Pathological Appearances observed in the Brains of the Insane.

By W. G. Balfour, L.R.C.S.E., &c., Medical Superintendent, Hampstead Asylum.

(*Read at the Quarterly Meeting of the Medico-Psychological Association, held in London, December 3rd,* 1873.)

In the "Journal of Mental Science" for October, 1870, Dr. Howden, the Superintendent of the Montrose Asylum, published an analysis of the lesions observed by him in the brains of 235 persons who died insane, and expressed a hope that some uniform method of arranging the morbid appearances found in the insane after death would be adopted by Psychologists, so as to render of scientific value the *post-mortem* records of the different asylums, and be a ready means of reference to any one working at special lesions. Dr. Tuke, in an appendix to the annual report of the Fife and Kinross Asylum for 1871, followed the plan proposed by Dr. Howden, and arranged in a tabular form the lesions found by him in the brains of 75 insane persons. With the sanction of Dr. Marshall, I collected and arranged, in a similar way, the lesions observed in the brains of 390 women who died in Colney Hatch. From these sources Table I. has been formed. It shows the lesions and their frequency in the brains of 700 people who died insane, and although its value is greatly lessened by the absence of the history, symptoms, and form of insanity under which the patients laboured, still it gives the changes from health to disease, which are, to a certain extent, peculiar to insanity.

Table I.—Showing the lesions and their frequency in the brains of 700 persons who have died insane:—

	Montrose. M.	Montrose. F.	Fife and Kinross.	Colney Hatch.	Total.
Number of Cases	108	127	75	290	700
Calvarium.—Abnormally thickened	11	6	27	68	112
,, thin	1	2	13	43	59
,, dense	...	...	9	3	12
,, loose in texture	...	...	3	6	9
Caries and perforation of	...	1	...	...	1
	...	...	...	83	83
Membranes, Dura Mater.—Adherent to Calvarium	15	5	22	32	74
2.—Abnormally thickened ...	3	1	8	64	76
4.—Calcareous deposit in ...	...	...	1	...	1
3.—Abnormally thin	...	...	...	1	1
5.—Ossification of	...	...	...	7	7
6.—Tumours attached to ...	2	2	...	6	10

	Montrose. M.	Montrose. F.	Fife and Kinross.	Colney Hatch.	Total.
Number of Cases	108	127	75	390	700
ARACHNOID—effusion of blood into sac of ...	2	5	1	19	27
" serum " ...	27	35	18	45	125
" pus " ...	...	...	...	2	2
False membrane in sac of ...	4	8	2	24	38
Sanguineous Cysts	2	...	...	1	3
Crystalline Granulations on ...	12	5	1	1	19
Opacity of	35	17	39	202	294
Adhesion of surfaces of	1	...	5	...	6
PIA MATER—marked injection of vessels of ...	17	16	...	20	53
Local bullae of fluid in meshes of ..	3	1	...	57	61
Sanguineous effusion into meshes of	3	8	...	30	41
Tumours attached to	...	1	...	2	3
Brown gelatinous deposit in ...	5	4	...	15	24
Adhesion of to surfaces of grey matter	23	8	...	32	63
BLOOD VESSELS OF BRAIN.—Atheroma of Arteries	19	20	16	53	108
Aneurismal dilatation ...	1	...	...	2	3
Injection of Marked ...	5	5	...	49	59
GREY SUBSTANCE.—Flattening of Convolutions of					
Abnormalities in thickness of ...	...	...	1	34	35
" colour ...	...	...	16	63	79
Gelatinous softening of ...	5	4	...	1	10
Effusion of blood into ...	...	1	1	4	6
Granulations on surface of Convolutions ...	...	...	3	...	3
Inflammation, acute, of / local atrophies of ...	...	...	...	...	10
WHITE MATTER.—Induration of	4	2	...	33	39
Œdema of	25	19	5	26	75
Softening of	4	2	1	24	31
Effusion of blood into	...	3	3	9	15
Excessive shrinking of	3	6	15	6	30
Marked infection of	2	2	7	53	64
Cysts in	1	...	1	4	6
OPTIC THALAMUS & CORP. STRIAT.—Sanguineous effusion into	4	4	4	7	19
Softening of	7	2	1	15	25
Tumours in	...	1	...	2	3
Cysts in	1	...	...	6	7
Cicatrices in	...	1	...	5	6
CEREBELLUM.—Adhesion of Membranes to surface of	2	...	...	1	3
Effusion of blood into Pia Mater of ...	...	4	...	1	5
" serum " ...	...	...	...	1	1
Blood into substance of	1	...	1	...	2
Softening of	...	...	...	1	1
Cysts in	...	...	...	1	1
VENTRICLES.—Excessive serous fluid in ...	47	46	28	232	353
Sanguineous effusion into	2	6	...	13	20
Granulations on lining membrane of					
Opacity of	...	...	...	68	68
Softening of floor of	...	...	2	2	4
CHOROID PLEXUS.—Cysts in	...	...	12	58	70
Tumours in	...	...	....	2	2
Earthy deposit in	1	...	...	12	12
PONS VAROLII.—Granulations on free surface of ...	...	...	...	1	1
CORPORA QUADRIGEMINA.—Softening of fissure of Rolando of left	...	...	...	1	1
Marked difference in size of the two hemispheres	4	2	1	1	8
Apparently Normal Brains	17	29	...	14	60

What the position which these changes in the brain and its membranes hold to the disease insanity is, can only be determined when a sufficient series of cases have been examined, and exact records kept both of the condition of the patients during life and the *post-mortem* appearances after death. Changes such as cancer, tumours, or softening of the brain, found in persons who have died insane, if known to have existed prior to the development of the mental symptoms, are more likely to be causes; whilst alterations such as opacity of the arachnoid, fluid in the ventricles, and adhesions of the membranes to the surface of the grey matter, will probably rank as effects of the insanity.

Three individuals have lately died in the Hampstead Asylum—two women and one man—in whom after death the lesions found were considered as a probable cause of the mental condition.

The first case was that of a woman, æt. 71, who suffered from a severe pain in the face for ten years previous to her admission, the pain being constant but irregular in severity, followed by a complete change in her habits and disposition from virtue to vice, with delusions, aphasia, paralysis, and apoplectiform seizures. The autopsy showed the brain structure to have been pressed on by tumours, some of which were osseous and others fibrous, varying in size from a pea to a walnut.

The second case is that of a woman, æt. 55, who had been twice married, suffered from syphilis previous to the second marriage (twenty-nine years before her death), in whom also there was pain in the frontal region, intense but irregular in severity, followed by a complete change in her ways of life; from being a good wife, steady, and industrious, she became drunken and dissipated, had many delusions—thinking that people were tracking her for having stolen money—suffered from loss of memory both for time and place, followed by paralysis, loss of sight and hearing, with epileptiform seizures. At the *post-mortem* examination a gummatous tumour was found arising from the dura mater, pressing on and destroying the brain substance in the neighbourhood of the left angular gyrus, &c.

The third case is that of a man, æt. 45, who up to three years before his admission had been steady and industrious, kind and affectionate to his wife, and free from disease of any kind. Was knocked down one night and kicked on the head by some men, who tried to rob him. Shortly afterwards he

began to complain of excruciating pain in his head, and he had a fit of an epileptic character. Then his whole life changed; he became a thief, tried to kill his wife, to set his house on fire, laboured under many delusions, with irregular epileptic seizures. The *post-mortem* examination showed tubercle arising from the dura mater, pressing on and destroying the grey matter in the neighbourhood of the inferior, middle, and superior frontal gyri.

In the foregoing cases actual organic disease seems to have commenced before any change in the mental condition of the patients was observed. This being the case, it seems a fair conclusion that the disease produced the mental symptoms.

Changes from virtue to vice in individuals at an age when it is expected that character is formed are not uncommon.

These changes are marked by a total alteration in the habits and conduct of the individuals, and generally end in confinement in asylums, paralysis, and a merely vegetable life. *Too often* the vagaries of people of this description are looked upon as faults, and their miserable end is attributed to their own misconduct. Alcohol plays with some men an important part in the production of organic dementia; that it produces a specific form of insanity, viz., delirium tremens, just as the puerperal state tends to puerperal insanity, is well known; but it has still to be proven that it will of itself lead to organic disease to such an extent as found in the persons a short outline of whose cases are given, and who are merely types of the general class that go to swell the number of paralytics in asylums. There can be but little doubt that what were considered their faults were in reality their failings, and from which escape was to them impossible.

An examination of Table I. shows that 13 times in 700 *post-mortems*, deviation from the normal condition was observed in the cerebellum, and that four only of the lesions were of any consequence, viz., effusion of blood into its substance twice, softening of once, and cysts in once. In one of the cases, of the effusion of blood into the cerebellum, a male patient in the Montrose Asylum suddenly fell down comatose, and convulsed; he was put to bed, and for 12 hours there was alternate contraction and relaxation of every muscle in his body—the contractions being stronger on the right than on the left side. At the autopsy the whole of the substance of the left lobe of the cerebellum was found disintegrated and broken up by semi-clotted blood. The almost total absence

of change in the cerebellum amongst the insane becomes the more remarkable when taken in conjunction with the fact that there is no alteration in its weight when contrasted with the sane, although the weight of the encephalon as a whole is lighter amongst the insane.*

The relation which this apparently normal condition of the cerebellum bears to its function is interesting. In establishing the function of any organ, experiment must be supported by pathology to arrive at correct conclusions, and if they do not go hand in hand, it is very likely that experiment is at fault. It has been asserted, as a possible function of the cerebellum, that it watches over and regulates the reflex actions which constitute life, and generally takes the place of the cerebrum during sleep. How far the pathology of insanity supports such a conclusion is at present uncertain; still, the apparent total absence of alteration in the organ in diseased mental condition does not negative such an idea; on the contrary, it rather favours it, for the insane during sleep are not known to present any marked difference from the sane in the same condition.

A second point of interest in Table I. is the fact that a certain number of persons die insane, in whom, after death, the brain presents no apparent deviation from the normal standard. In 60 of the 700 cases, or in about $8\frac{1}{2}$ per cent., no lesions could be found. The failure to detect alterations must be regarded as due entirely to the absence of sufficient power on the part of observers to discover them. Other diseases besides insanity kill people, in whom, after death, no trace of disease can be found in the body to account for the cessation of life, and in such instances the symptoms manifested during the illness, and known to be those of a specific disease, are taken, and from them the cause of death is inferred. It would be unfair to refuse the same licence to cases of insanity presenting no lesions after death, and they must be placed in the same category.

* In text books the weight of the entire brain is stated to be greater amongst the insane than in the sane, the assertion being founded on the authority of the late Dr. Skae, who published a series of tables, showing the weight of the insane brain when contrasted with the sane. An examination of the statistics furnished by Dr. Skae shows that, in calculating the average weight for the total number of brains weighed, he did not add all the weighings together, and then strike the average, but only the average weights in the decennial periods. Happening to have a very large brain weight in one of those periods, and only one in that period, he took *it* for an average, and so raised the whole much above what they would have been had he calculated from all the weighings.

TABLE II.—Showing the lesions and their frequency in the brains of 333 persons who died insane, arranged under the different forms of insanity.

	Mania.	Melancholia.	Epilepsy.	Dementia.	General Paralysis.	Total.
Number of Cases ...	100	26	68	82	57	333
CALVARIUM—						
Abnormally thick	17	3	16	13	8	57
Thin	8	2	9	11	9	39
Injection of Diplöe of ...	15	10	21	11	19	76
Softened	...	...	...	1	...	1
Hard and dense	3	...	...	...	...	3
MEMBRANES—						
Dura Mater very firmly adherent to Calvarium ...	9	...	4	7	6	26
Thickened	14	4	9	6	15	48
Ossification of	1	1	2	2	1	7
Tumours attached to ...	2	1	2	2	1	7
ARACHNOID—						
Effusion into Sac of Sanguine	4	1	2	4	1	12
„ „ serous...	10	...	4	9	5	28
...	...	...	...	1	1	2
False membrane in sac of ...	6	...	4	4	8	22
Injection of	1	...	...	...	...	1
Sanguineous cysts in ...	...	...	...	...	1	1
Granulations on	...	...	...	1	1	2
Opacity of	53	11	33	51	41	189
PIA MATER—						
Marked injection of vessels of	37	10	34	30	27	138
Œdema of	1	...	1	4	4	10
Local bulla of fluid in meshes of	16	3	4	18	11	52
Sanguineous effusion „ ...	8	1	7	7	5	28
Tumours attached to ...	...	1	1	...	...	2
Deposits in	3	...	2	2	1	8
Adhesions of to surface of grey matter	6	2	5	4	9	26
BLOOD VESSELS—						
Injection of in brain ...	14	7	11	7	9	48
Atheroma of	9	5	4	16	6	40
GREY SUBSTANCE—						
Abnormalities in thickness of	12	2	6	6	8	34
In colour of	14	6	17	15	8	...
Flattening of convolutions	4	...	9	3	6	...
Effusion of blood into ...	1	...	...	...	2	...
WHITE SUBSTANCE—						
Induration of...	7	...	7	9	6	...
Œdema of	3	...	1	...	1	...
White softening of	3	1	3	2	2	...
Effusion of blood into ...	...	...	2	1	5	...
Excessive shrinking of ...	1	...	2	...	1	...
Marked injection of vessels of	14	7	10	6	6	...
Cysts in	1	...	1	1	...	...
OPTIC Thal. and Corp. Striat.—						
Effusion of blood into ...	2	1	...	...	2	...
Pink gelatinous softening of	2	...	...	4	4	...
Tumours in	...	...	...	1	1	...
Cysts in	2	...	...	1	3	...
Cicatrix in	1	...	...	1	1	...
CEREBELLUM—						
Softening of	...	...	...	2	...	...
Cysts in	...	...	1	...	...	...
Cicatrix in	1	...	...	...	...	...

	Mania.	Melancholia.	Epilepsy.	Dementia.	General Paralysis.	Total.
Number of Cases ...	100	26	68	82	57	333
VENTRICLES—						
1. Excessive serous fluid in	50	11	38	49	45	...
Sanguineous ,,	2	2	...	3	3	...
Opacity of lining membrane of	9	1	6	7	8	...
Crystalline granulations on lining membrane of ...	18	1	11	9	19	...
Adhesions of lining membrane	22	5	14	14	11	...
Cicatrix in septum lucidum...	1	...	1	...	...	...
Choroid plexus cysts in ...	17	6	2	18	4	...
Tumours in	...	...	1	...	1	...
Earthy deposit in	3	1	3	3	2	...
Apparently normal Brains... ...	6	3	1	4	...	...

Table III.—Showing the percentage of the lesions found in the different forms of insanity.

	Mania.	Melancholia.	Epilepsy.	Dementia.	General Paralysis.
Number of Cases	100	26	68	82	57
CALVARIUM—					
Abnormally thick	17	11·45	23·5	15·8	14·03
,, thin	8	7·6	13·2	13·4	15·7
Diploë, injection of	15	38·4	30·8	13·4	33·3
Softened	...	...	...	1·2	...
Hard and dense...	3	...	...	...	...
DURA MATER—					
Very firmly adherent to Cal. ...	9	...	5·8	8·5	10·5
Abnormally thick	14	15·3	13·2	7·3	26·3
,, thin	...	...	...	...	...
Ossification of	1	3·8	2·9	2·4	1·7
Tumours attached to	2	3·8	2·9	2·4	1·7
ARACHNOID—					
Effusion sanguineous into Sac ...	4	3·8	2·9	4·8	1·7
,, serous	10	...	5·8	10·9	8·7
	...	...	...	1·2	1·7
False membrane in Sac of ...	6	...	5·8	4·8	14·0
Ossification of	...	...	1·4	...	...
Injection of	1	...	...	...	...
Sanguineous cysts in	...	...	...	...	1·7
Granulations on	...	...	...	1·2	1·7
Opacity of	5·3	42·3	48·5	62·1	71·9
PIA MATER—					
Marked injection of vessels of ...	37·	38·4	50·	36·7	47·3
Œdema of	1	...	1·4	4·8	7
Local bulla of fluid in	16	11·5	5·8	21·9	19·2
Sanguineous effusion in	8	3·8	1·4	...	...
Tumours attached to	..	3·8	1·4	...	...
Brown gelatinous deposit in ...	3	...	2·7	2·4	1·7
Adhesion of to surface of grey matter	6	7·6	7·	4·8	15·7
BLOOD VESSELS—					
Aneurismal dilatation of	...	...	1·4	...	...
Injection of in brain	14	26·9	16·1	8·5	15·7
Atheroma of	9	19	5·8	19·5	10·6
GREY SUBSTANCE—					
Abnormal in thickness	12	7·6	8·8	7·3	14·
,, colour	14	23	25	18·2	14·
Flattening of convolutions of ...	4	...	13·2	3·6	10·5
Effusion of blood into, old ...	1	...	...	...	3·5

	Mania.	Melancholia.	Epilepsy.	Dementia.	General Paralysis.
Number of Cases	100	26	68	82	57
WHITE SUBSTANCE—					
Induration of	7	...	10·2	10·9	10·5
Œdema of	3	...	1·4	...	1·7
Softening of	6	3·8	4·4	2·4	3·3
Effusion of blood into recent ...	...	...	2·7	1·2	8·7
Excessive shrinking of... ...	1	...	2·9	...	1·7
Marked injection of vessels of ...	14·	26·9	14·7	7·4	10·5
Cysts in	1	...	3·4	1·2	...
OPTIC Thal. and Corp. Striat.—					
Effusion of blood into	2	3·8	1·4	...	3·5
Softening of	2	...	...	4·8	7
Tumours in	...	...	...	1·2	7
Cysts in	2	...	...	1·2	5·2
Cicatrix in	1	...	...	1·2	1·7
CEREBELLUM—					
Adhesions of membranes to grey matter	...	...	...	...	...
Softening of	...	...	...	2·4	...
Blood in substance of	...	...	...	...	...
Cysts in	...	...	1·4	...	...
Cicatrix in	1	...	1·4	...	...
VENTRICLES—					
Excessive fluid in serous ...	50·	42·3	55·8	59·7	78·9
,, ,, sanguineous ...	2	7·6	...	3·6	5·2
Opacity of lining membrane ...	9	3·8	8·8	8·6	14
	18	3·8	16·1	10·9	33·3
Adhesions of	22	19·2	20·5	17·	19·2
SEPTUM LUCIDUM—					
Tubercle on	1	...	1·4	...	...
CHOROID PLEXUS—					
Cysts in	17	23·	2·7	21·9	7
Tumours in	...	...	1·4	...	1·7
Earthy deposit in	3	3·8	4·4	3·6	3·5
Apparently normal brain ...	6	11·4	1·4	4·8	...

In Table II. the lesions observed in the brains of 333 women are arranged under the form of insanity from which they suffered, viz., mania, melancholia, epilepsy, dementia, and general paralysis and paralytic dementia. General paralysis and paralytic dementia are conjoined in the table, on account of a sufficient differentiation not having been made in the records to permit of their distinction. In the present state of psychological nomenclature any attempt at more minute classification would only lead to confusion and differences of opinion as to the meaning of the terms employed. Some such arrangement as that used in Table II., in conjunction with such a classification as that recommended by the late Dr. Skae, would in time lead to fixed results. At present the number of cases is too few to furnish more than merely an outline of what may be the results of more extended observations. To render the table of use to others who may adopt this method of arranging the brain lesions in the insane, Table III. has been arranged.

It shows the frequency, per cent., in which the lesions were found in the different forms of insanity, and affords a ready means of contrasting the frequency of the alterations. The calvarium was found to differ from the normal condition oftenest in general paralysis and paralytic dementia; next in order comes epilepsy, then dementia, then melancholia, and lastly mania. The most frequent change observed was injection of the diplöe.

The constant determination of blood to the head, and the congestion of all the blood vessels of the brain, during an epileptiform seizure in general paralysis or paralytic dementia, and during the fits in epilepsy, may, to a certain extent, account for this. The dura mater is seen to be most frequently altered in general paralysis and paralytic dementia, and to be about in the same proportion in the other forms of insanity, each to each, the change most frequently met with having been thickening. The arachnoid presented alterations most frequently in paralytic dementia and general paralysis, next in dementia, then in mania, then in epilepsy, and last in melancholia, the change most frequently observed being opacity. This opacity of the arachnoid, so commonly observed, is apparently the consequence of inflammatory action. It varies in its intensity from being merely a slight milky white deposit along the course of the vessels to a complete dusky grey appearance of the whole membrane, entirely concealing the outline of the convolutions. Opacity of a kind closely resembling that met with in the arachnoid is not unfrequently found in other membraneous structures, as on the pericardium, and the capsule of the spleen. Effusions of blood into the arachnoid sac are not uncommon. The effusion varies in degree in different cases, being met with in all forms, from a delicate coating along the surface of the membrane, to the amount of many ounces. When the effusion takes place gradually and irregularly, it begins in the form of a delicate layer in the interior of the sac, the blood becomes organised, and a delicate false membrane is formed; another effusion takes place, which, becoming organised, leads to the thickening of the original membrane, and so the process goes on, till, in the course of time, a cyst is formed, into which some day a large quantity of blood is poured, and death follows.*

* Dr. Howden, of the Montrose Asylum, was the first to point out the origin of false membranes in the arachnoid sac, and I have frequently verified the correctness of his statements.

These successive effusions furnish a probable explanation of the repeated apoplectiform seizures so commonly met with in certain forms of insanity where hæmatoma are found after death. The pia mater is found altered most frequently in paralytic dementia and general paralysis. Adhesions of the pia mater to the grey substance are found in 15 per cent. of the cases in general paralysis. The adhesions were most commonly met with in the neighbourhood of the superior convolutions, in the middle and posterior parts of the brain. They are found in all forms of insanity, and are apparently a consequence of hyperæmia, leading to an increased development of connective tissue.

Local bullæ of fluid, sometimes clear, sometimes having a dirty yellow gelatinous appearance, are not uncommon in the meshes of the pia mater, and seem to be due to transudations of serum through the walls of the vessels, prevented from becoming general by the dipping down of the membrane between the convolutions. The most common alterations observed in the blood vessels of the brain are marked injection and atheroma. The injection of the blood vessels of the brain is found most frequently in melancholia, being in the proportion of 26 per cent. of the cases examined. It is least frequent in dementia, whilst epilepsy held an intermediate place. Atheroma of the blood vessels of the brain was most common in dementia, the deposit frequently converting the arteries into solid tubes, having an appearance closely resembling coral, and branching out in a similar way. In the cases in which atheroma was found in the blood vessels of the brain it was generally found in the aorta at its commencement, and at the base of the mitral valve. Alterations in the colour and thickness of the grey substance were frequently met with. But little dependence can be placed upon the records regarding this, seeing that what may be to one observer a deviation from the normal standard, will to another be perfectly healthy, and that the colour will be altered by the decomposition which sets in after death.

Flattening of the convolutions was found most frequently in epilepsy, and may depend partly upon the quantity of fluid in the ventricles as well as the frequent congestion of the blood vessels, causing the nerve substance to be pressed against the calvarium, there being at the same time no diminution in the quantity of the grey matter. Changes in the white substance bear only a small proportion to the changes observed in the other parts of the brain; they consist princi-

pally of softening, œdema, induration, shrinking, and injection of the vessels.

Changes in the optic thalmus and corpus striatum are most frequently found in general paralysis and paralytic dementia. Taking into consideration the function of these ganglia, this is what might be expected. The changes consist in softening, effusion of blood into, cysts in, and cicatrices, the remains of old disease. The ventricles, in all forms of insanity, appear peculiarly the seat of alterations from the normal condition. These alterations take the form of excessive fluid, in the so-called granular deposits on the lining membrane, cysts in the choroid plexus, &c., &c. The large quantity of fluid found in the ventricles in dementia is apparently the result of atrophy of the brain substance. The granular-looking deposit on the lining membrane of the ventricles appears most commonly to be due to small collections of fluid below the membrane, and not as a rule to an organic deposit, for in stripping off the membrane no traces of the granulations remain when it is examined under the microscope.

In all probability alterations, such as those enumerated, are the products of the diseased mental condition, or, to speak more correctly, of disease existing in the intimate structure of the brain, the position and nature of which is still undetermined. They in no way favour the opinions of those who refuse to recognize actual disease as being necessary for the production of insanity, and who deny a place to it amongst the other physical diseases. These lesions are to be considered as holding the same place as the ulceration of the bowels in typhoid fever, or the effusion of lymph on the pleura in pleurisy. It is known that to produce a case of typhoid fever a constitution capable of receiving a specific poison is required, before the poison will develop itself, and the same holds good as regards insanity. Before a man or woman can be insane, a brain capable of being diseased must exist, and upon its constitution, combined with the influences which directly lead to the manifestation of the diseased mental condition, the form which the insanity takes will depend. Exposure to cold will in one man produce coryza, in a second rheumatism, and in a third pneumonia; so, poverty and want will in one man lead to mania, and in a second to melancholia, the form of the insanity being due, in a great measure, to the condition of the nerve cells of the brain. An unhealthy idea, however generated, will surely produce in the nerve cells through which

it passes an unhealthy condition, which, if not remedied, will sooner or later lead to a permanent change in these cells, and they in turn will corrupt the others. The manifestations of abnormal intellectuation resulting from the morbid alterations in the nerve cells will, in one individual, lead to acts which society will pronounce vicious, and against which it will protect itself by sending the offender to gaol, whilst another man insisting that he is the Almighty, and that he can travel between heaven and earth at will, is judged by the same tribunal to be mad, and sent for safe keeping into an asylum. In both, disease is the original cause of the abnormal state.

The following conclusions appear to receive support from the preceding remarks—1st, that insanity is a disease requiring for its production a condition of nerve-structure capable of being acted upon by malign influences. 2nd, that in some forms of insanity, actual changes in the brain substance, which in all probability were the cause of the mental symptoms, exist, whilst in others the lesions observed must be regarded as secondary products. 3rd, that a certain number of persons die insane in whose brains neither original cause nor secondary effects can be detected. 4th, that the cerebellum is but little, if at all, affected by insanity.

Jean Jacques Rousseau: A Psychological Study.* By J. Hawkes, M.D., Medical Superintendent, Westbrooke House Asylum, Alton, Hants.

The life of the philosopher has for some minds a higher charm than that of a poet—the life of a practical worker a greater attraction than that of a student or dreamer—the career of an earnest living reality more than that of a mystic, or even of a professor of the ideal. The career of the natural phenomenon, whose name heads this article, embraced to a great extent all of these conditions. Born in an age when the dawn of a new creation was already beginning to climb over the hills by which men's minds were environed—at a time when the rude disentanglements, by processes new and strange, were shortly to make themselves felt among the believers in an old faith—when the first throes of the great moral volcano of modern times seemed to indicate but feebly its future terrible force—the mind of young Rousseau buds forth like some fragile blossom of spring pushing its sensitive shoots through the frozen snow on the mountains around his native town.

* "Rousseau," by John Morley. 2 vols.