THE
JOURNAL OF MENTAL SCIENCE

[*Published by Authority of the Medico-Psychological Association of Great Britain and Ireland.*]

No. 198 [NEW SERIES No. 162.] JULY, 1901. VOL. XLVII.

Part I.—Original Articles.

General Paralysis and Syphilis: a Critical Digest.

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GENERAL paralysis of the insane was first described by Haslam in 1798, thus its recognition is now a century old; and although an enormous amount of labour has been devoted to the search for the essential cause of this disease—perhaps the most fatal to which human flesh is heir—opinion is yet far from unanimous as to its origin. There is no doubt that the view that syphilis is the prime cause finds most favour at the present time; but in view of the want of uniformity of opinion on this matter, I have felt that a serious attempt to arrive at a definite conclusion would be welcomed by the alienists of this country. Such an attempt might at least help to clear the ground for future investigation.

The fact that (in 1857) Esmarck and Jessen, and subsequently Kjelburg (all Scandinavians), were the first to suggest the syphilitic origin of general paralysis is in itself a very strong point in favour of the view, since syphilis was then, and is still, treated in State hospitals in that country, and therefore the history of previous infection can there be easily obtained.

Fournier investigated the question some twenty years later, and although he was at first an avowed disbeliever, he is now convinced to such an extent that he now regards general paralysis as a parasyphilitic disease.

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As in most inquiries of this nature, we find that the methods of research which have been employed are three in number, viz. clinical observation, post-mortem evidence, and experimental evidence. Of these the last two may be shortly dealt with, and will therefore be considered first.

Post-mortem Evidence.

The evidence of past syphilis in the bodies of patients who have died of general paralysis is limited to observations upon the blood-vessels. Mott found from the examination of 160 male necropsies that atheroma of the aorta was present in the proportion of 1 in 3 cases of general paralysis, and 1 in 13 cases of men who had died at forty-five years or under; and he adds that the atheroma generally affected the cerebral vessels as well as the aorta. The numbers here given for general paralysis are below the numbers given by the same author for cerebral syphilis. As Mott states in another part of the same article, no disease is more productive of arterial degeneration than syphilis.

We have also the observation of Svenson who found chronic aortitis in 34 per cent. of his cases of dementia paralytica. This observation may be coupled with those of Malmsten and Evgren, the former of whom obtained a history of syphilis in 80 per cent. of his cases of aortic aneurysm, and the latter obtained a history of syphilis in one fifth of his cases of arterio-sclerosis.

Experimental Evidence.

The experimental method has been employed by one investigator only. At the International Medical Congress at Moscow, Krafft-Ebing communicated the results obtained by an experimenter, who did not wish his name to be published. This experimenter attempted to inoculate nine general paralytics with fresh syphilitic virus from a hard chancre, but failed in every instance, eight of these cases being closely observed for as long as one hundred and eighty days.

The deduction from these experiments was that all these patients had been rendered immune to syphilis by having acquired the disease in earlier life.

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On the other hand, it is argued that this is a *non sequitur*. It is a well-known pathological fact that the blood of patients suffering from any disease may have had its bactericidal power either augmented or diminished by that disease. We know not what may be the action of blood-serum from a general paralytic upon the micro-organism of syphilis (we assume there is one—Lustgarten's bacillus does not appear to be generally accepted); but observations have been made upon the action of such serum on the *Staphylococcus pyogenes aureus*. The results, however, are somewhat contradictory. Idelsohn found the bactericidal power to be active in 25 per cent., diminished in 28 per cent., and abolished in 47 per cent. of his cases. Scabia, on the other hand, found it augmented in 70 per cent., diminished in 15 per cent., and abolished in 15 per cent. of his cases; while d'Abundo found the bactericidal power of the blood-serum to be augmented in every one of the 17 cases in which he investigated it.

The inoculation experiments above referred to, upon general paralytics, were undertaken in order to reduce to the conditions of experiment the observation that no general paralytic had ever been reported as having a Hunterian chancre upon him at any time during his general paralysis.

Quite recently, however, Garbini has quoted the case of a man aged forty, whom he saw in an asylum in Italy, and who had contracted syphilis while in the initial stage of his fatal disease (general paralysis). We must, however, bear in mind that second attacks of syphilis are by no means unknown.

Clinical Evidence.

Under this heading we have to consider what evidence of syphilis may be obtained (*a*) from the physical examination of patients, and (*b*) from statistics referring to the numbers in which various observers have been able to obtain a history of previous syphilis.

(*a*) With regard to the first point, it may be at once stated that tertiary affections of the skin, eyes, liver, etc., are rare in cases of general paralysis. Mott puts this conversely, and states that he believes that general paralysis is more likely to occur in a man who has had syphilis, and who yet presents

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no tertiary manifestations. Scars on the penis are probably fairly common; but I know of no isolated statistics on this point, although several observers state that they have looked for them in obtaining their evidence of syphilis in patients.

Then tabes dorsalis, which is almost universally accepted as a parasyphilitic disease, is very frequently associated with general paralysis.

And lastly, the Argyll-Robertson pupil, which is one of the cardinal symptoms of general paralysis, has been regarded, by Gowers and many other distinguished neurologists, as a sign of past syphilis. Hyslop made the independent observation, while studying cases of alcoholic insanity, that when the pupils failed to react to light there was "almost invariably a history of syphilis in addition to that of alcohol."

(*b*) When we come to consider statistics relative to the numbers of general paralytics in which various observers have obtained a history or other evidence of syphilis, we find such an absurd want of accord that one is at first inclined to feel justified in shirking the duty of criticism. I append here a list of statistics obtained from various authors.

	Per cent.
Voisin	1·6
Nicoulau	3·96
Magnan	4
Eickholt	11
Siemerling	11·1 (in women).
Kundt	11·6—12·7
Thuredt	11·6—12·7
Obersteiner	21·6
Björnström	24
Brie	31
Ziehen	33—43 30—46 (in women).
Fürstner	32—40
Lange	33—51
Goldsmith	33
Rieger	33—45
Kraepelin and Gudden	34 (in men).
Ascher	34·7
Nasse	35
Renand	35
Percy Smith	35—52
Westphal	39·8 (in women).
Korsakow	40—72
Cullerre	42
Jacobsen	43—52
Graf	44
Koshenikow	45·16—60
Gudden	45·3 (in women).

	Per cent.
Thiernan	46
Goodall	47·5—63·5
Urquhart	48·1—92·6
Burkhardt	50
Goldstein	50
Sioli	50
Wahrendorf	50
Wollenberg	50
Binswanger	50—64
Gerlach	50·5
Jastrovitz	51
Pontoppidan	52
Erb	52
Le Felliâtre	55
Hirschl	56—81 (signs of syphilis present in 6 per cent.).
De Senna	56·2
Mierzejewski	60
Fischer	60
Petersen	60—70
Näcke	60—75
Pierson	60·5
Pietz	61·4
Oebeke	62
Thomson	62
Cristiani	64
Folsom	66
Hirt	66·1

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	Per cent.
Bonnet	66·6—80·2
Hanow	68 (in women).
Wollenberg	68 (in women).
Alzheimer	70
Bannister	72—88
Spillmann and Dengler	72—89
Sokolowski	73—83
Reinhardt	73·3—80
Lewis	73·5—87
Cuylits	75
Snell	75
Mendel	75
Hougberg	75·7—86·9
Rohmell	76·8
Jespersen	77·2
Garbini	77·7—92·6
Geill	78·41
Serieux and Farnarier	78·56
Conolly Norman	80
Rumpf	80
MacDowall	80
Savage	80
Mongeri	80·8—93·4
Anglades	81·8—93·4
Minor	86
Mott	86·49—90·9 (in juvenile cases).
Kowalewsky	86·7
Seeligmann	90
Dengler	93
Reinhardt	93
Régis	94

In endeavouring to discover how far these statistics represent the facts of the case, there are many points to be taken into consideration; and it will be seen that all these considerations tend to raise the percentages.

In the first place it should be mentioned that, speaking generally, the lowest percentages are from the earliest writers, and the highest are from the later writers on the subject.

In the second place, it must be borne in mind that, in nearly all these statistics, those cases of general paralysis in which no history at all has been obtained, or in which the history has been unsatisfactory (as when a negative history of syphilis has been obtained from a wife or sister), have been placed upon the negative side, whereas they should rather have been left out of the statistics altogether.

In the third place, we must not forget that several of these numbers are taken from the large public asylums of the various countries—institutions where it is extremely difficult to obtain a reliable history, or even, in many cases, any history at all. These institutions, too, are (as in our own country) almost invariably undermanned in the matter of medical officers, who have not enough time to make a sufficiently careful inquiry into this matter.

Fourthly, many of these numbers have been obtained by the observer looking up in his case-books in how many cases of general paralysis a history of syphilis is recorded, although the records may not have been taken throughout with a view to publishing statistics on the question. Now it seems to me that this is unfair, and that statistics so obtained ought not to

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be published without some statement to the effect that special attention had not been paid to each case with a view to publication. A casual question regarding syphilis often elicits a negative answer, whereas more careful inquiry would elicit a positive one. On the other hand, it must be admitted that a positive answer may also sometimes be erroneously given; for example, in our own navy all venereal disease has to be returned under the head of syphilis.

Fifthly, we have to consider the personal equation of the observer. Some observers would not admit that a patient had had syphilis unless there was obtainable a definite history of a *hard* sore which had left a scar, of secondary symptoms, and perhaps of the further confirmatory evidence that the doctor who treated the patient had administered mercury. On the other hand, there are observers who regard any venereal history, or even the history of a "fast life," as equivalent to a history of syphilis.

It may be argued that these two classes of observers would mutually correct one another. This must be admitted to be true, but we ought to reflect whether one class is not nearer the truth than the other. On the ground of experience I should personally be inclined to justify the latter class of observers. During my term of residence at the National Hospital for the Paralysed and Epileptic in Queen Square I was particularly struck with the large number of cases in which the patient came under observation with symptoms of tumor cerebri, which disappeared on treatment with mercury and potassium iodide, but in which no history or other evidence of syphilis could be obtained; indeed, it was the exception rather than the rule to obtain evidence of past syphilis in these cases. A history of gonorrhœa was frequently obtained, but not of syphilis.

Such experience is not limited to the domain of neurology. Crocker (quoted by Mott) states that he fails to obtain a history of syphilis in 20 per cent. of his syphilitic skin cases, Hirschl failed to obtain a history in no less than 36·5 per cent. of his patients suffering from tertiary manifestations, and Jumon states that he has diagnosed unnoticed infection in the secondary stage as follows:—in men 5 per cent.; in women 20 per cent.; and in the tertiary stage 17 per cent. Further, Fleiner, in his reports on syphilis occulta, shows how fre-

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quently syphilis exists without the patients having the slightest idea as to how or when they were infected.

A discussion on the dual nature of syphilis would be out of place in this communication; but the view which is fast gaining ground among syphilographers must be urged here, that the report that *only a soft sore* had been present does *not* permit the total exclusion of syphilis. Erb, in his allied discussion on the ætiology of tabes, states,—"There are numerous cases of so-called soft sores which are followed later by secondary and tertiary symptoms. I have notes of several cases where *after apparently gonorrhœa, with and without attendant buboes* (*urethral chancre ?*), *secondary symptoms followed*"—the italics are mine.

Mott has had similar experience to the above.

From these considerations, I think we may hold as justified those observers who regard a venereal history as almost equivalent to a history of syphilis.

Lastly, the possibility of inherited syphilis must not be forgotten. Of some 90 cases of juvenile and adolescent general paralysis scattered throughout the literature, evidence of inherited or acquired (3 cases) syphilis has been obtained in some 90 per cent. But why should the effects of inherited syphilis cease at adolescence? Serieux and Farnarier have had a case of general paralysis in an adult occurring thirty-two years after he had acquired syphilitic infection, and I see no reason why inherited syphilis should not similarly cause general paralysis at thirty-two or more years of age. Mott has reported three cases occurring at twenty-one years, one at twenty-two years, and two at twenty-three years of age, in most of which there were signs of inherited syphilis. Quite recently, Percy Smith has reported a case occurring at twenty-four years of age, who had certainly not had syphilis, and who had no signs of inherited syphilis, but whose father had had syphilis and died of general paralysis. In the same paper a similar case is reported as occurring at twenty-eight years of age. Her father died of general paralysis, and her sister has a very definite history of chronic interstitial keratitis, but the patient had no signs of inherited syphilis.

Mongeri draws attention to the fact that in none of the five cases, in which he failed to obtain evidence of past syphilis out of his series of forty-seven cases, was he able to obtain a

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history of the parents of the patient; and he suggests that, had he been able to do so, he might have obtained a history of syphilis (inherited or acquired) in 100 per cent. of his general paralytics. The ages of these five patients were respectively twenty-eight, thirty-five, thirty-five, thirty-seven, and forty years.

If the statistics given in the above table be compared with those of other assigned causes of general paralysis, it will be found that the numbers for syphilis are the highest. It would be outside the province of this paper to discuss these other assigned causes, but by way of illustration a few of the statistics given for these other causes are here appended.

Alcohol.

Author.	Percentage of alcoholism in general paralytics.	Author.	Percentage of alcoholism in general paralytics.
Westphal	3·4	Eiel	24·0
Siemerling	5·0	Ascher	37·0
Lange	17·0	Oebeke	43·0
Ziehen	17·0	Mairet and Vires	48·0
Cristiani	20·97	Garbini	57·14
Björnström	21·6	Macdonald	75·0
Stark	22·7		

Insane Heredity.

Author.	Percentage of general paralytics with insane heredity.	Author.	Percentage of general paralytics with insane heredity.
Westphal	5·4	Simon	33·0
Björnström	8·0	Cristiani	36·36
Siemerling	11·0	Jung	39·0
Obersteiner	11·5	Pontoppidan	41·33
Krafft-Ebing	15·2	Graf	41·6
Mairet and Vires	23·0	Garbini	42·3
Oebeke	23·4	Gudden	42·8
Eickholt	24·0	Lange	43·0
Aeinhard	24·5	Mongeri	44·7
Giraud	28·0	Ziehen	45·0
Ullrich	30·0	Bayle	50·0
Ascher	31·0	Armand	53·0
Calmeil	33·0	Mendel	56·3
König	33·0	Améline	58·7

Traumatism.

Author.	Percentage of general paralytics with trauma capitis as an assigned cause.	Author.	Percentage of general paralytics with trauma capitis as an assigned cause.
Siemerling and Westphal	1·4	Ascher	9·0
Cristiani	4·29	Garbini	11·04
Hirschl	7·4	Meyer	18·0
Oebeke	8·0	Bergmann	18·3
Mairet and Vires	8·0		

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Oebeke obtained a history of sexual excess in 69 per cent., and of overwork in 57 per cent. of his 100 cases of general paralysis; and Cristiani obtained a history of sexual excess in 11·88 per cent., and of worry and overwork in 27·97 per cent. of his 201 cases of general paralysis from all these statistics.

It will be gathered that syphilis easily heads the list of the assigned causes of general paralysis, in spite of the various reasons which have been adduced to show that the numbers for syphilis very much understate the facts.

The hypothesis which has been advanced, that syphilis is usually acquired during the early stages of general paralysis, when the patient is addicted to sexual excess, will not hold water for two reasons. In the first place, Marandon de Montyel has shown that sexual excess is not such a common symptom of general paralysis as has been supposed. He obtained a history of abnormality of the genital sense in 95 out of 108 general paralytics. In 35 cases this sense was exaggerated, and in the remaining 60 it was diminished. He made further observations after the patients had come under care, and in the abnormal cases he then found the genital sense diminished in 85 per cent. of his observations, and exaggerated in only 15 per cent.

These numbers agree in a general way with those of Cristiani and Oebeke, who only differ in placing sexual excess among the causes instead of among the symptoms of general paralysis.

In the second place, the accounts of authors do not admit of the hypothesis that syphilis is contracted in the early stages of general paralysis. Hirschl states that out of 78 cases, 23 occurred within the first ten years, and 40 between ten and twenty years after infection; and he points out that these numbers agree very closely with those of Obersteiner regarding tertiary syphilis. Kraepelin's figures are similar: out of 21 cases, 8 developed general paralysis less than ten years, and 8 between ten and twenty years after syphilitic infection, the extremes being two and thirty-one years. Serieux and Farnarier find the mean period of incubation to be between fourteen and fifteen years, their extremes being six and thirty-two years.

In addition to the above facts, there is a mass of circum-

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stantial evidence which bears on the relationship between general paralysis and syphilis.

Age.

Adolescent and juvenile general paralysis develop in individuals who have been born syphilitic, or have acquired the disease from a syphilitic wet-nurse shortly after birth (three such cases recorded).

Adult general paralysis is usually found in persons who have acquired syphilis in early adult life.

I have not met with statistics referring to the age at which syphilis has been acquired in cases of senile general paralysis, but I suggest that it would add to this circumstantial evidence if it could be shown that the senile cases had acquired syphilis late in life.

Sex.

Adolescent and juvenile general paralysis occur with almost equal frequency in males and females, females preponderating to a slight extent. This is what we should expect on the hypothesis that general paralysis is a parasyphilitic disease. Males and females are equally exposed to the inheritance of syphilis, and we should therefore expect general paralysis to be equally distributed between the sexes when considering the juvenile and adolescent cases, with a slight preponderance of females as in the general population.

Adult general paralysis occurs in the pauper class four times as frequently in men as in women, and in the private class fifteen times as frequently. These numbers agree fairly well with those furnished long ago by Fournier, who found syphilis 10·1 times as frequently in men as in women, and with those of Blascko, who found that one woman was a source of infection for four men, and this in a country where the laws affecting prostitution are very stringent (Denmark). This difference between the two classes is what we should expect in view of their different social customs.

Confining our attention for the moment to female adult general paralytics, we find that they are nearly all married,

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and of the rest, many are prostitutes. Salaris states that during the years 1891-1897 inclusive, there occurred in Sardinia only two cases of general paralysis in women. One was a prostitute and the other was married.

Nay, further, Campbell states that no case of general paralysis has been observed in a *virgo intacta*.

Lastly, we have to remember that female general paralytics are frequently sterile.

Heredity.

A history of insanity is less frequently obtained in the ancestry of general paralytics than in that of the general insane population. Statistics bearing on this point show that a history of insanity in the relatives of the insane-generally is obtained in 30 to 90 per cent. of the cases, whereas in the case of general paralytics the highest numbers obtained by any one observer show 58·7 per cent. Numerous cases have, however, been recorded of general paralysis in parent and offspring; at least 27 such cases have been recorded within the last twenty years. It is questionable if this number is sufficiently large to exclude the possibility of these cases being examples of mere coincidence.

Allied to this observation is the one that many cases have now been reported in which husband and wife have both suffered from general paralysis or from tabes, or the one from general paralysis and the other from tabes. Mendel has collected notes of twenty such cases; I have come across seven more published since his paper, and I know of one unpublished case in which the husband died of general paralysis (suicide) and the wife had tabes. But even this again may be merely a matter of coincidence—the numbers are very small.

Profession.

The professions are represented among general paralytics in proportions which are in accordance with the hypothesis of syphilitic origin of the disease. For example, one third of Hirschl's cases and two thirds of Garbini's cases belonged to the labouring class, 90 per cent. of Krafft-Ebing's cases were

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officers in the army; while Hirschl had only one Roman Catholic priest among his two hundred general paralytics and Krafft-Ebing had no instance, among two thousand cases of general paralysis, of the disease occurring in a Roman Catholic priest. Salaris states that there was only one case occurring in Sardinia in a priest during the years 1891-1897, and that that priest had certainly had syphilis. Bouchard also demonstrates the infrequency of general paralysis among the clergy.

Geographical and Racial Distribution.

The geographical and racial distribution of general paralysis bid fair to throw much light upon the ætiology of the disease. In Dr. Macpherson's *Mental Affections* the author remarks: "It may be generally stated that the disease does not exist in the Highlands of Scotland or in Ireland outside the larger cities, or in the more rural and remote districts of Wales and the south of England. It reaches its maximum in the busy manufacturing towns of the Midlands, and in the larger cities of the United Kingdom." The same remarks apply to Sweden. The author continues: "Taking a wider geographical area, it is present in the countries of Western Europe and North America, and is practically unknown among the uncivilised nations of the world."

We learn that in Germany general paralysis has invaded the more rural districts to a greater extent than formerly; but this can be accounted for by the military organisation which exists there, whereby every man is exposed in his youth to barrack-room life and syphilisation.

This distribution corresponds fairly well with the distribution of syphilis; the latter disease, however, is rather more widely spread, and there are some special countries which demand closer investigation.

Syphilis is a rare disease in Iceland, and does not spread throughout the population. Schierbeck, the principal medical officer of Iceland, met with only four cases in eight years. "Its introduction is not safeguarded by the habits of the people as by the necessary isolation imposed by nature on the inhabitants of this barren island. . . . General paralysis has been observed once only in the capital of the country, and then in a

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man who for six years had led a somewhat fast life abroad, and perhaps twice in the only port of Iceland, where there are some members of the native population who accept the advances of foreign sailors, and who have occasionally been infected by them." On the other hand, we find that in China and Japan there is a large amount of syphilis—an enormous amount according to some authorities; but general paralysis is comparatively rare (2 per cent. in the asylum at Tokio about two years ago). Again, in Mahommedan countries syphilis is rife, but general paralysis comparatively rare. Mott quotes a letter from Warnock in which he states that a short time ago there were twelve general paralytics at the asylum of Cairo (the only one in Egypt) out of an insane population of 450.

Basing conclusions upon the racial distribution, it is argued that general paralysis is essentially a disease of *civilisation;* to this conclusion we will return later.

Conclusion.

It is noteworthy that, in the history of medicine, hepatic syphilis, cutaneous syphilis, cerebral syphilis, etc., have all passed through a stage in which their syphilitic origin remained in doubt. This stage has, however, in each of these instances been a short one; because it soon became recognised that these diseases were rapidly cured by mercury and iodide of potassium. Now in the case of general paralysis this is just where we are handicapped; for the nature of the disease is such that no amount of mercury can cure the disease, however important an ætiological factor syphilis may be. We must, therefore, entirely rely upon other sources of information.

The sources of information epitomised above go very far to prove that general paralysis is due to syphilis.

It has been shown that the statistics of syphilis in cases of general paralysis are higher than those of any other ascribed cause, and further that these statistics very much underrepresent the facts. Indeed, considering the enormous odds against which the various authors have had to work (especially the difficulties of *syphilis occulta* and *ignorée*, and of obtaining a reliable syphilitic history of parents perhaps long dead), it is surprising to find that many of the numbers are as high as

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they are. But, in addition to all this direct evidence, we have an accumulated mass of circumstantial evidence from the study of the age, sex, heredity, profession, rank, and race of general paralytics which should convict syphilis in any court of law. On the whole the experimental evidence of Krafft-Ebing is also in favour of such a conviction.

The only argument of any importance against the view that general paralysis is essentially a parasyphilitic disease is the fact that general paralysis is rare in uncivilised communities where syphilis is rife.

It behoves us, therefore, to discover what is the element in civilisation which aids syphilis in causing general paralysis; especially we have to ask ourselves, "In what way is syphilis affected by civilisation?"

In the first place, syphilis is a less severe disease among the civilised than among the uncivilised, perhaps for the reason that syphilis has existed for a longer period among the civilised. Similarly, it is my experience that general paralytics have never previously suffered severely from their syphilis. The logical conclusion from such premises is that it is the mildness of the attack of syphilis which causes general paralysis—a *reductio ad absurdum*.

In the second place, syphilis remains untreated in uncivilised countries; for example, the Mahommedans' treatment of venereal disease is to say "kismet," and all is over. But among the civilised the patient is saturated with mercury, perhaps for two years. Now the question has never been investigated whether it is the mercury which causes general paralysis.

Marschalko has carefully investigated the question whether tertiary syphilis is or is not caused by mercury, and has conclusively demonstrated the drug to be innocent; but the relationship of mercurialism to general paralysis remains to be investigated.

As early as 1861 Kussmaul stated that, although he had taken much trouble to do so, he had not been able to meet with the record of a single worker in mercury who had acquired syphilis while affected with mercurialism. This observation suggests that some information on the point in question might be gleaned from firms whose employées work in mercury (jewellers'-rouge and mirror makers).

It has been suggested that the immunity of the Mahom-

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medan from general paralysis is due to his simple mode of life and to his moderation in the matter of eating meat. This is difficult of acceptance, for the poorer classes of even this country, and especially of such a country as Italy, among whom general paralysis is rife, cannot be accused of excessive meat-eating. Further, it has been shown that general paralysis is commonest in this country among those people who live the simplest lives (the poorer classes).

From all the above considerations we may conclude that syphilis is so frequent an antecedent of general paralysis, that the non-syphilitic cases (if such exist) may for the present be regarded as a negligible quantity. At least, we may say for practical purposes that hardly anybody runs the risk of getting general paralysis who has not had syphilis. But the question still remains to be answered whether general paralysis is due to syphilis *per se* or to the subsequent mercurialisation of the patient which occurs in civilised communities.

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The Cerebral Localisation of Melancholia. By BERNARD HOLLANDER, M.D., Freiburg-i.-B., M.R.C.S.Eng., L.R.C.P. Lond.

I. INTRODUCTION.

IN a previous paper has been demonstrated the possibility of localising the fundamental emotions in circumscribed areas of the cortex of the brain.

Alienists have never attempted localisation, though they must have noticed that there exist in the encephalon regions, the lesion of which nearly always brings about the appearance of the same symptoms. To those clinicists who believe in localisation, a solitary tumour, a simple limited hæmorrhage, or a localised softening would be the same for purposes of study as the experiment of excitation or artificial destruction is to the physiologist, with the advantage that the clinical observations would be more trustworthy, since they are made on man, whose mental and physical changes we can test.

Pure melancholia being an emotional and not an intellectual disease, we are not surprised that Jensen (*Archiv für Psychiatrie*, vol. xx) found that in this form of insanity the frontal lobes are not affected, in contrast to general paralysis. Tigges (*Allg. Zeitschrift für Psychiatrie*, 1888, vol. xlv) found the same. In melancholia, he says, the frontal lobe keeps its high weight; whereas in hilarious mania it sinks low, and in general paralysis lowest.

The present paper deals with the different degrees of simple

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