to have contracted syphilis from her husband and to have been treated for it.
(3)	,, 1918;	,,	1927	Both had syphilis 1918 or 1919 and were treated.
(4)	,, 1908;	,,	1930	Said to have acquired syphilis in 1914 from her husband; treated by injections.

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Table XI is very interesting and highly significant. It will be seen that the incidence of neurosyphilitic syndromes is much higher than that of tertiary syphilitic lesions. In 13 the conjugal partner suffered from G.P.I., in two from tabo-paresis, in seven from tabes, and in two from latent asymptomatic neurosyphilis. Bostroem (1930) rightly points out that meningo-vascular syndromes should be included under the heading of "tertiary manifestations," but Worster-Drought (1940) draws attention to the fact that if the syphilitic process affects principally the nerve cell it should be included with the neuro-syphilitic syndrome. The man with syphilitic meningo-myelitis ought, therefore, to be tabulated among the syphilitic lesions, and this may also apply to the other two cases with symptoms of spinal paralysis; but the toxic poly-neuritis and muscular atrophy properly belong to this group. It is interesting to note that the average duration of marriage in this group is 21·7 years, as

TABLE XI.

Conjugal neurosyphilis. Women with only one consort, 30.

Consorts suffering from G.P.I. 13
- 1 history of syphilis 1 year after marriage.
- 1 ,, ,, acquired 1 year pre-marriage from husband.
- 1 ,, ,, same year as marriage.
- 1 ,, ,, 19 years after marriage.
- 1 ,, ,, 20 ,, ,,
- 1 probably not a conjugal infection; woman is said to have had a congenitally syphilitic child 17 years before marriage.

Consorts suffering from tabo-paresis 2
- 1 husband gave a history of syphilis 7 years before marriage, but there is also a history of a 12-years' courtship.

Consorts suffering from tabes 7
- 1 history of syphilis 3 months after marriage.
- 1 ,, ,, 16 years ,, ,,

Other neurosyphilitic syndromes in consorts 4
- 1 toxic polyneuritis with paralysis of the diaphragm. W.R. positive.
- 1 syphilitic meningo-myelitis. Blood and C.S.F., W.R. positive.
- 1 muscular atrophy; seizure. C.S.F., W.R. weakly positive.
- 1 Argyll Robertson pupils, myocarditis. Blood, W.R. positive.

Probably neurosyphilitic syndromes in consorts 2
- 1 married 1910. About 1912 an illness diagnosed as rheumatic fever followed by paralysis. 1916 attended National Hospital with a spastic paraplegia, diagnosis ? disseminated sclerosis; possibly treated with arsenic. 1933, blood and C.S.F., W.R. negative.
- 1 married 1900; became paralysed in lower limbs about 1909; treated, but no evidence obtainable *re* diagnosis or treatment. Died 1935, cancer of lung.

Consorts with asymptomatic neurosyphilis 2
- 1 Blood + 30^{+} ++++. C.S.F. + 2^{+} + 35. 2334321000.
- 1 ,, + 30^{+} ++++. ,, + 2 + ±. 3322110000.

Duration of cohabitation before admission of woman:
- Date of marriage known in 25 cases.
- Average duration in this group 21·7 years; shortest 9 years; longest 38 years.

compared with 13·1 for the 37 cases recorded in Table VIII ; and it is particularly noteworthy that the shortest duration in this group is nine years—a figure which correlates very well with the facts which we know concerning the length of the latent period in neurosyphilis.

In Table XII are recorded the findings relating to those women known to have had two or more consorts. These women were put into a separate group, because in view of what we know concerning the duration of the contagious period in syphilis it is extremely unlikely that more than one consort will be implicated. In the majority of cases there are only two consorts, but in some few cases the woman had cohabited with three or even more men. In eight cases both consorts were known to be dead before the patient's admission, and there is nothing in our data to indicate whether or no any of these men had acquired syphilis. Nine women were separated, and no information was forthcoming about their consorts other than that in four cases the first consort was known to be dead. In 15 cases it was possible to ascertain that the men who were cohabiting at the time of the patients' admission to hospital had

TABLE XII.

Women who have had more than one consort, 90.

Widows, all consorts dead before patients' admission to Horton . . 8
Recorded causes of death, where known :—
1st consorts (2 cases) : Pneumonia. Sarcoma of knee.
2nd consorts (6 cases) : Cancer in 2. Tuberculosis. Nephritis. Prostate . Myocarditis and pneumonia.
Women living apart. Whereabouts of consorts unknown . . . 9
In 4 of these the first consort is known to be dead.
Women whose consorts (those cohabiting at time of patients' admission) have W.R. negative 15
Date of patient's infection known, 1 :
Syphilis at 18 ; patient had many cohabitants ; last W.R. negative.
Women offering evidence suggesting possibility of syphilis during 1st cohabitation, 3.
All these had infantile mortalities during their 1st cohabitation.
Duration of the last cohabitation known in 11 cases :
Shortest period . . 3 years.
Longest ,, . . 21 ,,
Average ,, . . 15 ,,
Fate of the first consort known in 11 cases :
Killed in the war . . . 3
Divorced 1
Separated 3
Dead 4
1 malignant prostate.
2 pulmonary tuberculosis.
1 accidentally drowned.

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TABLE XII—*continued.*

Women whose consorts (cohabiting at time of patients' admission) have not had blood tests 36

Whereabouts of former consort not known, 18.

1 of these women had had 2 previous consorts.

Women whose first consort is dead, 16.

Cause of death where known :

Killed in the war	4
Suicide	1
Tuberculosis	1
Cancer	1
Dropsy	1

Women divorced from their first consort, 1.

Women separated ,, ,, 1.

Date of patient's infection known . 1.

4 years before 2nd marriage, but after her 1st husband had been killed in the war.

Women whose 2nd consort died after patient's admission, 3.

Cause of death known in 2 cases :

Cancer, 1.

Tuberculosis, 1.

Women where there is a history of syphilis in one consort . . . 7

	1st Consort.	*2nd Consort.*	*3rd Consort.*
(1)	Said to have infected his child with syphilis.	m. 7 years before patient's admission.	
(2)	Died of tuberculosis.	m. 1917 (8 years before patient's admission). Secondary syphilis. W.R. ++.	
(3)	Killed in war.	Hard chancre 1905; treated for syphilis 1917. M. 1919. 11 years before admission.	
(4)	?	m. 1919 (12 years before admission). +30+++++.	
(5)	Died 1 year after marriage.	m. 1900. Syphilis 1902. Deserted patient 1921.	1923. Not tested.
(6)	Apart.	c. 1921 (17 years before patient's admission). W.R. weakly positive.	
(7)	m. 1917. Died 1930.	m. 1933. History of syphilis 1895. W.R. negative 1939.	

Women where the evidence suggests possibility of syphilis in one consort 3

	1st Consort.	*2nd Consort.*
(1)	Whereabouts unknown. 1 child died with meningitis. 1 child died with a papular rash.	Whereabouts unknown.
(2)	Divorced. 1 child died aged 6 months.	m. 1927, 7 years before patient's admission.
(3)	Deserted 1915, died 1933, "stroke." 2 healthy children.	c. 1916. Died 1936, cancer of lung. 1 stillborn child; 2 children died in infancy, 1 from congenital syphilis.

TABLE XII—*continued.*

Women with a history of syphilis in both consorts (neurosyphilis in 1) 2

	1st Consort.	*2nd Consort.*
(1)	Died G.P.I. 1911, 20 years before the patient's admission.	m. 1911. 14 years before admission. Syphilis 1917; rheumatic fever twice. 1927, auricular fibrillation.
(2)	m. 1906; deserted 1910, rejoined 1929; died of tabes 1933.	c. ? died 1922; syphilitic aortitis and regurgitation.

Women with a history of neurosyphilis in one consort 7

	1st Consort.	*2nd Consort.*
(1)	Died G.P.I. 1914, 13 years before patient's admission.	m. ? Alive at time of patient's admission.
(2)	Died G.P.I. 1910, 17 years before patient's admission.	m. ? ,, ,, ,,
(3)	m. 1914, died ?.	m. 1918. Tabes 1937. Both he and patient were treated for primary syphilis 1919. Patient admitted 1931.
(4)	m. 1906. W.R. negative 1936.	c. 1914–18. G.P.I. 1920. He gave history of primary syphilis in 1913. Patient admitted 1934.
(5)	m. 1911. Killed in war.	m. 1918. G.P.I. 1937. Patient admitted 1937.
(6)	c. ? Died 1911, "creeping paralysis" said to be due to wound from Boer War.	c. 1915. G.P.I. 1932. Vague history of syphilis, ? 1908 in India. Patient admitted 1937.
(7)	m. ? Separated 5 years after marriage; whereabouts unknown.	c. 1919. G.P.I. 1932. Patient admitted 1939.

Women with a history suggestive of neurosyphilis in one consort . 3

	1st Consort.	*2nd Consort.*	*3rd Consort.*
(1)	Died in a mental hospital.	m. 1925, patient admitted 1930.	
(2)	,, ,, ,,	m. 1912, patient admitted 1930. Died 1932 carcinoma.	
(3)	Committed suicide.	Became mentally unbalanced.	No information.

m. married. c. cohabited.

TABLE XIII.

Conjugal syphilis. Women with more than one consort, 12.

Consorts suffering from G.P.I. 7
Consorts suffering from tabes 2
In both these cases there is a history of syphilis 1 year after marriage.
Consorts possibly suffering from neurosyphilis 3
2 women; their first husbands died in mental hospitals, details unobtainable.
1 woman; her first husband committed suicide; the second became "mentally unbalanced," details unobtainable.
Further details given in the table, "Women with more than one consort."

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negative W.R's. In only one of these women was the date of the infection known; it occurred at 18, and she subsequently had many cohabitants, so that one would expect her last consort to have a negative blood. In three other women their obstetrical histories suggest that the infection was acquired during the first cohabitation. The duration of the last cohabitation is known in 11 cases, and it is instructive to compare this average duration of 15 years with that in Table VIII, which is 13·1 years for 37 women whose consorts had negative W.R's., and with that in Table XI, namely 21·7 years for 25 women whose consorts developed neurosyphilis.

In the case of 36 women no evidence could be obtained concerning a syphilitic infection in either consort, but it is probable that at least some of these men were implicated.

Of the seven women who give a history of syphilis in one consort it is probable that in two of them the infections were not conjugal, but derived from different sources, for in one there is a history that the second consort had a hard chancre in 1905, but did not marry until 1919, while in the other the date given for the man's infection is 1895, and he did not marry our patient until 1933. In none of these men is there any record of tertiary syphilitic lesions; such information as there is relates only to primary, secondary or latent infections.

The patients' obstetrical history sometimes gives indications as to the probable date of infection, and evidence of this sort is forthcoming in the case of three women. In two of them it is probable that they acquired syphilis either before or during their first cohabitation, and it is therefore possible that the first consort was implicated in the infection. In the third case the fact that she had a stillbirth and probably two congenital syphilitic children after her second cohabitation beginning in 1916—although she had previously had two healthy children by her first marriage—shows that in this case it is possible that one or both consorts may have been implicated, as she apparently began to live with the second shortly after the desertion of the first.

In two women there is a history of syphilis in both consorts, one suffering from neurosyphilis and the other from a cardio-vascular lesion. In the first case the infection may not have been a conjugal one, since the first husband died of G.P.I. 20 years before our patient's admission; but if it should have been a conjugal infection it is extremely unlikely that the second consort acquired his infection from our patient. With regard to the other woman the information is too scanty for any decision to be reached; either or both of these men may have been implicated in the woman's infection.

Seven women furnished a history of neurosyphilis in one of their consorts. In only two is there any definite record of the primary infection; in one our patient and her second husband were both treated at the same time for primary syphilis; and in the other the man gave a history of a primary infection about a year before he began his association with our patient, and it is possible

that she did not acquire her infection from him. For the rest, it is likely—though by no means certain—that the infections were conjugal.

Finally, in three women the occurrence of mental symptoms in three of their consorts, and the fact that a fourth committed suicide, suggests the possibility of neurosyphilis in these men.

Summary.

(1) Statistical results are presented concerning inquiries into the conjugal histories of 492 female neurosyphilitics.

(2) Tertiary syphilis was found to be rare in the infected conjugal partners of these women, while the incidence of neurosyphilis was unusually high.

(3) These findings lend support to the theory of a neurotropic strain.

(4) As the contagious period of syphilis appears to be relatively short, those conjugal partners whose relationships are instituted outside this period remain free from infection although cohabiting with a syphilitic spouse.

(5) The incidence of conjugal neurosyphilis is sufficiently high to warrant the adoption of routine measures for the investigation of all marital partners of neurosyphilitics, and the institution of prophylactic treatment in all cases of latent asymptomatic neurosyphilis so found.

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