SYPHILIS IN OLD AGE.

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DURING the routine investigation of the blood of patients at Tooting Bec Hospital it soon became obvious that a considerable number showed either a positive Wassermann reaction and a positive Meinicke or only a positive Meinicke.

A more detailed investigation was therefore undertaken to establish the proportion of patients with these serological signs and to correlate them with the clinical findings.

The groups of patients on whom this investigation was carried out are in many respects unique, as Tooting Bec Hospital is the only hospital in the country devoted entirely to senile dementia.

The group consists of:

A. Certified patients. These are old patients with a chronic psychosis transferred from other mental hospitals.

B. Non-certified patients. These are patients who are over the age of 70 when they become mentally ill and are admitted directly to Tooting Bec. This second group can further be subdivided into:

(i) True senile dementia.

(ii) Organic psychoses of old age, e.g. arteriosclerotic dementia.

(iii) Psychoses occurring in old age but with no obvious organic basis, e.g. mania and melancholia.

There are 2,300 beds at Tooting Bec, and the average age of patients is 73 years for men and 75 for women. The population changes rapidly owing to the poor expectation of life at this age.

Material.

The blood of all male patients admitted during 1936, 1937 and 1938 (except those who refused or had already died before this investigation was carried out) was examined.

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The investigation has been continued, and results obtained subsequent to 1938 are similar to those given in this report.

Table I shows that 69 out of 701 patients had either a positive Wassermann and/or Meinicke, i.e. 10 per cent. of all admissions. If the blood of the 108 cases not tested had been examined the percentage might be even higher.

TABLE I.—*All Admissions.*

	Positive.	Negative.	Not examined.	Total.
1936	25	149	90	264
1937	21	184	13	218
1938	23	191	5	219
Total	69	524	108	701

Table II gives the figures for the non-certified patients over the same period plus the small group originally examined. Ten per cent. of these cases had an abnormal serum.

TABLE II.—*Non-Certified Admissions.*

	Positive.	Negative.	Not examined.	Total.
pre 1936	13	109	17	139
1936	14	88	66	168
1937	14	82	7	103
1938	14	95	1	110
Total	55	374	91	520

These patients were entirely unselected. Where possible all admissions were examined irrespective of clinical findings.

A group of cases with abnormal sera was then examined in more detail, including the C.S.F. Of the 100 in this group 64 were non-certified and 36 certified, but *all* were over 70 years of age. Of the non-certified cases 8 (12·5 per cent.) had an abnormal C.S.F., i.e. about 1·5 per cent. of all non-certified patients admitted during this period.

Table A gives serological and clinical details of these 8 cases.

It was found that the positive serological findings could be classified into two main groups, one with strongly positive W.R. and M.R., and the other with negative W.R. but strongly positive M.R., leaving a comparatively small intermediate group with weakly positive W.R. and strong M.R.

The details relating to non-certified patients are given in Table B.

Note.—The numerical notation adopted in giving the Wassermann results is that described by Mann and Partner (1936). + 30 represents complete prevention of haemolysis in all tubes, while +30+ indicates that a further

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adsorption of complement would take place if the range of dilution of serum or cerebro-spinal fluid were extended.

TABLE A.—8 *Non-certified Patients with Positive Findings in C.S.F.*

Case No.	Age.	Blood. W.R.	Blood. M.R.	C.S.F. W.R.	C.S.F. Cells.	C.S.F. Protein.	C.S.F. Lange curve.
3	71	+30	++++	+15	++	90	5333333432
4	72	+30+	++++	+30+	++	90	5555554321
5	74	+30+	++++	+3	++	90	5332211100
6	73	+7·5	+++	+6	+	70	5555543210
7	76	+30	++++	—	—	50	5443210000
49	77	+30+	++++	+30+	+	100	2343211000
80	75	+30+	+++	+30+	+	110	5555554321
86	72	+30+	+++±	+30	+	100	5555543210

Case.	Age.	
3	71	Knee jerks +++, plantars extensor, pupils irregular and unequal. Seizures.
4	72	Wrist drop, aortic murmur. Mild dementia.
5	74	Blind in left eye, deaf, chronic bronchitis, incontinent. Seizures. Confused, deluded, impulsive.
6	73	Deaf, spastic legs, incontinent. Seizures. Confused, amnesic.
7	76	Trombone tremor of tongue, pupils unequal, ataxic. Seizures. Amnesic, slightly euphoric. (Tabo-paresis.)
49	77	Knee jerks absent, plantars extensor. Dementia. (Tabo-paresis.)
80	75	Extra systoles, B.P. 90/60. Suprapubic scar. Twitching of right side of face, left external strabismus, left pupil pin-point, right sluggish. Confused, perseverates.
86	72	B.P. 160/60. Tongue tremulous, speech slurred, knee-jerks +++, right > left, plantars extensor, right leg paretic. Irritable, persecuted.

TABLE B.—20 *Non-certified Patients with C.S.F. Normal. Blood W.R.* +30+, *M.R.* +++ *or* ++++.

Case No.	Age.	
10	73	Left pupil irregular, no reaction to light. Euphoric, grandiose and muddled.
12	76	Legs spastic and eczematous. Demented.
13	78	Pupils inactive. Dementia.
14	88	Feeble. Deaf. Scars on legs. Pupils unequal. Only slight dementia.
15	78	Died of heart block, probably luetic. (Meningo-vascular syphilis.)
16	73	(Meningo-vascular syphilis.)
17	80	Rash on legs. Irritable. Deluded and hallucinated.
18	76	Scars on legs. Deaf. Well behaved.
19	72	Apraxic. Aphasic (but sings well). Demented.
20	73	Pupils irregular, knee-jerks absent, Rombergism. Dementia. (Tabes.)
21	73	Scars on shins. Seizure. Mentally little dementia.
27	73	Knee-jerks sluggish, ankle-jerks absent. Incontinent. Smiles fatuously.
33	76	Blood pressure 230/80, ulcerated right leg. Deaf, hallucinated, no interests.
43	84	Pigmented legs, chronic bronchitis. Confused, wanders. Has improved.
48	72	Fatuous, euphoric, over-active.
82	72	Depressed, amnesic, disorientated. Incontinent. Improved, but later deteriorated.
88	74	Left hemiplegia and slight dysarthria. B.P. 160/100. Demented.
89	79	Scar penis and groin. Seizures (terminal). Perseverates. (? Cerebral thrombosis).
90	81	Blood pressure 260/100. Frail. Amnesic, disorientated and restless, fabricates.
93	73	Auricular fibrillation. Seizures. Deaf. Amnesic, confused and irritable.

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The following table gives the number of patients in each serological group:

C.S.F. Reactions.	Blood. W.R.	Blood. M.R.	64 Non-certified. Patients.	64 Non-certified. Table.	36 Certified. Patients.	36 Certified. Table.
+	+30	+++	8	A	4	E
—	+30	+++	20	B	23	F
—	—	+++	29	C	6	G
—	inter-mediate	+++	7	D	3	H

Significance of Positive Meinicke.

There are 29 patients with a negative W.R. and a positive parallel test as compared with 20 in Table B with both tests positive. The usual interpretations placed upon this finding is that the patients have had treatment as a result of which the W.R. has become negative, the parallel test remaining positive (Mann and Partner, 1936).

Although the histories given by our patients are in the majority of cases inadequate owing to their age and dementia, it is clear that in most instances no lesion was suspected by them, or if known had been ignored. It is therefore likely that few, if any, of these cases have had treatment sufficient to render the Wassermann negative, particularly when we reflect that they were born before 1870 and contracted their syphilis long before the arsenical preparations became available.

An alternative assumption is that these patients have had active syphilis but have undergone a spontaneous cure. It was noticed by one of us when examining a group of syphilitics (non-G.P.I.'s) at Horton hospital that in a number of cases the W.R. had become negative over a period of years without treatment. This phenomenon is well recognized, and Moore (1933) regards it as the natural outcome of 25–35 per cent. of cases of latent syphilis. Brausgaard (1929) found that 27 per cent. of the survivors of a large group of untreated syphilitics had a negative Wassermann.

The third possibility is that the positive Meinicke alone does not signify syphilis of necessity, but that some modification of the serum takes place in old age, which results in a positive Meinicke. This does not appear likely, but is difficult entirely to prove or disprove.

Significance of Physical Signs.

Many of these patients show signs which in younger persons might be taken as evidence of syphilis. In elderly people, however, the interpretation of these signs is a more difficult matter. Thus pupillary abnormalities (inequality, irregularity, eccentricity, inactivity to light) are extremely common in senile patients, as also are absent abdominal reflexes and extensor plantar responses.

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Hyperpiesis is also very common, but the existence of an aortic leak is taken as presumptive evidence of a syphilitic lesion.

Nature of Lesions.

If the physical signs are interpreted with this reservation in mind relatively few of these patients have active lesions ascribable to syphilis. Those with the neurological form of the disease (Table A) are naturally the most striking group. It must be emphasized that the diagnosis in these cases was made primarily as a result of routine tests and not on clinical grounds. There seems, however, no doubt that in 7 of the 8 cases the findings are compatible with a diagnosis of G.P.I. We must assume that in all these instances the incubation period was probably of considerable length. This is by no means unknown though somewhat unusual. The longest incubation period mentioned by Nicol and Hutton (1935) is 50 years. It is noteworthy that in an analysis of 440 cases of G.P.I. at Horton these workers found none over 70 years of age, though it is possible that in view of their age such cases, if diagnosed, would not have been sent to Horton for treatment. Another possibility is that many such patients end their days in infirmaries, their death being ascribed to "senile decay," cerebral arterio-sclerosis or cerebral thrombosis.

The discovery of the existence of this group with positive C.S.F. (Table A) is ample evidence, if any were needed, in favour of routine lumbar puncture on all cases with a positive Wassermann. Although the results of malaria therapy at this age are usually unsatisfactory, there is little doubt that the prophylactic use of malaria some years earlier might well have prevented the breakdown which led to the admission of these patients to hospital.

Apart from this group with abnormal findings in the C.S.F. there are only 7 non-certified patients with serious lesions definitely attributable to syphilis, viz., 2 aortic leaks, 1 heart block, 1 tabes, 3 hemiplegias. This gives 15 patients with obvious gross lesions, or 23 per cent. of the non-certified syphilitics. This represents a proportion of 2 per cent. of all non-certified cases.

It is, of course, possible that lesions may become obvious in the remaining 8 per cent. with latent syphilis, but this possibility is greatly reduced by the fact that their expectation of life is in any case poor.

Relation of Syphilis to Psychosis.

As with the physical signs, so with the mental symptoms, it is not easy to differentiate between the dementia due to G.P.I. and that due to senility or arteriosclerosis. The classical grandiose type of G.P.I. is rarer than is commonly supposed, and a mild euphoria with a general hypomanic personality is quite common in the senile psychoses. Thus for differential diagnosis we are compelled to place more emphasis on the findings in the C.S.F.

With a normal fluid one may reasonably presume that both G.P.I. and tabes

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are absent (Brain, 1933), and although meningovascular syphilis may sometimes occur with a normal fluid it is not usually an active form but rather the so-called "burnt-out" stage, with minimal signs and no symptoms (Moore). We may therefore suppose that only those of our patients with changes in the C.S.F. had definite syphilitic lesions in the brain—that is, 10 per cent. of the total non-certified syphilitics. In these 10 per cent. the psychosis is probably almost certainly due to the infection. In the remaining 90 per cent. we are forced to the conclusion that the presence of syphilis and a psychosis in the same patient is a mere coincidence.

Expectation of Life in Syphilitics.

These results at Tooting Bec show that infection with syphilis is by no means incompatible with the attainment of a ripe old age, and indeed one of our patients, a female not included in the present series, was aged 100 and had a strongly positive Wassermann (+3c+). We must, however, assume that many syphilitics of the same generation as our patients contracted more serious or more rapidly progressive lesions, such as aneurysm, syphilitic aortic valve disease, blockage of the mouths of the coronary arteries or G.P.I. and have long since died of their disease. It is not possible to say why our patients have successfully resisted the infection for so long. There are clearly two possible factors—the patient and the organism. The available evidence suggests that the former is probably the more important. A relevant observation frequently confirmed is that the prognosis is better in untreated than in *inadequately* treated patients.

Incidence of Syphilis in the Nineteenth Century.

It is not unreasonable to assume, for the purpose of this investigation, that the non-certified patients admitted to Tooting Bec are a fair sample of the general population over the age of 70, particularly as they are drawn from all strata of the population. It may be objected that the figures are biased by the fact that these patients are all psychotic, but, as has been shown, there is strong presumptive evidence that in 90 per cent. of them the association is merely fortuitous. If this be true we are compelled to conclude that some 10 per cent. of all men over 70 have been infected with syphilis.

From this it follows that of the generation born in or before 1870 many more than 10 per cent. must have had the disease, since the mortality rate in syphilitics is estimated at upwards of 140 per cent. (Dublin, 1929) of that in unaffected individuals. Although it is impossible from the inadequate data at our disposal to calculate the proportion exactly, the conclusion appears inescapable that if we were able to go back to, say, 1900 we should find some 20 per cent. or more of the young men of 30 with a positive Wassermann. It is

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interesting to note in this connection that several of our patients state that their infection was contracted during the South African War.

A similar investigation (Raybaud and Orsini, 1939) was conducted on a smaller scale at the Hospice de Sainte Marguerite on non-psychotic patients over 65 and the results compare very closely with our own, the percentage of positives being 14. These workers attribute the high incidence in this group to the absence, at the time when these patients acquired their disease, of the arsenicals with their action in curtailing the infectious period of syphilis.

It would be very interesting to compare these estimates with the present position, but very few data are available for this country. Some authorities have put the figure as high as 10 per cent. (Aitchison Robertson, 1921).

A number of investigations have, however, been carried out in the U.S.A. with very conflicting results. Amongst these is the painstaking work of Blount (1939), who investigated 5,000 recruits and casual soldiers. He found that only 1·2 per cent. were syphilitic, but noted a higher incidence in the older generation. Another investigation showed that 11·7 per cent. of the white population of Gibson County, Tennessee, were infected with syphilis (Roberts and Williams, 1937). Beck, however (1939), concluded that less than 2 per cent. of the white population of Delaware had the disease, but gives the amazing figure of 30 per cent. for the coloured population.

Erskine Hume (1939) notes that the incidence of syphilis in the United States Army has shown a steady decline from 1900 to 1935. Aselmeyer sums up for the country as a whole. He states that "isolated rural communities" show up best with a proportion of 1·8 per cent. infected. "Booming industrial towns" occupy an intermediate position, with 5 to 7·5 per cent. The depths are plumbed in the "under-privileged coloured communities of the deep South" with 20 per cent. or more. Of pregnant women 6 per cent. are infected, and industrial employees give a figure of 4·8 per cent. He also gives the following "attack rates" per 100,000 population: U.S.A. 796, Denmark 20, Holland 14, and Sweden 7 per annum. He deplores the fact that there is still a considerable variation in the efficiency of the tests as carried out in different states.

It would seem likely that the incidence of the disease in this country is similar to that in the white population of the States, but more extensive investigations are clearly desirable to permit of an assessment of the seriousness of the problem.

In this connection it may be well to emphasize the suggestion put forward by Dr. Golla of the Burden Neurological Institute that a sample of the recruits to the forces be submitted to a routine Wassermann test. This would offer a firm basis from which the efficacy of any measures for the prevention of syphilis could readily be checked by subsequent re-testing. Unless these measures are submitted to such tests as to their value it is to be feared that the rise in the incidence of the disease which took place after the last war and the South African War may be repeated on an even larger scale.

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Summary.

1. An investigation into the incidence of syphilis in the male population at Tooting Bec Hospital is described.

2. The significance of the Meinicke reaction is discussed.

3. The interpretation of the physical signs of syphilis in old age is considered.

4. The expectation of life in syphilitics is discussed.

5. An attempt is made to draw conclusions as to the prevalence of syphilis in the Victorian era.

6. Data on the incidence of syphilis in the general population are reviewed.

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