to that of Dr. Seymour Tuke; he did not understand Dr. Blair to set forth such extremely heterodox doctrines as those which had been attributed to him. That a nurse would occasionally feel some annoyance at having to work with a patient such as the one described was no more than to say that she was human. With regard to the comparative merits of nasal and œsophageal feeding, it was possible to talk almost for ever on such a subject, because both methods were very good in their own way, and he thought Dr. Seymour Tuke had summarised the matter in a nutshell. Where the patient resisted violently he considered that nasal feeding was the better, but where the patient could be fed without much trouble the œsophageal method was less disagreeable to the patient, and was much more rapid in use.

Dr. BLAIR, in reply, thanked the meeting for its courteous attention. With regard to the point raised by the first speaker, Dr. Tuke correctly said that he, Dr. Blair, simply put the question. It was the question which was suggested by all who came to see the case. He would not like it to go forth that nurses in asylums expressed disgust at having to carry out such procedures. His object had rather been to demonstrate the devoted care which the nurses gave to such cases.

---

## *An Inquiry into the Occurrence of an Inherited Tendency to Insanity in the Insane of a Rural Population.*

By JAMES FREDERICK CORSON, M.D., D.P.H.Camb., Assistant Medical Officer, Bucks County Asylum.

The important part played by heredity in the causation of insanity has long been recognised. Much has been written on the subject and investigations have frequently been made to show its influence. Owing to the complexity, variability and general indefinite character of insanity these inquiries have been mainly statistical. It is recognised that no form of insanity is of such definite and simple nature as to be readily available for study in its hereditary aspect by Mendelian methods. As has been repeatedly stated by various writers on the subject, it is not insanity, recognisable as such, that is inherited, but an abnormal nervous system liable to the development of the various conditions included in the term "insanity."

In his book on *Mendel's Principles of Heredity* (1), Professor Bateson refers to this aspect of the subject as follows:—"Forms of insanity, which appear when the individual is subjected to various strains and excitements, may not appear at all if these causes be absent. The element transmitted is evidently the liability, not necessarily the developed condition. The descent of such peculiarities is therefore beyond the range of our analysis."

Dr. Bevan Lewis, in an address on "The Biological Factor in Heredity" (2), recognises the same difficulty in dealing with mental disease. He says, "It is obvious that it is not the insanity that is transmitted, but the psychopathic basis out of which the insanity is evolved. . . . But here we observe we are dealing, not with any simple factor to which Mendelian principles can be readily applied, but rather with an enormously complex aggregate of factors which still awaits our patient analysis. The psychopathic constitution, far from being one and indivisible, is not necessarily identical for any two individuals, nor for any two forms of mental disturbance."

Apart from this, the collection of detailed and accurate information respecting all the individuals, sane and insane, of a family or stock, with the connections by marriage, would appear to be in most cases a matter of almost insuperable difficulty.

Hence it is that inquiries, attempting to give some quantitative estimate of the influence of heredity in insanity, are, in the main, statistical in character.

Considerable differences exist between the figures of various investigators of this subject. This is partly due to the fact that, in some statistics, insanity alone, occurring in relatives, is taken as evidence of an inherited predisposition, whilst in other statistics there are included also such alleged causative agents as alcoholism, tuberculosis, syphilis, epilepsy, eccentricity and other neuroses. The question of the inclusion or otherwise of these affections, occurring in the relatives of the insane, as evidence of the transmission to offspring of a tendency to insanity, is one of some difficulty. In the case of alcoholism, tuberculosis, syphilis and some other diseases, the question of the inheritance of acquired characters arises, but more particularly, admitting Weismann's doctrine that environment has practically no effect on the germ-plasm, whether such diseased conditions should be regarded as acquired characters or not. There appears to be some difference of opinion upon the latter point, but the majority of physicians to whose expressed views I have had the opportunity of referring incline to the opinion that such affections should not properly be regarded as acquired characters in the sense that, for example, a developed musical ability or the trained muscular sense in a banker or billiard expert is so regarded.

It is a matter of such importance in heredity that some opinions may be quoted. Dr. Donkin, speaking on "Some Aspects of Heredity in Relation to Mind" (3), refers to the subject in the following words: "Those who accept, as most biologists ostensibly accept, the conclusion that characters developed by parents after birth in response to environmental influences are not transmitted to offspring as innate characters not requiring such influence for their development, must reject wholly the doctrine that bad nutrition or other evil conditions or diseases, contracted by the parents, can appear in the offspring in the form of such abnormalities of the brain, as must subsist in all, as it is known to subsist in many, of the cases of mental defect we are now considering." From this it would appear, if I interpret the sentence correctly, that Dr. Donkin regards such diseases as acquired characters, and regards a belief in their influence as a cause of mental defect in offspring, as dependent on the acceptance or otherwise of Weismann's doctrine.

Many, on the other hand, hold a different view. Dr. Mott, in the recent Huxley Lecture on the Hereditary Aspects of Nervous and Mental Diseases (4), says in reference to alcoholism: "That the germ-cells are sequestered—'in the body and not of the body,' therefore not participating in the bio-chemical changes which occur therein—and that, in prolonged toxic conditions are uninfluenced in their nutrition and their specific vital energy, is contrary to reason."

Similar views are expressed by Dr. Wiglesworth (5). Speaking of alcoholism in parents, he says: "The particular case we are now considering has nothing whatever to do with the inheritance or otherwise of acquired characters. What we are here concerned with is a direct poisoning of the germ-plasm itself by means of the alcohol circulating in the blood and consequent direct injury to the delicate cells of which the structure is composed, which by virtue of this injury are thereby prevented from developing into a stable organism."

He states that similar considerations apply to the cases of so-called inherited syphilis.

Dr. Tredgold (6) considers that germinal plasm is capable of modification by environment, and that the alteration so produced may very materially affect subsequent generations, and expresses the view that certain diseases, chiefly alcoholism

and tuberculosis, bring about deterioration of the germ-plasm. Hence the weight of opinion is against regarding such toxæmic conditions as acquired characters.

Admitting that such conditions, occurring in the parents and other ancestral relatives of the insane, should be included as exerting hereditary influence, they, together with eccentricity and other neuroses, present considerable difficulties in the preparation of statistics. Such statistics depend largely upon information supplied by relatives of the insane, and the interpretation by them of such terms as eccentricity, asthma, alcoholism, and consumption is too varied to be reliable. Not only so, but knowledge of such affections existing in the family is by no means complete. Certified insanity, on the other hand, is a definite fact, not subject to individual opinion, practically speaking, and not liable, to the same extent, to be unknown or beyond the reach of inquiry. Accuracy of information as regards this particular depends mainly upon thoroughness of inquiry and the amount of deliberate concealment effected by relatives from motives which are obvious and natural.

There are objections, however, to the view that statistics which are based upon a mere enumeration of cases with insane relatives represent a correct statement of the numerical proportionate value of heredity as a cause of insanity. They have been clearly stated by Dr. Mercier in Hack Tuke's *Dictionary of Psychological Medicine* (7), and I quote here two of the most important:

"1. The factor directly inherited is not insanity but an instability or disordered arrangement of nerve-tissue which allows insanity to occur. . . . We must look for the heritable antecedents of insanity, not alone in insanity itself as existing in progenitors, but in all maladies which display evidence of undue instability or disorder of the highest nervous arrangements.

2. Even when successfully and completely carried out it (*i.e.*, this method) leaves one half of the field of hereditary antecedents unreaped—it neglects entirely one, and that not the least important, of the two laws of heredity. For the production of normal offspring it is necessary not only that the parents be each of them normal, but it is also necessary that the sexual elements of the parents be suitable one to another. A

defect in nervous organisation of the offspring may arise from unsuitability of sexual elements of two normal parents."

The latter of these objections indicates the origin of an unstable nervous system as a sudden variation or mutation, which would tend to be transmitted to offspring. The association of insanity in offspring with insanity in several ancestral relatives, especially as regards those forms which appear at a comparatively early age, is so frequent, taking into consideration the difficulties of obtaining information, that this mode of origin as a mutation may not perhaps be of such importance as is suggested. The former objection has already been referred to. These considerations, while diminishing to some extent the value of such statistics, do not, I think, destroy their practical worth. Regarding the statistics as not representing exact proportions but rather as a minimal statement of hereditary influence in insanity, it may be claimed that they afford valuable information and that useful inferences may be drawn from them.

Perhaps the chief defect of the method is due to the fact, previously mentioned, that the results in most cases so largely depend on information supplied by relatives. Lack of information due to ignorance on the part of the relatives of cases of insanity in the family is more likely to be met with in large industrial areas, where there is much moving about of the population with breaking up of families, than in rural districts. In cases of senile insanity so few relatives with much knowledge of the family are accessible that information is likely to be deficient.

In connection with a consideration of the defects of the method and the possible sources of error, the question of the number of cases arises. As a rule, in statistical inquiries, the greater the number of cases dealt with, the nearer to the truth are the results. This does not obtain, I think, in the present case. Admitting a certain percentage of error from insufficient information, a mere multiplication of numbers will not tend to eliminate this but rather tend the other way owing to the greater difficulty of making a fuller investigation of the greater number. At the beginning of this inquiry it was thought that some of the above-mentioned defects would be minimised in the case of the insane of the county of Buckingham, partly on account of the habits and mode of life of the population, which

is mainly a rural one, and partly by taking precautions in the preparation of the statistics, to exclude some of the sources of error.

The people of the working class are largely employed in agriculture and in certain trades more or less characteristic of the county, and families tend to remain in certain districts for several generations. It is generally stated that in many of the villages there is much intermarrying of related families.

It was consequently thought that inquiries would elicit fairly full information, and also that, where insanity was known to occur in antecedent relatives, many of the cases would have been sent to the Bucks County Asylum and be available for further reference. In order to make the figures as far as possible truly representative of the population properly belonging to the county, all out-county patients and also all patients known not to have been natives of the county have been excluded.

It is perhaps hardly necessary to state that all additional admissions of the same patient within the period selected have not been counted, so that the figures refer to individuals and not admissions.

The statistics and observations presented in this paper refer to patients admitted to the Bucks County Asylum during a period of nearly eleven years, from January 1st, 1900, to October 31st, 1910. The period taken is sufficiently recent for information to be within the memory of persons supplying it, and, while comprising a sufficient number of cases to enable figures, large enough for fair comparison, to be made, does not involve too great a number to permit of each case being investigated. One of the chief difficulties in tracing ancestors of insane patients was found to be the change of name by marriage. In all cases when the maiden name could be ascertained search has been made, and in several instances additional information has been thereby obtained. Certified or certifiable insanity in relatives has alone been considered in preparing these statistics. For reasons mentioned previously, other affections generally believed to have an important hereditary influence have been excluded, although, during the inquiry, their frequent occurrence in association with insanity has been noticed. Ancestral and co-fraternal relatives only have been selected as indicative of hereditary influence,

cousins, nephews and nieces and sons and daughters being excluded. Hence the figures have a minimal value, and by no means represent an over-statement of the influence of heredity in insanity.

In the method adopted I have been guided by previous researches on the subject, particularly by a paper by Dr. W. F. Farquharson (8), based on Dr. H. Grainger Stewart's method, and also by the Huxley lecture by Dr. F. W. Mott, as published in the *Lancet* (4).

In addition to examining the cases from a statistical point of view, I have given some attention to certain families which have shown a comparatively large occurrence of insanity, and in which a strong hereditary predisposition to insanity was apparent. In some of these cases pedigrees are given which serve to illustrate some of the conclusions drawn from statistical figures.

I am much indebted to Dr. H. Kerr, the Medical Superintendent of the Bucks County Asylum, for help in many ways during this inquiry, and have received much assistance from the assistant clerk to the asylum.

### *The Proportion of Cases with Hereditary Predisposition.*

The total number of cases admitted during the period was 1,131, consisting of 551 males and 580 females. Of this number, 360, comprising 151 males and 209 females, had an ancestral history of insanity. The numbers are conveniently stated in tabular form as follows:

| | |
|---|---|
| Number of male hereditary cases . . . | 151 |
| „ female „ „ . . . | 209 |
| | 360 |
| Number of male non-hereditary cases . . | 400 |
| „ female „ „ . . | 371 |
| | 771 |

Calculating percentages it is found that 31·8 *per cent.* of the cases showed insane hereditary influence, and, taking the sexes separately, it was present in 27·4 *per cent.* of the males and in 36 *per cent.* of the females. The figures of other observers may be quoted for comparison.

Farquharson: Total 30·7 *per cent.*; males, 27·4 *per cent.*; females, 34·16 *per cent.*

Stewart (quoted by Farquharson): Total 49·6 *per cent.*, eccentricity in relatives being included.

Urquhart (9): Total 45 *per cent.*, with hereditary history of insanity only; total 72 *per cent.*, with hereditary neuropathic history.

Hack Tuke (quoted by Urquhart): Total 20·5 *per cent.*

Savage (quoted by Urquhart): Total 34 *per cent.*

Wiglesworth: Total 28·01 *per cent.*, insanity, epilepsy, or marked degrees of eccentricity or peculiarity in relatives being included; males, 24·74 *per cent.*; females, 31·16 *per cent.*

F. R. P. Taylor, ('Annual Report of East Sussex County Asylum, 1910'): males, 28 *per cent.*; females, 43 *per cent.*

These results are not strictly comparable owing to the inclusion or exclusion of other neuropathic conditions besides insanity as hereditary factors. Different conditions of life in different parts of the country may also cause a real difference in the various figures.

The question of hereditary influence in such affections as general paralysis of the insane and organic brain disease, and especially as regards the former, is one upon which there is considerable difference of opinion. In the Huxley lecture, to which reference has already been made, Dr. Mott expresses the following view: "Many of the inmates of asylums are suffering with congenital or post-natal organic brain disease; these conditions are certainly not due to inheritance. General paralysis of the insane, syphilitic brain disease and softening from vascular disease are acquired conditions, and should not be classed among the inherited insanities, nor should Korsakoff's psychosis and chronic alcoholism."

Other physicians have expressed different opinions in the case of general paralysis of the insane.

In a very careful examination of seventy-two cases of this disease (10), Dr. J. S. Bolton found a family history of actual insanity in forty-five cases or 62·5 *per cent.*; including an ancestral history of epilepsy the percentage was 69·4, and there was a total psychopathic heredity of 81·9 *per cent.*, with an abnormally high family death-rate in another 9·7 *per cent.*

In the Morison lectures of the year 1907 (9), Dr. A. R. Urquhart says: "My experience leads me to believe that the

hereditary factor is of importance in general paralysis. It used to be regarded as not a hereditary disease, an opinion which must be revised if my experience is common, for in reference to these forty cases of general paralysis, the heredity of insanity finds expression ten times, eccentricity four times, neurosis twelve times, and alcoholism fourteen times. There was a distinct neuropathic heredity in thirty-two cases."

Näcke (11) found that in Bosnia, although syphilis is extremely common and usually severe, yet general paralysis is extraordinarily rare. He considers that this cannot altogether be explained by the change in relationship between general paralysis and syphilis, under the stress of civilisation, as seen in Japan, Roumania, and amongst the American negroes. He concludes that in most, if not all, cases, the general paralytic possesses an invalid brain either *ab ovo* or developed later, and thus, as a rule, presents a degenerative predisposition which is excited into activity by syphilitic infection, though such infection is not essential to the manifestation of the disease.

Bianchi (12), in a study of 87 cases of general paralysis, found heredity as sole cause in 17 and, combined with other causes, in 48 instances.

Ameline (13) found heredity (including alcohol and neuroses) present in 120 out of 238 cases of general paralysis, or about 50 *per cent.* In my cases there were 61 cases of general paralysis, consisting of 55 males and 6 females. Of these, 13, 11 males and 2 females, had a history of insanity occurring in relatives, forming 21 *per cent.* of the cases of general paralysis. In none of these cases, however, was there an extensive ancestral occurrence of insanity, such as was found in many of the cases of manic-depressive insanity. Possibly deficient history, which, as Dr. Bolton has pointed out (10), obtains to a greater extent in this form of insanity than in most others, may partially account for this.

As regards insanity due to arterio-sclerosis or other vascular changes, Dr. Urquhart's view may be quoted as differing from the opinion of Dr. Mott mentioned above. In reference to these cases he says: "We have to deal with a condition which has certain hereditary relations owing to a defect of organisation and comparable with arterio-sclerosis, gout and other diseases of obscure causation. It is not the crude heredity of yesterday, but a failure in development or metabolism, or a weakening of

somatic defences, apparent in early life, in the period of development, in the stress of maturity, or in the decay of old age. And the more marked the parental defect the earlier will be the failure of the new organism exactly in conformity with the vital statistics of gout (9)."

Cases of senile dementia present some difficulty in this connection. The fact that they have lived to old age without becoming insane suggests, as Dr. Clouston has remarked (14), a slight neurotic heredity or great absence of exciting causes of disease. The frequent occurrence, in these cases, as seen *post-mortem*, of vascular degenerative changes, and marked cerebral pathological lesions, tends to make the occurrence of insanity in relatives less convincing as evidence of an inherited predisposition to insanity.

Dr. Bevan Lewis considers that heredity plays some part in the causation of senile insanity as the following quotation indicates (15): "We should therefore incline to the view that the senile insane exhibit a fairly average predisposition to insanity, and that possibly its late development in such subjects may depend upon the nature of the neurotic inheritance and the developmental period during which it was originally acquired by the ancestor."

When all cases of general paralysis, organic brain disease, and definite senile dementia are excluded, the following figures are obtained for the remaining forms of insanity:

| | |
|---|---|
| Number of male hereditary cases . . . | 128 |
| „ female „ „ . . . | 187 |
| | 315 |
| Number of male non-hereditary cases . . | 268 |
| „ female „ „ . . | 272 |
| | 540 |

The corresponding percentages are higher, 36·8 *per cent.* showing hereditary influence. Of the males 32·3 *per cent.* and of the females 40·7 *per cent.* show evidence of an inherited liability to insanity.

*The Influence of Insane Heredity in Different Forms of Insanity.*

The classification of insanity into different forms, being mainly symptomatic, is somewhat unsatisfactory; but, if the

figures are regarded as representing approximate proportions, a comparison of the different forms of insanity in hereditary and non-hereditary cases is useful. I have included the cases in eight forms of insanity. The manic-depressive class, by far the largest, is chiefly composed of cases of ordinary mania and melancholia, but includes less definite cases where it has been difficult to decide whether or not to regard them, in the case of some, as cases of dementia præcox, and in the case of others as cases of delusional insanity. The questions of age of onset, predominance of sensory and emotional symptoms, and recovery have been considered in deciding upon these cases. Cases showing an alcoholic history have been decided on the same lines.

The class of epileptic insanity does not include cases of idiocy and marked imbecility with epilepsy, these being placed in the class of congenital idiocy and imbecility. The group of cases of senile dementia is limited to unrecoverable senile, first attack cases, where dementia was prominent and where the general symptoms and course pointed to this diagnosis. Some of the cases of organic brain disease were also senile, and in most cases of both classes definite pathological brain lesions in all probability existed.

The following table shows the proportionate occurrence of the different forms of insanity in hereditary and non-hereditary cases respectively and in both together.

| | Hereditary cases. | | Non-hereditary cases. | | All cases. | |
|---|---|---|---|---|---|---|
| | No. | Percentage of total. | No. | Percentage of total. | No. | Percentage of total. |
| Manic-depressive | 217 | 60·3 | 340 | 44·9 | 557 | 49·2 |
| Delusional | 32 | 9 | 60 | 7·7 | 92 | 8·1 |
| Dementia præcox | 24 | 6·6 | 23 | 3 | 47 | 4·1 |
| Epileptic | 13 | 3·6 | 49 | 6·3 | 62 | 5·5 |
| Congenital (idiocy and imbecility) | 29 | 8 | 68 | 8·8 | 97 | 8·6 |
| General paralysis | 13 | 3·6 | 48 | 6·2 | 61 | 5·4 |
| Organic brain disease | 10 | 3 | 47 | 6·1 | 57 | 5 |
| Senile dementia | 22 | 6·1 | 136 | 17·6 | 158 | 14 |
| | 360 | | 771 | | 1131 | |

These figures show a relatively large proportion of cases of manic-depressive insanity in the group of hereditary cases as compared with the non-hereditary group, 217 or 60·3 *per cent.* of the former and 340 or 44·9 *per cent.* of the latter being cases of this form of insanity.

The comparatively small number of cases of senile dementia with an insane ancestral history will be noticed. There were more cases of dementia præcox with an insane heredity than without, and a relatively much greater proportion.

A better comparison between the different forms of insanity is made by calculating the proportion of cases with insane heredity to the total number of each form. The following table shows this in percentage figures.

| | Males. | Females. | Total. |
|---|---|---|---|
| Manic-depressive insanity | 36 | 41·1 | 38·6 |
| Delusional | 25·6 | 41·5 | 34·8 |
| Dementia præcox | 40 | 63·6 | 51 |
| Epileptic insanity | 16·1 | 28 | 23 |
| Congenital (idiocy and imbecility) | 28·8 | 31·6 | 29·9 |
| General paralysis | 20 | 33 | 21·3 |
| Organic brain disease | 13·1 | 26·3 | 17·5 |
| Senile dementia | 11·3 | 15·6 | 14 |

This table shows a high percentage of hereditary cases in manic-depressive insanity, delusional insanity, and dementia præcox, forms which develop usually in comparatively early life. In the cases of manic-depressive insanity, 36 *per cent.* of the males and 41 *per cent.* of the females have a definite history of insanity in relatives, giving a total of 38·6 *per cent.* In the previous table it is seen that 49·2 *per cent.*, or practically one-half, of the patients admitted within the period were suffering from this form of insanity. When it is also remembered that manic-depressive insanity occurs chiefly in early adult and middle life, that it has by far the highest recovery-rate, the shortest duration of attack, and is practically the only form in which true recurrence takes place, the great influence of this form of insanity upon succeeding generations is realised. It is evident that a marked hereditary tendency to insanity is transmitted from generation to generation chiefly in association with this form of mental disease.

Dr. Mott found insanity to occur in other members of the family in 55 *per cent.* of cases of manic-depressive insanity, and the above figures are in agreement with his conclusion that the

four types, manic-depresive insanity, delusional insanity, dementia præcox and imbecility, have the most marked tendency to inheritance. The figures of other observers are quoted for the purpose of comparison.

Dr. Wiglesworth (5):

| | |
|---|---|
| Congenital | 44·11 *per cent.* |
| Epileptics | 31·66 ,, |
| General paralysis | 18·93 ,, |
| Mania, melancholia, dementia, etc. (excluding the above three types) | 28·85 ,, |

Dr. Farquharson (8):

| | |
|---|---|
| Congenital imbecility | 34·9 ,, |
| Epileptic insanity | 22·7 ,, |
| General paralysis | 18·6 ,, |
| Mania | 32·5 ,, |
| Melancholia | 34·7 ,, |
| Dementia | 18·8 ,, |

Dementia præcox is undoubtedly due in great measure to hereditary influence. It has the highest percentage figure in my list, and several of the cases showed a large occurrence of insanity in ancestral relatives.

Cases of pronounced congenital mental defect (idiocy and imbecility, with and without epilepsy) formed 8·6 *per cent.* of the total cases admitted. An insane ancestral history was present in 29·9 *per cent.* of these cases. This is a lower figure than is usually obtained, and may be due, in part, to deficient information. The lesser degrees of mental defect are not sent to asylums. Perhaps this is the case more in agricultural districts than in large towns, as slight mental defect is not incompatible with earning a living as an agricultural labourer. Hence the number of cases of congenital mental defect admitted to asylums is no indication of the extent of its occurrence in a population. In this connection it is of interest to quote the following from *The Family and the Nation* (16):

"Those familiar with our country villages recognise that feeble-mindedness is especially rife in certain localities. The cross-marriages between a few neighbouring families, in which mental defects are hereditary, produce gradually a feeble-minded population. The present tendency for the abler youth of the country to drift into the town leaves the inferior stocks behind in the villages."

https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

Dr. Tredgold (6) found that 80 *per cent.* of persons suffering from severer grades of amentia were descendants of a pronounced neuropathic stock, and in 64 *per cent.* the heredity was in the form of insanity or epilepsy.

Epilepsy is known to be markedly subject to hereditary influence, and the ancestral form is frequently similar. Sir William Gowers (quoted by Dr. Mott) stated that cases of epilepsy with insanity in a parent are only one third the number compared with parental epilepsy. As in my cases insanity alone, occurring in ancestors, is counted, and as epilepsy in association with idiocy and imbecility is included in the congenital cases, the figure of 23 *per cent.* probably falls far short of the full amount of hereditary influence in this form.

The proportion of 14 *per cent.* in senile dementia is the smallest of all the classes. The difficulty of obtaining full information on these cases has already been mentioned, and the reasons for regarding hereditary statistics in this form of insanity as having less value than in other forms have been stated. It is probable that, as regards the next generation, transmission of any hereditary tendency would have been very slight unless it had been intensified by unsuitable marriage or by other cause.

The figures of other observers relating to this form of insanity may be mentioned:

| | |
|---|---|
| Farquharson (8) . . . . . | 27·5 *per cent.* |
| Clouston (14) . . . . . | 13 „ |
| Bevan Lewis (15) . . . . . | 22 „ |

It may reasonably be supposed that differences will occur according to the limitation of the interpretation of the term "senile dementia" by various observers.

As the majority of persons suffering from pronounced mental defect, insanity with epilepsy, or dementia præcox, remain unmarried, these forms of insanity cannot be regarded as taking a large share in the transmission of hereditary tendency from generation to generation. Perhaps their chief importance, considered collectively, is the part they constitute of the large burden which insanity lays upon the community.

### *The Relative Frequency of Transmission of Hereditary Influence by Father and Mother respectively.*

When calculating the proportionate numbers of cases showing paternal and maternal heredity respectively, it was found that

in a small number of each sex it was not stated whether the ancestor was related to the father or mother. These cases have been divided proportionately to the other figures and added to the respective numbers according to sex, and as to whether the ancestral relationship was in the direct or collateral line.

Of the 360 cases, the hereditary influence was transmitted by the father in 142, by the mother in 114, and by both parents in 13. In ninety-one cases there was co-fraternal evidence only (brothers and sisters insane). Omitting these ninety-one cases as not indicating whether inherited liability was from paternal or maternal side, the proportions are shown in the following table:

| | | *Per cent.* |
|---|---|---|
| Cases with paternal ancestral history of insanity (direct and collateral) . . | 142 | 52·8 |
| Cases with maternal ancestral history of insanity (direct and collateral) . . | 114 | 42·4 |
| Cases with both paternal and maternal ancestral history of insanity (direct and collateral) . . . . . | 13 | 4·8 |
| | 269 | |

Excluding cases of general paralysis, organic brain disease and senile dementia, the following figures are obtained:

| | | *per cent.* |
|---|---|---|
| Cases with paternal hereditary influence | 131 | 53·7 |
| ,, ,, maternal hereditary influence | 102 | 41·8 |
| ,, ,, both paternal and maternal hereditary influence . . . | 11 | 4·5 |
| | 244 | |

In these cases paternal transmission is seen to be considerably greater than maternal, 52·8 *per cent.* as compared with 42·4 *per cent.*, or, taking the second table, 53·7 *per cent.* as compared with 41·8 *per cent.* Statistics of different observers show some variation on this question. In an analysis of 752 instances of insanity occurring in two of a family, Dr. Mott found a much greater incidence of transmission to offspring through the female side, as shown by his figures here quoted. The difference was not wholly accounted for by the fact that there are more females than males in asylums.

| | | |
|---|---|---|
| Father and son | 44 | instances |
| Father and daughter | 58 | „ |
| | 102 | |
| Mother and son | 51 | instances |
| Mother and daughter | 104 | „ |
| | 155 | |

Dr. Farquharson's figures show a near approach to equality, there being a very slight preponderance on the maternal side, 8·1 *per cent.* paternal to 8·2 *per cent.* maternal, taking the percentage of the total number of admissions. He quotes the following figures of other writers:

| | Paternal. | Maternal. |
|---|---|---|
| Thurnam | 8·3 | 8·5 |
| Grainger Stewart | 9·1 | 7·5 |
| Brigham | 6·7 | 7·7 |

Dr. Turner (17) found a greater maternal hereditary influence. Dr. Wiglesworth also found the maternal influence to be slightly greater, but, taking the parents only, the preponderance was on the paternal side. His conclusion may be quoted (5): "I incline therefore to the opinion that the female sex, as such, has little, if any, greater power of transmitting insanity than the male, but that the relative potency of either parent, in handing down the insane diathesis, is governed by the same laws as those which regulate prepotency in general, laws of which we are still profoundly ignorant, and which stand in urgent need of elucidation." Excluding cases where inheritance was from both parents and calculating on a basis of an equal number of males and females, I find a proportion of 56 *per cent.* with paternal hereditary influence only and 44 *per cent.* in which the influence is maternal only.

### *Direct and Collateral Heredity.*

Considerably more of the cases show insanity in the direct line of ancestors than in collateral lines only. In the former cases there is frequently insanity in collateral lines as well. The following figures show the relative proportion of cases with direct and collateral insane ancestors.

| | | *Per cent.* |
|---|---|---|
| Cases with insane ancestors in the direct line (including collateral lines when also present) | 174 | 64·7 |
| Cases with insane ancestors in collateral lines only | 95 | 35·3 |
| | 269 | |

*The Comparative Susceptibility of the Sexes to Hereditary Influence.*

A greater proportion of the females than of the males admitted had a family history of insanity, the figures, already stated, being as follows:

| | Males. | *Per cent.* | Females. | *Per cent.* |
|---|---|---|---|---|
| Cases with insane relatives | 151 | 27·4 | 209 | 36 |
| Cases without insane relatives | 400 | | 371 | |
| | 551 | | 580 | |

Excluding cases of general paralysis, organic brain disease, and senile dementia, the figures are: males 32·3 *per cent.*, and females 40·7 *per cent.* The greater percentage of females is in accordance with the results of other observers, previously quoted.

The numbers of male and female cases with either paternal or maternal ancestors insane, but not both, were found to be respectively 114 and 142. These are divided as follows, in regard to paternal and maternal hereditary influence.

| | Males. | *Per cent.* | Females. | *Per cent.* |
|---|---|---|---|---|
| With paternal ancestors insane | 70 | 61·4 | 72 | 50·3 |
| With maternal ancestors insane | 44 | 38·6 | 70 | 49·3 |
| | 114 | | 142 | |

This table shows that a much greater number of the males inherited from the father than from the mother while in the case of the females the numbers are approximately equal. To compare the distribution of paternal and maternal influence between the male and female offspring it is necessary to calculate on the basis of an equal number of each sex.

Taking 1,000 males and 1,000 females the above proportions give the following table:

| | Paternal heredity. | *Per cent.* | Maternal heredity. | *Per cent.* | Total. |
|---|---|---|---|---|---|
| Males | 614 | 54·8 | 386 | 43·9 | 1000 |
| Females | 507 | 45·2 | 493 | 56·1 | 1000 |
| | 1121 | | 879 | | 2000 |

Hence paternal hereditary influence in these cases affected chiefly male offspring in the proportion of 54·8 *per cent.* to 45·2 *per cent.* females. Maternal hereditary influence, on the other hand, affected chiefly female offspring, the proportions being 56·1 *per cent.* females to 43·9 *per cent.* males.

The figures indicate that inherited tendency to insanity is more liable to be transmitted from mother to daughters than from father to sons, the differences in the percentages being respectively 12·2 and 9·6.

These inferences are in general agreement with those of other writers on the subject. Thus Dr. Farquharson concludes from his statistics that "insanity inherited through the father is slightly more dangerous to the sons than to the daughters, while insanity inherited through the mother is markedly more dangerous to the daughters than to the sons."

Both Dr. Turner and Dr. Wiglesworth, however, found that both paternal and maternal hereditary influence affected female offspring more than male, although the difference was greater in the case of maternal influence.

### *Cases with Evidence of Insanity in Brothers and Sisters only.*

There were 91 cases with brothers or sisters or both insane, without a history of ancestral insanity. These have been analysed as follows:

| | Brothers insane. | Sisters insane. | Brothers and sisters insane. | Total. |
|---|---|---|---|---|
| Males | 18 | 10 | 2 | 30 |
| Females | 21 | 36 | 4 | 61 |
| | 39 | 46 | 6 | 91 |

By multiplying the males by two the totals are approximately equal, and the following proportions are obtained:

https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

| | With one or more brothers insane. | With one or more sisters insane. | Total. | With both brothers and sisters insane. | Total. |
|---|---|---|---|---|---|
| Males | 36 | 20 | 56 | 4 | 60 |
| Females | 21 | 36 | 57 | 4 | 61 |

From these figures it may be inferred that, where two or more individuals of the same generation of a family are insane, similarity of sex is much more frequent than dissimilarity, and the proportions appear to be about the same as regards each sex. Thus, of 56 males with brothers or sisters insane, in 36, or 64·3 *per cent.*, there is a similarity of sex, and of 57 females, similarity of sex occurs in 36, or 63·1 *per cent.*

If this conclusion is considered in relation with the view that fathers transmit chiefly to sons and mothers to daughters, it may be stated that in the case of an insane son with paternal heredity or an insane daughter with maternal heredity, the other members of the family of the same sex have a greater liability to insanity than those of the opposite sex.

### *A Comparison between Hereditary Cases and Non-hereditary Cases as Regards the Age at which a First Attack of Insanity Occurred.*

On examining the two groups of cases it appeared that a true comparison could not be made if all forms of insanity were included. Owing to the relatively greater number of manic-depressive cases in the hereditary group and of senile dementia in the non-hereditary group, a considerably greater percentage of cases begin at a comparatively early age in life in the former than in the latter group. To attempt to make a fair comparison, therefore, I have taken only cases of manic-depressive insanity, delusional insanity and dementia præcox in the two groups, excluding cases of marked congenital defect, insanity with epilepsy, general paralysis, organic brain disease and senile dementia.

To simplify the figures the cases are classified under two age-periods: (1) from fifteen years to forty-four years inclusive, and (2) forty-five years and upwards. The following table shows the relative occurrence within these two periods of life in the two groups of cases:

| Age-period. | Hereditary cases. | Per cent. | Non-hereditary cases. | Per cent. |
|---|---|---|---|---|
| 15–44 years . . | 192 | 70·3 | 273 | 64·5 |
| 45 years and upwards. | 81 | 29·7 | 150 | 35·5 |
| | 273 | | 423 | |

The cases with an insane ancestral history show a somewhat greater percentage of occurrence within the earlier age-period than those without. When the two age-periods are compared it is found that 41·3 *per cent.* of those cases with first attack within the earlier period show hereditary influence, while of those cases within the later period hereditary influence is present in 35 *per cent.*

| | Age-period 15–44 years. | Per cent. | Age-period 45 years and upwards. | Per cent. |
|---|---|---|---|---|
| Hereditary cases . . | 192 | 41·3 | 81 | 35 |
| Non-hereditary cases . | 273 | 59·7 | 150 | 65 |
| | 465 | | 231 | |

These figures suggest that insanity tends to occur in those predisposed to it by heredity at an earlier age than in those not so predisposed.

In an analysis of 730 cases of melancholia (18), Dr. Farquharson found that 20·1 *per cent.* of the hereditary cases were under thirty years of age when attacked, as compared with 16 *per cent.* of the non-hereditary cases.

These results are only what might be reasonably expected from a consideration of the causes of insanity, and will be referred to later when comparing the ages at first attack in ancestors and descendants.

### *Recurrence of Attack in Manic-depressive Insanity in Relation to Hereditary Influence.*

The terms "recurrence" and "relapse" in reference to insanity are subject to some latitude of interpretation. Periodicity, considered in a broad sense, is observable in all forms of insanity, being a feature of normal brain function. If the meaning is limited, however, to a recurrence of an attack of insanity after a period of apparently complete recovery, it is found that the form of manic-depressive insanity includes,

practically speaking, all the cases of recurrence. This applies to the cases under present consideration, and, consequently, in making a comparison between hereditary and non-hereditary cases, this form of insanity only has been taken. The following table shows the proportion of cases in which there was a true recurrence of attack :

*Hereditary Cases.*

| | Males. | Percentage. | Females. | Percentage. | Total. | Percentage. |
|---|---|---|---|---|---|---|
| Recurrent cases | 27 | 31·7 | 54 | 40·9 | 81 | 37·3 |
| Total cases | 85 | | 132 | | 217 | |

*Non-Hereditary Cases.*

| | Males. | Percentage. | Females. | Percentage. | Total. | Percentage. |
|---|---|---|---|---|---|---|
| Recurrent cases | 40 | 26·4 | 74 | 39·1 | 114 | 33·5 |
| Total cases | 151 | | 189 | | 340 | |

By calculating the proportion of recurrent cases in relation to the total number of individuals admitted in the hereditary and non-hereditary groups respectively, the following percentage figures are obtained :

| | Recurrence of attack. |
|---|---|
| Hereditary cases | 22·5 *per cent.* |
| Non-hereditary cases | 14·8 ,, |

The greater difference in the latter figures is largely accounted for by the greater proportion of cases of senile dementia in the non-hereditary group, and the figures do not convey, I think, so correct an idea of the effect that inherited liability to insanity may have in causing an increase of the recurrent type of mental disease.

Dr. Farquharson (8) found recurrence of attack in 36·5 *per cent.* of hereditary cases, and quotes for comparison Thurnam's figure of 23·7 *per cent.* for cases of insanity in general.

In an analysis of 450 cases (19), with special reference to recurrence of attack, Dr. Kerr found this feature to be present in 25 *per cent.* of the cases of each sex in which there was a history indicating an inherited predisposition to insanity.

The above table shows that recurrence is present in 37·3 *per cent.* of hereditary cases and in 33·5 *per cent.* of non-hereditary cases.

So far as a conclusion may be legitimately drawn from these figures it would seem that the occurrence of insanity in

ancestors tends to favour the development of recurrent insanity in later generations.

It will be noticed that the difference is much less in the female cases (1·8 *per cent.*) than in the male cases (5·3 *per cent.*). The percentage of females showing recurrence of attack is much greater than that of males in each group. This is in accordance with Dr. Clouston's observations on the occurrence of periodic variations, including a tendency to alternation, periodicity of symptoms, remissions and recurring relapses. He found this tendency to occur in 46 *per cent.* of female cases and 40 *per cent.* of male cases (14).

It is of interest to calculate the percentages of recurrent cases that show hereditary predisposition to insanity. The following table, derived from the above figures, shows the proportion:

*Recurrent Cases.*

| | Males. | Females. | Totals. |
|---|---|---|---|
| Hereditary predisposition | 27 | 54 | 81 |
| No Hereditary predisposition | 40 | 74 | 114 |
| Totals | 67 | 128 | 195 |
| Percentage. | 40·3 | 42·2 | 41·5 |

The recurrent cases, therefore, show a proportion of 41·5 *per cent.* with a history of insanity in relatives. In the manic-depressive form alone it was seen that 38·6 *per cent.* had an inherited tendency to insanity. Including all forms of insanity hereditary tendency was found to occur in 31·8 *per cent.* In dementia præcox alone is there found a higher figure, 51 *per cent.* of these cases having an insane family history.

Hence it may be inferred that heredity plays an important part in the causation of the recurrent type of insanity.

This is recognised by observers who have studied this form of insanity. Dr. Bevan Lewis says, in reference to recurrent cases (15): "They have a strongly stamped hereditary history of insanity, the parentage, when facts are procurable, revealing attacks of insanity often along both paternal and maternal lines." He states that the heredity is more often atavic than direct, and gives a proportion of 36 *per cent.* as having strongly

marked hereditary features, insanity in parents occurring in 12·5 *per cent.* only.

### *A Comparison between the Forms of Insanity in Ancestors and Descendants.*

In nearly 200 of the 360 cases showing hereditary influence, the relatives have been received into the Bucks County Asylum, and the majority have been traced. The case-book records of these cases have been referred to with a view to comparing ancestors with descendants in relation to (1) the form of insanity and (2) the age at the onset of the first attack.

The subject was found to be too complex to admit of a statement in tabular form being made, there being too many combinations of ancestors and descendants to enable this to be done.

Certain general relations were, however, observed, tending to confirm, in a more direct way, some of the conclusions drawn from the preceding statistics. In this inquiry, near ancestors in the direct line have been considered to have had more influence than collateral relatives.

Omitting cases of co-fraternal heredity, and dealing solely with ancestral relatives, the following observations were made.

#### (1) *The Form of Insanity in Ancestors and Descendants.*

There was a great preponderance of the manic-depressive form in both ancestors and descendants. It was found that similarity of form between ancestors aud descendants was nearly twice as frequent as dissimilarity. In manic-depressive cases it was observed that a distinctly maniacal or melancholic state in an ancestor was more frequently associated with a similar state in a descendant—mania with mania and melancholia with melancholia—than with the alternative state. Dr. Mott's observations (4) may be mentioned for purposes of comparison. He found in the case of 319 pairs of parents and children, that in 69 instances the children suffered from periodic insanity, and of these 40·6 *per cent.* had parents similarly affected. Of the remaining 250 children, only 16·4 *per cent.* had parents suffering from periodic insanity. In his book, *Mind and its Disorders*, Dr. Stoddart expresses the following view (20): "From observa-

tion of my own patients I am inclined to the opinion that the proportion of cases of similar heredity is in excess of its probability, and that the distinction between similar and dissimilar heredity is therefore justifiable."

The occurrence of a pronounced suicidal tendency was noted, and it was found that when this was present in the ancestors it was somewhat more frequently present in the descendants than absent. The difference was not great, however. When both ancestors and descendants suffered from manic-depressive insanity, the occurrence of a marked suicidal tendency in the latter only was comparatively rare. Slight degrees of suicidal tendency, so frequently present in manic-depressive insanity, were disregarded.

A pronounced suicidal tendency appears to be a mental feature, liable to be transmitted through several generations. Dr. Mott gives a pedigree (4) showing the occurrence of suicide or attempted suicide in four generations. The question of suggestion from antecedent knowledge tending to cause irritation is one of importance in these cases. I have noticed the occurrence of a marked suicidal tendency in several members of a family stock when inquiring into the pedigrees of some of the present cases.

### (2) *The Age at Onset of the First Attack of Insanity in Ancestors and Descendants.*

A later age in ancestors than in descendants was found about four times as frequently as the converse. Although the method of calculation is necessarily somewhat inexact, so great a difference would appear to warrant the conclusion that, in general, an inherited liability to insanity tends to favour the occurrence of an attack at an earlier age than when the liability is absent, for we may apply average figures to the ancestors and assume that 60 to 70 *per cent.* would have no history of inherited tendency to insanity. Apart from the physiological stress of puberty and adolescence, the age at onset of an attack in any one case, whether hereditarily predisposed or not, would appear to be largely a matter of chance; depending upon the time at which environment happened to exert sufficient stress to produce insanity. It is reasonable to suppose, however, that, in general, the nervous system of the hereditarily predisposed

individual would be less fitted to survive so many stresses as that of one without inherited tendency, and consequently might be expected to break down at an earlier age.

The adolescent period is particularly dangerous to individuals with a strong hereditary predisposition to insanity, as is shown by the high percentage of cases of dementia præcox with an insane ancestral history.

Owing to the variety of the combinations of insane relatives, it has not been found practicable to represent in tabular form their number and degree of kinship to the patients. The following figures, however, are interesting, as showing the frequency of occurrence through several generations and also occurrence in several brothers and sisters.

In forty-eight cases unrelated to one another, insanity was found to occur through three generations, in five cases through four generations, and in three cases through five generations.

There were five families in which four members, and ten families in which three members of the same generation became insane. These were composed as follows:

Four members of the same generation insane:

| | |
|---|---|
| 4 brothers | 1 |
| 3 brothers and 1 sister | 2 |
| 2 brothers and 2 sisters | 1 |
| 1 brother and 3 sisters | 1 |

Three members of the same generation insane:

| | |
|---|---|
| 3 brothers | 2 |
| 2 brothers and 1 sister | 1 |
| 1 brother and 2 sisters | 5 |
| 3 sisters | 2 |

Some of these families show an extensive ancestral occurrence of insanity. In others there is a strong presumption of this from the number of persons admitted with the same uncommon name and coming from the same district. In these cases, however, it has not been possible to establish their relationship to one another.

### *Illustrative Pedigrees.*

The influence of various hereditary factors in the causation of insanity is well seen by examining pedigrees of those patients in whom heredity appears from the ancestral history to act as a strong determining cause. It is not possible in most cases,

https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

unfortunately, to obtain information showing any approach to completeness, owing mainly to the long period of time between successive generations. I have attempted to make pedigrees in some of these cases, and the examples figured, incomplete as they are, serve to illustrate some of the facts of heredity.

*Pedigree I.*—This shows five generations with thirteen cases of insanity. Eleven of these cases have been under treatment in the Bucks County Asylum. The tendency for sons to inherit from the father is well illustrated, only two of the thirteen cases of insanity being of the female sex. It is particularly interesting from the fact that, so far as can be ascertained, the conditions of life constituting the patient's environment appear to have been very similar in most of the cases. These have lived in the same district and have followed the same trade. A marked similarity of form of insanity is observed in ancestors and descendants.

The following brief description of the cases is taken from the case-books and partly from my own observations of five of the cases.

(1) Nothing is known of this patient beyond the fact of insanity.

(2) Admitted in 1854; a case of recurrent mania, this being his fourth attack; age on admission 45 years, age at first attack 24 years; he had one attack previous to his marriage.

*Prominent symptoms.*—Great excitement and restlessness with incoherence of speech, alternating with brief periods of depression lasting for a few days.

*Duration.*—Ten months, followed by recovery.

(3) Admitted in 1879, first attack, æt. 33; a case of acute mania.

*Prominent symptoms.*—Great excitement and restlessness, incoherence of speech, shouting and singing, etc.

*Duration.*—Ten months, followed by recovery.

(4) Admitted twice.

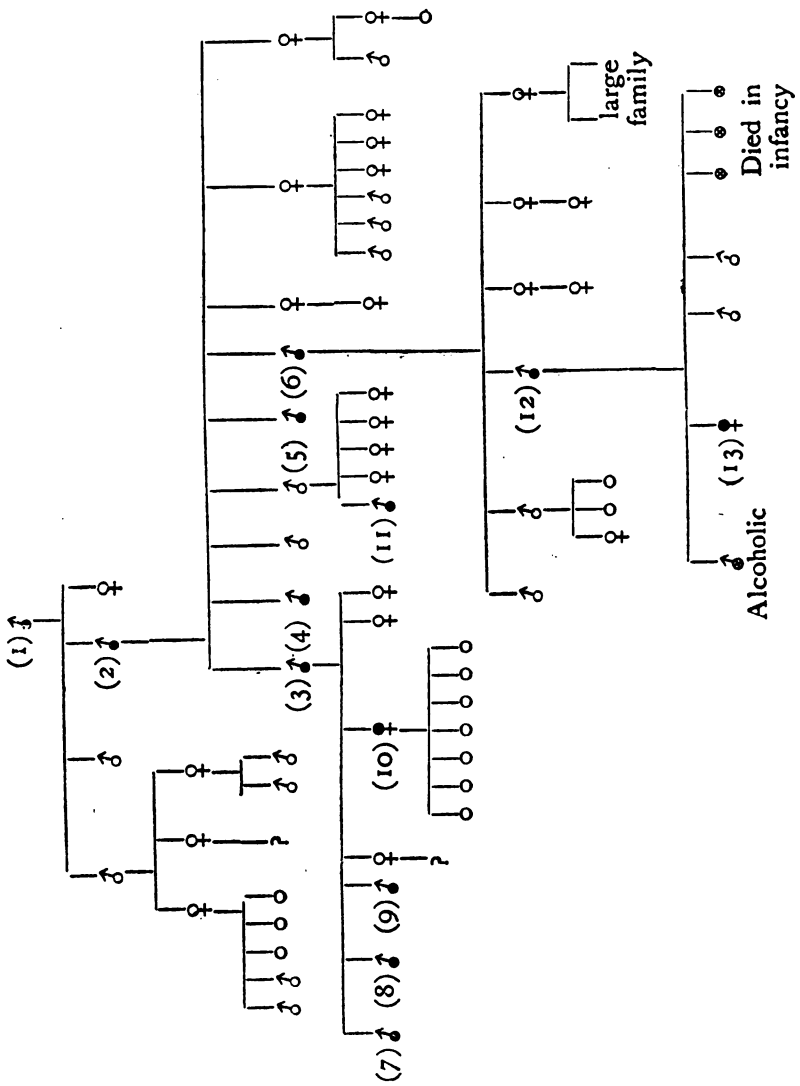
*First attack* 1871, æt. 19; a state of melancholia; "says his soul is lost." Previous to admission he threatened his mother with a knife; later he became less depressed, adopted absurd attitudes, and would sing silly songs.

*Duration.*—Ten months, followed by recovery.

*Second attack*, 1880; æt. 29, a state of acute mania.

*Prominent symptoms.*—He was greatly excited, reciting

PEDIGREE I.




*Explanation of Signs.*

A black circle indicates insanity; other mental and bodily affections are shown by a crossed circle; the sexes are denoted by the ordinary signs.

https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

passages of scripture, tearing his clothing and shouting and singing incoherently. He showed temporary improvements followed by relapses and has gradually become demented. He has the appearance of being at least ten years older than he is.

(5) Admitted in 1867, æt. 23; first attack, a case of acute mania. He is stated to have been restless, unruly and changeable for five years previous to admission.

*Prominent symptoms.*—Great excitement with restlessness and violence and incoherence of speech.

*Duration.*—Five months, followed by recovery.

(6) This man was never certified as insane; his brother, the father of Case 11, informs me that he had several attacks of insanity but could always be managed, though with difficulty, at home.

(7) Admitted in 1892, æt. 17; first attack, a case of acute mania.

*Prominent symptoms.*—Great excitement with incoherent shouting and singing and tearing of clothing. He was paraplegic.

*Duration.*—Six months, followed by recovery.

(8) Admitted twice.

*First attack*, 1891, æt. 21; a case of acute mania.

*Prominent symptoms.*—Great excitement, restlessness, incoherence of speech, shouting and singing, etc., and tearing of clothing.

*Duration.*—Seven months, followed by recovery.

*Second attack*, 1910, æt. 40; a state of acute mania with repetition of the above symptoms.

*Duration.*—Two months, followed by recovery.

(9) Admitted in 1902; first attack, æt. 25; a case of acute mania.

*Prominent symptoms.*—Restlessness, great excitement, incoherence of speech, visual hallucinations.

*Duration.*—Ten months, followed by recovery.

(10) This woman was æt. 35 on admission in 1908; had been married twelve years and had had seven children. This was the first attack.

*Prominent symptoms.*—She is described as being dull and resistive, refusing to take food. Previous to admission she had attempted to cut her husband's throat with a razor.

*Duration.*—Three months, followed by recovery.

(11) Admitted in 1908; first attack, a case of acute mania, æt. 23 years.

*Prominent symptoms.*—Great excitement and restlessness with impulsive violence; frequent brief periods of mental improvement followed by relapses.

*Duration.*—Nine months, followed by recovery.

(12) Admitted in 1902, æt. 44; first attack. He had shown eccentricity for years previous to admission and there is a history of alcoholic excess.

*Prominent symptoms.*—Exaltation, with delusions of wealth, frequent quarrelsome moods, with varying irrational ideas. There is less excitement than in the previous cases. He is at present in the asylum as a case of chronic mania:

(13) Admitted in 1908, æt. 19; probably a case of dementia præcox, but as yet shows no dementia. Shows a strong physical resemblance to her father (12).

*Prominent symptoms.*—Periodic variations of mood, alternations of periods of restlessness with occasional outbreaks of impulsive violence and periods of cheerfulness and amiability. She has a brother who is given to alcoholic excess, and three or four other brothers or sisters died in infancy.

The frequent occurrence of acute mania in these cases is interesting; in most of the cases the attack appears to have had a similar course and was characterised by very similar symptoms.

The other pedigrees will be more briefly referred to.

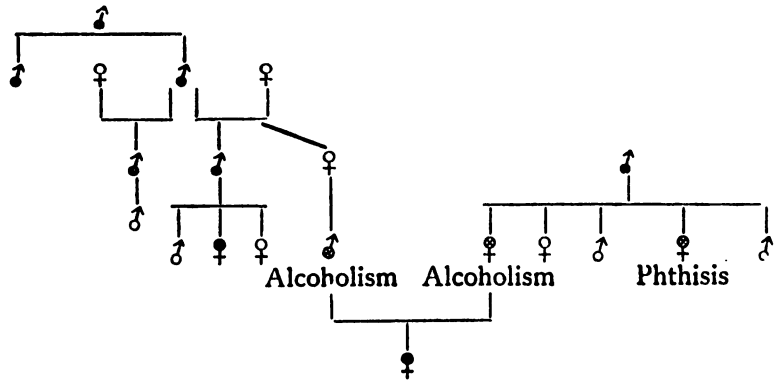
*Pedigree II.*—This pedigree shows, in the latest descendant, the effect of the marriage of two members of unsound stocks. On the father's side the insane hereditary influence extends to the fourth preceding generation, and on the mother's side to the second. The inherited tendency is probably intensified by alcoholism in both parents.

*Pedigree III.*—Maternal insane hereditary influence, accentuated by alcoholism on the father's side, is seen. One sister was insane, another suffered from chorea, and a third from epilepsy.

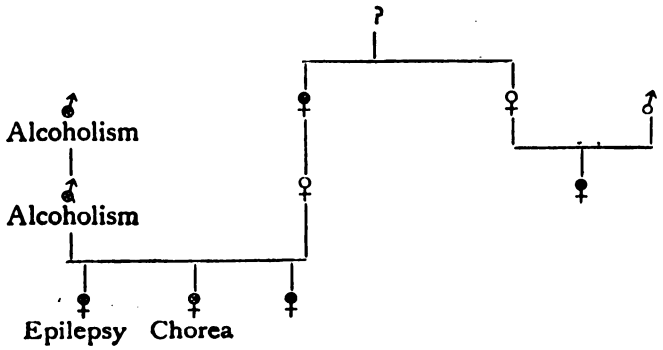
*Pedigree IV.*—This is very incomplete, but is interesting as showing the intermarrying of unsound families. Most of the cases of insanity were of melancholic type with a suicidal tendency. Alcoholism and phthisis also occur.

*Pedigree V.*—The tendency to insanity in this family is very marked, and it is unfortunate that the two branches cannot be traced farther back.

PEDIGREE II.



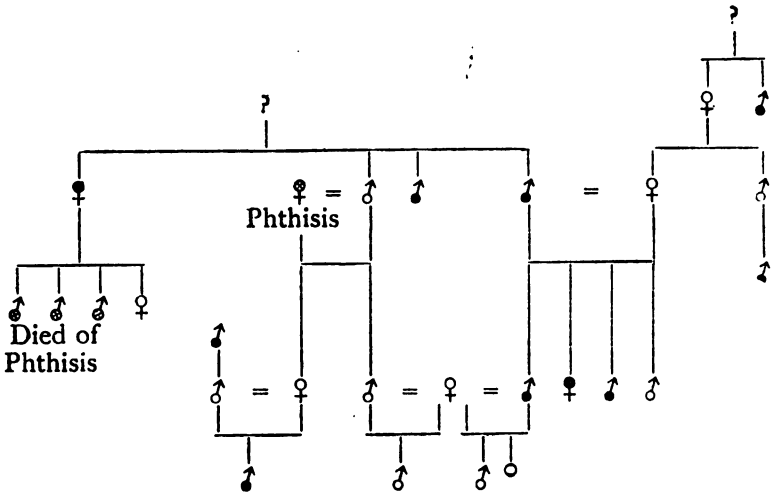

PEDIGREE III.



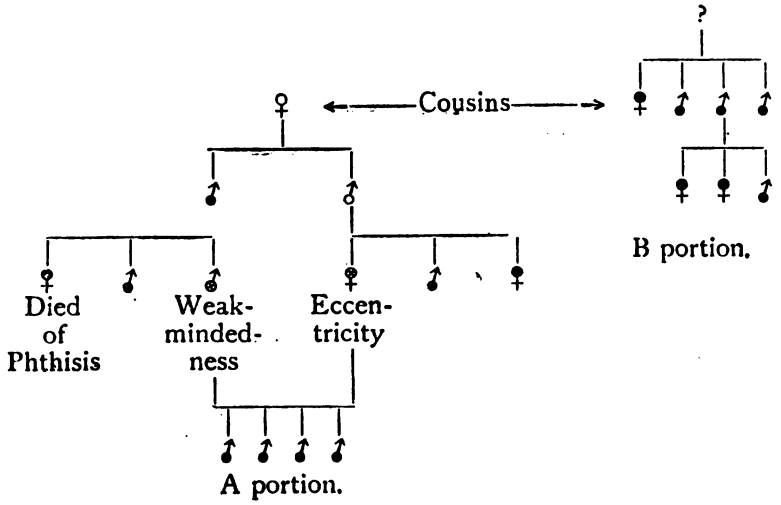

The "A" portion shows a series of manic-depressive cases with exaltation, excitement, and a curious repetition in several of the cases of the same delusion as to inheritance of property. There was, however, some slight foundation in fact for this delusion, the individuals having some blood relationship to the actual heirs.

Neither of the parents was certifiably insane, yet a strong hereditary tendency to insanity was transmitted.

PEDIGREE IV.




PEDIGREE V.

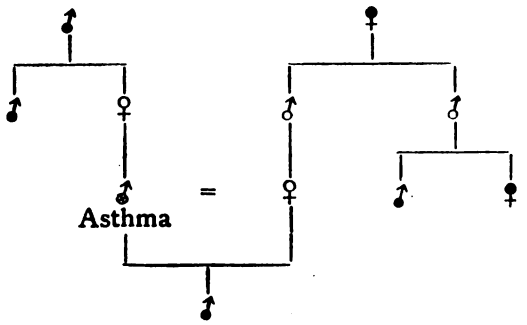



In the "B" portion the insane members were mostly suffering from melancholia with pronounced suicidal tendency.

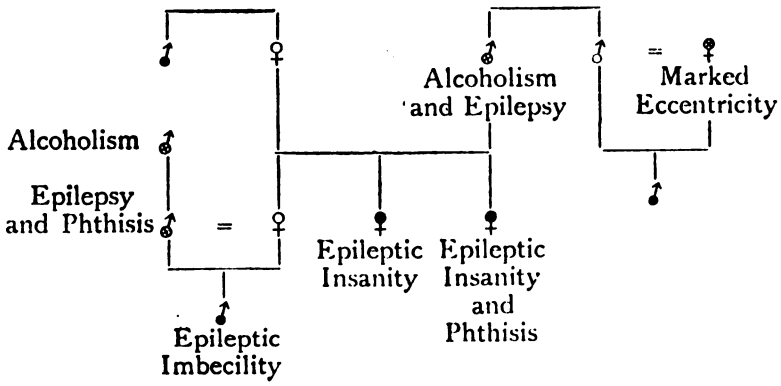
https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

*Pedigree VI.*—This pedigree of an imbecile shows insanity occurring in great-grandparents on both sides. His grandparents and parents escaped an attack of insanity, but the marriage of members of two unsound families resulted in

PEDIGREE VI.




PEDIGREE VII.



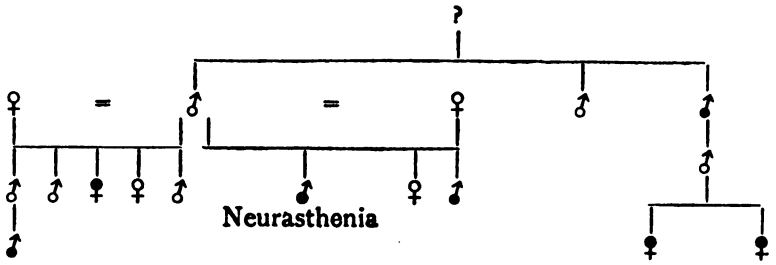

imbecility in offspring. The inherited tendency is also indicated by the occurence of insanity in collateral relatives.

*Pedigree VII.*—Here the occurrence of insanity, epilepsy, alcoholism, phthisis and eccentricity in relatives of an epileptic imbecile is shown.

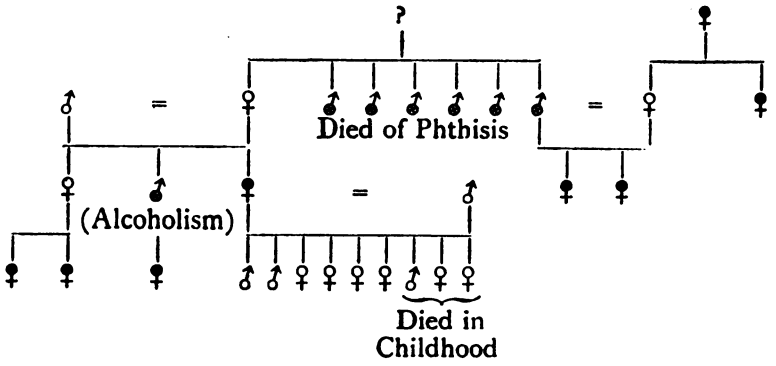
The similarity of heredity in epilepsy is well demonstrated.

*Pedigree VIII.*—The transmission of a latent tendency is shown. The children of both families of a man who married twice show cases of insanity although the father escaped an attack. His brother was insane, and two grand-daughters of

PEDIGREE VIII.




PEDIGREE IX.



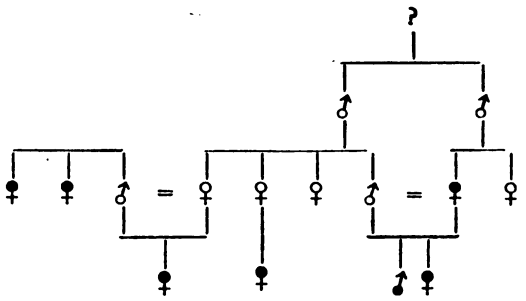

the latter are at present in this asylum suffering from dementia præcox.

*Pedigree IX.*—The chief point of interest in this pedigree is the marked occurrence of phthisis associated with insanity. Out of a family of seven, six brothers died of phthisis. One of the brothers married a member of an unsound family and had

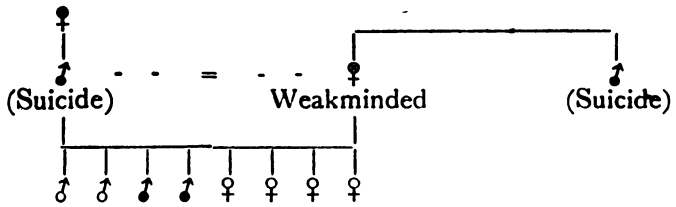
https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

two daughters who became insane, both showing a strong suicidal tendency.

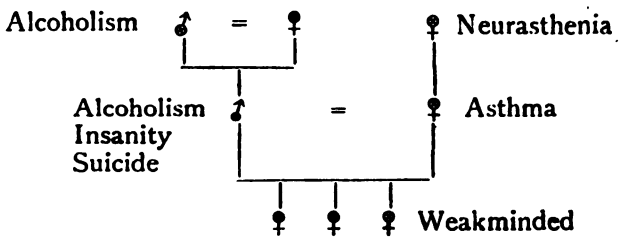
PEDIGREE X.




PEDIGREE XI.




PEDIGREE XII.




The sister of the six brothers married and had a daughter insane, a son alcoholic, and three grand-daughters insane. In this family insanity appears to have affected the female sex only.

https://doi.org/10.1192/bjp.58.241.262 Published online by Cambridge University Press

*Pedigree X.*—This shows a marriage of first cousins, one of whom afterwards became insane. Both children of the marriage are imbeciles. Latent tendency to insanity in the husband is indicated by the occurrence of insanity in nieces, although in one case this was largely due to an unsuitable marriage with a member of another family showing insanity.

*Pedigree XI.*—This is a short pedigree of two brothers, both of whom are suffering from dementia præcox. It is interesting from the fact that, in spite of the existence of an insane tendency on both paternal and maternal sides of the family, the other brothers are successful in life and the sisters show considerable mental ability, two of them having adopted the teaching profession with success.

*Pedigree XII.*—In this pedigree the occurrence of insanity, alcoholism and neurosis in the ancestors of two sisters suffering from dementia præcox is shown. A third sister is somewhat weak-minded.

These pedigrees represent some of the extreme cases of hereditary influence. They are given as examples because they show most clearly the influence of those affections which are generally believed to be the most important hereditary factors in the causation of insanity.

Some of the features of heredity which are shown or at least suggested by an examination of these pedigrees may be mentioned briefly as follows:

(1) The persistent transmission from generation to generation is seen in the longer pedigrees. Occasionally a generation escapes, but the tendency is transmitted as shown by the occurrence of insanity in later generations. It is questionable whether the term "latency" can be applied to such a complex group of characters as is implied when we speak of an inherited mental instability.

(2) Accentuation of the transmitted tendency, by unsuitable marriage and by the associated occurrence of alcoholism, phthisis, epilepsy and other neuroses is shown. Elimination by death from disease and by the production of marked forms of amentia is connected with this accentuation.

(3) The tendency to elimination by the contending influence of a sound parent, resulting in improvement and gradual return to normal in later generations, is also illustrated.

(4) The association of insanity with one sex to a much

greater extent than with the other is seen in some of the pedigrees. This is particularly noticeable in the first pedigree, in which eleven of the thirteen insane persons were males.

In conclusion, reference may be made to inquiries into the occurrence of psychopathic conditions in ancestors of sane persons made for the purpose of comparison with the insane. Dr. Tigges, of Düsseldorf, inquired into the history of an equal number of healthy families in connection with a study of the heredity of insane patients, and the results are stated in the review of this paper (21) to give "a solid confirmation of the views which have been reached by most experienced physicians, of the frequent transmission of insanity and nervous derangements to the descendants." Dr. Mott made a similar investigation in the case of hospital patients, and his results may be quoted (4): "In 32 pedigrees, which would include about 1,000 living representatives and 250 dead individuals, there were 8 who had been in asylums, and in 8 others fits were chronicled. In no case was either parent of the patient insane or epileptic. Two of the pedigrees furnished most of the cases."

These observations, when compared with the statistics of insane families, are a strong confirmation of the belief in the influence of heredity in the causation of insanity.

## References.

(1) *Mendel's Principles of Heredity*, by W. Bateson, M.A., F.R.S., V.M.H.

(2) "The Biological Factor in Heredity," by W. Bevan Lewis, M.Sc., *Journ. of Ment. Sci.*, October, 1909.

(3) "Some Aspects of Heredity in Relation to Mind" (Harveian Oration), by H. B. Donkin, M.D., F.R.C.P., M.R.C.S., *Lancet*, October 22nd, 1910.

(4) "The Hereditary Aspects of Nervous and Mental Diseases" (Huxley Lecture), by F. W. Mott, M.D., F.R.S., F.R.C.P., *Lancet*, October 8th, 1910.

(5) "Presidential Address to the Medico-Psychological Association," by J. Wiglesworth, M.D., F.R.C.P., *Journ. of Ment. Sci.*, October, 1902.

(6) *Mental Deficiency* (*Amentia*), by A. F. Tredgold, M.R.C.S., L.R.C.P.

(7) *A Dictionary of Psychological Medicine*, edited by D. Hack Tuke, M.D., LL.D. (article on "Heredity" by C. A. Mercier, M.B., F.R.C.S.).

(8) "Heredity in Relation to Mental Disease," by W. F. Farquharson, M.B., *Journ. of Ment. Sci.*, July, 1898.

(9) "Insanity with Special Reference to Heredity and Prognosis" (Morison Lectures), by A. R. Urquhart, M.D., F.R.C.P.Ed., *Journ. of Ment. Sci.*, April, 1907.

(10) *Amentia and Dementia*, by J. S. Bolton, M.D., M.R.C.P.

(11) "Heredity and Predisposition in General Paralysis" (*Archiv. f. Psychiat.*, Bd. xli, Heft 1, 1906), by P. Näcke (review in *Journ. of Ment. Sci.*, 1906, p. 409).

(12) *A Text-book of Psychiatry*, by L. Bianchi, M.D.

(13) "Heredity in General Paralysis with regard especially to the Hereditary Transmission of this Disease itself," *Ann. Med. Psych.*, May and June, 1900, Ameline (review in *Journ. of Ment. Sci.*, July, 1900).

(14) *Clinical Lectures on Mental Diseases*, by T. S. Clouston, M.D., F.R.C.P.Ed., 6th ed.

(15) *A Text-book of Mental Diseases*, by W. Bevan Lewis, L.R.C.P., M.R.C.S.

(16) *The Family and the Nation, a Study in Natural Inheritance and Social Responsibility*, by W. C. D. Whetham, M.A., F.R.S., and C. D. Whetham.

(17) "Statistics dealing with Hereditary Insanity, based on upwards of a thousand cases occurring in the Essex County Asylum," by John Turner, M.B., *Journ. of Ment. Sci.*, July, 1896.

(18) "On Melancholia: an Analysis of 730 Consecutive Cases," by W. F. Farquharson, M.B., *Journ. of Ment. Sci.*, 1894, p. 201.

(19) "Recurrent Insanity; an Analysis of Relapsed Cases," by Hugh Kerr, M.A., M.D., *The Glasgow Medical Journal*, December, 1899.

(20) *Mind and its Disorders*, by W. H. B. Stoddart, M.D., F.R.C.P.

(21) "On the Danger to Posterity of Neurotic Diseases in the Ancestors," by Tigges, *Allgem. Zeits. f. Psychiat.*, Bd. lxiii, H. 3 (review in *Journ. of Ment. Sci.*, April, 1907).

---

## *Dr. Turner's Paper on Classification and Other Matters.*

By C. MERCIER, M.D., F.R.C.P.

IN Dr. Turner's paper on the classification of insanity in the January number of the Journal occurs this passage: "It is from cases of this class" (epileptic insanity, psychasthenia, morbid obsessions, and impulse) "that subtle dialecticians seek to prove there may be disorder of conduct without disorder of mind." As I am the only person who has ever made any distinction between disorder of conduct and disorder of mind, or has ever said that the one may be disordered without disorder of the other, it is manifest that I am the subtle dialecticians referred to by Dr. Turner, and I must express to him my obligation for justifying me in the future use of the royal WE. We must point out to him, however, that after the manner and