dealt with? There can be no doubt that they have hitherto not received the amount of consideration which their afflicted condition demands. Provision is made for lunatics and imbeciles, but for these cases, which stand between sanity and a mild degree of imbecility, and which, to my mind, are every whit as deserving of consideration as the lunatic and imbecile, little or no notice is taken; their mental defect is not sufficiently marked to secure for them a haven in the asylum, and they drift about from the vagrant ward of the workhouse to the gaol, and ultimately become convicts; their lot is more pitiable really than that of the insane, they drag out a miserable existence, a considerable part of which is spent in prison, with occasional interludes of squalid liberty, during which they are a nuisance and very frequently a danger to society. At the present time these unfortunates really appear to fare best in the convict prison, for there, as I have already said, their mental condition is recognised and allowances are made for it, and they are ultimately sent to the penal establishment set apart for invalids and convicts of weak mind. There can be no doubt that such cases ought never to come to prison: whilst there, they are a source of endless trouble and anxiety; besides, the punitive and preventive sides of the question have little or no meaning for them, and these objects I do not believe are attained in one single instance. For them some special means of permanent disposal ought to be provided; when at liberty they are simply the victims of their own low grade individuality, and what is worse, they propagate descendants broadcast, the majority of whom go to swell the ranks of insanity, drunkenness, and crime.

Heredity in Relation to Mental Disease. By W. F. Farquharson, M.B.Edin., Assistant Medical Superintendent, Counties Asylum, Carlisle.

In the following paper, dealing with the hereditary transmission of mental disease, my conclusions are based on a statistical review of 1200 cases of hereditary insanity admitted into the Cumberland and Westmorland Asylum during a period of thirty years (1865—1895). So far as I can ascertain, no analysis of such a large number of cases of hereditary insanity has hitherto been made by any one observer; there is, therefore, ground for the hope that results

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of value may accrue from such an investigation. One of the most important contributions to this subject is contained in a paper* by the late Dr. Hugh Grainger Stewart, which appeared in the *Journal of Mental Science* in 1864. That paper was based on the statistics of 447 hereditary cases admitted into the Crichton Royal Institution, Dumfries; the patients belonged mainly to the middle and upper classes of society, with a smaller number of pauper cases. The cases I propose to analyse were almost entirely paupers admitted from the general population of Cumberland and Westmorland. Private patients often come to an asylum from a considerable distance, and from beyond the limits of the district in which the asylum is situated; inferences drawn from the tabulation of such cases are scarcely likely to give so reliable a picture of the features of insanity in any district as when the cases analysed stand for almost the entire insane population of all the districts from which the patients come.

I propose, to a certain extent, to follow the methods used by Stewart, but shall endeavour also to throw some light on additional points not touched on by him.

I shall deal with the subject under the following headings, and shall consider at the same time various side issues that arise:

1. *The Proportion of Cases of Insanity in which there is Hereditary Predisposition to the Disease.*—The 1200 cases under review represent all the cases admitted into Garlands (Cumberland and Westmorland) Asylum during a period of thirty years in which there was ascertained an hereditary history of actual insanity in the family. It must, however, not be inferred that these 1200 cases include all the patients admitted who inherited the predisposition to insanity. In reality the number of cases with neuropathic heredity should be much greater. In the first place, it is often very difficult to ascertain reliable particulars about the family history of pauper patients; and if, secondly, in many cases of an undoubtedly hereditary nature, though there may hitherto have been no actual insanity in the family, yet the unsoundness of the stock may have previously evidenced itself by other allied nervous disorders, such as epilepsy, chorea, neuralgias, spasmodic asthma, &c., I have not included such cases in tabulating the present series. For these reasons it is impossible to state accurately the proportion that the hereditary

* "On Hereditary Insanity," by H. G. Stewart, M.D., *Journ. Ment. Sci.*, vol. x, p. 50.

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cases bear to the total admissions during the same period; only a very rough estimate can be given. The total admissions during the thirty years numbered 3907, giving the proportion of hereditary cases as 30·7 per cent. of the total.

Authorities vary very greatly in the proportions at which they estimate the frequency of hereditary predisposition in cases of insanity; some have put it as low as 5 per cent., while, on the other hand, some* maintain that at least 90 per cent. of the insane have an heredity of insanity.

Grainger Stewart found that 49·6 per cent. of the cases admitted into the Crichton Institution had a history of hereditary insanity or eccentricity; but, as already stated, a majority of his patients belonged to the middle and upper classes of society, about whom more reliable facts as to ancestry can usually be ascertained than in the case of paupers.

It is evident that in a computation of this kind a great deal depends on the personal equation of each investigator (*i. e.* on what he considers sufficient evidence of neurotic heritage), and also on the thoroughness or otherwise of the knowledge about the family history of the patients.

2. *Degree of Relationship, to the hereditarily Predisposed, of those Members of a Family previously affected.*—A history of insanity in relatives, whether in the direct line or collateral, has been considered sufficient evidence of hereditary predisposition to warrant the case being included in my list. Naturally, a history of insanity in the direct line is the strongest testimony; but, failing this, the occurrence of insanity in collateral relatives is also of great importance. It is well recognised that it is not actual insanity that is transmitted from parent to child, but an inherent flaw in the nervous organisation, which renders the individual liable at some critical period of his life to an attack of mental disease. This flaw need not necessarily make its appearance during the life of an individual who has inherited it; it may lie dormant for one or more generations till in some subsequent descendant it is called into active being—it may be as the result of an unsuitable marriage of the tainted parent, or it may be from mere stress of environment. Though it may not be possible to ascertain a history of insanity in ancestors in the direct line, the neuropathic heredity may be evidenced by insanity in collateral relatives, *e. g.* in uncles or aunts of

* Cf. "Heredity in Mental Disease," by J. F. Briscoe, *Journ. Ment. Sci.*, vol. xlii, p. 759.

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the patient, or, again, in the children of those relatives, *i. e.* in cousins of the patient. Insanity in cousins only is less reliable evidence of hereditary predisposition, as the flaw in them may have been imported into the family from outside by a faulty marriage. Some authorities (*e. g.* Bucknill and Tuke*) would exclude such evidence entirely; still, insanity in cousins *does* afford a degree of probability of neurotic inheritance, especially if associated with insanity in others of the stock. Again, in the absence of a history of direct transmission, insanity in brothers or sisters of the patient affords strong presumptive evidence of an inherited flaw, more particularly if at the same time there is insanity in other collateral relatives.

The following table shows how the insanity was distributed amongst the relatives of the 1200 hereditary cases. Each case is noted once only; where more than one relative was affected, that one has been selected whose insanity throws most light on the transmission of the disease to the patient under consideration (as a rule the nearest of kin affected).

TABLE I.

		Males.	Females.	Total.
Grandparents	Insane ...	25 ...	19 ...	44
Parents	„ ...	193 ...	219 ...	412
Brothers or sisters ...	„ ...	130 ...	188 ...	318
Uncles or aunts	„ ...	114 ...	122 ...	236
Cousins	„ ...	28 ...	43 ...	71
Nieces or nephews ...	„ ...	9 ...	8 ...	17
Relatives, degree undefined	„ ...	56 ...	46 ...	102
	Total ...	555 ...	645 ...	1200

3. *The Influence of Sex in transmitting Insanity.*—Table II shows from which side of the family the predisposition to insanity was inherited.

TABLE II.

	Males.	Females.	Total.
Cases hereditary on the paternal side	170 ...	147 ...	317
„ „ „ maternal side	136 ...	185 ...	321
„ „ on both paternal and maternal sides	23 ...	26 ...	49
Not defined from which side...	226 ...	287 ...	513
Total hereditary cases	555 ...	645 ...	1200
Total admissions in same period	2019 ...	1888 ...	3907

The hereditary predisposition is strongest when it is inherited from both parents; this double heritage was ascertained in 49 cases, *i. e.* in 4·09 per cent. of the total number. Table III gives details of these cases.

* *Psychological Medicine*, second edition, p. 266.

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TABLE III.

	Males.	Females.	Total.
Both paternal and maternal grandparents insane	2	0	2
Father and mother both insane	7	14	21
Father insane, also reversional or collateral maternal H. P.	5	4	9
Mother „ „ „ paternal H. P.	0	2	2
Paternal and maternal „ „ H. P. combined	9	6	15

Turning now to a comparison of the paternal and maternal influence in transmitting insanity, we find from Table II that the actual numbers of cases hereditary on the paternal and maternal sides respectively are nearly equal, with a very slight preponderance on the maternal side.

TABLE IV.

Total admissions ... ... 3907.	
Paternal influence—	Maternal influence—
317.	321.
Percentage on total admissions—	
8·1.	8·2.

The majority of writers appear to consider that the maternal influence is more potent than the paternal in transmitting the tendency to insanity. Bucknill and Tuke* quote from Baillarger that "the insanity of the mother, as regards transmission, is more serious than that of the father; not only because the mother's disorder is more frequently hereditary, but also because she transmits it to a greater number of children."

I quote the statistics of other writers on this subject:— Thurnam,† paternal influence 8·3 per cent., maternal 8·5 per cent.; Grainger Stewart, paternal 9·1 per cent., maternal 7·5 per cent; Brigham (quoted by Grainger Stewart), paternal 6·7 per cent., maternal 7·7 per cent. Thurnam's statistics tally closely with mine; Brigham's results show more markedly the greater potency of the maternal influence; Grainger Stewart is the only authority who has found the paternal influence the stronger. From a study of all these statistics we must for the present conclude that insanity inherited through either parent seems almost equally dangerous for the children, but that on the whole the insanity from the mother is slightly more liable to be transmitted.

Another question to be considered here is whether the insanity of one parent is more dangerous to children of one sex than of another. From Table II we can extract the following:

* *Op. cit.*, p. 269.
† *Statistics of the Retreat*, Table 14.

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TABLE V.

Paternal influence.				Maternal influence.			
Male	170	Female ...	147	Male	136	Female ...	185
Percentage on total admissions.				Percentage on total admissions.			
8·4		7·7		6·7		9·8	

It is thus shown that insanity inherited through the father is slightly (·7 per cent.) more dangerous to the sons than to the daughters, while insanity inherited through the mother is markedly (over 3 per cent.) more dangerous to the daughters than to the sons.

4. *The Influence of sex in receiving Insanity.*—The female sex is markedly more liable to suffer from hereditary insanity than the male, as is shown by—

TABLE VI.

	Males.		Females.		Total.
Total number of admissions	2019	...	1888	...	3907
Cases with hereditary predisposition	555	...	645	...	1200
Percentage of hereditary cases	27·4	...	34·16	...	30·7

The statistics of Thurnam, Grainger Stewart, and other authorities show similar results; but, as a rule, the diversity between the proportions in the two sexes has been stated to be less marked than that given in the above table.

5. *The Frequency of the Different Forms of Insanity in those hereditarily Predisposed.*—

TABLE VII.

	Total admissions.		Hereditary cases.		Percentage of hereditary cases.
Congenital imbecility	... 126	...	44	...	34·9
Epileptic insanity ...	... 154	...	35	...	22·7
General paralysis ...	... 231	...	43	...	18·6
Mania	... 2234	...	717	...	32·5
Melancholia ...	... 892	...	310	...	34·7
Dementia	... 270	...	51	...	18·8
Total ...	... 3907	...	1200	...	30·7

Table VII gives the total number of admissions of each class of cases during thirty years, with the number of instances in each class in which hereditary predisposition to insanity was ascertained. The highest ratio of hereditary cases is found in congenital imbecility (with and without epilepsy); taking epileptic imbecility separately, it was found to yield the highest proportion of all, but the series of cases is so small as to render exact inferences unreliable.

Melancholia gives the next highest ratio of hereditary cases. In an analysis of 730 cases of melancholia published by me

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some years ago,* hereditary predisposition was ascertained in 38·2 per cent.; in the present series the selection of hereditary cases was more rigid, and a few cases in which there was slight doubt as to its presence were excluded. This, and also the fact that the present series of cases of melancholia is considerably larger, have given a slightly lower proportion of hereditary cases; the proportion, however, still remains high. The proportion of hereditary cases in mania is over 2 per cent. lower than in melancholia. There is a considerable drop in the proportion of hereditary cases in epileptic insanity (mania and dementia). Next comes dementia, while general paralysis has the lowest proportion of all.

Leaving out of account cases due to accidents at birth, or to serious illnesses or injuries during infancy, congenital imbecility is frequently a sign of origin from an excessively faulty stock; the flaw in the nervous organisation is so great that it makes its appearance at an early period of the life of the organism; it is not to be wondered at that a history of hereditary predisposition to mental disease is very common in such cases. Imbecility with epilepsy represents a still greater departure from the normal, and therefore, as one would expect, shows the highest proportion of hereditary cases. Most authorities agree that hereditary predisposition to insanity is present more frequently in cases of melancholia than in mania. In Grainger Stewart's statistics dipsomania shows the highest ratio of hereditary cases. Owing to insufficient data I have not tabulated cases of dipsomania separately.

As already indicated, it is not actual insanity, or any special form of it, that is transmitted from one generation to another, but a flaw in the germ-plasm, which, if it become manifest at all in a member of a new generation, need not necessarily appear in the same guise as it did in preceding generations. Nor do members of the same generation of a family always exhibit the same form of mental aberration; some may throughout life show average or even exceptional mental development (every now and then a genius crops up in families with a history of mental instability); one or more may be imbecile, another may be melancholic and suicidal, a daughter may have puerperal insanity at successive confinements; other members of the family may never exhibit signs of insanity, but may be subject to neuralgias or other nervous ailments; or, again, one or more individuals,

* *Journal of Mental Science*, vol. xl, p. 11.

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though they may never be actually insane, may throughout life be eccentric or cranky, irritable or highly immoral, or may in other ways give evidence of their ill-balanced nervous system. The law of variations goes hand in hand with the law of heredity; the offspring never exactly resemble each other or their parents.

6. *The Forms of Insanity in the Ancestors of those hereditarily Predisposed.*—It is often impossible to ascertain the forms of insanity in the ancestors of those hereditarily predisposed to the disease, and one cannot give complete statistics on this point. However, in 532 cases out of the 1200 I am able to specify forms of insanity that had previously occurred in relatives, direct or collateral. In a considerable number of cases more than one form of insanity had previously occurred in the family, but, to simplify matters, I only quote the form that occurred in the relative nearest in the direct line to the patient:

TABLE VIII.

Mental disease in patients.	Mental disease in relatives of patients.							
	Mania.	Melancholia.	Suicide.	Dementia.	Epilepsy.	Imbecility or weak-mindedness	Gen. paralysis.	Total.
Congenital imbecility	10	2	1	—	1	13	1	28
Epileptic imbecility	4	2	1	—	2	2	—	11
Epileptic insanity	1	—	4	1	8	4	—	18
General paralysis	2	—	3	—	—	4	—	9
Mania	111	27	104	4	10	33	3	292
Melancholia	31	25	85	—	7	10	1	159
Dementia	3	4	5	—	—	3	—	15
Total	162	60	203	5	28	69	5	532

A glance at Table VIII shows that one form of insanity in a patient may have been preceded in another member of the same stock not only by the same form of insanity, but also by almost any other variety of mental disease. The most noteworthy fact to be derived from this table is the frequency with which suicide precedes, or is contemporaneous with, insanity in a family. Out of those 532 cases no fewer than 203 had had relatives who had committed, or had attempted to commit, suicide. The proportion of suicides in

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Cumberland is very high. According to Morselli,* Cumberland has the fourth highest suicide rate amongst the counties of England, the annual average of suicides in this county being 96·2 per million inhabitants. As shown by Table VIII, suicide occurred in the same family tree as each of the different forms of insanity there classified. Suicide and dipsomania may, however, be classed together as the two forms of neurotic heritage that have the strongest tendency to be transmitted unchanged from one generation to another. Of the 85 melancholiacs who had an hereditary history of suicide, 61 (or 71·7 per cent.) had themselves the suicidal tendency. The suicidal impulse is very frequently present in cases of hereditary insanity considered generally; it existed in 381 of the 1200 cases (*i. e.* in 31·75 per cent.).

The different forms of insanity may all occur in the members of the same family tree at one period or another, and it is interesting to trace in a stock the progress of the neuropathic diathesis. A flaw in the nervous organisation of a family may become intensified in successive generations as a result of unsuitable marriages and antagonistic environment; or, on the other hand, owing to favourable combinations of circumstances, the flaw may gradually fade away, till at last only healthy members of the family are produced, still retaining, however, the latent tendency to disease, which unfavourable conditions may once more call into active existence. When there is progressive deterioration of the mind in successive generations, the march is onwards to complete destruction of the mind, *i. e.* to amentia or dementia.

In many cases the origin of hereditary neuroses in a stock can be traced to alcoholic excess in one or more ancestors, where one can find no history of previous insanity; in other cases inherited drunkenness often goes hand in hand with a neurotic heredity.

Along with hereditary predisposition to mental disease there may exist in a family the predisposition to other bodily diseases. Thus in many cases of the present series there was a family history of phthisis as well as of insanity, and a considerable proportion of the deaths in the hereditary cases resulted from tubercular disease. Some members of a family may develop tubercular disease, others may be subject to attacks of insanity, or the two diseases may co-exist in one person.

7. *The Exciting Causes of Insanity in those hereditarily*

* *Suicide*, by H. Morselli, 2nd edit., p. 189.

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Predisposed.—On the whole, the alleged exciting causes, moral or physical, of attacks of insanity do not seem to vary greatly in proportion in the hereditary as compared with the non-hereditary cases. I find, for instance, that the proportion of cases in which alcoholic excess preceded the attack has been much the same in the hereditary cases as in all cases together.

TABLE IX.

	Total admissions.	Hereditary cases.
	3907	1200
Alcohol the exciting cause	488	147
Proportion per cent.	12·4	12·25

Hereditary insanity is prone to show itself at critical periods of life, such as the puerperium; thus I find that amongst the females the proportion of cases of puerperal insanity has been appreciably higher in the hereditary series than in the total admissions.

TABLE X.

	Total female admissions.	Hereditary female admissions.
	1888	645
Cases of puerperal insanity ..	145	60
Proportion per cent.	7·6	9·3

In looking through these cases I have found it noted in repeated instances that the mother or other relative of a woman suffering from puerperal insanity has been afflicted with the same malady; in a considerable number of other cases it has been stated that the mother of a patient admitted with hereditary insanity suffered from puerperal insanity at the time of the patient's birth.

8. *The Number of Attacks in Cases of Hereditary Insanity.*—Relapses are more frequent in cases of hereditary insanity than in non-hereditary cases.

TABLE XI.

Hereditary cases	1200
First attack...	761, or 63·4 per cent.
Not first attack	439, or 36·5 per cent.

I am unable to give similar statistics with regard to the total admissions to Garlands Asylum during the thirty years, but for comparison quote the following table from Thurnam,* giving particulars as to cases generally.

* *Statistics of the Retreat*, table xxii.

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TABLE XII.

First attack...	358, or 76·3 per cent.
Not first attack	111, or 23·7 per cent.

In my analysis of 730 cases of melancholia I also found relapses to be appreciably more frequent in the hereditary than in the non-hereditary cases.

9. *The Age on First Attack in Cases of Hereditary Insanity.*—On the whole, hereditary cases of insanity are apt to come on earlier in life than non-hereditary cases. Referring again to the 730 cases of melancholia, 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; 13·6 per cent. of the hereditary cases were above sixty years of age when attacked, as compared with 18·4 per cent. of the non-hereditary.

TABLE XIII.

	Hereditary cases.		Thurnam—cases generally.
Ages.	No. of cases.	Percentage.	Percentage.
Under 10 years	49 ...	6·4 ...	0·9
10 to 20 years	54 ...	7·1 ...	12·7
20 to 30 ,, ...	206 ...	27·1 ...	32·5
30 to 40 ,, ...	166 ...	21·8 ...	20·0
40 to 50 ,, ...	136 ...	17·9 ...	15·9
50 to 60 ,, ...	75 ...	9·8 ...	10·6
60 to 70 ,, ...	44 ...	5·9 ...	6·03
70 to 80 ,, ...	27 ...	3·5 ...	0·9
80 to 90 ,, ...	4 ...	·5 ...	·2

The above table shows in decennial periods the ages at which the insanity first appeared in the 761 cases of hereditary insanity that were admitted suffering from their first attack; for comparison, Thurnam's statistics of cases generally * are quoted alongside: this is not altogether a satisfactory mode of comparison, but I am unable to give in a similar fashion the ages at the origin of the attack of all the cases admitted to Garlands Asylum during the same period of thirty years. Table XIII shows that in the hereditarily predisposed the first attack of insanity may set in at any period of life; in the largest proportion of cases the attack comes on in the third decade, and the proportion gradually diminishes in each subsequent decade. The high proportion of cases in which the attack came on before the age of ten years is owing to the cases of congenital imbecility being included; the inherited flaw in such cases must be very great, and shows itself at an early stage of the individual's life-history. On

* *Statistics of the Retreat,* p. 71.

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the other hand, persons hereditarily predisposed to insanity may remain sane during the greater part of their lives, and have an attack of insanity late in life. I have made an analysis of 200 consecutive cases of senile insanity admitted into Garlands Asylum during ten years (1886—1896), taking solely those cases in which the first attack of insanity came on after sixty years of age. Hereditary predisposition to insanity was ascertained in fifty-five of these cases, *i. e.* in 27·5 per cent. This is a much higher proportion of hereditary cases in senile insanity than that given by Clouston * (13 per cent.), and considerably higher than that given by Bevan Lewis † (22 per cent.). The percentage of hereditary cases ascertained here in all forms of insanity has already been stated to be 30·7 per cent. The difficulties in ascertaining particulars about the ancestry of the aged poor are very great, and were it possible to obtain more accurate information it would probably be found that the proportion of hereditary to the total cases of insanity occurring in the aged did not fall far short of the corresponding proportion at all ages combined. An inherited flaw in the organism frequently tends to make its appearance in the descendants at the same period of life as it originally developed itself in the ancestors. When, from unfavourable combinations of causes, the inherited flaw is gaining in intensity as it passes onwards from generation to generation, the mental breakdown is apt to appear at an earlier age and in a more aggravated form in each succeeding generation, till finally there is reached the stage of congenital imbecility with subsequent extinction of the race. On the other hand, when, owing to the introduction of healthy blood into the stock, and also owing to the environment being favourable, the inherited flaw is becoming neutralised, then we frequently find that the attacks of insanity are milder and come on later in life in each new generation, and that at last there comes a generation the members of which remain sane throughout life.

Melancholia, hereditary or otherwise, is more essentially a disease of middle and advanced life than is mania; hereditary insanity coming on early in life is more prone to take the form of mania; in the later stages of life hereditary insanity is proportionately more liable to be of the melancholic type.

10. *The Domestic Condition of those having Hereditary Insanity.*—Table XIV gives the condition as to marriage of

* *Mental Diseases*, 4th edit., p. 625.

† *Text-book of Mental Diseases*, p. 409.

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the 1200 cases of hereditary insanity, and also of the other cases admitted during the same period.

TABLE XIV.

	Hereditary cases.		Non-hereditary cases.	
	No. of cases.	Percentage.	No. of cases.	Percentage.
Single	616	51·3	1250	46·1
Married	482	40·1	1101	40·7
Widowed	102	8·5	356	13·1

It will be observed that the proportion of unmarried persons is considerably higher in the hereditary, while the proportion of widowed is markedly higher in the non-hereditary, the proportion of married being almost equal in the two series. Probably the reason of the difference between the hereditary and the non-hereditary cases in this respect is chiefly to be found in the tendency of insanity to come on at an earlier age in those hereditarily predisposed.

11. *The Proportion of Recoveries and Deaths in Hereditary Insanity.*—

TABLE XV.

	Males.		Females.		Total.	
	No. of cases.	Percentage.	No. of cases.	Percentage.	No. of cases.	Percentage.
Total hereditary cases	555	—	645	—	1200	—
Discharged recovered	294	52·9	345	53·4	639	53·25
Died	113	20·3	154	23·8	267	22·25

The proportion of recoveries in cases of hereditary insanity is considerably higher than in non-hereditary cases. The general recovery rate in Garlands Asylum during these thirty years was 44·6 per cent., so that the recovery rate in the hereditary cases has been 8·6 per cent. higher than the general recovery rate. In my analysis of 730 cases of melancholia I found a recovery rate of 60·2 per cent. in the hereditary as compared with 56·5 per cent. in the non-hereditary. The higher recovery rate in hereditary insanity is partly, but by no means entirely, due to the higher number of readmissions of cases with hereditary predisposition.

The death-rate is lower in hereditary than in non-hereditary cases; the proportion of deaths calculated on the total

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admissions during the thirty years was 28·5 per cent., as compared with 22·2 per cent. in the hereditary cases. In the 730 cases of melancholia the hereditary cases showed 17·9 per cent. of deaths, the non-hereditary 21·3 per cent.

12. *The Age at Death in Cases of Hereditary Insanity.*—The following were, in decennial periods, the ages at death in the 267 cases of hereditary insanity that died in the asylum, contrasted with the ages at death of all the cases that died in the asylum during a period of ten years (1885—1894).

TABLE XVI.

Age periods	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Total.
Number of deaths in hereditary cases	1	26	54	58	38	47	36	7	267
Percentage	·37	9·7	20·2	21·7	14·2	17·6	13·4	2·6	100
Total deaths (10 years)	4	35	82	94	90	84	86	21	496
Percentage	·8	7·05	16·5	18·9	18·1	16·9	17·3	4·2	100

It will be seen from an examination of the above table that, on the whole, the duration of life in those suffering from hereditary insanity is shorter than it is among the insane generally. In the former class 51·9 per cent. of the deaths occurred before the age of fifty, as compared with 43·3 per cent. of the deaths of all classes of cases; only 16 per cent. of the hereditary cases reached the age of seventy before death, as compared with 21·5 per cent. of cases generally.

13. *The Causes of Death in Hereditary Insanity.*—

TABLE XVII.

	Males.	Females.	Total.
Cerebral and spinal diseases ...	47	39	86
Thoracic diseases	41	72	113
Abdominal diseases	6	9	15
General diseases	19	34	53
Total	113	154	267

Of the deaths due to cerebral and spinal diseases 39 resulted from general paralysis, 8 from cerebral hæmorrhage, 11 from softening of the brain, and 6 from epilepsy. Phthisis pulmonalis caused 56 deaths, while other tubercular diseases accounted for 4 more deaths. Tubercular diseases thus caused 22·4 per cent. of the total number of deaths. Out of

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a total of 1162 deaths in Garlands Asylum during the thirty years from 1865 to 1894 tubercular diseases were the cause of death in 178 instances, *i. e.* in 15·3 per cent. Of the 1200 cases of hereditary insanity exactly 5 per cent. died in the asylum from tubercular disease; of the total number of admissions of all classes of cases during the same period 4·6 per cent. died from those diseases. Persons suffering from hereditary insanity, therefore, appear to be distinctly more liable to suffer from tubercular disease than are persons suffering from non-hereditary insanity. The other causes of death do not seem to call for any special comment, except the fact that ten deaths were due to cancer; these have all been included amongst the deaths due to "general diseases," although in the majority of instances one or more abdominal organs were affected. Cancer thus accounted for 3·7 per cent. of all the deaths. In the same period forty-five patients in the asylum died from cancer, *i. e.* 3·8 per cent. of the deaths of all classes of cases; so that the proportions of deaths from cancer amongst cases generally and in hereditary cases are practically identical. Cancer, therefore, does not seem to have any special relation to hereditary insanity, though the number of cases has been rather small to permit of reliable inferences being drawn.

14. *The Duration of the Attack in Cases that recover.*—A comparison of cases generally and hereditary cases has brought out no very striking differences in this respect. In the hereditary series I found a smaller proportion of very short attacks getting well within three months of coming to the asylum; on the other hand, during the next nine months a considerably larger proportion recovers of the hereditary cases than of cases generally. Of the hereditary cases that recover 80·5 per cent. do so within a year after admission, as compared with 78·4 per cent. of cases generally.

Summary.—The principal points brought out in this paper may thus be briefly summarised:

(1) Authorities vary greatly in the estimates they give of the frequency of hereditary predisposition in cases of insanity. In the Cumberland and Westmorland Asylum 30·7 per cent. of all the cases admitted showed a history of previous insanity in their family.

(2) A history of insanity in relatives, whether in the direct line or collateral, may be deemed sufficient evidence of hereditary predisposition. It is not actual insanity that is transmitted, but an inherited flaw in the nervous organisation.

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This may remain latent for one or more generations, and subsequently reappear.

(3) Hereditary predisposition to insanity is strongest when it is inherited through both parents.

(4) The maternal influence is very slightly more potent than the paternal in transmitting the tendency to insanity.

(5) Insanity inherited through the father is slightly more dangerous to the sons than to the daughters; insanity inherited through the mother is markedly more dangerous to the daughters than to the sons.

(6) The female sex is markedly more liable to suffer from hereditary insanity than is the male.

(7) The order of sequence of the different forms of mental disease amongst the cases admitted into Garlands Asylum, as regards the frequency of hereditary predisposition which they exhibit, has been as follows:—1. Congenital imbecility. 2. Melancholia. 3. Mania. 4. Epileptic insanity. 5. Dementia. 6. General paralysis.

(8) The suicidal impulse is very frequently present in cases of hereditary insanity.

(9) Suicide and dipsomania have a marked tendency to be transmitted unchanged from one generation to another.

(10) In most cases, however, the form of insanity in the descendants shows great variations from that which occurred in the ancestors, and different members of the same family or generation may exhibit widely different varieties of mental disease or other nervous disorder. Insanity, the tendency to which is inherited, may have been preceded in the family not by actual insanity, but by other forms of nervous disease.

(11) In successive generations the propensity to mental disease may become gradually intensified; finally a state of amentia or dementia is produced, with a tendency to bring about extinction of the family. On the other hand, the tendency to mental disease may become gradually eliminated in the course of generations.

(12) The origin of hereditary neuroses in a family can sometimes be traced to alcoholic excess in the ancestors.

(13) Hereditary predisposition to insanity in a family is frequently associated with the tubercular diathesis.

(14) The exciting causes of attacks of insanity seem on the whole to be of much the same nature in the hereditarily predisposed as in those without predisposition.

(15) Hereditary insanity is specially prone to show itself at critical periods of life; thus puerperal insanity is propor-

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tionately more frequent in the hereditarily predisposed than in those without predisposition.

(16) Relapses are more frequent in cases of hereditary insanity than in non-hereditary cases.

(17) Hereditary cases are apt to suffer somewhat earlier in life than non-hereditary cases.

(18) Attacks of hereditary insanity may come on at any period of life. Even in senile insanity the proportion of hereditary cases does not fall very far short of the proportion existing in cases at all ages combined.

(19) Hereditary insanity frequently makes its appearance at about the same period of life in successive generations. When the taint is becoming intensified it tends to make its appearance at an earlier age in each succeeding generation; and, conversely, when the taint is becoming eliminated it tends to appear later in life in each succeeding generation.

(20) The proportion of unmarried persons is considerably higher amongst those suffering from hereditary insanity than amongst those without predisposition.

(21) The recovery rate in hereditary cases of insanity is considerably higher than in non-hereditary cases.

(22) The death-rate is lower in hereditary than in non-hereditary cases.

(23) The duration of life is somewhat shorter in those suffering from hereditary insanity than it is in the insane generally.

(24) A larger proportion of deaths from tubercular diseases occurs in cases of hereditary insanity than in non-hereditary cases.

(25) The duration of the attack in hereditary cases that recover does not seem to differ very much from that in non-hereditary cases.

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