No. 3.—Shows an intercalary cell (to left of picture) giving off a stout process. Notice how this process springs abruptly from the cell, is somewhat irregular in contour, and runs for some distance without diminishing in calibre. At the right-hand side of the picture is a pyramidal cell, of which the nucleus (A) only shows in the photograph. A little distance above the nucleus some of the beaded fibrils of the network about the apex of the pyramidal cell can be seen (C). Springing from the side of the process of the intercalary cell, a short distance before it bifurcates, is a delicate beaded fibril (B), which runs up obliquely to join and take part in the network about the pyramidal cell.

All three photographs are magnified 700 diameters.

Amentia and Dementia: A Clinico-pathological Study.

By JOSEPH SHAW BOLTON, M.D., M.R.C.P., Fellow of University College, London; Senior Assistant Medical Officer, Lancaster County Asylum, Rainhill.

CONTENTS.

PAGE

Introduction 270
Summary of Contents 276

PART I (pp. 282—340).

Morbid anatomy of mental disease, a clinico-pathological description of 433 cases of insanity—
I. *Group I.*—Insanity without dementia 284
II. *Group II.*—Insanity with appreciable dementia 291
III. *Group III.*—Insanity with moderate dementia 302
IV. *Group IV.*—Severe dementia, with symptoms of insanity . . . 311
V. *Group V.*—Gross dementia 316
VI. General summary of morbid appearances 323
Degeneration of the cerebral vessels in mental disease 333
Influence of tuberculosis on the symptomatology and morbid anatomy of mental disease 336

Introduction.

THE following paper consists of further instalments of a research which has been conducted by the author for several years and which deals with the general pathology of mental disease from both clinical and pathological standpoints. The essential bases of a scientific general classification of mental diseases are a morbid anatomy and a general pathology. Before the latter problem could be successfully attacked a prolonged

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

study of the structure and mode of development of the cell-layers of the cortex was necessary. This was commenced by a lengthy investigation of the region of the cortex concerned with the special sense of vision, and a paper on this subject was published in 1900.(1) This paper dealt, by the method of micrometric examination, with the general histology of the regions of the cortex cerebri concerned in the immediate reception (projection centre) and the elaboration (lower associational centre) of visual impressions; and the research resulted in the exact localisation of the primary visual area of the cerebral cortex. This region was described by the author as the "visuo-sensory" area, and to the surrounding area of visual association he applied the term "visuo-psychic.(2) The results obtained from this study of the cortical areas concerned with one special sense were considered sufficient for the purposes of the research, and the region of the cortex cerebri which occupies a higher plane in the hierarchy of cerebral function than those concerned with sensory reception and elaboration was then taken into consideration. Before, however, it was possible to apply the same method to the region of the cortex cerebri concerned in higher association and the general orderly co-ordination of psychic processes, it was first necessary to satisfactorily determine the particular part of the cortex which possesses these functions, as this is the subject of grave dispute on the part of different authors.(3)

This question was settled by a careful clinical and pathological analysis of 200 cases of mental disease, with the result that the regions of under-development in cases of developmental mental deficiency and of wasting in cases of dementia (or permanent psychic disability due to neuronic degeneration) were satisfactorily determined to have their chief focus in the prefrontal region.

The cortex cerebri of twenty carefully selected cases was then examined by the micrometric method. The material made use of was obtained from the cerebra of normal individuals, of fœtuses of different ages, and of cases of marked mental deficiency, of chronic and recurrent insanity without dementia, of chronic insanity with moderate dementia, of severe and gross dementia, and of gross dementia paralytica (general paralysis of the insane).

The research dealt with the modes and time of development

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

of the cell-layers of the cortex cerebri and with their relative degrees of development and retrogression in these different types of mental alienation.(4) As this investigation elicited many important facts and is the basis on which the present research has been founded, the conclusions which were derived from it will be referred to at some length.

The cortex cerebri is composed, in the opinion of the author, of five primary layers. Of these, two, the first or superficial, and the fourth, are essentially nerve-fibril layers. The remaining three, namely the second, the third, and the fifth, containing respectively the "pyramidal," the "granule," and the "polymorphic" cells, are essentially nerve-cell layers, and form the original basis from which the complex adult cortex cerebri is derived. Owing to the absence of this key to the structure of the cerebral cortex, much confusion, especially in the nomenclature employed by different authors, has arisen. For example, in the primary visual area, the third or granule layer (middle cell layer) is hypertrophied and duplicated owing to the presence in its midst of the line of Gennari, but it is often described as three separate layers. Again, the second or pyramidal layer (outer cell layer), which is structurally and developmentally single, is commonly subdivided into separate layers of small and large pyramids. The Betz or ganglionic cells, also, which lie in the fourth layer or inner line of Baillarger (inner fibril layer) of the psychomotor area, and are homologous with the "solitary" cells lying in this layer in other regions of the cortex, are commonly described as "pyramidal cells," and referred to as if they were part of the pyramidal layer of nerve-cells.

The following conclusions concerning the functions of the three primary cell layers of the cortex cerebri resulted from the researches of the writer.

(1) *The second or pyramidal layer of the cortex cerebri (outer cell-layer). (a) The prefrontal region.*—The pyramidal layer is the last cell-layer of the cortex to develop during the process of lamination, and it is also the first to undergo retrogression in dementia. It is the only layer which appreciably varies in depth in normal brains; the degree of its development in normal fœtuses and infants varies directly with the mental power of the individual; it is under-developed to different degrees, not only in idiots and imbeciles, but also in chronic and recurrent lunatics without dementia; and the degree of its retrogression in de-

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

mented patients varies directly with the amount of dementia existing in the respective cases. (*b*) *The visuo-psychic region*—The pyramidal layer reaches practically the same adult depth as in the prefrontal region, but it does not vary in depth according to the degree of dementia, though a small and practically constant decrease in depth is evident. This layer develops much later than does the pyramidal layer in the visuo-sensory region, and in a child of one month it is less than two thirds of the adult depth. (*c*) *The visuo-sensory region*—The pyramidal layer in this region is in the adult only about five ninths of its depth in the regions above referred to. It, however, develops much earlier, being in infants of one and three months very little below the adult depth.

The pyramidal layer, therefore, subserves the "psychic" or associational functions of the cerebrum. These functions are pre-eminent in the prefrontal region; they are less important in the visuo-psychic region; and they are of the least importance in the visuo-sensory region. These three regions are therefore of different grades in the hierarchy of cerebral function.

(2) *The third, or granule layer* (*middle cell-layer*), is developed before the pyramidal layer. In the primary visual area the optic radiations end in the midst of the hypertrophied and duplicated granule layer. *This layer, therefore, probably*, reasoning by analogy, *subserves the reception or immediate transformation of afferent impressions, whether from the sense organs, or from other parts of the cerebrum.*

(3) *The fifth or polymorphic layer* (*inner cell-layer*) is the first layer to be differentiated during the process of lamination, and it is the last to fail in the retrogression of dementia. A decrease in this layer exists in extreme aments (whether normal infants or idiots), and in dements who are unable to carry on the ordinary animal functions, such as attending to their wants, etc. *This layer, therefore, probably subserves these lower voluntary functions of the animal economy.*

In this connection it seems desirable to refer to an unpublished research in which Watson is at present engaged, and which, even in its unfinished state, would appear to prove the correctness of the writer's view concerning the functions of the polymorphic layer. Watson is making an extensive histological investigation of the cortex cerebri in various types of mammals. In his work he has adopted very closely the classification of the cerebral cortical layers described by the writer, and he clearly recognises the great importance of the "granule" or middle

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

cell-layer as delimiting the true pyramidal layer from the more or less pyramidal-shaped nerve-cells which are found below the granule layer. As, however, in some mammals he finds certain difficulties in accurately defining the writer's fourth and fifth layers, he prefers for the purposes of a general statement to use the terms "supra-granular" and "infra-granular," supra-granular being equivalent to the writer's second or pyramidal layer, and infra-granular including his fourth and fifth layers, although probably the majority of the infra-granular nerve-cells belong really to the polymorphic layer. As a result of his investigation, Watson has found that whilst the supra-granular layer (the writer's pyramidal) in various low types of mammal is poorly developed and inconsiderable in depth, in some consisting of at most two or three rows of cells, the infra-granular layers, on the other hand, are well developed, complex in structure, and occupy the greater part of the depth of the grey matter, constituting in every way the most prominent part of the cortex. As one rises in the mammalian scale, there is seen a corresponding increase in the depth of the supra-granular layer relative to the infra-granular. He has also found that whilst in certain mammals of little antiquity a considerable number of cells in the poorly-developed supra-granular layer remain even in the adult in a more or less embryonic condition, in other mammals of greater antiquity all, or practically all, the cells in this layer are fully developed and complex in structure.

From these facts he concludes that the infra-granular layers constitute the most important cell formation of the lower mammalian cortex as regards functional activity. Further, he considers that certain mammals of relatively great antiquity, *e.g.*, some of the insectivora, which have survived in the struggle for existence because of their adoption of a safe mode of life, have fully developed their trifling supra-granular layer, owing, no doubt, partly to their relatively longer existence in the earth's time-history. These animals, however, still depend largely upon their infra-granular layer for such mental capacity as they possess: yet, still more so, must certain other newer mammals, *e.g.*, some rodents, in which great numbers of the elements of the supra-granular layer remain, even in the adult animal, in a more or less embryonic condition, depend upon their infra-granular layer for the mental capacity they possess. These latter animals, it is concluded, are still being weighed in the balance for survival or extermination. They must either further develop their immature supra-granular layer and survive, or cease to do so, and suffer extermination, unless this is prevented by such other aids to survival as fecundity or artificial means of protection against their enemies. Taking educability as the criterion of intelligence, and correlating this with the state of development of the supra-granular layer especially, certain differences have been noted even in mammals of the same order. The guinea-pig, for example, is born in a relatively mature state, and learns little during its after-life: there is, correspondingly, little difference between the cortex of the young and adult specimens. In the case of the rabbit, however, which is born in a very immature condition, there is a marked difference in the development of the cortex of the young and adult, whilst corresponding with this fact is the observation that the young rabbit has much less intelligence than is possessed by the adult.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

These and many other related facts will be published *in extenso* on the completion of the research, but Watson has kindly permitted the writer to make the above premature reference to his work.

From these studies in morbid anatomy and general histology the writer concludes that *the cellular elements throughout the cortex cerebri which are especially concerned in the performance of associational functions are those of the pyramidal layer of nerve-cells;* and he considers it proved that *the great anterior centre of association of Flechsig in the prefrontal region is under-developed on the one hand in all grades of primary mental deficiency, and on the other hand undergoes primary atrophy* pari passu *with the development of dementia. This region of the cerebrum is therefore concerned with the performance of the highest co-ordinating and associational processes of mind.*

As the methods of the writer have been subjected to such strictures and the results to such criticism, it seems desirable to repeat here certain reasons for the former and certain explanations concerning the latter.

The scope of the subject is so wide that a complete review of the literature bearing on many of the subjects of discussion would in itself constitute a volume. Further, the collation of such data as are obtainable from the various published articles is well-nigh impossible owing to the different methods by which they have been obtained and also in many cases to their entirely contradictory nature, even on essential points concerning the morbid anatomy of mental disease. The author has therefore, on the whole, contented himself with the recording and classifying of the results of his own observations, and at the expense of much time and trouble has personally verified even many well-known and accepted facts of morbid anatomy. This has been especially necessary as the whole research has for its object the correlation of the clinical types of mental disease and the morbid appearances observed by naked-eye examination of the contents of the cranium and by micrometric examination of carefully selected regions of the cortex cerebri in equally carefully selected cases, and as from this double point of view the literature available has been found to be of little or no practical value.

With reference to his results, the writer wishes to point out that, as the *correlation* of clinical types with morbid appearances has been his object, any given descriptions of morbid appear-

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

ances do not necessarily imply that he wishes to claim originality for them, as very few of those embodied in the papers are not well known or have not been frequently described at length as facts of morbid anatomy. Finally, as regards the results of micrometric examination and his positive conclusions from these, which are the basis of the present further contribution, he wishes to repeat that the utmost care was taken to obtain trustworthy material and to correctly orientate the parts made use of, and that his prolonged experience of the method of micrometric measurement adopted justifies him in guaranteeing their correctness and value.

Summary of Contents.

The present paper consists of three parts, of which the first is concerned with clinico-pathological data, and deals with the morbid anatomy of mental disease, whilst the second and third deal with clinical data only.

The first part is devoted to the general verification and amplification of the facts obtained during the writer's study of the morbid anatomy of dementia. The 200 cases previously published have been increased to 433, with practically identical results, and the percentages given in the previous paper may therefore be accepted as substantially accurate in the case of the particular population, that of the London County Asylum, Claybury, from which the data are derived. It has hence been unnecessary to insert such a minute analysis of morbid appearances as was contained in the previous paper, and only those details to which the writer wishes especially to draw attention are therefore referred to at length. It was, however, incumbent on him to repeat his observations and to generally verify and in some cases amplify the facts previously obtained, as percentages derived from the study of naked-eye morbid appearances in a large series of cases belong to quite a different plane as regards accuracy from that occupied by the statistics resulting from micrometric examination of the cortex of a small series of carefully selected cases. In the case of general naked-eye morbid anatomy, for example, the cause of death, the interval before the *post-mortem* examination, the temperature at which the body is kept after death, etc., all exercise an important influence in modifying in some degree the morbid appearances, and consequently a large series of cases is necessary for the

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

preparation of approximately correct percentages. On the other hand, such contrary factors as œdema or marked congestion of the cerebrum, a delayed *post-mortem* examination, etc., would render a brain absolutely useless for the purposes of micrometric examination; and the writer had, in fact, great difficulty in obtaining, in an entirely satisfactory condition, even the small number of brains he required in spite of the hundreds of cases at his disposal.

As a result of his clinico-pathological and histological studies the writer enunciated a provisional classification of mental diseases, in which he used the term "*amentia*" to in the widest sense connote *the mental condition of patients suffering from deficient neuronic development*, and the term "*dementia*" to similarly connote *the mental condition of patients who suffer from a permanent psychic disability due to neuronic degeneration following insufficient durability.*

The term *amentia* as thus defined covers a much larger group than that indicated by the terms *idiocy* and *imbecility*, and includes all cases possessing a general or special developmental deficiency which may become evident either with the dawn of psychic life or at such critical periods as early childhood and school-life, puberty, adolescence, marriage, maturity, childbirth, the climacteric, etc., at any one of which the degenerate may fail to respond normally to his environment and may show his or her inherited deficiency.

The class may be grossly divided into two subdivisions, namely, *low grade aments*, or idiots and imbeciles, and *high grade aments*, in whom the developmental deficiency becomes evident at or after puberty. In the case of the latter group, apparently complete recovery of a permanent or a temporary nature may occur, a stationary condition of insanity without appreciable dementia may follow, or at once or later a varying degree of dementia may ensue. These patients usually show more or less marked stigmata of degeneracy, and, in the case of the first two sequelæ referred to, *post-mortem* examination of the cranium shows no abnormality of the intra-cranial fluid or membranes, apart from those associated with the local or systemic diseases which are the cause of the fatal issue.

The term *dementia*, as defined by the writer, is also applied in a somewhat different manner from that sanctioned by common usage, in that it refers to a *permanent* psychic disability due to

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

neuronic degeneration, and not to a loss of mental power, which may be temporary or permanent. He employs the term *mental confusion* to connote the symptom-complex, which occurs in many acute cases of insanity, and which is not peculiar to what is usually described as Korsakow's disease, but occurs to some degree not only in many cases which recover, but in all cases which are developing dementia. The symptomatology of mental confusion, and the diagnosis of this from dementia, will be referred to in a later part of the paper, but the chief causes of this important symptom-complex will be briefly indicated here. These appear to be (1) *direct action of toxines*, especially alcohol and those following childbirth. In these cases, even when severe, almost complete or apparently complete recovery frequently occurs, and persons with relatively normal cerebra may probably be affected. Under this class may be included many cases of epileptic confusion, and it is into this group that the cases described by many writers as Korsakow's disease properly fall. (2) *Indirect action of toxines*, resulting in deficient nutrition of the cortical neurones (*a*) by vascular and neuroglial (and chiefly secondary neuronic) changes, which follow prolonged action of the toxine, and which are probably largely of the nature of secondary proliferation after, or of reaction to, the injury produced by the toxine. The chief, if not the only variety under this heading, is the dementia paralytica (general paralysis of the insane) which is a frequent sequela of systemic syphilis in degenerates, and which rapidly or slowly passes on to a fatal issue. (*b*) By the vascular degeneration accompanying senility or premature senility, which similarly results in secondary toxic and nutritional affection of the cortical neurones. In cases of this type, also, the dementia which supervenes, progresses rapidly or slowly till death ensues.

Onset of mental confusion.—As in the highest grades of pure amentia, so in all cases associated with mental confusion, the time of onset of the attack (*i.e.* when the potential lunatic becomes an actual one) depends on "stress" in the very widest sense, and including the causes of mental confusion enumerated above. The "stress" required may be slight, as when the hereditary disability is marked, in which case the patient rapidly enters an asylum and either partially recovers, often only to relapse, or remains a permanent inmate ; or it may be extremely great, as in the highest psychopaths, where syphilis, alcoholic

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

excess, a generally irregular life, and the severest business strain and worry may be needed, in which case an extremely rapid case of dementia paralytica is likely to ensue; or any intermediate degree may be necessary to determine the breakdown.

Development of dementia.—In the more lowly aments the neurones are relatively stable, as their functional power is so slight that "stress" cannot intervene to any dangerous extent, and consequently these cases do not, as a rule, develop dementia, especially as they frequently die before (premature) senile involution of the cortical neurones occurs. On the other hand, in higher degenerates of any grade whose neurones suffer from deficient durability, it may almost be considered a general law that the higher the development of the neurones, the greater is the degree, or at any rate the more rapid is the progress, of the dementia which results when "stress" has determined the time of onset of the insanity. Until senility occurs, or apart from vascular changes due to whatever cause, the dementia is never severe, the ordinary chronic lunatic being the common result. It is, however, probably correct as a general average (excluding dementias ensuing on mental confusion following the indirect action of toxines) that the dementia of puberty and adolescence is severer on the whole than the dementia of maturity, and this, again, than the dementia of presenility (*e.g.*, climacteric melancholia, etc.). The primary cause of the development of dementia is thus a deficient durability of the cortical neurones. If this decrease in durability is slight, neuronic degeneration ensues in old age; if it is more marked, it occurs at the climacteric; if it is still more marked, it will appear at maturity; and if it is very marked, it will appear evident at adolescence or even puberty. On the other hand, in amentia the deficiency is developmental, though in many aments deficient durability also exists, and the mental condition thus often becomes a mixed one owing to the development of dementia in a high-grade ament or in one of the milder types of low-grade ament.

In Parts II and III of the present paper, which deal from the clinical aspect with "amentia" and "dementia" respectively, the data are derived from a study of 728 chronic or recurrent lunatics admitted into the East Sussex County Asylum, Hellingly, during the first seven months after the opening of the asylum. Practically all the cases were transfers and all were chargeable to the different unions of East Sussex. All

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

TABLE A.—*Clinical Classification of 728 Cases of Mental Disease.*

	M.	F.	T.	M.	F.	T.
AMENTIA.						
(1) IDIOCY AND IMBECILITY (primary and secondary)	—	—	—	51	43	94
(*a*) Extreme	13	8	21	—	—	—
(*b*) Moderate	15	8	23	—	—	—
(*c*) Slight	7	8	15	—	—	—
(*d*) Extreme, with epilepsy	6	9	15	—	—	—
(*e*) Moderate, with epilepsy	8	9	17	—	—	—
(*f*) Slight, with epilepsy	2	1	3	—	—	—
(2) EXCITED AND "MORAL" CASES	—	—	—	22	64	86
(*a*) "Moral" cases	5	9	14	—	—	—
(*b*) Simple emotional chronic mania	4	32	36	—	—	—
(*c*) Chronic mania with incoherence and delusions	6	13	19	—	—	—
(*d*) "Cranks" and asylum curiosities	7	10	17	—	—	—
(3) RECURRENT CASES	—	—	—	17	30	47
(*a*) Relapsing	6	13	19	—	—	—
(*b*) Now chronic	11	17	28	—	—	—
(4) HYSTERIA	—	6	6	—	6	6
(5) EPILEPTIC INSANITY	—	—	—	6	18	24
(*a*) Epileptic mania	2	5	7	—	—	—
(*b*) High-grade amentia with epileptic mania	4	11	15	—	—	—
(*c*) Mild imbecility with epileptic mania	—	1	1	—	—	—
(*d*) Epileptic mania with mild senile dementia	—	1	1	—	—	—
(6) CASES WITH SYSTEMATISED DELUSIONS (including paranoia)	10	16	26	10	16	26
Total amentia	106	177	283	106	177	283
DEMENTIA.						
(1) PRIMARILY NEURONIC (age, stress, or both).						
(*a*) *Senile or "worn out" dementia in high-grade amentia, etc.*	—	—	—	53	70	123
(I) Cases with previous attacks and now chronic dements	9	23	32	—	—	—
(II) Chronic cases with dementia	6	7	13	—	—	—
(III) Melancholia with dementia	12	8	20	—	—	—
(IV) Mania with dementia	6	8	14	—	—	—
(V) High-grade amentia, recurrent cases with dementia	4	12	16	—	—	—
(VI) High-grade amentia, chronic cases with dementia	16	12	28	—	—	—

(*b*) *Pre-senile or climacteric dementia*								—	—	—	18	47	65
(I) Mild				14		30		44					
(II) Moderate				4		17		21					
Type	Mania								7	12	19	—	—	—
	Melancholia								6	20	26	—	—	—
	Chronic insanity								1	11	12	—	—	—
	Simple dementia								4	4	8	—	—	—
(*c*) *Dementia of maturity* (chiefly from intemperance, syphilis, child-birth, etc.)									26	34	60	26	34	60
(*d*) *Premature dementia* (dementia præcox)									—	—	—	57	55	112
(I) Approximately "hebephrenic"									32	32	64	—	—	—
(II) Approximately "katatonic"									23	18	41	—	—	—
(III) Approximately "paranoid"									2	5	7	—	—	—
(2) PROGRESSIVE AND SECONDARY.														
*(*a*) *Dementia senilis*									—	—	—	9	15	24
(I) Melancholia with dementia									3	2	5	—	—	—
(II) Mania with dementia									—	5	5	—	—	—
(III) Simple dementia									6	8	14	—	—	—
(*b*) *Dementia paralytica*									—	—	—	14	9	23
(I) Juvenile									1	—	1	—	—	—
(II) Ordinary									11	9	20	—	—	—
(III) Senile									2	—	2	—	—	—
(3) SPECIAL VARIETIES OF DEMENTIA.														
†(*a*) *Dementia following sense-deprivation*									6	4	10	6	4	10
(*b*) *Dementia following epilepsy*									12	8	20	12	8	20
(*c*) *Dementia following cerebral lesions*									—	—	—	3	5	8
(I) Cerebral syphilis									2	—	2	—	—	—
(II) Other lesions (gross)														
(A) Old standing (embolism, etc.)									1	2	3	—	—	—
(B) From vascular degeneration									—	3	3	—	—	—
Total dementia									198	247	445	198	247	445
Grand total									304	424	728	304	424	728

* The delusional types of senile dementia come under sub-division (1) (*a*).
† A distinct class from amentia of deprivation.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

the mental states were taken personally by the writer on a constant system, and the personal equation may thus be considered constant. The cases are grouped on the clinico-pathological lines above indicated, and the author's clinico-pathological experience of over 1000 cases of mental disease at the London County Asylum, Claybury, and the Pathological Laboratory of the London County Asylums, justifies him in thinking that relatively few of the 728 cases are wrongly classified.

As Part I only of the paper will be included in the present instalment, a general classification of the cases to be referred to at length in Parts II and III will be found on pp. 280 and 281.

A full discussion of this table, including illustrative examples of the different types referred to, will appear in Parts II and III of the present paper.

PART I.

The present division of this paper deals with the morbid anatomy of dementia on similar lines to those adopted in a previous contribution. By a comparison of the mental conditions of the patients with the naked-eye morbid appearances found within the skull-cap at the *post-mortem* examinations, it was demonstrated that the latter vary in degree with the amount of dementia, and are otherwise independent of the duration of the mental disease. It was further shown that the severer grades of dementia are associated with a much more extreme degree of vascular degeneration than occurs in non-demented or less severely demented lunatics of the same age, and that the latter is the cause of the former. "In a cerebrum which has begun to break down, or where degeneration has passed to the 'moderate' stage (Group III), the presence or incidence of gross vascular degeneration will cause rapid progress of the neuronic degeneration with gross dementia."

To the 200 cases previously analysed a further 233 are here added, making a total of 433, and throughout the present contribution Series A refers to the earlier 200, and Series B to the present 233. The latter is selected from a later consecutive series of 311 *post-mortems*, of which the following is an analysis :—

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

	Males.	Females.	Total.
Dementia paralytica . . .	44	18	62
Special	8	8	16
Classified	83	150	233
	135	176	311

The special cases, namely unusual gross lesions, tumours, etc., are excluded, and the cases of dementia paralytica (general paralysis of the insane), will not be made use of as the subject was exhaustively treated in a previous paper.

The remaining 233 cases will be classified into the five groups previously made use of, namely (1) cases without dementia; (2) cases with appreciable dementia; (3) cases of insanity with moderate dementia; (4) cases of dementia which still show symptoms of insanity, and (5) cases of gross dementia. These groups agree remarkably closely with the following five classes, based on morbid appearances: (1) Cases without morbid changes and where the pia-arachnoid strips naturally; (2) cases with slight morbid changes and where the pia-arachnoid strips rather more readily than natural; (3) cases with moderate morbid changes, with subdural excess to the level of the tentorium and where the pia-arachnoid strips readily; (4) cases with marked morbid changes and where the pia-arachnoid strips very readily, and (5) cases with very marked morbid changes, and where the pia-arachnoid strips like a glove from the hemisphere.

Further reference to details of morbid anatomy and to the manner in which intra-cranial morbid changes are in certain cases modified by such general diseases as are the cause of death will be made later in the paper. It may, however, be noted here that the difference between Groups I and II is not very marked, that both these differ considerably from Group III, and that this differs even more from the again similar Groups IV and V.

Groups I and II contain the majority of the cases of amentia, though several scattered cases with senile or presenile involution of the cerebrum occur in the later groups. Group III is composed largely of cases of the dementias of maturity and pre-maturity (dementia præcox), but contains many senile

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

and pre-senile cases which, had they lived, would have passed into Groups IV and V. Finally, Groups IV and V contain cases of advanced involution of the cerebrum of either a primary nature or due to the primary factors referred to earlier under the second group of causes of mental confusion.

The cases to be referred to are as follows :—

	Series A.	Series B.	Total.
Group I. No dementia	33	32	65
Group II. Appreciable dementia	52	44	96
Group III. Insanity with moderate dementia	51	50	101
Group IV. Severe dementia with symptoms of insanity	37	55	92
Group V. Gross dementia	27	52	79
Total	200	233	433

It will be noted that Series B contains a much larger proportion of cases in Groups IV and V than Series A, and that the numbers of cases in each group are more alike in the total of 433 than in either of the two series.

GROUP I.

The cases in this group are as follows:

	Series A.	Series B.	Total.
(1) Various and recent cases	5	6	11
(2) Recurrent insanity without dementia	4	8	12
(3) Excited and "moral" cases:			
(*a*) Hysteria	3	1	
(*b*) Excited cases	5 } 16	3 } 8	24
(*c*) Excited cases with delusions	8	4	
(4) Epileptics, imbeciles, and idiots	8	10	18
Total	33	32	65

Though the cases contained in this group are obtained on a pathological basis, the clinical divisions into which they so readily fall bear the semblance of a scientific classification, and at once show that the group is composed of cases which are by

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

the author classified under the heading "amentia." As was shown in a previous paper, where selected cases were examined histologically by the micrometric method, the essential common feature of this group (except in certain "sane" or quite recent cases in Class 1), is an incomplete development of the pyramidal or superficial cell layer of the cortex cerebri, and not the retrogressive change which occurs in dementia. The author hence considered it necessary to extend the field occupied by cases of mental disease due to defective development (idiots and imbeciles) and considered the term "amentia," as defined earlier, a suitable one for the purpose.

A comparison of the cases in Series A and Series B also shows a much closer resemblance than might have been expected when it is remembered that the two series are drawn from consecutive *post mortems*, as at different periods so many factors cause modifications both in the general death-rate and in the special types of cases which succumb to prevailing fatal diseases.

Series B. Group I. Class 1.

Various and Recent.

Of the six cases in this class, the first, a young girl with simple melancholia and tuberculosis of the lungs, died two months after admission, and the second and third were examples of puerperal mania who died after seven days and seven months respectively. The fourth was a case of mental confusion (alcohol) who died in eighteen days; the fifth was a case of mental confusion, dying in 13 days with otitis media, meningitis, and cerebellar abscess; and the sixth was a man æt. 57, with mental confusion, restlessness, and a syphilitic stricture of the œsophagus, who died after eight days' residence.

Series B. Group I. Class 2.

Recurrent Insanity without Dementia.

This class contains eight recurrent cases of various types, and as has been shown elsewhere, cases of this variety constitute probably the very highest grade of amentia. The attacks are due to functional instability, and not to neuronic degeneration, and the patients during their lucid intervals are perfectly sane

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

and at times of above average intelligence. They are merely unable to withstand the strain caused by the normal environment of sane individuals.

Great variation exists in the brain-weights of these cases. Of the four females, the brain of No. 8 weighs 975 grammes only, whilst that of No. 10 weighs 1500 grammes (average female normal, 1275); and of the four males, No. 13 weighs only 1220 grammes, whilst Nos. 11, 12, and 14 vary from 1527 to 1600 grammes (average male normal, 1400). It is desirable here to note that the author has already amply demonstrated that no relationship whatever exists between the depth of the cortex cerebri and the brain-weight, and that the former is the only important criterion of the functional value of the organ. Such marked variation in the brain-weights of the cases in this class is, however, useful evidence in favour of abnormal development of the cerebrum when considered in association with the general results of micrometric examination of the cortex cerebri of such cases.

Cases 10, 13, and 14 are inserted as examples of the different types included in the group.

CASE 10.—Admitted March 8th, 1897; died March 1st, 1902. Female, æt. 45; single; cousin insane.

History.—Six previous attacks, the first at the age of 21 years. "Excited, noisy, and troublesome; chatters continuously, uses very foul language, and has vague delusions about a blind doctor."

Course.—Soon began to work, but was excitable, unstable, noisy, and foul-mouthed. At times was quarrelsome and impulsive, at others was dull and reticent, and at others worked.

Dura and S.D.: natural; no excess. Pia-arachnoid: very œdematous, and strips like a glove owing to œdema. S.A.: no excess. Vents., Lat.: natural. IV: a few granulations in lateral sacs. Vessels: natural. Slight decrease in size of prefrontal convolutions, chiefly developmental. Encephalon: 1500 grammes. Right hemisphere, unstripped: 645; left hemisphere, unstripped: 678. Right hemisphere, stripped: 612; left hemisphere, stripped: 637.

Cause of death.—Left lobar pneumonia.

CASE 13.—Admitted March 6th, 1901; died March 8th, 1902. Male æt. 26, single; aunt insane.

History.—Had chorea at the age of 13 years. Was always very dull First attack at the age of 15 years, and has done no work for six years. Strayed from home twice eighteen months before admission, and was each time lost for several days. "Depressed, sullen, restless; stares wildly about; obstinate, violent, cunning; a pronounced masturbator."

Course.—Rapidly brightened up and worked well for months; then became dull and depressed and lost flesh (*cf.* p. 336).

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Dura and S.D.: natural; slight excess of fluid. Pia: very œdematous and congested, but otherwise natural, and strips rather more readily than natural. S.A.: no excess. Vents., Lat. and IV, and Vessels: natural. The brain is œdematous. and the prefrontal gyri are small. Encephalon: 1220 grammes. Right hemisphere, unstripped: 530; left hemisphere, unstripped: 530. Left hemisphere, stripped: 520.

Cause of death.—Acute tuberculosis of lungs.

CASE 14.—Admitted December 11th, 1894; died January 17th, 1903. Male, æt. 56, single. No family history.

History.—Previous attack in 1892. Present certificate dated 1893. "Dull and melancholic; says he is pursued and hunted down by a number of men whose voices he hears wherever he is, but whose names he cannot remember."

Course.—Developed ideas of grandeur concerning the possession of property in various counties. Frequently talked to himself. Then he became quiet and well-behaved, but later developed delusions of persecution by electricity and was somewhat aggressive. Developed severe morbus cordis and became dull and depressed, and continued to suffer from auditory hallucinations.

Dura and S.D.: natural; no excess. Pia: natural; strips naturally. S.A.: no excess. Vents., Lat. and IV, and Vessels: natural. Brain: natural, 1600 grammes. Right hemisphere, unstripped: 695; left hemisphere, unstripped: 700. Left hemisphere, stripped: 685.

Cause of death.—Cardiac failure, morbus cordis, and renal cirrhosis.

Series B. Group I. Class 3.

Cases of an Excited or "Moral" Type.

Of the eight cases in this class, seven are women, and five of these are unmarried. The other case, No. 15, is a male, æt. 29, whose mental condition, one of religious exaltation with periods of trance, much resembled "catatonia," as do so many marked cases of hysteria. As full reference will be made to the cases under this class in Part II of the present paper, further remarks here are unnecessary.

Sub-class (a) Hysteria.

In the present series of cases, only one, a male, falls under this category, whereas in Series A there were three females.

CASE 15.—Admitted March 12th, 1900; died March 29th, 1902. Male æt. 29, single. Father insane.

History.—Has done no work for two years, but has been worse for seven months. "Spends his time gazing into vacancy and laughing and

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

muttering to himself. Notices neither surroundings nor neighbours. Does no work, as he takes his directions from the Bible, and does not go to church because he is talked about and his 'absence preferred.' Refuses food."

Course.—In a condition of religious exaltation. Holds communion with God and the dead. Looks as if in a trance. Was fed for months with a tube. Gradually became profoundly depressed and lost flesh rapidly (*cf.* p. 336).

Dura and S.D.: natural; no excess. Pia: natural. The brain is so softened that stripping is almost impossible, but it is natural throughout excepting for œdema. S.A.: no excess. Vents., Lat. and IV, and Vessels: natural. Brain œdematous, 1350 grammes. Right hemisphere, unstripped: 555; left hemisphere, unstripped: 555.

Cause of death.—Acute tuberculosis of the lungs, tuberculous pneumonia and gangrene of the lung.

Sub-class (b) "Excited" Cases.

This sub-class contains three unmarried females, all of whom possessed brains much below the average weight. They were all chronic maniacs who were subject to severe relapses alternating with "sane" intervals.

CASE 16.—Admitted December 21st, 1894. Died September 27th, 1902. Female, æt. 42, single. No family history.

History.—"Very excitable. Undresses herself in the grounds. At times refuses her food and says it is poisoned. Thinks she is coming into a fortune. Tried to commit suicide by holding her head under the cold water tap. Laughs and talks to herself and makes very funny noises."

Course.—A chronic maniac with severe relapses and recoveries. In the former she is excitable, restless, and impulsive, and has auditory hallucinations. In the latter she is quiet and industrious. Frequently washes herself, as she thinks her clothes are infested with vermin. Finally became paraplegic from Pott's disease.

Dura and S.D.: natural; slight excess. Pia: slight fronto-parietal milkiness; little or no thickening; strips rather more readily than natural. S.A.: no excess. Vents., Lat. and IV, and Vessels: natural. Slight fronto-parietal rounding of convolutions; little or no wasting. Encephalon: 1145 grammes. Right hemisphere, unstripped: 490; left hemisphere, unstripped: 490; left hemisphere, stripped: 480.

Cause of death.—Chronic tuberculosis of lungs, large intestine, and vertebral column, with involvement of the cord.

CASE 17.—Admitted May 29th, 1896; died December 27th, 1902. Female, æt. 25, single. No heredity of insanity, but marked stigmata of degeneracy.

History.—"Dull and depressed. Cries when spoken to. Says that impulses come over her so that she does not know what she does.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Screams, shouts, and disturbs the whole place. Lies on the floor and kicks at everything."

Course.—Was in eighteen wards during her residence in the asylum. Excited, unreasonable, restless, troublesome. Required firm treatment. On different occasions recovered and relapsed, smashing, and requiring seclusion.

Dura and S.D.: natural, no excess. Pia: natural, strips naturally. S.A.: no excess. Vents., Lat and IV, and Vessels: natural. Brain simply convoluted, 1035 grammes. Hemispheres of equal weight; unstripped: 440; stripped: 425.

Cause of death.—Cardiac failure; hæmatoporphyrinæmia.

Sub-class (c) "Excited" Cases with Delusions.

Of the four females in this sub-class, two were married. The brains of three were much below the average weight, varying from 1155 to 1180 grammes, and that of the other was much above, weighing 1385 grammes. This last case, No. 22, was an unmarried female, æt. 29, with a heredity of insanity and phthisis, who was depressed and taciturn and suffered from sexual delusions.

CASE 20.—Admitted March 23rd, 1895; died May 8th, 1902. Female, æt. 33, married. No family history.

History.—"Says the devil is burning her with red-hot pokers, that a voice told her her mother was Bishop Cranmer's wife. Thinks her food is poisoned."

Course.—Excited, restless and fidgety, and wild in appearance. At times recovers, becomes very tidy and works; at others is noisy and violent, and suffers from sexual and persecutory delusions, with auditory hallucinations.

Dura and S.D.: natural; slight excess. Pia: natural; strips naturally. S.A.: no excess. Vents., Lat.: natural. IV.: a few small granulations in the lateral sacs. Vessels: natural. Slight underdevelopment of the prefrontal region. Encephalon, 1155 grammes. Right hemisphere, unstripped: 495; left hemisphere, unstripped: 495; right hemisphere, stripped: 490; left hemisphere, stripped: 485.

Cause of death.—Recent tuberculosis of the lungs; chronic dysentery.

Series B. Group I. Class (4).

Epileptics, Imbeciles, and Idiots.

Of the ten cases in this class, three are examples of epileptic insanity without dementia, and of these one, a male æt. 35, was so unstable, violent and dangerous as to require constant treatment by sedatives, though in his lucid intervals he was well-

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

behaved and good-natured. His family were very neurotic. The fits began in these cases between the ages of 21 and 27 years. Of the remaining seven cases, four were imbeciles, one was an imbecile with epilepsy, and two were idiots. The brain-weights of these cases, as they were all of naked-eye normal appearance except in some instances for œdema, afford a striking illustration of the remarks made on page 286. Of the three cases of epileptic insanity the weights of the female encephala were 1220 and 1005 grammes, and of the male 1473 grammes, the former being below and the latter above the average normal. The average weight of those of the four male imbeciles was 1286 grammes, that of the male epileptic imbecile was 1143 grammes, and those of the male and female idiots were respectively 1407 and 1110 grammes.

The following examples, Nos. 26 and 32, are inserted for illustrative purposes, the former being a male idiot and the latter a male imbecile:

CASE 26.—Admitted October 27th, 1900; died February 5th, 1902. Male, æt. 17, single. No family history.

History.—Hurried instrumental labour. In asylums since six years of age. Had a fit at the age of eight years. "Rapid movements of eyes. Bit his hands when in a passion. No appreciation of environment. Does not speak. Cannot attend to himself in any way. Sometimes restless and violent."

Course.—Gibbers and makes grimaces in answer to questions. Strikes grotesque attitudes. Salivates. Regurgitates food and then eats it again. Impulsive. Unable to attend to himself. Habits defective. Gradually lost flesh and died almost a skeleton.

Dura and S.D.: natural; slight excess. Pia: œdematous; a little fronto-parietal milkiness; difficult to strip owing to the extreme œdema of brain and membrane. S.A.: no excess. Vents., Lat.: dilated; ependyma very œdematous. IV.: a few granulations in lateral sacs. Vessels: natural. The brain appears normal apart from œdema, 1407 grammes. Right hemisphere, unstripped: 597; left hemisphere, unstripped: 597; right hemisphere, stripped: 565.

Cause of death.—Tuberculous pneumonia.

CASE 32.—Admitted August 17th, 1896; died April 1st, 1903. Male, æt. 30, single. No family history.

History.—Certified since May, 1895. "Imbecile in manner, speech, and behaviour. Talks to no one, and usually answers questions with a threat. Unoccupied, restless, sleepless. Masturbates. Dangerous."

Course.—Of low intelligence. Says he has never been able to get on as he cannot keep more than one idea in his head at a time. Neglectful of himself. Grins inanely. Memory very deficient. Noisy, restless,

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

and often aggressive. Quite idle. Finally, quite uninterested in his surroundings, and wet and dirty (*cf.* p. 336).

Dura and S.D.: natural. Slight excess. Pia: natural. Strips naturally. S.A.: no excess. Vents., Lat.: natural. IV.: granulations in lateral sacs. Vessels: natural. Pre-frontal gyri small and poorly developed. Encephalon 1375 grammes. Right hemisphere, unstripped: 595; left hemisphere, unstripped: 600; left hemisphere, stripped: 585.

Cause of death.—Acute tuberculosis of lungs, small intestine, and mesenteric glands.

The Heredity of Insanity in Group I.

Of the thirty-two cases in this group family histories were available in eighteen. Of these a psychopathic history existed in twelve, or 66 *per cent.* It is noteworthy that of the five histories available in Class 4 (epileptics, imbeciles, and idiots), in four an hereditary taint existed, and in the case of the fifth (epileptic insanity) the grandfather suffered from paralysis and the maternal grandmother had two fits of "apoplexy."

GROUP II.

The cases in this group are as follows:

	Series A.	Series B.	Total.
(1) Various	2	4	6
(2) Adults with mental confusion	9	3	12
(3) Seniles:			
(*a*) Recent senile cases	7	4	
(*b*) Recurrent senile cases	10 — 24	3 — 13	37
(*c*) Chronic senile cases	7	6	
(4) Chronic and recurrent maniacal adults	3	4	7
(5) Chronic delusional adults	8	11	19
(6) Epileptics	6	9	15
Total	52	44	96

In this group, as in the last, the subdivisions bear the semblance of a scientific classification and, on comparison with the classification of mental diseases given in the introduction, it will be seen that, except as regards classes 1 and 2, class 3 (*a*) and part of class 6, the cases as a whole come under the category of amentia. Further evidence on this point will be brought forward later in the general summary of morbid appearances,

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

when Groups I and II are generally compared with Groups III, IV, and V.

On comparison of Series A and Series B it will be seen that as in Group I, so in the present group, the types are the same, and even the proportions are similar, a fact which shows that the number of cases made use of is amply sufficient for the purpose.

Series B. Group II. Class 1.

Various.

This class includes cases of acute delirium of 8 days' and of acute mania of 17 days' residence respectively; a case of cerebral hæmorrhage after 3 months' residence; and a case of resistive melancholia, which died of tuberculosis after a residence of 9 months. The latter two are selected as examples.

CASE 33.—Admitted March 14th, 1902. Died June 6th, 1902. Female. æt. 52 years. Widow. Fits and paralysis on father's side.

History.—Symptoms for two years. "Memory very weak. Delusions as to where she is and how long she has been here. Rambles incoherently about her family and constantly contradicts herself."

Course.—Dull and confused. Garrulous. Gives an incoherent account of her past life. Speech slurred. Clean in habits. Fell from a chair seriously ill, and died in four days.

Dura and S.D.: natural; no excess. Pia: slightly thickened; strips rather more readily than natural. S.A.: no excess. Vents, Lat.: slightly dilated. IV: natural. Vessels: extremely atheromatous, even to the smallest vessels. No visible wasting of the cerebrum, 1424 grammes. Right hemisphere, unstripped, 614. Left hemisphere, unstripped: 610. Left hemisphere, stripped: 580. In the right hemisphere at the commencement of the Sylvian fissure is a softening due to a moderately recent hæmorrhage affecting the lower and outer part of the orbital surface of the frontal lobe. Further backwards a small older hæmorrhage has occurred into the outer and lower corner of the lenticular nucleus. Just behind the latter is another old hæmorrhage lying between the cortex and white matter at the bottom of the parallel sulcus. Still further back is a relatively large recent hæmorrhage in the posterior part of the optic thalamus.

Cause of death.—Cerebral hæmorrhage. Systemic vascular degeneration and cardiac hypertrophy.

CASE 35.—Admitted August 9th, 1901. Died May 29th, 1902. Male, æt. 34 years, single. No family history.

History.—Previous attack six years ago. "Was standing with his face to the wall and either only muttered or did not answer questions

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

at all. Looks vacantly around him. Very silent and vacant. Often stops for hours with his head under the sheet."

Course.—When spoken to covers his face with his hands and mutters incompleted sentences. Takes no notice of his surroundings and wanders aimlessly about. Extremely resistive to everything done for him. Usually requires tube feeding. At times wet and dirty. At one time gained several pounds in weight under tube feeding, but later rapidly became emaciated (*cf.* p. 336).

Dura and S.D.: natural; moderate excess. Pia: very œdematous. Strips rather more readily than natural. S.A.: slight excess. Vents., Lat.: slightly dilated. IV: œdematous. Vessels: slightly thickened. Prefrontal gyri smaller than normal. Encephalon: 1395 grammes. Right hemisphere, unstripped: 588. Left hemisphere, unstripped: 565.

Cause of death.—Tuberculosis of lungs and intestines.

Series B. Group II. Class 2.

Adults with Mental Confusion.

This class includes three cases of "mental confusion," with a residence in the asylum of days, months, and years respectively. All the cases had a history of alcoholic excess, but all were above the average age of 57 years, and two suffered from degeneration of the cerebral vessels. All three cases are summarised below.

CASE 37.—Admitted May 12th, 1902. Died May 23rd, 1902. Female, æt. 57 years, married. No family history.

History.—History of alcoholic excess. "Totally unconscious of her surroundings. Keeps continually muttering to herself, and fails to understand any questions put to her. Has been shouting and raving continually. Difficult to keep in bed, and filthy in her habits."

Course.—Intensely confused. Mutters incoherently. Very sensitive to touch. Paraplegic. Sore throat and bleeding gums. Septic rash.

Dura and S.D.: natural; marked excess. Pia: thickened and slightly milky. Strips rather more readily than natural. S.A.: slight excess. Vents., Lat.: natural or slightly dilated. IV: natural. Vessels: moderate atheroma. Small prefrontal region. Moderate fronto-parietal wasting. Encephalon: 1060 grammes. Right hemisphere, unstripped: 447. Left hemisphere, unstripped: 440. Left hemisphere, stripped: 415.

Cause of death.—Purulent bronchitis.

CASE 38.—Admitted June 21st, 1902. Died March 2nd, 1903. Male, æt. 61, married. No heredity of insanity.

History.—History of alcoholic excess. "Tells me he is going to the devil at two o'clock to-day. Hears the devil calling him, and says he has been after him for six months. Says people are trying to kill him."

Course.—Very miserable, as he has committed every possible sin.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Sees the devil flitting to and fro and waiting for him. Slowly improved and became brighter, but was still apathetic.

Dura and S.D.: congested. No excess. Pia: some œdema. Slight fronto-parietal milkiness and thickening. S.A.: considerable excess. Vents., Lat.: natural. IV.: lateral sacs very granular. Vessels: natural. Considerable wasting in the prefrontal region and moderate in the first temporal gyrus and the rest of the fronto-parietal region. Encephalon: 1325 grammes. Right hemisphere, unstripped: 575. Left hemisphere, unstripped: 583. Left hemisphere, stripped: 545.

Cause of death.—Cardiac failure and broncho-pneumonia. Vascular degeneration and early renal cirrhosis. Probable systemic syphilis.

CASE 39.—Admitted March 18th, 1895. Died April 10th, 1903. Male, æt. 58, married. Mother intemperate.

History.—History of alcoholic excess. Symptoms two years. Several previous attacks. "Violently excited, shouting, screaming, boasting of the number of asylums he has been in, and threatening to commit suicide. Cries, makes faces, etc."

Course.—Noisy, excitable, impulsive, and very garrulous. At times was very depressed and refused food. Continued very unstable, emotional, and restless, and constantly talked to himself. Alternated between excitement and depression till death.

Dura and S.D.: natural; some excess. Pia; a little thickening, chiefly in the fronto-parietal region. S.A.: some excess. Vents., Lat.: somewhat dilated. IV.: lateral sacs very granular. Vessels: a little patchy, early atheroma, and some irregular dilatation. Prefrontal gyri small. A little wasting in the first temporal gyrus and in the fronto-parietal region. Small superficial softenings on the orbital surfaces of the frontal lobes and on the tips and the under surfaces of both temporo-sphenoidal lobes. Encephalon: 1200 grammes. Right hemisphere, unstripped: 520. Left hemishere, unstripped: 515. Right hemisphere, stripped: 495.

Cause of death.—Chronic ulcerative dysentery. Vascular degeneration and cerebral softening.

Series B. Group II. Class 3.

This class includes 13 senile cases, which are divided into recent, recurrent, and chronic sub-classes.

Sub-class (a).

Recent Senile Cases.

Of the four senile cases in this sub-class, all appear to be recent; one died during the acute stage of the attack, two improved and relapsed, and one continued unimproved, all three dying after a residence of months. In all the last three

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

cases some degeneration of the cerebral vessels existed. In all the cases mental confusion was a prominent feature.

CASE 41.—Admitted October 4th, 1901. Died July 5th, 1902. Female, æt. 73, widow. No heredity of insanity.

History.—Double senile cataract. Fell down the workhouse stairs some time ago and has been light-headed ever since. "Thinks people are constantly following her about. At times quite lost in her mind, not knowing what she is doing. Violent, and throws things about."

Course.—Resistive and troublesome. Thinks she is persecuted and followed, and suffers from auditory hallucinations. Simple-minded. Became quieter, clean, and tidy. Memory fair. Ideas of suspicion. Then developed illusions of identity, and thought her daughter was dead, and wanted to attend her funeral.

Dura and S.D.: thickened; slight excess. Pia: considerably thickened; little or no milkiness; strips fairly readily. S.A.: slight excess. Vents., Lat.: slightly dilated. IV.: granulations in lateral sacs. Vessels: slightly thickened. Wasting is fairly marked in the prefrontal region, less in the parietal lobules and first temporal gyrus, still less in the motor area, and least in the rest of the cerebrum. Encephalon: 1205 grammes. Right hemisphere, unstripped: 515. Left hemisphere, unstripped: 510. Left hemisphere, stripped: 470.

Cause of death.—Broncho-pneumonia; chronic disseminated tuberculosis of lungs; morbus cordis; empyema of appendix.

Sub-class (b).

Recurrent Senile Cases.

The three cases in this sub-class, although in two instances vascular degeneration exists, differ entirely from the cases in the last category in the general absence of mental confusion and in the fact that such cerebral lesions as are present are of local vascular origin. Nos. 45 and 46 are inserted as types. In the former, mental hebetude followed vascular lesions after recurrences of insanity for thirty years; in the latter a similar result occurred after several years of chronic insanity.

CASE 45.—Admitted February 26th, 1900. Died November 6th, 1901. Female, æt. 75, widow. No family history.

History.—First attack at the age of 45 years. Several during 1893–5. "Rambling and incoherent. Thinks a roof is a green field and that chimney-pots are people walking about. Strange in manner. Sews rags together, etc. Stores rubbish."

Course.—Cannot give a rational account of her past life. Depressed, visual hallucinations, memory impaired. Talkative. Decorates herself with rubbish. Once for a few weeks was dull and stupid and dirty in habits and then brightened up, but had ceased to care for her personal

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

appearance. Continued to alternate from depression to excitement and to collect rubbish.

Dura and S.D.: thickened, and adherent to skull-cap on left side; considerable excess. Pia: a number of scattered recent extravasations of blood; slight fronto-parietal milkiness; considerable œdema; strips fairly readily in fronto-parietal region and naturally elsewhere. S.A.: considerable excess. Vents., Lat.: little or no dilatation. IV.: granulations in lateral sacs. Vessels: dilated, and a little atheromatous. A little local wasting of vascular origin. Encephalon: 1195. Right hemisphere, unstripped: 525. Left hemisphere, unstripped: 515. Right hemisphere, stripped: 495. Left hemisphere, stripped: 485.

Cause of death.—Broncho-pneumonia. Gross vascular degeneration, with secondary morbus cordis.

CASE 46.—Admitted December 11th, 1894. Died November 1st, 1901. Female, æt. 62, widow. No family history.

History.—Previous attack in 1891. "Obstinately silent. Stares vacantly around. Indifferent to her surroundings. Assumes grotesque attitudes. Cannot attend to her own wants. Never well since last attack. Thinks she is to marry the family doctor. At times hears voices."

Course.—Intense pseudo-hallucinations of hearing. Soon began to work well, and as a rule was pleasant and friendly, but was inclined to be sullen at times. Continued to think that she was to be married to the doctor. During the past two years of her life was quiet and somewhat dull, and worked in the needleroom.

Dura and S.D.: natural; moderate excess. Pia: little or no thickening; many blood extravasations on the fronto-parietal region of the left hemisphere, and scattered everywhere over the right hemisphere; strips rather more readily than natural. S.A.: slight excess. Vents., Lat.: right exceedingly dilated, especially in the posterior half, which is brown and scarred from old-standing softening; left natural. IV.: a few granulations in the lateral sacs. Vessels: well-marked atheroma. In the hinder part of the right superior parietal lobule is a patch of softening which is not of recent date. Encephalon: 1300 grammes. Right hemisphere, unstripped: 535. Left hemisphere, unstripped: 545. Right hemisphere, stripped: 515. Left hemisphere, stripped: 525.

Cause of death.—Cardiac failure. Acute pleurisy and collapse of left lung. Very gross arterial degeneration.

Sub-class (c).

Chronic Senile Cases.

This sub-class contains six chronic lunatics with very little dementia. It is noteworthy that all are considerably above the average age of 57 years, and that only one, æt. 70, exhibits naked-eye degeneration of the cerebral vessels, and in this case it is slight. These cases showed a general absence of mental confusion and very little dementia, and the normal

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

condition of the cerebral vessels is noteworthy in this connection. In two cases the brains are very large, a male weighing 1645 grammes and a female 1480 grammes, and in two they are small, weighing only 1100 grammes each.

CASE 49.—Admitted April 9th, 1896; died January 6th, 1903. Female, æt. 67, widow. No family history.

History.—"Expression dreadfully depressed. Continually groans and cries. Sleepless, and says 'They are all lost,' and wrings her hands. Wants to be killed. Refuses food."

Course.—Restless, depressed, moans "Oh, dear!" Thinks people are against her. Wanders about. Very apprehensive. Tries to strangle herself. Has auditory hallucinations. Destructive, and knocks herself about a good deal. Frequently defective in habits.

Dura and S.D.: natural; slight excess. Pia: considerable œdema; moderate thickening; slight fronto-parietal milkiness. S.A.: slight excess. Vents., Lat.: slightly dilated. IV.: natural. Vessels: natural. Wasting obscured by œdema. It is present in the fronto-parietal, but most marked in the pre-frontal region. Encephalon: 1095 grammes. Hemispheres, unstripped: 470, equal. Left hemisphere, stripped: 453.

Cause of death.—Tuberculosis of the lungs.

CASE 51.—Admitted November 4th, 1893; died November 14th, 1901. Female, æt. 67. No family history.

History.—Certified since January, 1888. "Thinks certain people introduce substances or gases of a noxious nature into her body, and says that these give out a vile stench and produce fatal effects if inhaled for any length of time. Peculiar in manner. A man came out of the wall of her bedroom and talked to her both day and night. The man finally 'gassed' her, and poisoned her whole system."

Course.—Marked delusions of persecution. People in the street were able to pull her flat down by taking hold of her feet. Quiet and well behaved, but of uncertain temper. Occasionally worked. Then became untidy and resistive, and constantly talked to unseen people. Finally, after an attack of dulness with faulty habits, she brightened up and worked in the needle-room. Was most incoherent, and at intervals became noisy and troublesome.

Dura and S.D.: natural; slight excess. Pia: slightly thickened. Strips readily except at the occipital pole and on the under surface of the temporo-sphenoidal lobe. S.A.: No excess. Vents., Lat.: little or no dilatation. IV.: a few granulations in the lateral sacs. Vessels: natural. Wasting absent. Encephalon 1480 grammes. Right hemisphere, unstripped, 645. Left hemisphere, unstripped, 640. Right hemisphere, stripped, 623. Left hemisphere, stripped, 612.

Cause of death.—Cardiac failure. Organs healthy, but very wasted.

Series B. Group II. Class 4.

Recurrent and chronic maniacal adults.

This class contains four ordinary chronic maniacal female adults. The cerebral vessels were natural and the brains of

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

two were of normal weight, and of the other two were much below the normal weight. Nos. 54 and 55 are inserted as illustrative examples, the former of the general type of case and the latter to illustrate the influence of tuberculosis.

CASE 54.—Admitted February 26th, 1898; died October 30th, 1902. Female, æt. 50, single. Father intemperate and died of paralysis. Mother died of cancer.

History.—Symptoms, two years. "Refuses food. Thinks she is watched and accused of things that she is not guilty of. Is suspicious of being poisoned."

Course.—Confused and incoherent, and slow in answering questions. Auditory hallucinations. Improved, but later was violent owing to her hallucinations. Then varied from improvement to violence, and constantly complained of ill-usage. Was in thirty-four wards during her residence in the asylum.

Dura and S.D.: natural; large excess. Pia.: much œdema. Very little thickening. Strips rather more readily than natural. S.A.: large excess. Vents., Lat.: little or no dilatation. IV.: a few granulations in the lateral sacs. Vessels: natural. Some general wasting, which is most marked in the pre-frontal region and next in the first temporal gyrus and the parietal lobules. Encephalon 1070 grammes. Hemispheres: 453, equal. Left hemisphere, stripped: 423.

Cause of death.—Exhaustion of acute parotid abscess. Pneumonia.

CASE 55.—Admitted March 30th, 1899. Died December 6th, 1901. Female, æt. 47, widow. Paternal cousin suffered from fits.

History.—Symptoms for eight months: "Is raving and talking to imaginary people. Hears voices, and tears up her clothes."

Course.—Noisy, restless, and resistive. Strips off her clothing, and refuses her food; apprehensive; incoherent; has auditory hallucinations; then became quiet and well-behaved, but solitary in her habits. Finally was dull and stupid, and rarely spoke or occupied herself (*cf.* p. 336).

Dura and S. D.: somewhat opaque; excess. Pia.: little or no opacity; no thickening; strips readily, except lower temporo-sphenoidal region and occipital pole, where it strips naturally. S. A.: no excess. Vents., Lat. and IV, and Vessels: natural. A small amount of generalised wasting. Encephalon: 1165 grammes. Right hemisphere, unstripped: 495. Left hemisphere, unstripped: 490. Right hemisphere, stripped: 482. Left hemisphere, stripped: 477.

Cause of death.—Tuberculosis of the lungs.

Series B. Group II. Class 5.
Chronic Delusional Adults.

This class contains eleven chronic delusional adults. The three males all have brain-weights above the average and normal cerebral vessels. Of the eight females, only one brain

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

is above the average weight and the other seven are much below. In two the cerebral vessels are degenerated, in one moderately, and in the other severely. The cases as a whole are of the usual types. The following are inserted as illustrative examples:

CASE 62.—Admitted August 3rd, 1894. Died February 20th, 1902. Female, æt. 50, married. Father insane. Mother epileptic.

History.—Previous attack in 1893, and symptoms, following a dog-bite, for two years before this. "Delusions and hallucinations of persecution by electric wires and telephones in her abdomen and connected with her heart. Electricity is flashed in her face. Hears them laughing and talking loudly. Has seen them in a machine which floats like a balloon in the air."

Course.—Memory good. Auditory hallucinations, and delusions about electric wires and telephones. Denies these in order to get home, but is seen to reply to voices. On trial for a month in 1895. Continued unchanged, but was reticent about her delusions. In 1900 had a right-sided convulsion, after which her memory became somewhat impaired. Permanent paresis of the right arm and leg resulted.

Dura and S. D.: natural; considerable excess. Pia: some fronto-parietal milkiness; strips rather more readily than natural in fronto-parietal region, and first temporal gyrus, and almost naturally elsewhere. S. A.: slight excess. Vents., Lat.: somewhat dilated. IV: granulations in lateral sacs. Vessels: moderate atheroma of basilar artery. Encephalon: 1155 grammes: right hemisphere, unstripped: 505; left hemisphere, unstripped, 515; right hemisphere, stripped: 475; left hemisphere, stripped, 485. Considerable fronto-parietal diminution. An old softening in the floor of the left lateral ventricle.

Cause of death.—Hæmorrhage into left pleural cavity from rupture of an aortic aneurism. Recent pericarditis. Old-standing mitral stenosis.

CASE 67.—Admitted October 21st, 1893. Died May 28th, 1903. Male, æt. 59, married. Eldest brother and two cousins insane.

History.—Certified since 1887 and a previous attack fourteen years earlier. "Excited, and thinks that there is a conspiracy against him, to which the relieving officer is a party; is suspicious, and refuses his food."

Course.—Exalted, simple-minded, memory fair. Suspicious. Ideas of persecution. Then was quiet and happy, and employed in the mess-room. Rather unstable and eccentric, and better in the asylum than outside. Poisonous fumes are blown into the asylum, and he continually opens windows to let them out. A year before his death he relapsed and was restless and troublesome, and afterwards slowly became more childish.

Dura and S. D.: natural; some excess. Pia: some fronto-parietal thickening and œdema. S.A.: slight excess. Vents., Lat.: natural. IV.: granulations in the lateral sacs. Vessels: natural. Pre-frontal gyri small. Slight general wasting. Encephalon: 1440 grammes.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Right hemisphere, unstripped: 630. Left hemisphere, unstripped: 625. Left hemisphere, stripped: 600.

Cause of death.—Right lobar pneumonia and pleural effusion. Morbus cordis.

Series B. Group II. Class 6.

Epileptics.

Of the nine patients in this class, one female and two males were somewhat feeble-minded congenitally, and the remaining three females and three males were ordinary epileptics with relatively little dementia. The vessels are natural in each case and the brains as a whole are of good weight. Three cases, an ordinary epileptic (No. 70), a case stated to be due to trauma (No. 75), and a patient who was congenitally feeble-minded (No. 76), are inserted.

Epileptic Insanity.

CASE 70.—Admitted October 9th, 1897. Died December 9th, 1901. Female, æt. 32, married. Father died insane.

History.—Fits since the age of 21, occurring chiefly during menstruation. "Very nervous and strange. Says a fit brought on by medicine sent her out of her mind. Does not remember where she lived. Thinks she heard her husband's voice when she was downstairs. Restless and noisy and very violent. Thinks she hears and sees her husband. Is incoherent and destructive, and at times refuses her food."

Course.—Confused and dull after fits. Very unstable, and liable to acute mania with auditory hallucinations. Has a few fits each month, and, after a series, becomes excited and restless with delusions of persecution.

Dura and S. D.: natural; no excess; thin recent film, most marked on right vertex. Pia: slightly thickened; strips rather more readily than natural, except on the under surface of the temporo-sphenoidal lobe. S.A.: no excess. Vents., Lat. and IV, and Vessels: natural. Prefrontal gyri small. A small amount of general wasting. Encephalon: 1275 grammes. Right hemisphere, unstripped: 565. Left hemisphere, unstripped: 560. Right hemisphere, stripped: 545. Left hemisphere, stripped: 540.

Cause of death.—Morbus cordis (button-hole mitral). Chronic dysentery, nearly healed.

Epileptic Insanity following Trauma.

CASE 75.—Admitted December 13th, 1900. Died October 16th, 1902. Male, æt. 56, married. Mother suffered from asthma.

History.—Injured the left side of his head by a fall at the age of 21 and since then has been deaf on that side. Later again fell on his head and had fits, which continued until 1888. Previous attacks of insanity in 1893, 1894, and 1899. Present illness began by a series of fourteen

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

fits, after which he was stuporose for two days, and then so excited as to require removal. "Dazed. Rambling and hesitant in his statements. Says he was driving a cab this morning and had an accident. Has a number of unreasonable dislikes. Violent since admission, and has had a fit."

Course.—Lost, vacant, mental reaction slow. Rubs his hands together. Then in a few weeks became brighter. Had only one fit in the asylum, but at times was very excited.

Dura and S.D.: natural; some excess. Pia: some thickening in the fronto-parietal region; strips rather more readily than natural. S.A.: no excess. Vents., Lat.: natural. IV: lateral sacs granular. Vessels: natural. Prefrontal gyri small. Little or no wasting. A few small mouse-eaten softenings on the outer side of the right temporo-sphenoidal lobe and on the orbital surface of the frontal lobes. Encephalon: 1415 grammes. Right hemisphere, unstripped: 625. Left hemisphere, unstripped: 620. Left hemisphere, stripped: 590.

Cause of death.—Cardiac failure; right pleurisy, with effusion and collapse of lung; morbus cordis.

Epileptic Insanity in High-grade Amentia.

CASE 76.—Admitted January 25th, 1900. Died February 9th, 1903 Male, æt. 31, single. Maternal uncle died of paralysis. Father intemperate.

History.—Epileptic fits since 6 years of age. Symptoms during the past five years. "Very weak-minded and childish in talk and manner. Bad recent memory. Frequent and violent fits."

Course.—Dazed and confused. Articulates badly. A fit within twenty minutes of admission. At times impulsive. Had frequent and severe fits.

Dura and S.D.: natural; much excess. Pia: very little thickening; marked fibrosis of small vessels. S.A.: no excess. Vents., Lat.: moderately dilated. IV: natural. Vessels: natural. Prefrontal gyri small. Encephalon: 1305 grammes. Right hemisphere, unstripped: 570. Left hemisphere, unstripped: 575. Left hemisphere, stripped: 560.

Cause of death.—Acute ulcerative dysentery; chronic tuberculosis of lungs.

Heredity of Insanity in Group II.

Of the 44 cases included in this group, family histories were available in 20 instances, and of these 10, or 50 *per cent.* exhibited a psychopathic heredity. The only history available in Class 3 (*b*) (recurrent seniles) was positive, and 5 of 8 histories in Class 5 (chronic delusional adults) were positive. On the other hand, the two available histories in Class 2 (primarily toxic confusions), and the one in Class 3 (*a*) (recent seniles) were all negative. Though the number of available cases is small, these results are suggestive, and may be usefully compared

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

with those already published in the corresponding classes of Series A.

GROUP III.

The cases in this group are as follows:—

	Series A.	Series B.	Total.
(1) Cases beginning, or with first attack, between 16 and 25 years.	3	4	7
(2) Cases beginning, or with first attack, between 26 and 40 years.	11	15	26
(3) Cases beginning, or with first attack, between 42 and 56 years.	13	14	27
(4) Cases beginning, or with first attack, between 57 and 70 years.	10	10	20
(5) Cases beginning, or with first attack, after 70 years of age	7	2	9
(6) Epileptics.	7	3	10
(7) Cases with age of incidence of attack unknown	—	2	2
Total	51	50	101

The cases in this group are classified according to the age of incidence of the first attack of insanity, as this method, in such a mixed series of moderate dements, appears to be on the whole less open to objection than would have been one founded on an etiological or a clinical basis. In this grouping Class I. contains chiefly the dementias of prematurity, *i.e.* puberty and adolescence (dementia præcox), Class 2 the dementias of maturity, Class 3 the dementias of presenility (climacteric), and Classes 4 and 5 the dementias of senility. The latter three classes of patients would probably as a whole, had they lived, have rapidly or slowly passed into Groups IV. and V., which groups also include a larger or smaller number of long-standing cases of mental disease which at one time belonged to Group III., Classes 1 and 2.

A comparison of Series A and Series B shows, as in the previous groups, a close similarity in the general incidence of cases in the different classes.

Series B. Group III. Class 1.

Age of Incidence between 16 *and* 25 *Years.*

This class contains four cases, of which one appears to have been somewhat feeble-minded congenitally, whilst the others

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

developed their first attack at the ages of 20-25 years. The cerebral vessels are natural and the brains are of good weight, that of the female weighing 1240 grammes, and those of the males weighing from 1310 to 1495 grammes, in spite of the existence of cerebral wasting. The heaviest brain of the series (No. 80) also showed slight microgyria.

CASE 77.—Admitted August 29th, 1893. Died February 9th, 1902. Female, æt. 41, married. Family excitable and irritable.

History.—Three of seven children died in convulsions, and one had a harelip. Youngest child 11 months old. Previous attack in 1885. "Hears neighbours saying things about her. Says they watch and worry her. Is very excitable, mutters, and is of dirty habits."

Course.—Laughs and mutters to herself and answers questions inconsequently. Became noisy, destructive, obscene, and violent, and required sedatives. At times smashed. Finally was unoccupied, slovenly, silly, and erotic, and masculine in behaviour and appearance. Had a giggling laugh, and a general lack of intelligence and impaired memory.

Dura and S.D.: natural; moderate excess. Pia: considerable œdema; slight fronto-parietal milkiness and some thickening; strips readily throughout. S.A.: little or no excess. Vents., Lat. and IV, and Vessels: natural. Slight prefrontal wasting and relatively little elsewhere; the wasting is probably much obscured by the œdema. Encephalon: 1240 grammes. Right hemisphere, unstripped: 535. Left hemisphere, unstripped: 525. Right hemisphere, stripped: 520. Left hemisphere, stripped: 510.

Cause of death.—Exhaustion and cardiac failure.

CASE 80.—Admitted October 5th, 1901; died January 23rd, 1903. Male, æt. 31, single. No family history.

History.—Previous attack at the age of 20. "Delusion that people are coming to murder him. Fancies that he has taken some foul disease from a water-closet."

Course.—Feeble-minded, restless, irrelevant in his replies to questions; mischievous; masturbates. Does a little work. Finally childish, simple-minded, impulsive, and often noisy.

Dura and S.D.: natural; moderate excess. Pia: slightly thickened; strips readily. S.A.: slight excess. Vents., Lat., IV, and Vessels: natural. Slight microgyria of the middle third of the first and second frontal gyri and of the greater part of the posterior third of the hemispheres. Encephalon: 1495. Right hemisphere, unstripped: 635; left hemisphere, unstripped: 650. Left hemisphere, stripped: 620.

Cause of death.—Dysentery—a severe atttack which has disintegrated almost the whole mucous membrane of the large intestine.

Series B. Group III. Class 2.

Age of Incidence between 26 and 39 Years.

This class includes 15 chronic lunatics, of whom 12 are females and 3 are males. Three females and 1 male were

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

primarily confused cases of alcoholic origin, and the rest were practically all chronic delusional cases with moderate dementia. No less than 11 of the 15 died of tuberculosis, and the variation in the mental condition which occurs during the alternate improvements and relapses in sufferers from this disease are well shown in the examples cited (Nos. 86 and 89). One case with a history of alcoholic excess, No. 92, who died from the secondary results of venereal disease, is also inserted, as such marked vascular degeneration rarely occurs in a patient of 48 years of age unless there is a history of alcoholic excess, syphilis, or both.

Nine females and two males have brains somewhat below the average weight, but, allowing for the wasting which has occurred, it is probable that in only one case, No. 92, was the weight of the brain originally much below the average.

CASE 86.—Admitted February 13th, 1894; died March 31st, 1902. Female æt. 36, single. No family history.

History.—"Says that every person who walks past her affects her stomach in a peculiar manner. Feels electricity passing through her. Hears her friends say all sorts of queer things about her. The voices prevent her from sleeping."

Course.—Improved rapidly during the spring, but in autumn became dull, silent, and depressed; then became incoherent and her memory and perception were much impaired; finally was silent and kept her mouth covered, and was morose and indifferent to her surroundings. Wet and dirty in habits unless constantly supervised (*cf.* p. 336).

Dura and S.D.: natural; moderate excess. Pia: relatively little thickening; strips readily in the fronto-parietal region and rather more readily than natural elsewhere, except at the occipital poles, where it strips naturally. S.A.: slight excess. Vents., Lat.: somewhat dilated; IV: a few granulations in the lateral sacs. Vessels: natural. Wasting most marked in the prefrontal region, and moderate elsewhere, except at the occipital pole, where it is absent. Encephalon: 1210 grammes. Right hemisphere, unstripped: 535; left hemisphere, unstripped: 530. Right hemisphere, stripped: 515; left hemisphere, stripped: 510.

Cause of death.—Tuberculosis of the lungs, left kidney, and other parts.

CASE 89.—Admitted May 21st, 1894; died January 18th, 1902. Female, æt. 48, married. Aunt, brother, and sister insane. Sister phthisis.

History.—Previous attacks in 1882 and 1893–4. "Will not move. Sits motionless. Resists every attempt to move her. Does not speak or answer questions. Refuses food and has to be fed."

Course.—Depressed, heavy, stupid, and resistive. Wet and dirty.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Then became bright, cheerful, clean, tidy, and industrious; then had several relapses. In each was at first sane, and then stuporose, with restless and purposeless movements and defective habits. Was at times very noisy and excited. Finally became quiet and depressed, but was subject to attacks of excitement. She was unoccupied and her memory was impaired (*cf.* p. 336).

Dura and S.D.: natural; moderate excess; thin, transparent film on both vertices. One or two blood-flakes in right anterior fossa. Pia: a few small subpial extravasations on posterior part; much œdema; strips readily except at occipital pole. S.A.: no excess. Vents., Lat.: slightly dilated; IV: a few granulations in the lateral sacs. Vessels: natural. Left hemisphere more simply convoluted than right. Wasting most marked in prefrontal region, and moderate in motor area, first temporal gyrus, and superior parietal lobule. Encephalon: 1205 grammes. Right hemisphere, unstripped: 515; left hemisphere, unstripped: 510. Right hemisphere, stripped: 490; left hemisphere, stripped: 486.

Cause of death.—Chronic tuberculosis of lungs and intestines.

CASE 92.—Admitted September 27th, 1897. Died October 18th, 1901. Female, æt. 48, widow. No family history.

History.—Previous attack from 1893 to 1896. "Talks excitedly, continuously, and rapidly. Will laugh vacantly at nothing at all. Conversation is at times incoherent. Very troublesome and restless. Ravenous. Sometimes wild or violent."

Course.—Very confused and vacant. Peculiar staring appearance. Sees faces in the dark and used to hear voices. Owns to alcoholic intemperance. Then became wild in behaviour and exposed and abused herself; then was cleaner and worked a little. She later had several relapses, and lastly was noisy, impulsive, excitable, obscene, and of dirty habits. Three weeks before her death she lost the use of her left side.

Dura and S.D.: natural; considerable excess. Pia: slight fronto-parietal milkiness and thickening; strips readily in this region, and rather more readily than natural elsewhere. S.A.: slight excess. Vents. Lat.: in the floor of the anterior horn of the left are a number of small superficial softenings; little or no dilatation; right natural. IV.: markedly granular in lateral sacs. Vessels: all extremely calcareous, but especially the cortical arteries. In the left hemisphere the prefrontal and lower midfrontal convolutions are in a condition of chronic wasting, associated with severe degeneration of the middle cerebral artery. The condition is less obvious in the surrounding parts of the hemisphere. In the right hemisphere a softening, not of recent date, exists in the distribution of the lenticulo-striate artery. Encephalon: 1095. Hemispheres, unstripped equal: 470. Right hemisphere, stripped: 450. Left hemisphere, stripped: 448.

Cause of death.—Double pyosalpinx, with rupture of that on the left side. Gross vascular degeneration and renal cirrhosis. Marked hypertrophy of left ventricle.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Series B. Group III. Class 3.
Age of Incidence between 42 and 56 Years.

This class includes six male and eight female chronic lunatics with moderate dementia. Four of the cases suffered from delusions, and in the remainder the chief symptom was mental confusion, one of them, No. 103, being a severe example of confusion of alcoholic origin and suffering from peripheral neuritis. The age of the patient and the degeneration of the cerebral vessels which was present made this case a mixed one, and although the patient only resided in the asylum for six weeks it is probable that the disease was of a chronic nature.

The causes of death were numerous and thus differ from those of Class 2. In only one case was the brain-weight below 1100 grammes, and in eight cases there was slight or moderate degeneration of the cerebral vessels. Several of the cases, had they lived, would, on clinical grounds, have become more demented and passed into Groups IV and V.

CASE 99.—Admitted May 22nd, 1894. Died March 5th, 1902. Female, æt. 63, widow. Eldest daughter insane.

History.—Many previous attacks since 1890. "Thinks people follow her about and get on the roof of the house and talk and prevent her from sleeping at night. Sees faces and figures on the ceiling."

Course.—Stupid, vacant, confused. Hallucinations of hearing; then improved, and a year later suddenly relapsed and became the Dowager Duchess of Sutherland and acted the part; then again improved and relapsed several times; finally became dull and semi-stuporose as the physical disease progressed.

Dura and S.D.: natural; much excess. Pia: fronto-parietal opacity and some general thickening; strips readily. S.A.: considerable excess. Vents., Lat.: natural. IV: a few granulations in the lateral sacs. Vessels: moderately atheromatous. Moderate wasting, obscured by œdema, in fronto-parietal region. Encephalon: 1258 grammes. Right hemisphere, unstripped: 545. Left hemisphere, unstripped, 540; right hemisphere, stripped: 514. Left hemisphere, stripped: 510.

Cause of death.—Secondary columnar epithelioma. Primary source in either uterus or vagina.

CASE 103.—Admitted November 8th, 1901; died December 21st, 1901. Female, æt. 58. No heredity of insanity.

History.—Has drank heavily for six months. "Ideas of time, place and dates are quite confused. Hallucinations of hearing and vision. Rambling and incoherent, and unable to take care of herself."

Course.—Peripheral neuritis. Very tremulous. Vacant, dazed, con-

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

fused. Auditory and visual hallucinations. Then very restless and could hardly be kept in bed. Dirty in habits. Took food fairly well.

Dura and S.D.: somewhat thickened; marked excess. Pia.: a little generalised milkiness. Strips very readily in fronto-parietal region, and readily elsewhere. S.A.: excess. Vents., Lat.: slightly dilated. IV.: numerous fine granulations in the lateral sacs, and also lying scattered in the upper half of the ventricle. Vessels: moderate basal atheroma. Much wasting in pre-frontal region, considerable in fronto-parietal, slight elsewhere. Encephalon: 1198 grammes. Right hemisphere, unstripped: 515. Left hemisphere, unstripped: 520. Right hemisphere, stripped: 485. Left hemisphere, stripped: 491.

Cause of death.—Pneumonia. Emphysema. Cardiac hypertrophy.

CASE 105.—Admitted June 6th, 1899; died March 26th, 1902. Male, æt. 48, single. Father died insane.

History.—Had gonorrhœa ten years ago. Denies syphilis, but has pigmented scars on legs. "No sense of decency. Dirty in habits. Eats out of refuse pail. Fills his pockets with all kinds of rubbish and steals everything he can get hold of."

Course.—Foolish and childish and indifferent to his surroundings. Had choreic movements of the head, hands and feet. Then improved, and worked well for a time, but afterwards became vacant, slovenly and dull, with a very impaired memory.

Dura and S.D.: natural; great excess. Pia.: thickened and opaque. Is œdematous and less thickened on the lower temporo-occipital region. Strips very readily. S.A.: considerable excess. Vents., Lat.: dilated and a little granular. Choroid cystic. IV.: natural. Vessels: apparently natural. Right hemisphere: wasting is considerable in prefrontal region; almost as marked in Broca's convolution, the first temporal gyrus, and the inferior parietal lobule; less marked in the rest of the motor area and the superior parietal lobule; least marked in the remainder of the hemisphere, but practically absent at the occipital pole and on the internal temporo-occipital region. Left hemisphere: less marked wasting. Encephalon: 1190 grammes. Right hemisphere, unstripped: 495. Left hemisphere, unstripped: 500. Right hemisphere, stripped: 465. Left hemisphere, stripped: 465.

Cause of death.—Rupture of aneurism of arch of aorta into right bronchus. Systemic syphilis.

Series B. Group III. Class 4.
Age of Incidence between 57 and 70 Years.

This class contains 10 senile cases, of whom 7 are females and 3 are males. The duration of the mental disease varied from 1½ to 9 years. Six of the cases showed naked-eye atheroma of the cerebral vessels, and this was slight in 3, moderate in 2, and severe in 1. The majority of these cases were of a very slow type and would probably have taken years to pass into later groups.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

CASE 114.—Admitted November 14th, 1893; died February 20th, 1902. Female, æt. 72, married. Brother insane.

History.—"Dull and stupid-looking. Will not answer a single question. Delusions of following and annoying. Melancholic. Quite unmanageable."

Course.—Sullen, resistive, aggressive. Wants her rights. Has a habit of moving her right hand as if turning a barrel-organ, and of holding the other hand over her face. Now and then clasps her hands and hits the air. Continued unchanged for years, and then had visual hallucinations and frequently brushed away "spirits" with her hand. Continued restless and noisy and kept up the "winding" movements till within a few weeks of her death.

Dura and S.D.: natural; moderate excess. Pia.: moderate fronto-parietal milkiness and considerable general thickening. Strips very readily in the fronto-parietal region and readily elsewhere. S.A.: considerable excess. Vents., Lat.: moderately dilated. IV.: a few faint granulations in the lateral sacs. Vessels: moderate patchy atheroma. Wasting: most marked in pre-frontal region, next in rest of frontal lobe, superior parietal lobule and first temporal gyrus, next in inferior parietal lobule and outer temporal and pre-occipital regions, and least elsewhere. Encephalon: 1195 grammes. Right hemisphere, unstripped: 518. Left hemisphere, unstripped: 510. Right hemisphere, stripped: 493. Left hemisphere, stripped: 490.

Cause of death.—Exhaustion and cardiac failure. Chronic ulceration of ileum, the probable remains of former dysentery. Renal cirrhosis.

Series B. Group III. Class 5.

Cases beginning after the Age of 70 Years.

This class contains two females in whom the attack commenced at the ages of 75 and 84 years respectively. Both cases have a heredity of insanity, and the latter also has a history of alcoholic excess. In both cases the brains, allowing for the wasting, were of good weight, the stripped hemispheres weighing respectively 475 and 500 grammes; and in both there was considerable degeneration of the cerebral arteries. In No. 120, which is inserted below, a local vascular lesion existed.

CASE 120.—Admitted October 28th, 1901. Died May 28th, 1902. Female, æt. 86, widow. Father died insane at the age of 60; mother and son paralysed.

History.—Intemperate. Symptoms twelve months. Fell four weeks ago and partially lost her speech. "Incoherent, garrulous, and noisy. Talks incessantly the most absurd rubbish. Has attempted suicide."

Course.—Confused, repeats her words. Deaf. Often weeps. Improved somewhat, but rarely spoke coherently.

Dura and S.D.: thickened; generally adherent; marked excess;

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

thin film scattered over the base, especially on the left side. Pia: thickened and opaque in fronto-parietal region; natural elsewhere. Strips readily in the fronto-parietal region and naturally elsewhere. S.A.: some excess. Vents., Lat.: right moderately dilated; left much dilated. IV.: a few granulations in the lateral sacs. Vessels: some atheroma; considerable fibrosis, especially of the smaller vessels. In the left hemisphere is an old softening in the distribution of the postero-inferior branches of the middle cerebral artery. Encephalon: 1170 grammes. Right hemisphere, unstripped: 505. Left hemisphere, unstripped: 475. Right hemisphere, stripped: 475.

Cause of death.—Cardiac failure. Cardio-vascular degeneration. Atrophous emphysema. General fibrosis of viscera.

Series B. Group III. Class 6.

Epileptics.

This class includes 3 epileptics suffering from moderate dementia. Of these 1 was an adult with epileptiform attacks and the other 2 were senile cases with epileptic fits and degeneration of the cerebral vessels. There is a marked contrast in the weights of the brains of the two cases cited.

CASE 122.—Admitted February 27th, 1894. Died February 18th, 1903. Female, æt. 40, married. Mother intemperate.

History.—Intemperate. Convulsion six months ago. "Dull, apathetic, never speaks unless spoken to. Indifferent to surroundings. Memory a blank. Lost to time and place. Cannot attend to his own wants."

Course.—Ideation slow. Memory much impaired. Often wet and at times dirty. Later frequently had epileptiform attacks affecting the right side.

Dura and S.D.: natural; large excess. Pia: some fronto-parietal milkiness and a few blood extravasations. S.A.: slight excess. Vents., Lat.: slightly dilated. IV.: granulations in lateral sacs. Vessels: natural. Prefrontal gyri small; moderate wasting in fronto-parietal region and in first temporal gyrus. Encephalon: 965. Hemispheres, unstripped, equal: 410. Left hemisphere, stripped: 395.

Cause of death.—Tuberculosis of lungs and intestines. Double gonorrhœal pyosalpinx, most marked on the right side. Chronic alcoholism.

CASE 124.—Admitted February 1st, 1898. Died April 30th, 1903. Male, æt. 70, married. No family history.

History.—Fits for ten years. "Frequent epileptic seizures, followed by periods of excitement, and, at times, of great violence. Stupid feeling in his head. No recollection of anything after recovering from attack."

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Course.—Marked loss of recent memory. Dull and slow. About eight fits a month, and quite lost and often violent after them.

Dura and S. D.: natural; some excess; slight brown punctate film over the whole of the right base, and in the left posterior fossa above the tentorium. Pia: some fronto-parietal thickening. S. A.: slight excess. Vents., Lat.: moderately dilated. IV: a few granulations in lateral sacs. Vessels: extremely atheromatous, with some calcareous deposit throughout. Some general wasting. Encephalon: 1600 grammes. Right hemisphere, unstripped: 718. Left hemisphere, unstripped: 690. Left hemisphere, stripped: 655.

Cause of death.—Lobar pneumonia. Cardio-vascular degeneration. Renal cirrhosis. Systemic syphilis.

Series B. Group III. Class 7.

Cases with Age of Incidence of Attack Unknown.

This class contains two senile recurrent cases in which the date of the first attack of insanity is unknown. The following case is inserted as it is a good example of a recurrent senile case of the type which only slowly develops dementia:

CASE 126.—Admitted March 12th, 1895. Died May 9th, 1902. Female, æt. 64, widow. No family history.

History.—Previous attack. "Says she feels so low-spirited that she would like to destroy herself; that everyone seems against her; that whatever she does goes wrong; that she hears people talking about her."

Course.—Excited and nervous. Hears voices calling her names through telephones; then became quiet, pleasant, clean, tidy, and industrious, and was sent out on trial; then again developed recurrent attacks of depression. Was a troublesome patient, and in 23 wards during her residence.

Dura and S. D.: natural; large excess. Pia: moderate fronto-parietal opacity; some thickening; strips readily. S. A.: slight excess. Vents., Lat.: natural. IV: a few small granulations in the lateral sacs. Vessels: moderately atheromatous; an aneurism as large as a pea on the left vertebral artery. Marked pre-frontal wasting, and considerable in the fronto-parietal region and the first temporal gyrus. Encephalon: 1210. Hemispheres, unstripped, equal: 500. Left hemisphere, stripped: 483.

Cause of death.—Cardiac failure; morbus cordis; fatty heart; atrophous emphysema.

Heredity of Insanity in Group III.

Of the 50 cases contained in this group, family histories were available in 26 instances and these showed a psychopathic heredity in 17, or 65 *per cent.*

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

GROUP IV.

The cases in this group are as follows :

	Series A.	Series B.	Total.
(1) ? Recent seniles	6	10	16
(2) Chronic seniles	19	37	56
(3) Seniles with convulsions . .	12	8	20
Total	37	55	92

Of the 55 cases in this group, no less than 47 are above the average age of 57 years. On comparison of Series A and B, as will again be noticed in Group V, the number of chronic senile cases in Series B is greatly in excess of that in Series A.

Series B. Group IV. Class 1.

(?) *Recent Seniles.*

This class includes 10 cases, of whom 8 are females and 2 are males. In all of these cases the most important clinical feature was mental confusion. Their lengths of residence varied from three weeks to a year, but it is probable that the disease, as shown by the chronic and advanced nature of the morbid appearances found at death, was of longer duration. In 9 cases there was degeneration of the cerebral vessels. The tenth, No. 129, had survived the acute stage of her attack and would, had she lived, have continued to be a quiet, inoffensive dement.

CASE 129.—Admitted February 14th, 1902. Died January 10th, 1903. Female, æt. 72, widow. No family history.

History.—"Memory defective. Depressed. Conversation incoherent and difficult to sustain. Lost to time and place. Dirty and destructive and annoys other patients, and strips herself naked at times."

Course.—Confused. Marked illusions of identity. Has known the A.M.O. and the charge nurse for years. Very happy. Wet in her habits. Became a quiet, inoffensive dement, who was happy and contented, lost to time and place, and of defective habits.

Dura and S.D.: natural; some excess. Pia: slight fronto-parietal milkiness; slight thickening; strips readily. S.A.: some excess. Vents., Lat.: dilated. IV: natural. Vessels: natural. Encaphalon:

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

1170 grammes. Right hemisphere, unstripped: 500. Left hemisphere, unstripped: 485. Left hemisphere, stripped: 458.

Cause of death.—Cardiac failure; pneumonia; gangrene of right foot; morbus cordis and vascular degeneration; left hydronephrosis from calculus.

CASE 132.—Admitted June 11th, 1902. Died July 3rd, 1902. Female, æt. 78, widow. No family history.

History.—"Vacant, lost, and forgetful. Rambles vaguely in talk. Needed tending like an infant; childish. Dirty in habits. Shouts and raves. Restless and noisy. Does not recognise her daughter."

Course.—Intense motor restlessness. Attention fair. Answers questions readily, but is rambling and incoherent. Easily confused. Memory much impaired. No idea of time and little of place.

Dura and S.D.: Somewhat thickened; large excess. Pia: fronto-parietal opacity; considerable general thickening; strips very readily. S.A.: considerable excess. Vents., Lat.: very dilated. IV: natural. Vessels: considerable atheroma and dilatation. Fairly marked general wasting, which is greater in degree in the prefrontal region and less in the lower occipito-temporal. Encephalon: 1055 grammes. Hemispheres, unstripped, equal: 450. Left hemisphere, stripped: 415.

Cause of death.—Cardiac failure; morbus cordis: vascular degeneration and renal cirrhosis.

Series B. Group IV. Class 2.

Chronic Seniles.

This class includes 37 chronic and recurrent senile cases, of whom 22 are females and 15 are males. The chief clinical features were mental confusion, frequently associated with visual and auditory hallucinations, and restlessness, which passed on to dementia of a fairly severe grade. In several cases improvement occurred prior to the final development of severe dementia.

The duration varied from two to twenty years and some cases had suffered from attacks for as long a period as forty years. Of the thirty-seven cases, degeneration of the cerebral vessels existed in twenty-nine.

CASE 156.—Admitted December 20th, 1893. Died January 25th, 1902. Female, æt. 74. No family history.

History.—In several asylums since 1887, and now certified since 1889. "Talks in an excited manner. Uses bad language. Calls me a scoundrel. Says the police and doctors are Fenians."

Course.—Very lost. Memory much impaired. Does not employ herself; then improved considerably and worked; then again became dull and lost, and again improved and worked; finally became very

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

lost, with impaired memory. Put scraps of paper into every letter she wrote. Talked to voices. Was at times noisy, and was unemployed.

Dura and S.D.: very adherent in frontal region; great excess. In the left middle and posterior fossæ above the tentorium and extending halfway up to the vertex is a layer of recent blood-clot weighing 18 grammes. Small puncta exist on the dura all over the left base. The hæmorrhage has occurred from the anterior extremity of a vein passing from the left great anastomotic vein to the lateral sinus. Pia: moderate fronto-parietal milkiness. Considerable thickening. S.A.: Slight excess. Vents, Lat.: somewhat dilated. IV: granulations in the lateral sacs. Vessels: markedly atheromatous. Fairly marked prefrontal wasting; rather less in motor area, superior parietal lobule and first temporal gyrus, still less in inferior parietal lobule, and slight elsewhere. Encephalon, somewhat simply convoluted: 1215 grammes. Right hemisphere, unstripped: 525. Left hemisphere, unstripped: 515. Right hemisphere, stripped: 498.

Cause of death.—Subdural hæmorrhage; old pleuro-pericardial adhesions and mediastinal fibrosis; moderate degeneration, chiefly of larger arteries; cystic degeneration of kidneys.

CASE 160.—Admitted March 13th, 1895. Died November 27th, 1901. Male, æt. 61, single. No family history.

History.—"Thinks strange people come into his room and take hings from him. Does not know where he is."

Course.—Very noisy, excitable, violent, resistive, and apprehensive. Improved, and became quiet and worked. A year later was dull, partially lost, and a purely mechanical worker. Had vague delusions of persecution. Lastly, was garrulous, incoherent, and noisy day and night, and spent a good deal of time catching imaginary rats and mice.

Dura and S.D.: natural; marked excess. Brown readily detachable film over left vault and base above the tentorium, and over part of right vault, and in right middle and posterior fossæ above the tentorium. Pia: marked fronto-parietal thickening and opacity, and considerable thickening elsewhere. Strips very readily generally, but readily on under temporo-sphenoidal region, and less readily over occipital pole. S.A.: considerable excess. Vents, Lat.: much dilated. IV: a few granulations in the lateral sacs. Vessels: very atheromatous throughout. Wasting is marked in fronto-parietal region and moderate elsewhere, except at occipital pole. Encephalon: 1580 grammes. Right hemisphere, unstripped: 690. Left hemisphere, unstripped: 685.

Cause of death.—Cardiac failure; left pleural effusion; vascular degeneration.

Two of the cases, Nos. 141 and 168, were degenerates who suffered from severe premature dementia, and presented unusual features. Neither was, however, a case of dementia paralytica, though both in many of their symptoms simulated this disease (see *Archives of Neurology*, vol. ii, p. 504).

CASE 141.—Admitted May 11th, 1896. Died January 3rd, 1903. Female, æt. 48, single. Sister died insane. Mother intemperate.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

History.—"Dirty in habits. No idea why she is here. Hesitates at questions and laughs. Very violent, and goes to bed in her clothes lest they should be stolen. Cuddles the teapot and will not let anyone else have any tea."

Course.—Heavy, stupid, happy, contented. No idea of time or place. Movements exaggerated when asked to do anything. Speech slow and slurred. Says "yes" to most questions. Gained flesh after admission, and then gradually got weaker and thinner. March, 1900: emotional, lively. Runs about very quickly. Laughs when spoken to. Answers in a very incorrect manner to questions. Says she is twenty-seven years old. Remembers that her sister was at Canehill, and says she is dead and gone. Does not know where she is. Knows the day of the week at once, and when asked the time looks up at the clock and replies. Knows where she has her meals. Is easy to manage and sleeps well. Takes her food well, but has a great craving for fluids. The following record of varying reflexes shows the existence of active cortical degeneration:

Date.	Knee-jerks.		Pupils.							
			Size in faint light.		Accommodation.		Artificial light.		Daylight.	
1900.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.
March 8th	Normal	Slightly +	3½ mm.	3½ mm.	2½ mm.	2½ mm.	2½ to 2	2½ to 2	No change	2½ to 2
April 6th	Present	+	3	3	2½	2½	?	?	3 to 2½	3 to 2½
June 7th	Absent	Absent	4½	4	3+	3	—	—	—	? trace
July 19th	+ Occ. P.J.	+ + P.J.	3½	4	2	2½	—	—	—	—
Oct. 11th	Present	Slight	4	4−	2½+ / 2	2½ / 2−	—	—	—	—
Nov. 20th	Just present	+ +	5	4½	3+ / 2	3− / 2	Trace	Trace	?	?

November 20th, 1900.—Slight paresis of right side of face. Paresis of right arm. Some tremor of tongue. A drawl in speaking, which might be that of imbecility or G.P.I. Happy and smiling. Very childish.

August 3rd, 1902.—"Lost; very deaf; at times destructive. Habits clean. Pupils equal and react."

Dura and S.D.: natural; considerable excess. Pia: moderate fronto-parietal opacity; considerable thickening. S.A.: much intra-arachnoid fluid in fronto-parietal region. Vents., Lat.: moderately dilated, not granular. IV.: many granulations in lateral sacs, more elsewhere. Vessels: natural. Wasting marked in prefrontal region, considerable in first temporal gyrus, parietal lobules, and Broca's gyrus, rather less in rest of motor area, slight elsewhere. Encephalon: 1350 grammes. Hemispheres, unstripped equal: 590. Left hemisphere, stripped: 550.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Cause of death.—Asthenia from scirrhus of pylorus.

[*Note.*]—This case may be usefully compared with Case 19 reported in the *Archives of Neurology*, vol. ii, pp. 603–5, and referred to also on page 504.

Series B. Group IV. Class 3.

Seniles who suffered from Convulsions.

This class includes 4 male and 4 female patients, all of whom suffered from severe dementia and all but one of whom were above the average age of 57 years. Two were epileptics, one had a very chronic osteo-fibroma of the falx cerebri associated with convulsive attacks, and the remainder suffered from convulsions due to local lesions of vascular origin. The cerebral vessels were grossly degenerated in 6 cases and moderately affected in one.

CASE 178.—Admitted September 5th, 1900. Died October 11th, 1901. Male, æt. 62 years, married. Mother died of phthisis.

History.—Previous attack eleven years ago. Intemperate. Symptoms three to four months. "Thinks his wife is unfaithful. Lost to time. At times quite incoherent. Has threatened to cut his throat and his wife is afraid of him."

Course.—Quiet, listless, and depressed. Confused. Clean in habits. Nine days before death patient had a slight convulsion affecting the right arm and face and two days later a second, which occurred before he had recovered from the effects of the first.

Dura and S.D.: natural; marked excess. Pia: much fronto-parietal opacity and thickening. Strips very readily, excepting on the under surface of the temporo-sphenoidal lobe and the occipital region, where it strips fairly readily. S.A.: great excess, chiefly as "arachnoid cysts." Vents., Lat.: dilated. IV.: granulations in the lateral sacs. Vessels: markedly atheromatous. Moderate general wasting, most marked in the prefrontal region. A large area of recent softening in the left middle frontal convolution. Encephalon: 1135 grammes. Right hemisphere, unstripped: 480. Left hemisphere, unstripped: 500. Right hemisphere, stripped: 440.

Cause of death.—Cerebral softening. Generalised degeneration of smaller arteries, with hypertrophy of the left ventricle.

Heredity of Insanity in Group IV.

Of the 55 cases in this group, family histories were available in 20 instances. Of these 12, or 60 *per cent.*, showed a hereditary history of insanity.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Group V.

The cases included in this group are as follows:

	Series A.	Series B.	Total.
(1) (?) Recent seniles	7	8	15
(2) Chronic seniles	17	30	47
(3) Seniles suffering from convulsions, etc.	3	14	17
Total	27	52	79

Of the 52 cases in Series B, all but 3 are above the average age of 57 years. It will be noted that there are many more cases in Classes 2 and 3 in Series B than in Series A. The chief difference, in fact, between the two series of cases lies in the larger number of senile patients in the second.

Series B. Group V. Class 1.

(?) Recent Senile Cases.

Of the 3 females and 5 males in this class, all were above the average age of 57 years, and in all the cerebral vessels were degenerated, this condition being severe in 7 cases.

Case 183.—Admitted March 26th, 1902. Died June 16th, 1902. Female, æt. 79 years, widow. No family history.

History.—"Has lost her memory and talks all sorts of rambling nonsense. Pulled the nurse's cap off and said she was told to. Thinks everyone here is her relation and she is going to give everyone money on her departure."

Course.—No interest in her surroundings. Replies to questions in inarticulate monosyllables. Swallows food mechanically and is wet and dirty. Patient became rather brighter in a couple of months, answered questions, and occasionally made remarks.

Dura and S.D.: adherent in frontal region; great excess. Pia: markedly thickened and somewhat opaque; strips like a glove. S.A.: marked excess. Vents., Lat.: very dilated. IV.: natural. Vessels: highly calcareous. Wasting very marked and rather more extreme in the prefrontal region and rather less evident on the inferio-internal aspect of the hemispheres. Encephalon: 970 grammes. Right hemisphere, unstripped: 395. Left hemisphere, unstripped: 420. Left hemisphere, stripped: 385.

Cause of death.—Senile decay; gross generalised vascular degeneration.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Series B. Group V. Class 2.

Chronic Senile Cases.

This class includes 22 female and 8 male senile cases of various types, some exhibiting the symptom-complexes associated with the different varieties of high-grade amentia when in a condition of senile involution of the cortical neurones, others being in more or less marked stages of mental confusion associated with coarse or fine lesions of vascular origin, and others, again, being of a mixed type and falling into both these categories.

As will be pointed out later, whilst in many cases *post-mortem* differentiation is difficult or impossible, there is a marked difference in type between the regions of wasting in cases suffering from fairly pure senile involution of the cortical neurones and those in cases in which the dementia is directly due to coarse or fine lesions of vascular origin, or where degeneration of the cerebral vessels has exercised a marked influence on the degree and site of neuronic degeneration. In the latter, as the writer has shown in a previous paper, a stage of mental confusion is coincident with (and the writer thinks he has proved the consequent of) the development of marked degeneration of the cerebral vessels.

Of the 30 cases, the cerebral vessels were slightly affected in 2 cases, moderately in 11, and severely in 17. The duration of the insanity varied from 2 to 35 years, and in one case, No. 204, æt. 64, symptoms had existed during the whole of the life of the patient.

In Part III of the present paper the cases of dementia there referred to will be classified under the two categories above suggested, as the more complete clinical details available have rendered this possible, whereas in the present clinico-pathological summary no such attempt at a scientific classification has been attempted.

Of the cases selected as examples, Nos. 204 and 207 belong to the first category (senile involution in high-grade aments), No. 209 to the second (senile dementia associated with coarse or fine cortical lesions), No. 213 is a compound of the two types, and No. 217 is a case of medium or high-grade amentia with premature senility of the cortical neurones.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Senile Involution in High-grade Aments.

CASE 204.—Admitted November 25th, 1899; died February 21st, 1902. Female, æt. 64, single. Heredity of epilepsy.

History.—"Very nervous" 30 years ago. Symptoms all her life, but especially since the age of 54. "Rambling and irrational. Excitable. Confused."

Course.—Excitable; garrulous; quite incoherent; continually repeats that she has two lovely sisters in heaven. Wanders about in a lost and aimless manner. No idea of time or place. Finally quite lost, dirty in habits, and very feeble and shaky.

Dura and S.D.: natural; moderate excess. Pia: much thickened; little or no opacity; strips very readily. S.A.: considerable excess Vents., Lat.: considerably dilated. IV.: natural. Vessels: all very atheromatous. Marked general wasting, which is extreme in the prefrontal region and least visible in the lower temporo-occipital region. Encephalon: 1275 grammes. Right, hemisphere, unstripped: 555. Left hemisphere, unstripped: 545. Right hemisphere, stripped: 510. Left hemisphere, stripped: 508.

Cause of death.—Broncho-pneumonia; systemic vascular degeneration and secondary cardiac hypertrophy.

CASE 207.—Admitted April 23rd, 1895; died January 22nd, 1902. Female, æt. 75, widow. Mother and grand-daughter insane.

History.—Symptoms for twenty years. "Lies huddled up in bed. Very confused and strange in manner. Difficult to get her to answer questions, but she says people worry her at night and look in at the window. Simple and often incoherent. Says she sees carriages and well-dressed women and also figures and cats in the room. Strange for some time. Got up at night and wrapped the bed-clothes round her. Used to undress herself naked."

Course.—Restless, confused. Cannot take care of herself. Lost to time and place. Wet and dirty. Continued in this state for years.

Dura and S.D.: adherent in frontal and left parietal regions; great excess. Pia: relatively little opacity; considerable thickening; strips very readily. S.A.: some excess. Vents., Lat.: dilated. A few granulations. IV.: many granulations in the lateral sacs. Vessels: moderately atheromatous. Rather simply convoluted. Marked general and extreme prefrontal wasting. Encephalon: 1010 grammes. Right hemisphere, unstripped: 420. Left hemisphere, unstripped: 432. Right hemisphere, stripped: 395. Left hemisphere, stripped: 413.

Cause of death.—Cardiac failure. Vascular degeneration and renal cirrhosis. Cardiac hypertrophy and dilatation. Lipomatosis.

Senile Dementia associated with Cortical Lesions.

CASE 209.—Admitted February 28th, 1894; died October 30th, 1901. Female, æt. 68, widow. No family history.

History.—"Melancholy, tearful without adequate cause. Rambling, incoherent, and loquacious. Noisy at night. Wants to get out of the window. Difficult to get to take sufficient food."

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Course.—Constantly throws herself about and gabbles a conglomeration of words. Says she is 21 years of age. Noisy, dirty, and destructive. Improved considerably, and helped a little and was quiet and obedient; then became restless and excited and stripped herself. Continued excitable, garrulous, and was always asking for her omnibus fare to go home, and saying she could get there for sixpence. Finally was dull, lost to time and place, had illusions of identity, and was wet and dirty.

Dura and S.D.: natural; great excess. Pia: marked fronto-parietal opacity and thickening; moderate thickening elsewhere; strips very readily excepting at the extreme occipital pole, and the lower temporo-sphenoidal region, where it strips readily. S.A.: marked excess. Vents., Lat.: slightly dilated; choroid cystic; a few granulations. IV: granulations in the lateral sacs. Vessels: exceedingly atheromatous throughout. Considerable general wasting. Right hemisphere: Superficial softening in the posterior third of the middle frontal gyrus. Left hemisphere: superficial softenings of the posterior part of first frontal gyrus and of the posterior third of the cuneus and the neighbourhood of the pole, but not involving the lower lip of the calcarine fissure. Encephalon: 1105 grammes. Hemispheres, unstripped, equal: 465. Right hemisphere, stripped: 428. Left hemisphere, stripped: 423.

Cause of death.—Cardiac failure; gross vascular degeneration, especially of the cerebral and coronary arteries.

Senile Involution in a High-grade Ament associated with Cortical Lesions.

CASE 213.—Admitted May 11th, 1899; died March 11th, 1902. Male, æt. 62, married. Father insane.

History.—Intemperate and stated to have had syphilis. Symptoms twenty-five years. "Continually wandering about. Quite incoherent. Cannot give a rational account of himself. Lost."

Course.—Says his age is 7 years. Restless and performs purposeless actions. Would be wet without attention. Became quite lost, and was rambling and incoherent and very slovenly. Continued for some time clean in habits and then was shaky, helpless, and wet and dirty.

Dura and S.D.: slight generalised thickening; great excess. On the left side of the cranium, excluding the median part of the base and vault, is an old organised membrane which is a quarter of an inch thick in its thickest part. The membrane on its inner surface is brown, as is also the subjacent pia and cortex. Pia: prefrontal adhesions in mid-line below the falx, marked fronto-parietal opacity and marked thickening; strips very readily. S.A.: marked excess. Vents., Lat.: much dilated; granular. III: granular. IV.: marked granulations in the lateral sacs. Vessels: markedly thickened and atheromatous. Wasting: extreme in prefrontal region, very marked in Broca's and first temporal gyri, marked in the ascending frontal gyrus the posterior one third of the first and second frontal gyri and the superior parietal lobule, rather less marked elsewhere, and least at the occipital pole. It is also extreme, and here, probably, largely vascular in origin, in the outer aspect of the temporo-sphenoidal lobe and the inferior parietal lobule. Encephalon: 1140

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

grammes. Right hemisphere, unstripped: 498. Left hemisphere, unstripped: 460. Left hemisphere, stripped: 430.

Cause of death.—Tuberculous pneumonia. Vascular degeneration and secondary morbus cordis; renal cirrhosis.

High-grade Amentia with Premature Senility of the Cortical Neurones.

CASE 217.—Admitted November 24th, 1894; died January 12th, 1903. Male, æt 48, widower. No family history.

History.—Symptoms for thirty-five years. "Simple and childish and cannot remember where he lives. Does not know day, month, or year. Does not work. Eats ravenously."

Course.—Very reticent. Depressed. Takes little interest in his surroundings. Later a working dement who was lost to time and place. Finally became dull and slow and quite lost and had much difficulty in swallowing.

Dura and S.D.: adherent at vertex; great excess over the whole vertex, but especially on the right side; the dura is roughened and there are thin scattered patches of film. There is also a thin film on the falx cerebri, also chiefly on the right side. The pacchionian bodies are very marked, and adherent to the dura over a large area. Pia: very opaque and thickened; many extravasations of blood in the anterior half. S.A.: much excess. Vents., Lat.: considerably dilated. IV.: many granulations in the lateral sacs; none elsewhere. Vessels: some thickening. Wasting: marked in prefrontal region, next in Broca's and first temporal gyri and in the parietal lobules, next in the posterior third of the first and second frontal gyri, next in the rest of the motor area and least elsewhere. Encephalon: 1318 grammes. Right hemisphere, unstripped: 570. Left hemisphere, unstripped: 555. Left hemisphere, stripped: 517.

Cause of death.—Broncho-pneumonia. Epithelioma of the œsophagus involving the trachea.

Series B. Group V. Class 3.

Senile Cases suffering from Convulsions, etc.

This class includes 9 female and 5 male senile cases, all but two of which are above the average age of 57 years. In 13 of the cases degeneration of the cerebral vessels existed, and in 8 of these it was severe.

Of the 9 cases in which lesions of vascular origin existed, in one of these the condition was thrombosis of pial veins due to tumour cerebri and in another it was hæmorrhage into the right internal capsule. Five of the patients were epileptics, and in one of these, No. 230, a local lesion also existed.

Of the illustrative cases cited below, No. 223 is an epileptic, No. 230 is an epileptic with a gross vascular lesion, No. 225 is

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

an example of a gross vascular lesion, and No. 233 is one of capsular hæmorrhage.

Epileptic.

CASE 223.—Admitted December 16th, 1893. Died April 22nd, 1902. Female, æt. 51, single. No family history.

History.—Previous attack in 1892. Symptoms for one year. "Epileptic, excited, and violent. Memory defective. Does not recognise her friends, and cannot converse."

Course.—Excited. Memory and ideation fair. Says that after fits she loses herself, and cannot remember anything for some time. Became dull, heavy, and stupid. Was much excited after fits. Frequently quoted and read Scripture. On April 8th, 1902, had 200 fits. Recovered consciousness four days later, but continued very feeble till death.

Dura and S. D.: natural; large excess. Pia: very opaque and thickened; strips like a glove. S. A.: Large excess. Vents., Lat.: natural. IV: granulations in the lateral sacs. Vessels: all markedly atheromatous. Marked general wasting, which is extreme in the prefrontal region. Encephalon: 1145 grammes. Right hemisphere, unstripped: 495. Left hemisphere, unstripped: 485. Right hemisphere, stripped: 455. Left hemisphere, stripped: 445.

Cause of death.—Cardiac failure, following status epilepticus. Hæmorrhage from stomach and bladder. Purpuric patches on skin. Severe degeneration of cerebral arteries.

Epileptic with a Gross Vascular Lesion.

CASE 230.—Admitted February 16th, 1901. Died June 16th, 1902. Male, æt. 73, married. No family history.

History.—Fits for nine years, and has had hundreds. "Thinks something is going to happen to him. Does not, he says, know what he is doing. Has no idea of time. Has been violent."

Course.—Lost to time and place. Talks irrelevantly and incoherently. Six months after admission he had three fits, confined to the left side, and beginning in the face. He had several similar fits during his residence, and died quite lost and helpless.

Dura and S. D.: thickened; great excess. Pia: considerable fronto-parietal opacity and thickening; strips very readily. S.A.: slight excess. Vents., Lat.: immensely dilated. IV: granulations in the lateral sacs. Vessels: very atheromatous. Left hemisphere: marked wasting of the pre-frontal region and the whole of third frontal gyrus; the wasting is nearly as marked in the first temporal gyrus; it is fairly marked in the remainder of the fronto-parietal region, and is less marked elsewhere. Right hemisphere: just behind the middle of the second temporal sulcus is a softening as large as a hazel-nut. Encephalon: 1185 grammes. Right hemisphere, unstripped: 485. Left hemisphere, unstripped: 498. Left hemisphere, stripped: 450.

Cause of death.—Senile decay and broncho-pneumonia.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Gross Vascular Lesion.

CASE 225.—Admitted March 27th, 1899. Died March 5th, 1902. Female, æt. 87, widow. No family history.

History.—"Continually talking and raving incoherently, and vehemently demands to be married to-day in the Church of England to Squire H—. Lost. Will not answer a question, but repeats she is to be married to-day. Talks incoherently day and night till she gets exhausted. Sleepless. Constantly wet."

Course.—Restless, and crows like a cock. Much distressed, as she thinks she has lost her infant in the ward, and keeps getting out of bed to look for it. October 23rd, 1899. Right-sided convulsion. No paralysis next day; shortly afterwards fractured her right femur. Incomplete union occurred, and patient became lost and helpless, but was cheerful and very little trouble.

Dura and S.D.: thickened; great excess. Pia: thickened and opaque; strips very readily. S.A.: considerable excess. Vents., Lat.: dilated. IV: granulations in lateral sacs. Vessels: markedly atheromatous. Marked wasting in pre-frontal region, and rather less in fronto-parietal region and first temporal gyrus. In the left hemisphere softenings exist in the distribution of the supra-marginal and calcarine arteries. The former is much the more recent. Encephalon, 1140 grammes. Right hemisphere, unstripped: 470. Left hemisphere, unstripped: 480. Right hemisphere, stripped: 450. Left hemisphere, stripped: 455.

Cause of death.—Lobar pneumonia.

Capsular Hæmorrhage.

CASE 233.—Admitted February 12th, 1903. Died March 29th, 1903. Male, æt. 76, married. Father and two brothers died from phthisis. Daughter suffers from asthma.

History.—"Depressed. Tired of life. Threatened suicide. Carries a lamp about the house to burn it and him."

Course.—Restless. Answers questions slowly, and in a rambling and incoherent manner. Auditory hallucinations. Illusions of identity. Memory impaired. A month later had an apoplectic attack with resulting paralysis of the left side, and did not recover from its effects.

Dura and S.D.: natural; great excess. Pia: marked fronto-parietal opacity and thickening. S.A.: large excess. Vents., Lat.: very dilated. IV.: granulations in the lateral sacs. Ependyma œdematous. Vessels: very fibrous and calcareous throughout the brain. In the posterior part of the right internal capsule was a hæmorrhage the size of a walnut, which had torn up the surrounding parts. It was purple in colour and fairly recent. A few small local softenings existed in the white matter of the cerebellum surrounding each dentate nucleus. Encephalon 1490 grammes. Right hemisphere, unstripped: 660. Left hemisphere, unstripped: 640. Left hemisphere, stripped: 575.

Cause of death.—Right capsular hæmorrhage. Acute cystitis. Cardio-vascular degeneration.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

The Heredity of Insanity in Group V.

Of the 52 cases contained in this group, family histories were available in 24 instances, and these showed a psychopathic heredity in 11, or 46 *per cent.*

General Summary of Morbid Appearances.

The morbid appearances found in the cases above referred to are summarised in the following table, in which the percentages given are based on the whole of the 433 cases. It has been found unnecessary to give also the figures obtained from Series A and Series B as they much resemble one another and also those in the conjoined table. This may be seen on comparison of the latter with the table which was compiled from the cases in Series A and published in a previous paper. The similarity of the results from the separate series naturally adds largely to the value of the conjoined table.

On examination of the percentages given below it will be seen that the morbid changes existing in the 433 cases made use of vary directly with the amount of dementia present.

433 cases of insanity.	Group I (65 cases).	Group II (96 cases).	Group III (101 cases).	Group IV (92 cases).	GroupV (79 cases).
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Dura: thickened or adherent	4·6	17·7	27·7	42·4	45·6
Subdural deposit	3·1	5·2	17·8	17·4	22·8
Subdural excess	*38·5*	*76·0*	*92·1*	*100·0*	*100·0*
(1) Slight	26·2	31·2	9·9	5·4	—
(2) Moderate	10·8	40·6	67·3	27·2	17·7
(3) Great	1·5	4·2	14·9	67·4	82·3
Pia-arachnoid strips:					
(1) Naturally	69·2	6·2	—	—	—
(2) Rather more readily than natural	29·2	74·0	2·0	—	—
(3) Readily	1·6	19·8	82·2	13·0	1·3
(4) Very readily	—	—	15·8	82·6	40·5
(5) Like a glove	—	—	—	4·4	58·2
Subarachnoid excess	*21·5*	*61·4*	*92·1*	*100·0*	*100·0*
(1) Slight	16·9	27·1	31·7	19·6	3·8
(2) Moderate	4·6	33·3	56·4	47·8	36·7
(3) Great	—	1·0	4·0	32·6	59·5
Lateral ventricles:					
(1) Dilated	10·8	39·6	73·3	92·4	98·7
(2) Granular	1·5	1·0	8·9	10·9	26·6
(3) Dilated and granular	4·6	2·1	1·0	3·3	1·3
IV. Ventricle:					
Granular lateral sacs	35·4	55·2	65·3	78·3	70·9

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

It is not proposed to deal in this paper with the general pathology of the morbid appearances here referred to, or with their bearing on our knowledge of the functions of the cerebrum, as these subjects have already been fully considered in previous contributions. For the purposes of the present paper it is desirable to refer at some length to certain of the more important morbid changes present in cases of mental disease, and to the conditions under which these are modified in different cases and under special circumstances.

Subdural deposits (*pachymeningitis hæmorrhagica*).

In a previous paper the writer formulated the opinion that the ordinary subdural deposits found in the insane develop owing to the alteration in the intra-cranial physical conditions which occur in dementia. The excess of intra-cranial fluid, which primarily occurs to replace loss of cerebral substance in the closed bony chamber, interferes with the normal relations of the pia-arachnoid to the dura mater, and converts a potential space into an actual one full of fluid. This excess of fluid, which is often of abnormal composition, necessarily predisposes to the development of a chronic degenerative process in both the dura mater and the pia-arachnoid, as does also the hopeless attempt at the formation of replacement or scar-tissue which is made by these membranes. Hence, any more or less sudden alteration of intra-cranial tension, due *e.g.* to a convulsion, a trauma, etc., or even to the change of blood-content from the arterial to the venous side which occurs at the time of death, tends to cause an effusion of blood from the degenerate and often dilated vessels of the dura mater, the pia-arachnoid, or both.

As may be seen in the above table, the percentage of subdural deposit in the five groups is respectively 3·1, 5·2, 17·8, 17·4, and 22·8. These figures strongly support the above thesis, and an analysis of the cases occurring in Groups I and II, which should be *a priori* of an accidental nature, affords equally useful evidence.

Of the 200 cases in Series A, only 2 examples occur in Group I and only 3 in Group II; and of the 233 cases in Series B, there are no instances in Group I and only 2 in Group II.

The following are the cases:

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Series A. Group I.

Class 1.—"Various." No. 2, male, æt. 70. Blood-cake, 3 by 4 inches in area and ½ an inch thick in the centre, pressing on the right motor area. Duration, four months. Vessels natural. Death from the after-effects of the clot.

Class 3 (*c*).—"Excited cases with delusions." No. 23, female, æt. 41. Small bony deposit in the dura mater beneath the left parietal foramen. Underneath this for about two square inches is a thin brownish readily-detachable membrane. Vessels natural. Death from acute tuberculosis.

Series A. Group II.

Class 1.—"Various." No. 35, female, æt. 59. Marked right-sided vascular lesion of ten years' duration. Brown, readily detachable film over the base of the skull. Vessels natural. Death from morbus cordis.

Class 3 (*c*).—"Recurrent seniles." No. 56, female, æt. 70. Great excess of blood-stained subdural fluid with recent blood-clots on the right vertex. Vessels thickened and a little atheromatous. Death from broncho-pneumonia.

Class 5.—"Chronic delusional adults." No. 74, male, æt. 37. A high-grade ament with some secondary dementia. Thin, reddish, detachable film on right vertex. Considerable excess of subdural fluid. Vessels natural. Death from tuberculosis of the lungs.

Series B. Group II.

Class 6.—"Epileptics." No. 74, male, æt. 56. Great excess of blood-stained fluid and a thin layer of reddish film throughout. Vessels natural. Œdema of the limbs for months before death, which was from cardiac failure.

Class 6.—"Epileptics." No. 70, female, æt. 32. Thin recent film, most marked on the right vertex. No subdural excess. Vessels natural. Death from extreme mitral stenosis.

Hence, of these seven cases, the two occurring in Group I are both accidental, and of those occurring in Group II one is accidental in association with the gross legion, and the other four

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

are all recent, and are sufficiently explicable on general pathological grounds by the cause and mode of death.

Sub-dural and Sub-arachnoid Excess.

The writer feels that he cannot too strongly emphasise the importance of excess of intra-cranial fluid in the pathology of dementia. This excess is so commonly neglected in discussions on intra-cranial morbid changes in favour of gross or fine changes in the dura, the pia, or the cerebrum, that it might almost be supposed to be valueless as a criterion of the degree of cerebral wasting which is present. It is, however, now proved, chiefly through the masterly researches of Leonard Hill, that the intra-cranial fluid is normally minimal in amount, and that the blood-content of the cranium is for practical purposes constant([5]); and therefore any considerable and constant increase in the former is necessarily associated with a corresponding loss of cerebral tissue. Certain cases, like some of those cited above, who die slowly from cardiac failure with secondary œdema of the lungs, etc., show also some œdema of the brain or some excess of sub-dural fluid of *recent* development, with associated alteration of intra-cranial blood-content; but these belong to quite a different category in being recent and due to blood-stasis, temporary if the patient should live, and part of a general pathological body-state, and therefore not of local origin. The recent subdural deposits which, as already stated, occur in, but are not peculiar to, Group II, are chiefly found in cases of this type.

For the purposes of the present study of morbid appearances, the amount of intra-cranial fluid present has been estimated on the following plan, which has been employed owing to the ease with which it can be practically applied. The cases are divided into three groups, namely those where the subdural fluid was in excess of the normal small quantity, and which are described as showing "slight" excess; those where with the brain *in situ* it reached to the level of the tentorium, described as showing "moderate" excess; and those where it extended above the tentorium, described as showing "great" excess. In the majority of instances the first is equivalent to Groups I and II, especially the latter, the second to Groups II and III, especially the latter, and the third to Groups IV and V, especially the latter, though some overlapping occurs, as may be seen in the table.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

In the case of the subarachnoid fluid, three degrees have again been adopted, but here the estimation is more a personal matter and is dependent on experience. "Great" excess, however, on the whole signifies a ballooning up of the arachnoid in the frontal and prefrontal regions; "moderate" excess indicates an obvious amount of fluid in the frontal and central regions of the hemispheres; and "slight" excess denotes a smaller, but visible, amount of fluid in the same regions.

The Pia-Arachnoid.

For practical purposes the morbid appearances found in this membrane can be most satisfactorily summarised by the ease with which it can be removed from the hemispheres. As is shown in the table, five grades have been adopted, which on the whole correspond to the five groups into which the cases have been classified.

The chief factor in modifying the manner of stripping is the œdema of the cerebrum, which at times exists, especially in patients slowly dying from exhausting diseases, *e.g.* tuberculosis, cancer, etc., or rapidly dying from acute dysentery, convulsions, etc. In some cases of œdema the membrane comes off abnormally readily, whereas in others, where the cerebral tissue is very œdematous, stripping is extremely difficult. Cases in which the condition was very marked were excluded in order to avoid error.

Post-mortem changes also markedly modify the process of stripping, but owing to the use of a cold chamber they were slight or absent in the cases employed.

The Lateral Ventricles.

Dilatation of the lateral ventricles is, equally with the above, evidence of loss of cerebral tissue. As, however, it is probably of late occurrence, and as the degree to which it exists is somewhat difficult to estimate, different grades of dilatation have not been introduced into the table, though its increasing frequency in the different groups is well shown.

Granularity of the Ventricles.

This morbid appearance is probably the homologue of the normal proliferative (and degenerative) condition of the

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

epithelium of the central canal of the spinal cord in adults. Here it is due to the small size of the canal, owing to development of the white matter of the cord, and to the absence of flow of cerebro-spinal fluid. Probably granularity of the ependyma of the ventricles is due to a similar cause, namely, loss of function aggravated by bathing with abnormal cerebro-spinal fluid which contains products of neuronic degeneration. As is seen in the table, it rarely exists in the lateral ventricles in Groups I and II, but occurs with increasing frequency in Groups III–V. In the fourth ventricle, however, it is frequently present in the "lateral sacs," or lateral pockets containing the choroid plexuses, occurring even in Group I in these situations in one third of the cases. In both Series A and Series B it is less frequent in Group V than in Group IV, and therefore the observation is probably accurate; and a possible cause may be the greater chronicity of the cases in Group IV and the grosser vascular degeneration in Group V. It occurs also in a small percentage of cases, in the later groups, in the upper half of the floor of the fourth ventricle on each side of the mid-line, and in a similar small percentage in the third ventricle. These appear to represent the more extreme stages of this morbid appearance, which, however, does not occur solely in dementia, but is also seen to a marked degree in certain general diseases, *e.g.* chronic Bright's, etc. In the experience of the writer it never occurs in the calamus or lower half of the fourth ventricle to an appreciable extent except in dementia paralytica (general paralysis of the insane), in which disease, except in very early cases, it is a constant and obvious sign; and it is probably due to stagnation, in the lower apex of the ventricle, of highly toxic cerebro-spinal fluid loaded with products of neuronic degeneration.

Regions of Wasting of the Cerebrum in Mental Disease.

The cases in which wasting of the cerebrum exists may approximately be divided into three categories—those in which the wasting is chiefly or wholly due to involution of the cortical neurones, those in which it is chiefly or wholly due to local or fairly general atrophies which are directly of vascular origin, and those in which both these conditions exist. The mixed cases will not be further referred to, and it is sufficient with reference to the cases of vascular origin to state that all degrees,

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

from definite old or recent softenings to extensive or quite local secondary atrophies of convolutions, often with vermiform or cross-striated markings, are included. The cases which are chiefly or entirely due to retrogression or involution of the cortical neurones will, however, be more fully considered.

On the whole in all three, but especially in this last category, the amount of cerebral wasting and the other associated morbid changes inside the cranium vary directly with the amount of dementia existing in the patients. The relationship is much more absolute than might at first appear probable, as in the majority of cases of insanity a more or less complete removal of the products of neuronic degeneration has occurred by the time of death. It is, however, less constant in dementia paralytica (general paralysis of the insane); for, whilst in chronic cases the wasting may be more profound even than in corresponding cases of severe dementia associated with senile involution of the cortical neurones and gross vascular degeneration, in acute and rapid cases of the disease, owing to incomplete removal of the products of degeneration, much less wasting exists. The writer has, however, seen several cases in which macroscopic and microscopic *acute* changes were as marked as is the wasting in advanced chronic cases of the disease.

The relationship of the degree of wasting to the degree of dementia is on the whole, however, very exact, and the regions of relative wasting can be determined with considerable accuracy. Taken generally—for individual variations exist—the *regions of wasting*, from personal study of over a thousand cases, are as follows:

(1) The greatest amount occurs in the pre-frontal region (anterior two thirds or so of the first and second frontal convolutions, including the neighbouring mesial surface, and the anterior third or so of the third frontal convolution).

(2) The wasting is next most marked in the remainder of the first and second frontal convolutions. [In dementia paralytica Broca's convolution should, as a rule, be included here, and (2) and (3) should follow (4).]

(3) It is perhaps next most marked in the ascending frontal and Broca's convolutions, though this grade should, in many cases at least, follow (4).

(4) It is next most marked in the first temporal convolution and the insula, and in the superior and inferior parietal lobules.

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

In practically all cases it is more marked in the two former than in the two later.

(5) It is least marked in the remainder of the cerebrum (including the orbital surface of the frontal lobes), particularly the inferio-internal aspect of the temporo-sphenoidal lobe and the posterior pole of the hemisphere.

In the experience of the writer exceptions to this general order are invariably due to vascular or traumatic causes, and should, therefore, be excluded from the ordinary and normal wastings of dementia.

Reference may here be made to the researches of Watson, who independently and from the histological standpoint, arrived at almost exactly similar conclusions regarding the comparative degrees of affection of the different regions of the cortex cerebri in several cases of juvenile general paralysis. The author would also in this connection draw attention to his own histological studies, and especially to those carried out on the pre-frontal cortex by the method of micrometric measurement. He has demonstrated that in ordinary dementia degrees of retrogression, limited to the pyramidal layer, exist, which vary directly with the amount of dementia present, and that in gross dementia and gross dementia paralytica the other layers of the cortex cerebri are also involved. In the severest grades, where the mental power is that of the new-born child, all the cortical layers are, as regards depth, approximately in the same condition as in the latter. The pre-frontal cortex is the last region of the cortex cerebri to develop; it possesses the highest associational functions, and it is the first to undergo retrogression. The pyramidal layer in this region is under-developed in the various grades of amentia; it varies somewhat in depth in normal individuals, and it undergoes retrogression in the various grades of dementia. These facts are cited here as they sufficiently disprove the opinion recently expressed by Campbell ([6]): "That there are simple physical reasons why the cortex of the frontal lobes specially shows changes to the naked eye in the course of cerebral wasting; it is that it is built up on an extremely weak and collapsible framework of nerve-fibres. The central gyri, the occipital lobe, and other parts do not present this naked-eye change because they, on the contrary, are built on a stout framework."

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Regions of Under-Development of the Cerebrum.

Apart from the necessarily excluded abnormalities of development which are of vascular or traumatic origin, the degrees of under-development of the cerebrum follow the order given above, at least as regards (1) and (2). A further statement regarding macroscopic detail cannot be made, as it is more usual to find small and simply convoluted cerebra than brains with average but small convolutions, and it is relatively rare to meet with under-developed cerebra of average convolutional complexity which show a decrease reasonably comparable with the marked wasting which occurs in severe dementia. The question, in fact, of the functional value of an *under*-developed cerebrum requires for solution microscopic rather than macroscopic study, and, as the author has elsewhere shown, the micrometric method applied from the lamination standpoint affords a ready means of determining the degree of departure from the normal. One case of idiocy, for example, which was examined by the writer, and in which the brain, though somewhat below the average weight, appeared to the naked eye perfectly normal except for slight simplicity of the convolutions and a somewhat decreased development of the pre-frontal region, when investigated by the micrometric method, gave general average measurements which were almost identical with those obtained from a female still-born infant. (7)

Weights of Stripped Hemispheres in Relation to Amentia and Dementia.

The male encephalon between the ages of 15 and 80 years averages (F. Marchand) 1400 grammes in weight, and the female similarly weighs 1275 grammes. The ratio of the conjoined cerebellum and pons to the cerebrum is in the adult 13 : 87 (Huschke). The cerebral hemispheres thus weigh 609 grammes each in the male, and 554 grammes each in the female; and in the stripped condition about 589 and 534 grammes respectively.

Of the 433 cases contained in Series A and Series B, the weights of the stripped hemispheres are available in 136 males and 281 females, a total of 417. The average weights in the different groups are given in the following table, in which,

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

owing to their varying and usually greater weight, the epileptics are classed separately :

Weights of Stripped Hemispheres from 417 Cases.

Group.	Males.			Females.		
	Normal weight . .	average	589 grs.	Normal weight . .	average	534 grs.
I. 61 cases	Ordinary	(16)	553 grs.	Ordinary	(36)	499 grs.
	Epileptic	(5)	548 grs.	Epileptic	(4)	472 grs.
	Total	(21)	552 grs.	Total	(40)	497 grs.
II. 95 cases	Ordinary	(14)	565 grs.	Ordinary	(66)	480 grs.
	Epileptic	(7)	561 grs.	Epileptic	(8)	524 grs.
	Total	(21)	564 grs.	Total	(74)	485 grs.
III. 96 cases	Ordinary	(27)	551 grs.	Ordinary	(59)	482 grs.
	Epileptic	(4)	617 grs.	Epileptic	(6)	484 grs.
	Total	(31)	560 grs.	Total	(65)	482 grs.
IV. 90 cases	Ordinary	(27)	509 grs.	Ordinary	(44)	455 grs.
	Epileptic	(11)	516 grs.	Epileptic	(8)	460 grs.
	Total	(38)	511 grs.	Total	(52)	456 grs.
V. 75 cases	Total	(25)	513 grs.	Total	(50)	437 grs.
G. total 417 cases	G. total	136 cases.		G. total	281 cases.	

In the above table it is probable that the weights in the female cases are more reliable, owing to their greater number, than those in the male. As, however, both sets support the same conclusions and differ very little in detail, any departure from average accuracy which may exist is not of importance.

The following facts are readily elicited from the table :

The weights throughout are considerably below the normal average, and this statement applies even to Group I, where no wasting exists, and to Group II, where little or no wasting has occurred. In the case of Group III, however, it is possible that the wasting which has occurred may be sufficient to account for the decrease in average weight, on the supposition that this originally reached the normal. In Groups IV and V, in which much wasting exists, it is difficult to estimate the

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

original weight of the brains, which may or may not have been up to the normal.

It is clearly shown in the table that the cases in Group III originally possessed a greater weight than those in Groups I and II. This agrees entirely with the writer's micrometric studies, which showed that there exists in the first and second groups a considerable under-development of the cortex cerebri which is in some cases almost as marked as in the wasting in Group IV. *The cases in Groups I and II are therefore macroscopically and microscopically cases of "amentia" as defined by the writer.*

It is thus evident that the facts of macroscopic and of microscopic anatomy support the views which were expressed by the author in the Introduction to this paper and which are the basis of the classification of mental diseases to which Parts II and III are devoted.

Degeneration of the Cerebral Vessels in Mental Diseases.

The examples of degeneration of the cerebral vessels which are present in the 233 cases of Series B are as follows:

	Per cent.
Group I. *Average age: 35 years; 1 in 32 cases*	3
No. 6.—Male æt. 57. Systemic syphilis and syphilitic stricture of the œsophagus; atheroma slight.	
Group II. *Average age: 50 years; 12 in 44 cases.*	27
32 natural, 6 slight, 5 moderate and 1 severe.	
Group III. *Average age: 54 years; 23 in 50 cases*	46
27 natural, 11 slight, 9 moderate and 3 severe.	
Group IV. *Average age: 68 years; 46 in 55 cases*	84
9 natural, 7 slight, 18 moderate and 21 severe.	
Group V. *Average age: 69 years; 51 in 52 cases*	98
1 natural, 3 slight, 16 moderate, and 32 severe.	

The average age of the cases in Series A was, in a previous paper, shown to be 57 years. In the 233 cases in Series B, the average is again, by what might seem a remarkable coincidence, 57 years, and the writer is thus enabled to once more divide the cases into those above and those below the age.

The average age in the several groups of Series B is respectively 35, 50, 54, 68, and 69 years, as compared with 38, 55,

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

57, 68, and 70 years respectively in the several groups of Series A.

The percentage below the average age in each group of Series B is respectively 97, 61, 48, 15, and 6, as compared with 82, 54, 45, 11, and 7 in the respective groups of Series A.

Of the cases below the average age of 57 years, there is not a single instance of atheroma in Group I, and there are 4 examples (in 27) in Group II, 4 (in 26) in Group III, 4 (in 8) in Group IV, and 3 (in 3) in Group V.

As was the case in Series A, the atheroma, except when slight, is, in patients below the age of 57 years, a physical sign of systemic disease, *e.g.* syphilis, renal disease, etc., and therefore belongs to the category of "accidental" atheroma.

The incidence of "normal" vascular degeneration can, therefore, without serious error, be studied by means of the cases which are above the average age of 57 years.

The percentage of cases above the average age of 57 years in Groups I–V respectively of Series B is 3, 39, 52, 85, and 94, as compared with 18, 46, 55, 89, and 93, in the corresponding groups of Series A.

The atheroma in each of these groups is as follows:

Group I.—One case only. Male, æt. 57. Atheroma, slight. Sytemic syphilis and syphilitic stricture of the œsophagus. This case must be classed as "accidental."

Group II.—Of the 17 cases, 9 are natural. Of the 8 examples of atheroma, 5 are slight, and 3 are moderate (47 *per cent.* of atheroma).

Group III.—Of the 24 cases, 5 are natural. Of the 19 examples of atheroma, 8 are slight, 9 are moderate, and 2 are severe (79 *per cent.* of atheroma).

Group IV.—Of the 47 cases, 5 are natural. Of the 42 examples of atheroma, 7 are slight, 16 are moderate, and 19 are severe (89 *per cent.* of atheroma).

Group V.—Of the 49 cases, 1 is natural. Of the 48 examples of atheroma, 2 are slight, 15 are moderate, and 31 are severe. (98 *per cent.* of atheroma).

An examination of these figures demonstrates that *the percentage and also the severity of the atheroma increase directly with the amount of dementia present.*

On the other hand, the following figures show that, whilst it is nevertheless true that atheroma is one of the degenerative

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

conditions consequent on senility, *the existence of degeneration of the cerebral vessels is independent of the age of the patient*, even when senile, as the average age in each group, whether atheroma exists or not, varies little.

233 Cases.	Group I (32 cases).		Group II (44 cases).		Group III (50 cases).		Group IV (55 cases).		Group V (52 cases).	
	No.	Age.	No.	Age.	No.	Age.	No.	Age.	No.	Age.
Number of and average age of all patients above 57 years	1	57	17	64	24	66	47	71	49	70
Number of and average age of all patients above 57 years, without atheroma .	—	—	9	63	5	65	5	67	1	68
Number of and average age of all patients above 57 years, with atheroma . .	1*	57	8	65	19	67	42	71	48	70

* Accidental.

It is thus evident that, whilst senility is an extremely elastic term, the actual age at which the body elements wear out depending on their inherent resistance and on the "stress" to which they are subjected, *there is a direct relationship between the presence of degeneration of the cerebral vessels and the development of severe dementia.* That the latter is not a *necessary* consequence of the former is proved by the occasional existence of gross vascular degeneration without the co-existence of dementia. This subject has, however, in a previous paper, been exhaustively discussed, and it suffices here to repeat the more important data in favour of a causal relationship between severe degeneration of the cerebral vessels and gross dementia. These are as follows :—

(1) Simple senility (*i.e.* old age) is not necessarily associated with gross degeneration of the cerebral vessels.

(2) In the insane gross degeneration of the cerebral vessels may exist without dementia.

(3) Dementia, except in rare cases of slowly progressive presenile involution of the cortical neurones, does not progress beyond a moderate stage, if gross degeneration of the cerebral vessels does not co-exist.

(4) In the 200 cases of Series A and the 233 cases of Series B, the percentage amount, and also the severity, of naked-eye

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

degeneration of the cerebral vessels varies directly with the degree of dementia present.

(5) Severe degeneration of the cerebral vessels occurs before the development of gross dementia. In recent senile cases, with the mildest dementia but considerable confusion, which, had they lived, would on clinical grounds have been expected to develop gross dementia, the percentage of naked-eye degeneration of the cerebral vessels is as great as it is in Groups IV and V. On the other hand, in chronic and recurrent senile cases with mild dementia only, naked-eye degeneration of the cerebral vessels is rarely present and is then relatively slight.

Hence the relationship between the presence of degeneration of the cerebral vessels and the development of dementia may be thus summed up: *In a cerebrum which has begun to break down, or where degeneration has progressed to the "moderate" stage (Group III), the presence or incidence of gross degeneration of the cerebral vessels will cause rapid progress of the neuronic degeneration, with gross dementia.*

The Influence of Tuberculosis on the Symptomatology and Morbid Anatomy of Mental Disease.

Active tuberculous disease was present at death, or the cause of death, in 105, or 24 *per cent.* of the 433 cases in Series A and Series B. In the former series of 200 cases there were 47 examples (23·5 *per cent.*), and in the latter series of 233 cases there were 58 examples (25 *per cent.*). In both series the percentage was very high in Group I, high in Groups II and III, and low in Groups IV and V. The cases were fairly evenly scattered throughout the several divisions of the different groups, but somewhat preponderated in Classes 2 and 3 of Group III, which contain the cases in this group where the onset of the insanity occurred at or after maturity. In all the groups the average age of the patients dying with tuberculous disease was considerably below that of the whole of the cases in the respective groups.

These facts are fully expressed in the following table:—

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Series A (200 cases).								Series B (233 cases).							
Group.	No. of cases.	Average age at death.	Tubercle.					Group.	No. of cases.	Average age at death.	Tubercle.				
			M.	F.	T.	*Per cent.*	Average age at death.				M.	F.	T.	*Per cent.*	Average age at death.
I	33	38	3	8	11	33	27	I	32	35	7	9	16	50	30
II	52	55	4	8	12	23	43	II	44	50	4	9	13	30	44
III	51	57	8	6	14	27	49	III	50	54	5	11	16	32	44
IV	37	68	3	3	6	16	66	IV	55	68	5	2	7	13	58
V	27	70	2	2	4	15	67	V	52	69	6	0	6	12	65
Total	200	57	20	27	47	23·5	46	Total	233	57	27	31	58	25	44

For the purposes of this paper it is necessary to now refer to the important influence exerted by tuberculosis in modifying both the symptomatology manifested during life and the morbid appearances found in the encephalon after death. This is especially the case as no less than one fourth of the 433 patients suffered from the disease.

Symptomatology.—Tuberculosis in the insane usually exerts a profound influence on the mental symptomatology exhibited by the patients, and not infrequently tends to cause errors in diagnosis.

Usually the patient becomes dull and apathetic and gradually ceases to work, and is finally almost stuporose, sitting all day with the head and spinal column flexed and the arms lying or hanging listlessly. The extremities are cold and blue, and the patient loses weight and frequently is wet and dirty. This mental condition may exist for long periods without the development of dementia.

In other cases the patient becomes surly, suspicious, and solitary in habits. He refuses food, often from fear of being poisoned, becomes violent if interfered with, and loses flesh. His behaviour in many respects resembles that of a caged beast suffering from severe injury or bodily disease.

In other cases, again, and especially when the tuberculous affection is of a very chronic type, the mental condition alternates

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

between excitement during the remissions and dulness and apathy during the exacerbations of the bodily disease. The patients, for example, are not uncommonly described as suffering from mania during the summer and from dementia during the winter.

Whilst in some instances the mental condition is little, if at all, affected by the presence of tuberculosis, and in others either *spes phthisica* or depression, which may be associated with extreme resistiveness, is met with, the above three types, in the experience of the writer, represent the most common effects of tuberculosis on the mental condition of the sufferers from mental disease.

Morbid anatomy.—As a preliminary remark it may be stated that in not a single case was any portion of the intra-cranial contents affected by tuberculosis, and the writer has never yet seen a case of active intra-cranial tuberculosis in the insane. Though a few examples have been described, this condition is probably of extreme rarity in spite of the fact that hardly any other part of the body, especially in the chronic disseminated form of the disease, appears to escape occasional infection.

In 15 of the 47 cases (32 *per cent.*) in Series A, and in 21 of the 58 cases (36 *per cent.*) in Series B, the pia-arachnoid and cerebrum were œdematous, in many instances markedly so. This condition much modifies the process of stripping, in some cases the membrane stripping readily and in others the softness of the grey matter making stripping almost an impossibility. The œdema is frequently of importance in rendering the cerebra useless for histological purposes.

In the more chronic cases also, where the patient dies in a condition of extreme emaciation, some general wasting of the cerebrum, with increase of intra-cranial fluid, occurs and at first makes it difficult to assign the case to its proper group. It is usually, however, possible to make the necessary allowances on careful examination of the cerebrum.

The following table shows the relative amount of œdema of the encephalon in the tuberculous and the non-tuberculous cases of the two series :

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

Cases with œdema of the brain.	Series A.		Series B.		Total.	
	No.	*Per cent.*	No.	*Per cent.*	No.	*Per cent.*
With tuberculosis . . .	15 in 47	32	21 in 58	36	36 in 105	34
Without tuberculosis . .	18 in 153	12	30 in 175	17	48 in 328	15
Total . . .	33 in 200	17	51 in 233	22	84 in 433	19

Hence the proportion of œdematous brains in the cases with tuberculosis is more than double that in the cases not suffering from this disease. As is, however, shown in the following table, which comprises all the cases in which cerebral œdema occurred, this condition is not directly due to the presence of tuberculosis.

Disease.	Number of cases with cerebral œdema.		
	200 of Series A.	233 of Series B.	Total of 433.
Tuberculosis	15	21	36
Pneumonias	5	9	14
Other infections and toxæmias . . .	4	6	10
Cardio-vascular disease	1	8	9
Cerebral affections	3	2	5
Carcinoma	4	1	5
Senile decay, etc., with cardiac failure . .	1	4	5
Total	33	51	84

It is probable that intra-cranial œdema, apart from cases of cerebral lesion, is usually due to progressive cardiac failure, to the different toxæmias and infections, or to these conditions combined, and that tuberculosis acts either by causing exhaustion and cardiac failure or by means of the secondary infections which in chronic cases are important factors in the production of "pulmonary phthisis."

Apart, however, from the mode of production of œdema of the brain, the facts, that about one-fourth of the 433 cases referred to died with tuberculosis and that one-third of these

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press

cases exhibited intra-cranial œdema, justify the writer in drawing special attention to a factor which so frequently modifies the morbid anatomy of mental disease.

(1) "The Exact Histological Localisation of the Visual Area of the Human Cerebral Cortex" (*Phil. Trans.*, Series B, vol. cxcii, pp. 165–222).—(2) Working on somewhat different lines, Campbell has since mapped out the latter area and also many other regions of the cerebrum.—(3) "The Functions of the Frontal Lobes" (*Brain*, 1903, part cii, pp. 215–241).—(4) "The Histological Basis of Amentia and Dementia" (*Archives of Neurology*, vol. ii, pp. 424–620).—(5) In this connection the author's experiments on the effect of gravity on the intra-cranial contents of the cadaver (*Archives of Neurology*, vol. ii, pp. 492–8) are of importance.—(6) *Journ. Ment. Sci.*, Oct., 1904, pp. 655–6.—(7) *Archives of Neurology*, vol. ii, pp. 579–80.

Adolescent Insanity: A Protest against the Use of the Term "Dementia Præcox."

By J. C. McCONAGHEY, M.B., Senior Assistant Medical Officer, Parkside Asylum.

KAHLBAUM in 1863 described a form of mental disease occurring at puberty and rapidly terminating in dementia; this he called "hebephrenia." In 1874 the same author described the condition known as "katatonia" or the "insanity of rigidity." These terms do not appear to have been adopted till 1891, when Pick, under the heading of "dementia præcox," described cases, including hebephrenia, characterised by maniacal symptoms followed by melancholia and rapid deterioration. This term has now been extended by Kraepelin to include the "hebephrenia" and "katatonia" of Kahlbaum, together with certain forms of paranoia which undergo early deterioration.

I have been reading two translations of Kraepelin's books, and the following is a short description of his views: As regards the *cause* of the disease, he obtains a defective hereditary history of various neuroses in 70 *per cent.*, and 60 *per cent.* of the cases appear before 25 years of age; he advances the theory that auto-intoxication, acting on a subject with a bad family history during an acute disease or during the various stages of reproduction, is the chief cause.

The essential symptoms of the disease are that voluntary attention and activity are much impaired, although the patients are, as a rule, well oriented; judgment becomes progressively defective, and there is a marked dulling of the emotional field;

https://doi.org/10.1192/bjp.51.213.270 Published online by Cambridge University Press