OBSERVATIONS - POST-MORTEM - UPON THE SANE AND INSANE.

BY

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T H E S I S

FOR

THE DEGREE OF

M.D.

INTRODUCTION.

During a four and half years' residence as pathologist at one of the Glasgow District Asylums (Gartloch), I performed 220 post-mortem examinations. As the number was so small it was possible to make the examinations and to record them with unusual care. In every case a report was written, during the examination, on printed forms, and a number of accurate observations were thus recorded. (I had previously undergone a six months' training at the Laboratory of the London County Asylums - under Dr.Mott, F.R.S. - where the post-mortem examinations numbered more than one a day.) I have thought it worth while to make an analysis of these cases: and as I have recently had an opportunity, at the Glasgow Royal Infirmary, of making similar observations upon sane subjects, there are interesting comparisons - the patients in both hospitals coming from the same class and district. In the Royal Infirmary there were/

EXTERNAL EVIDENCE OF SYPHILIS.

Some pathologists regard the presence of "shotty" groin glands as presumptive evidence of syphilis. I have attempted to ascertain to what extent these may be relied upon in this respect. If, as is most probable, it is the case that syphilis is the most important factor in the production of general paralysis, one would expect to find evidence of it very frequently in such cases.

In 91 male insane cases - including 42 general paralytics - in which the condition of the groin glands and the presence or absence of a penile scar was noted post-mortem, shotty glands and a scar were both present in 9 - 6 of them general paralytics. A scar alone was present in 8 cases including 5 general paralytics. Shotty glands alone were present in 5 cases including 2 general paralytics. Both scar and shotty glands were absent in 67 cases - including 29 general paralytics. A reliable history as regards venereal disease was seldom obtained, but in the clinical records it was found that 7 male general paralytics admitted syphilis,and 2 gonorrhoea. In only 2 of these were the above signs present, and in the remaining 5 they were definitely absent. It is held by some alienists that there is a form of general/

general paralysis caused by abuse of alcohol. In 18 cases of general paralysis in which there was no external evidence of syphilis observed post-mortem, there was a note in the clinical record regarding the use of alcohol, and in 11 or 12 cases there was a definite and reliable history of immoderate drinking. In 6 cases it could be excluded. As, however, it is clear that the occurrence of syphilis cannot be affirmed or negatived as the result of post-mortem external inspection, these observations have no value.

In the case of the sane, a penile scar was not always looked for. Shotty groin glands, however, were present in 23 out of 111 cases (20%): whereas in the insane they wereobserved in only 15%.

DEFORMITIES OR SIGNS OF DEGENERACY OBSERVED EXTERNALLY.

1. EARS.

In 206 cases, the ears were asymmetrical
in 1 - the right the larger:
in 2 cases they were abnormally large:
in 3 very flat, the usual folds and prominences being absent:
in 6 unusually small, and
in 2 they were pointed above.
In 1 case a supernumerary auricle was observed.
In 2 instances haematoma auris affected both ears,
in 1 the right ear only.

In 294 sane cases the only deformities observed were
in 2 instances undue smallness, and
in 1 case one ear was pointed above.
Haematoma auris did not occur.

Signs of degeneracy appeared in the ears in 8.7% of the insane and in 1% of the sane.

2. TEETH./

2. TEETH.

In 206 insane cases these were good in only 10, ages ranging between 17 and 62 years - average 39 .
They were fairly good in 34.
Gross irregularity occurred in 4.
In 158 they were bad (i.e.carious) or gone.

In 166 sane patients, good teeth were present in 9 (in 2 of these they were very good, but the patients were Poles), the ages ranging from 21 to 44 years - average 32.
They were fairly good in 17, irregular in 1, bad or gone in 139.

The condition of the teeth does not greatly differ in the two sets of cases, and is due,in all probability, to the difference in age.

3. PALATE.

In 197 insane cases the palate was unusually high/

high in 51, and narrow in 15, flat in 24, flat and narrow in 1, and flat and wide in 1.

In 195 sane cases it was high or narrow in 41 and flat in 2.

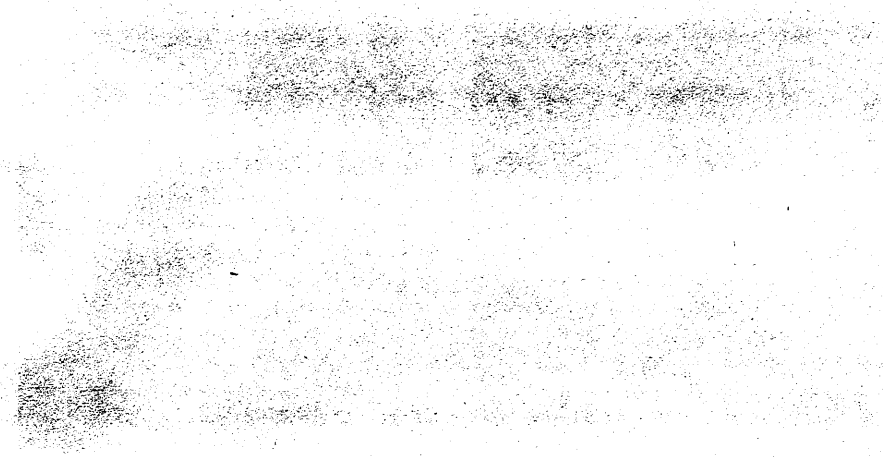
Abnormal conformation of the hard palate occurred in 46.7% of the insane, and in 22% of the sane.

4. OTHER DEFORMITIES OR DEFECTS OBSERVED IN 220 INSANE CASES.

A degree of phimosis existed in 6:
there was an abnormal growth of hair on the face of 6 women:
in 5 adult men there was scanty growth of hair on the face:
hair was scanty on the pubes and in the axillae of 2 men and 1 woman:
hernia was observed in 3 men and 2 women:
the insteps were unduly high in 5 cases:
the toes were webbed in 1:
a large hairy mole occurred 3 times, and prognathism onee.

Among/

Among the sane in 294 cases, hernia was observed twice, unusually high insteps twice, and albinism once.



CONDITION/

CONDITION OF THE PUPILS.

This was noted in 177 insane cases, excluding all cases in which there was local cause for inequality. They were equal in 94 and unequal in 83.

Among the sane also, observation led to the conclusion that inequality of the pupils after death is of no significance.

HEAD.

The condition of the scalp was noted in 202 insane cases.

In 60 it was 3-4 mm. in thickness,

in 70 it was over 4 mm., and

in 32 under 3 mm.

In 40 it was morbidly adherent.

Baldness of the scalp had no relationship to any of these conditions.

In the sane, the condition of the scalp was not specially noted.

SKULL CAP./

SKULL CAP.

In the insane abnormal thickening occurred alone in 31 out of 215 cases (14.4%) - including 4 (12.9%) cases of general paralysis, the ages ranging between 17 and 84 (average 56). In 3 (9.6%) of these the density was less than normal.

The density alone was increased in 55 cases (22%) - including 10 (20%) cases of general paralysis, the ages ranging between 23 and 83 (average 50).

In 11 (20%) of these the thickness was diminished.

Thickness and density were both increased in 39 cases (41.3%) including 35 (39.3%) cases of general paralysis, the ages ranging between 17 and 98 (average 49).

The skull cap was normal in 40 cases (18.6%) including 1 (2.5%) case of general paralysis, the ages ranging between 20 and 83 (average 53).

In the case of the sane, increase of thick-

thickness alone was observed in 6 out of 124 cases (4.8%), the ages ranging between 29 and 79 (average 52½): increase of density alone occurred in 9 (7.2%) ages 22 to 60 (average 48).

In 5 others both thickness and density were increased (4%) - ages 41 to 56 (average 47¼).

In 104 cases it was natural (83.8%),ages 18 to 72 (average 43).

Variations in thickness and density of the skull cap are much more frequent in the insane than in the sane, although in the latter variations do occasionally occur to such a degree as to appear pathological. When the insane cases in which the skull cap was natural are selected so as to bring the average age down to 43 (the same as in the normal sane) the percentage in which the skull cap was natural is 12.5 as against 83.8 in the sane.

DURA/

DURA MATER.

MORBID THICKENING.

In the case of the insane, only the notes of the last 100 cases were examined, as some experience is required to enable one to estimate abnormal thickening of this membrane.

In 81% it was thickened - the ages ranging between 20 and 98 (average 50½): and in 69 of these it was also morbidly adherent. (In 4 others there was morbid adhesion without appreciable thickening - ages 20, 36, 47, 73).

Of the 81, 33 were cases of dementia,
26 of general paralysis,
8 of mania
8 of epilepsy, and
6 of melancholia.

Of those 19 cases in which the dura mater was natural in thickness, 15 were under 50 years of age (average age 34). The remaining 4 included
2 cases of dementia - aged 73 and 61,
1 of melancholia - age 57, and
1 of idiocy - age 53.

Thickening of the dura mater occurs in the insane/

insane in the absence of the changes that are characteristic of pachymeningitis haemorrhagica, and also in cases in which there has been no excessive indulgence in alcohol. In 4 cases in which the membrane was thickened, the ages ranged between 20 and 28, and in all of them excessive indulgence in alcohol could be excluded.

In 124 sane cases, the dura mater was more or less thickened in 38 (30.6%) - in one case on one side only without apparent cause. The ages of these ranged between 29 and 70 (average 48).

The frequency of morbid adhesion of the dura mater to the skull cap was not noted in the sane. It not infrequently occurs, however.

Thickening of the dura mater among the sane is not a necessary accompaniment of old age. It occurs in cases of chronic alcoholism. In the case aged 29 there had been excessive drinking for 8 years.

Rusty/

Rusty staining or false membrane occurred on the inner surface of the dura mater in the insane in 57 out of 217 cases (26.1%).

21 of the 57 were cases of general paralysis, and in them the ages ranged between 34 and 65 (average 45¼). In only 2 of the 21 was thickening of the dura mater inappreciable.

Of the remaining 36, 31 were aged between 54 and 86 (average 69¼), and in all but 3 the cerebral vessels were atheromatous. In these three there was nothing local to account for the staining. The ages of the remaining 5 ranged between 23 and 49: in three, the vessels were atheromatous, and the other two were cases of mania.

In 22 of the 36 that were not cases of general paralysis, the rusty staining or false membrane was associated with the presence of more or less extensive subdural haemorrhage or of softenings or cysts of the encephalon.

In 13 additional cases there was recent subdural haemorrhage (excluding cases in which there was known to have been head injury) either in the form of bulky clot or as a thin red layer.

In 6 of them there was atheroma of the cerebral/

cerebral vessels, of the remaining 7,

3 were cases of general paralysis,

2 of mania,

1 was of epilepsy, and

1 of melancholia.

In the sane, rusty staining was observed only twice in 124 cases - in both of these the cerebral vessels were very atheromatous, and there was cerebral softening in one and haemorrhage in the other. False membrane occurred in 6 other cases (excluding those in which there was local cause such as injury or operation). In only 1 of these was there pachymeningitis haemorrhagica, in the others, 2 of which were cases of pernicious anaemia and 2 cases of women dying shortly after labor, the false membrane was obviously due to the presence of a thin layer of extravasated blood.

Rusty staining and false membrane occur

1. simply as the result of extravasation of blood into/

into the subdural space. When the extravasation has been recent and slight, there is a thin fibrinous membrane which can be readily stripped from the dura. At a later stage only rusty staining remains. If the extravasation has been large, organisation occurs and the dura is thus secondarily involved. Extravasation may be the result of a local vascular condition (atheroma) or of one of those general conditions in which it is a frequent occurrence (purpura, pernicious anaemia), or it may occur during attacks of cerebral congestion (labor, fits, mental excitement). In all of these the dura mater is or may be perfectly healthy.

2. In cases of pachymeningitis haemorrhagica.

In these cases the false membrane - if not recent - is organised clot - but the source of the haemorrhage is the vessels of the diseased and thickened dura mater. In these cases and in cases of large extravasation adhesion between the dura and the false membrane is more intimate.

PIA-ARACHNOID/

PIA-ARACHNOID

Morbid opacity of this membrane was absent in only 9 out of 179 insane cases.

Of these, 3 were 30 years of age or under,

2 were probably cases of amentia - as frontal wasting was absent although the patients had been in the asylum for years,

1 was a case of cerebral abscess and died soon after admission.

In the remaining 3 cases, frontal wasting was well-marked, and the ages were respectively 48, 64 and 67 years.

So that in only 3 cases with evidence of dementia was this membrane free from opacity to a degree that was considered morbid (1.6%).

Morbid thickening of the membrane was absent in only 5 out of 168 cases.

2 of these were aged 20 and 23 years respectively. In the other 3 the mental illness was acute and had lasted only from a few days to 6 months.

It/

It may therefore be said that in all cases in which dementia has been present, this membrane shows thickening, and the amount of thickening varies directly with the degree of dementia that has existed. This may be roughly estimated by comparing the weights of the stripped and unstripped cerebral hemisphere, or by weighing the stripped membranes themselves - the operation of stripping being easily performed when thickening has occurred.

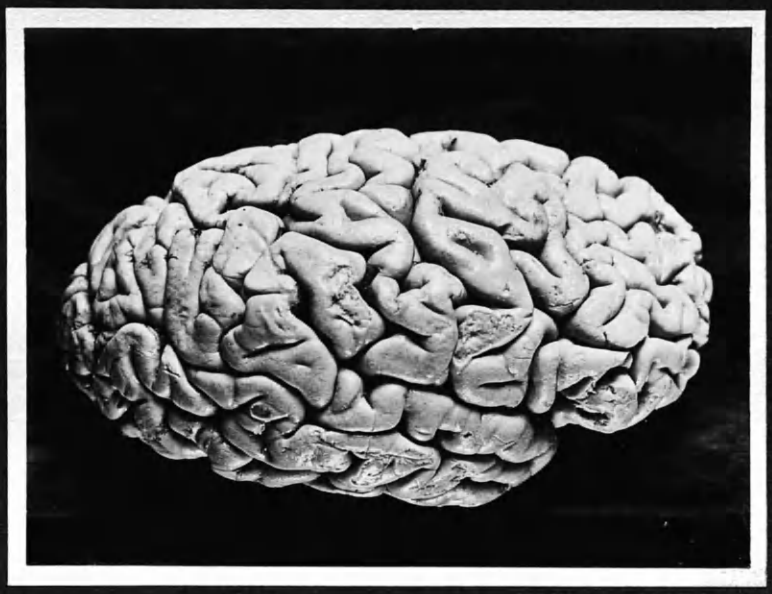
In only one case did purulent infiltration of the meninges occur. It was one of general paralysis, but the patient died of pneumonia.

Prefrontal adhesions - i.e. adhesion between the membranes covering the mesial aspect of each frontal lobe - were present to a greater or less degree in 48 out of 213 cases (22½%): 38 (17%) of the 213 were cases of general paralysis.

Decortication was produced by stripping the soft membranes in 21 cases out of 200 (10½%) - including 18 general paralytics. In 32 cases of general paralysis, decortication did not occur, although stripping/

Fig.1.

Cerebral hemisphere from a case of general paralysis, showing patches of decortication produced in stripping off the membranes.



stripping was effected with some difficulty in 23 of them. The occurrence of decortication does not seem to be related to any of the following:-

1. Length of time of post-mortem after death.
2. Duration of illness.
3. Thickness of membranes.
4. Presence or absence of overgrowth of neuroglia.
5. Amount of brain wasting.

The 3 cases in which decortication occurred that were not of general paralysis were, 1. brain syphilis; 2. dementia; 3. epilepsy with dementia.

Decortication then occurs very commonly in cases of general paralysis - rarely in other forms of insanity, and indicates an acute form of illness. (Fig.1.)

In the case of the sane, a morbid degree of thickening and opacity of the pia-arachnoid was noted in 65 out of 124 cases (52.4%) the ages ranging between/

between 18 and 72 (average 47). In 2 there was prefrontal adhesion and in 1 distinct decortication. In none of these 3 was there any other evidence of general paralysis (one was a case of diabetes, one had taken opium habitually and died of opium poisoning, the third was alcoholic).

Although a degree of thickening and opacity of the soft membranes is not infrequently observed in the sane, it is never - so far as my experience goes - so striking in appearance nor so extreme in degree as in the insane. It occurs to some extent as an accompaniment of old age, and is also present to a considerable degree in cases of chronic alcoholism, and when met with in persons under the prime of life, it indicates - in my experience - chronic alcoholism (excluding of course cases of chronic meningitis that are known to be associated with the presence of micro-organisms).

HEIGHT/

HEIGHT AND WEIGHT OF THE INSANE.

In the case of the insane, the height and weight of 98 men and 83 women was noted. The height was measured on the post-mortem table, the weight was the last one obtained during life, and is therefore only relatively correct.

Average male weight 8 st.12¾ lb. (56.556 kilogrammes)
Average age 50 .

Average female weight 6 st. 5½ lb. (40.597 kilogrammes)
Average age 45 .

Average male height, 5ft.5¾in. (1.67 metres).
Average female height, 5 ft.1¼in. (1.55 metres).

The average height of both sexes is below the normal.

Emaciation is very frequent among the insane, hence the body weight is of relative significance only.

As it was impossible to obtain the body weight in the sane, the height was unfortunately not measured.

BRAIN WEIGHT.

In the insane the average weight of the brain in males - calculated on 82 cases - was 1346 grammes (average age about 50).

The average weight in females - calculated on 75 cases - was 1186 grammes (average age about 45).

The heaviest and lightest brains among males weighed respectively 1682 and 1080 grammes. (The former was not included in making the calculation, as in it there was some cortical softening).

Among females, the brain weight varied between 1457 and 910 grammes.

All cases of idiocy were excluded: also all cases in which there was any considerable distruction or compression of cerebral substance.

In the sane, the brain weight in males varied between 1750 and 1077 grames, and the average - calculated on 88 cases - was 1428 grammes (average age 43½).

In/

In females, it varied between 1460 and 1020 grammes, the average - calculated on 43 cases - was 1247 grammes (average age 44).

In both sane and insane, the largest number of cases were aged between 41 and 60 years, and the average weights of these were as follows:-

Male insane:	1338 grammes.	(40 cases)
Male sane:	1371 grammes.	(39 cases).
Female insane:	1150 grammes.	(30 cases).
Female sane	1240 grammes.	(24 cases).

RELATIONSHIP/

RELATIONSHIP BETWEEN BRAIN AND BODY WEIGHT IN THE INSANE.

In males, calculated on 79 cases - the ages ranging between 21 and 80, it is as 1 is to 42.5, and in females, calculated on 69 cases, as 1 is to 35.29.

Tabulated according to age these are as follows:-

Males.

Between 21 and 40 yrs. the weight is as 1 to 39.(23 cases)
Between 41 and 60 yrs. " " " " 1 to 44.(38 cases)
Between 61 and 80 yrs. " " " " 1 to 47.3.(18 cases)

Females.

Between 21 and 40 yrs.the weight is as 1 to 32.6.(24 cases)
Between 41 and 60 yrs. " " " " 1 to 41.4.(31 cases)
Between 61 and 80 yrs. " " " " 1 to 40.8.(14 cases)

In the case of the sane these calculations could not be made, as the body weight was not obtainable.

RELATIONSHIP BETWEEN WEIGHT OF CEREBRUM AND CEREBELLUM IN THE INSANE.

An attempt has been made to ascertain whether in cases of gross cerebral wasting in the insane, the cerebellum partakes in the process.

The normal relative weight of the cerebellum - including pons and medulla - to the cerebrum, is as 13 is to 87, or about 1/7 (Huschke).

In 29 cases of very marked cerebral wasting the average relation was as 14 is to 86. In 17 cases of slight cerebral wasting it was as 13.5 is to 86.5. In 10 cases of marked cerebral destruction or compression it was as 13.7 is to 86.2.

The following table will make the relationship more clear.

87 ÷13 = 6.7 - Normal.

86 ÷14 = 6. - Gross cerebral wasting.

86.5÷13.5 = 6.4 - Slight cerebral wasting.

86.2÷13.7 = 6.2 - Cerebral destruction or compression.

It will be seen that the relative weights remain fairly constant, but that the cerebellum does not waste quite pari passu with the cerebrum.

CEREBRAL/

CEREBRAL VESSELS.

In the insane, atheroma was present to some extent in 93 out of 217 cases - 42.8% - the average age 63 years.
In 48 it was well-marked - the ages ranging between 39 and 98 (average 67).
In the 45 cases in which it was slight the average age was 62½.
Atheroma was quite absent in 124 out of the 217 cases - 57% - the ages ranging between 17 and 72 (average 42¾).

Aneurism of the basal vessels was noted in 9 out of 214 cases - 42%. One case was aged 34, the ages of the others averaged 63.

Abnormal arrangement of the cerebral arteries was observed in the insane 6 times in 217 cases.
In 3 it consisted of a discrepancy in size between the two vertebral arteries;
in 1 the basilar and both internal carotids were very small;
in 1 the basilar alone was small, and
in 1 the posterior cerebrals arose from the internal carotids.

There/

There was evidence of intracranial haemorrhage in 22 out of 217 cases (10%). In 9 of these it was slight subdural extravasation - probably the result of congestive seizures and fits (see notes on Dura Mater): in 3 it was cerebral, in 1 meningeal, and in 9 subdural (in 8 of these 13, the vessels were atheromatous).

Cases of accident were excluded.

Cerebral softenings and cysts - alone or combined - occurred in the insane in 60 out of 217 cases - 27.6% - the ages ranging between 34 and 98 (average 63) (Fig. 22½).

The distribution of these was as follows:-

MIDDLE CEREBRAL ARTERY	36:	Cortical branches 23 Perforating 13.
ANTERIOR " "	10:	Including 4 in the corpus callosum.
POSTERIOR " "	9:	
CEREBELLUM.	3:	(Vertebral artery).
PONS.	1:	
MEDULLA.	1.	

In the sane, atheroma of the cerebral arter-

ies/

arteries was present more or less in 25 out of 124 cases - 20% - the average age 55 . Of the 99 cases in which atheroma was absent, the average age was 31.

Aneurysm of the basal vessels occurred in 2 cases - aged respectively 30 and 62 years.

Abnormal arrangement of the cerebral vessels was occasionally observed, but the exact frequency was not noted.

Intracranial haemorrhage occurred (apart from accidents) in 12 cases out of 100, the average age 52½.

Softenings and cysts occurred in 16% - average age 50 .

GRANULARITY/

GRANULARITY OF THE FOURTH VENTRICLE.

In the insane this was present in 181 out of 215 cases - 84%.

In 108 of these it was limited to the lateral sacs of the floor (average age 55); 5 of these were undoubtedly cases of general paralysis.

In 73 the granularity was present on the central part of the floor - 49 of these were cases of general paralysis. In 8 of the remaining 24, the granularity was well-marked, and in 16 it was slight. In those cases in which it was well-marked it was also present in the 3rd and lateral ventricles.

Of the 34 cases (15.8%) in which granularity was quite absent,

2 were cases of general paralysis dying in an advanced stage of the disease, and the diagnosis corroborated by microscopic examination.
14 were cases of dementia,
7 were cases of mania,
6 were cases of epilepsy,
3 were cases of melancholia,
1 was a case of cerebral abscess, and
1 of idiocy.

In/

In the sane, a fine granularity of the lateral sacs of the ventricle was observed in 25 out of 124 cases - 20% - (average age 46).

In only 2 cases was a slight granularity of the floor observed, and these were certainly not cases of general paralysis.(Distinct granularity of the floor was observed once in a child of 15).

Although occasionally seen in post-mortems on the sane, this granularity is in them recognised with difficulty and is not readily seen, or even felt, as is the case frequently in the insane.

Granularity of the Fourth Ventricle then is a very common appearance in the insane brain. Its exact significance is not understood. It is certainly not always due to hypertrophy of neuroglia. Possibly it may be caused by proliferation of ependymal cells and the fact that it is most marked, and is indeed often a very striking appearance in cases of general paralysis, suggests the presence of an irritant in the cerebro-spinal fluid. Granularity of the calamus scriptorius is a frequent, but not a constant, appearance in cases of general paralysis.

Fig.2.

Cerebral hemisphere - left - showing microgyria of the frontal lobe and also gross wasting. The patient was a woman aged 84: she had been in Asylums for 64 years and was demented. Although the frontal gyri are exceedingly small, the sulci are not remarkably wide, which led one to conclude that there was a congenital defect. Observe that the wasting affects frontal, central, and superior parietal regions chiefly, but that the remainder of the hemisphere is also affected to a quite appreciable degree.

The immediate cause of death in this case was cancer of the stomach.

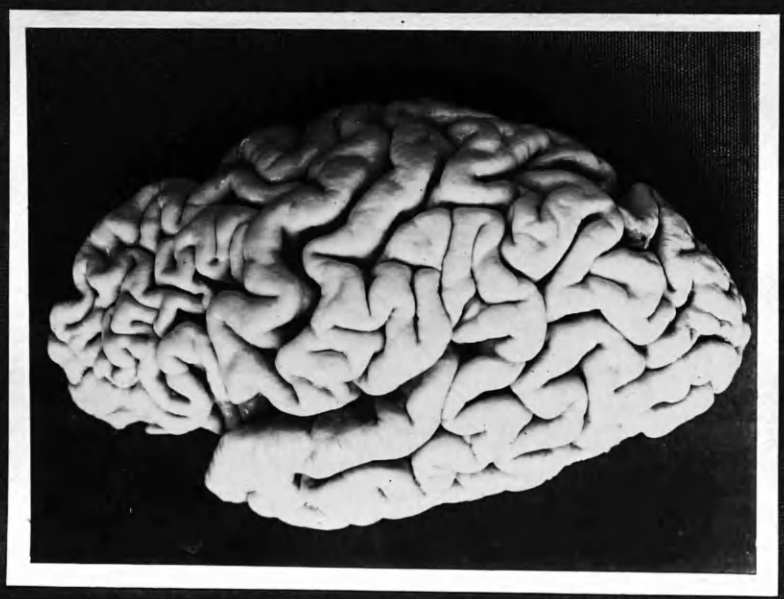


Fig.3.

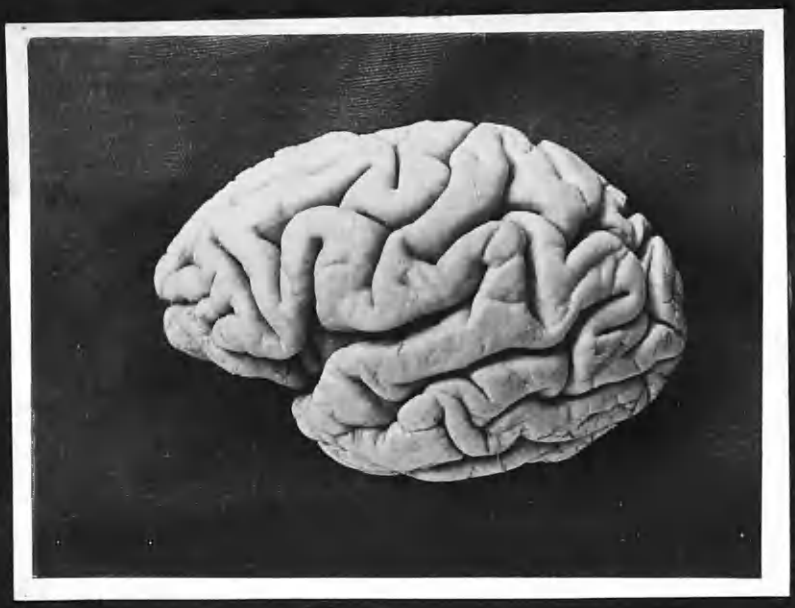
Left cerebral hemisphere from a case of microcephaly. The patient, a man of 53, was an absolute idiot: the head exceedingly small and dome-shaped: ears very large: testes very small. 29 polypi were counted in 5 feet of small intestine and one of these examined microscopically was found to be a cancer. The patient was hemiplegic for a year before death and died as a result of recent cerebral haemorrhage.

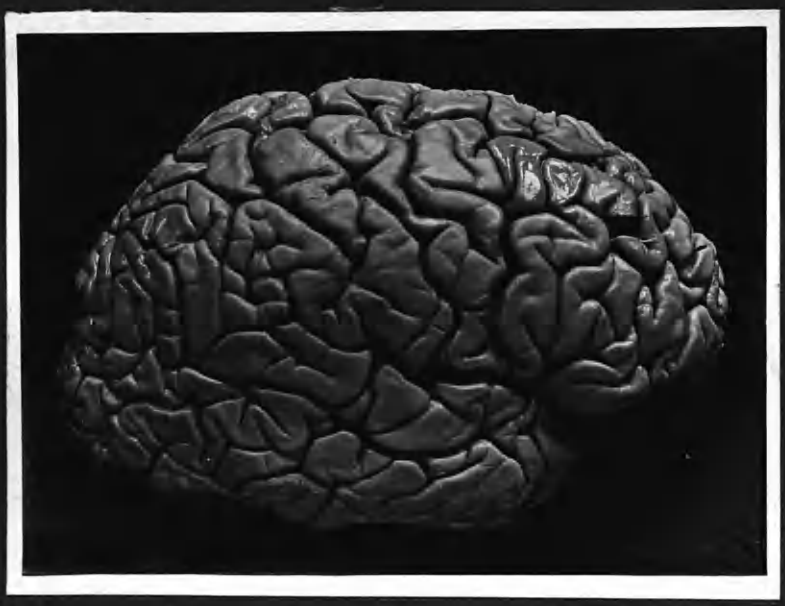
Notice the remarkably small size of the hemisphere and the extreme simplicity of the gyri. There is also some wasting.

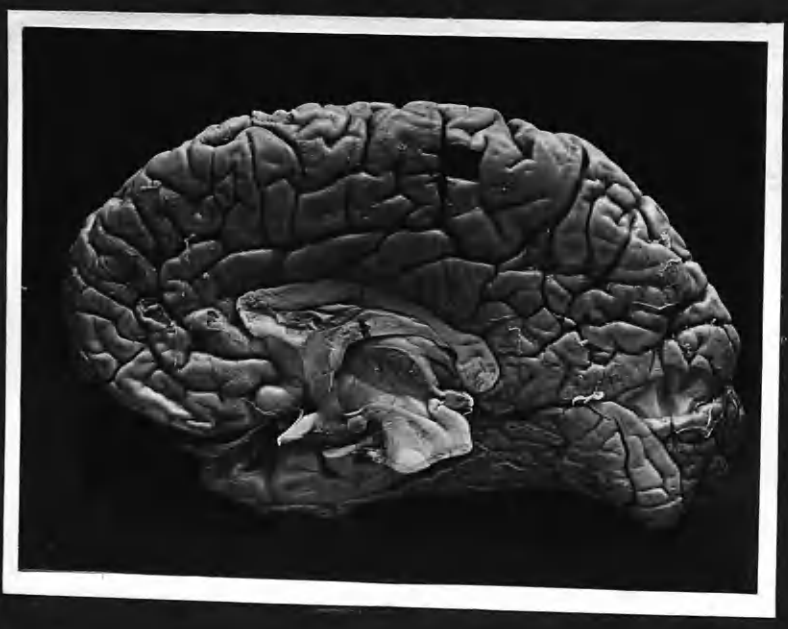
Fig.4.

(1). Right cerebral hemisphere from a case of idiocy. The patient was an epileptic idiot aged 23 years, and died in the status epilepticus. The physique was poor: height 5 feet 3 ins.: weight 6 st.7½ lb. Observe the large size of the hemisphere, the complex flattened convolutions (except in the central region, where they are more simple).

(2) On the mesial aspect notice the shortness of the corpus callosum as if it and the ventricles had been compressed by want of space.







GROSS ABNORMALITIES OF THE CEREBRAL CONVOLUTIONS IN THE INSANE.

These occurred in 12 out of 217 cases.

In 7 of them the ascending parietal gyrus was unusually small (including 1 case of epilepsy, 1 of general paralysis, and 3 of dementia):

in 2 cases (of epilepsy) there was a small area of localised hypoplasia of one cerebellar hemisphere:

in 1 case (of general paralysis) there was a hollow in each cerebral hemisphere, occupying about half of the occipital lobe on its upper border - without any loss of cerebral substance:

in 1 case (of general paralysis) the central sulcus was interrupted by a broad annectant, and in another the left ascending parietal and the third frontal gyri were joined - the annectant separating the central gyri from the Sylvian fissure.

In 4 other cases there were gross abnormalities of the brain, but these were cases of amentia:-

1. microgyria - affecting both frontal lobes: (Fig.2)
2. microcephaly - weighing only 736 grammes: (Fig.3)
3. macrocephaly - weighing 1360 grammes, gyri com-

plex/

Fig.5.

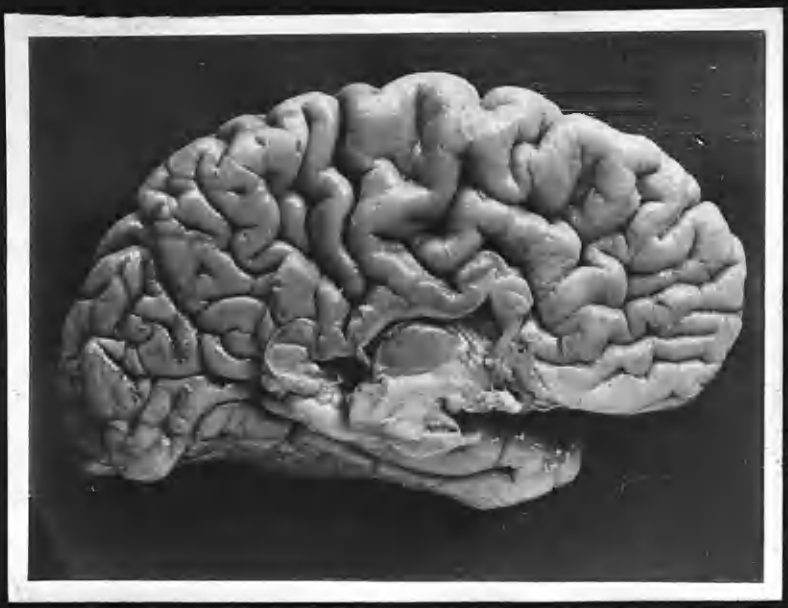
Left cerebral hemisphere, mesial aspect, from a case of amentia. The patient was a man of 31. He was dumb, but could hear and understand what was said to him, was clean and tidy in his habits, and did a little housework under supervision. The brain is large: it weighs 1347 grammes (47¼ oz.: height of patient 5 ft. 7½ ins.: weight 6 st. 10 lb.): the corpus callosum is absent except at its anterior and posterior extremities: the arrangement of gyri and sulci in the paracentral lobule is quite abnormal, and there is apparently some hypoplasia of this part of the brain. (The falx cerebri was much shorter than usual, extending for only about half the distance between the tentorium cerebelli and the crista galli. The middle commissure and the septum lucidum were also absent.)

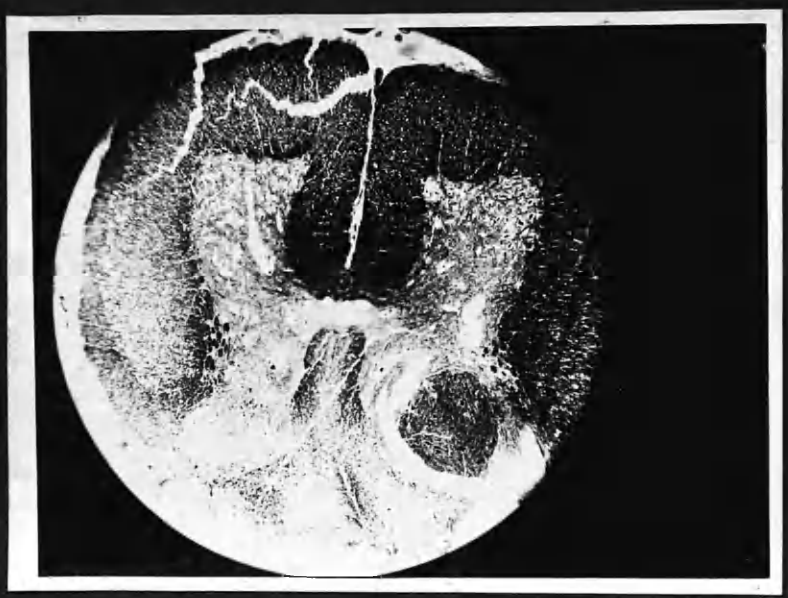
Fig.6.

Transverse section of spinal cord from 1st lumbar segment, showing a well-defined group of ganglion cells in one posterior horn. The case was one of tabic general paralysis.

Fig.7.

Transverse sections of spinal cord from the 5th, 6th and 7th cervical segments, showing irregular arrangement of the grey and white matter. This case was also one of tabic general paralysis.





complex and flattened and ventricles diminshed in size as a result of flattening: (Fig.4)

4. absence of corpus callosum - except at its anterior and posterior extremities, the hemispheres being united by cortex and underlying white matter. The fornix and the middle commissure were also absent. (Fig.5).

It is convenient to note here that in 2 cases of tabic general paralysis, gross abnormality of the spinal cord was found upon microscopic examination:-

(1) throughout the first lumbar segment there was in the left posterior horn, slightly posterior to Clarke's column - which was represented by a few cells - a well-defined encapsuled group of large pigmented ganglion cells: (Fig.6)

(2) in the cervical region from the fourth to the seventh segments the arrangement of grey and white matter/

matter on the right side was quite irregular, the anterior horn being broken up by a band of white matter passing through it. (Fig.7)

Also in a case of dementia the left cressed pyramidal tract, in which there was recent degeneration, was found to cross at the level of the fifth cervical segment.

In another case of dementia there was hydromyelia.

No gross abnormalities of conformation were met with in the sane brain in 124 cases. Slight irregularities,however, may have been overlooked.

CEREBRAL/

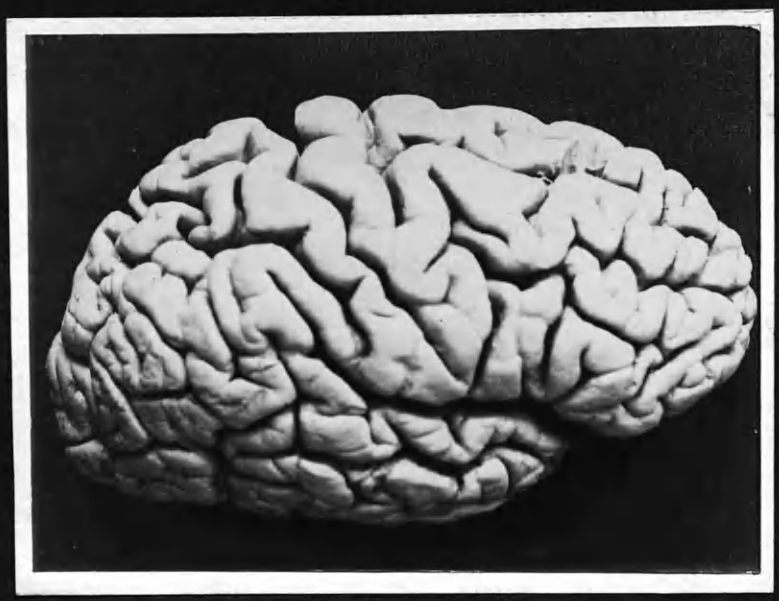
Fig.8.

Right hemisphere from the brain of a man aged 86 who died in Merryflatts Poorhouse, of pneumonia. Notice the considerable degree of wasting that is present and that the areas affected are the same as in dementia. Observe also that the membranes have evidently stripped cleanly and in a sheet - there are no decortication and no fragments of membrane left adhering.

Fig.9.

Right hemisphere from the brain of a girl who died in Belvidere Fever Hospital of scarlet fever. There is a slight degree of wasting in the same areas as in the specimen above. Observe that the membranes have been stripped off with difficulty, as small areas of cortex have been removed by the finger-nail or forceps, and that fragments of them remain in the sulci in places.

(For the first of these two cases I am indebted to Dr. Mary Liston, and for the second to Dr.Brownlie.)



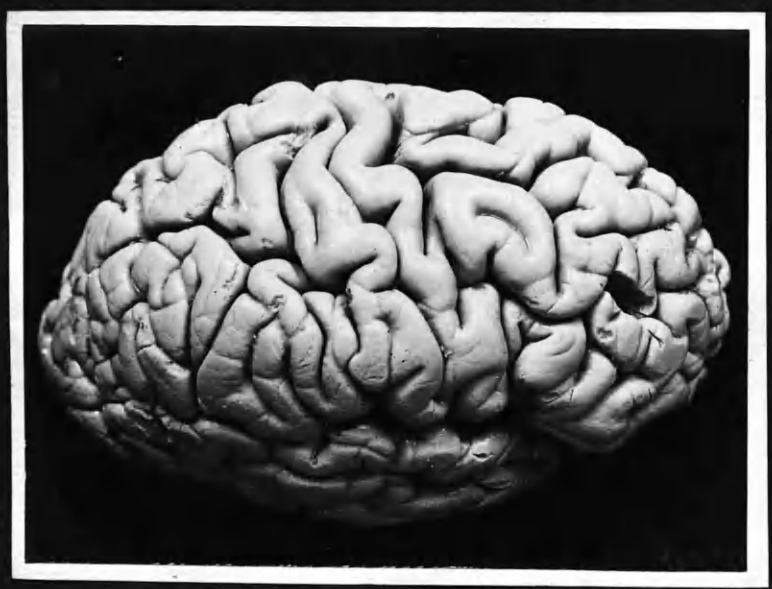
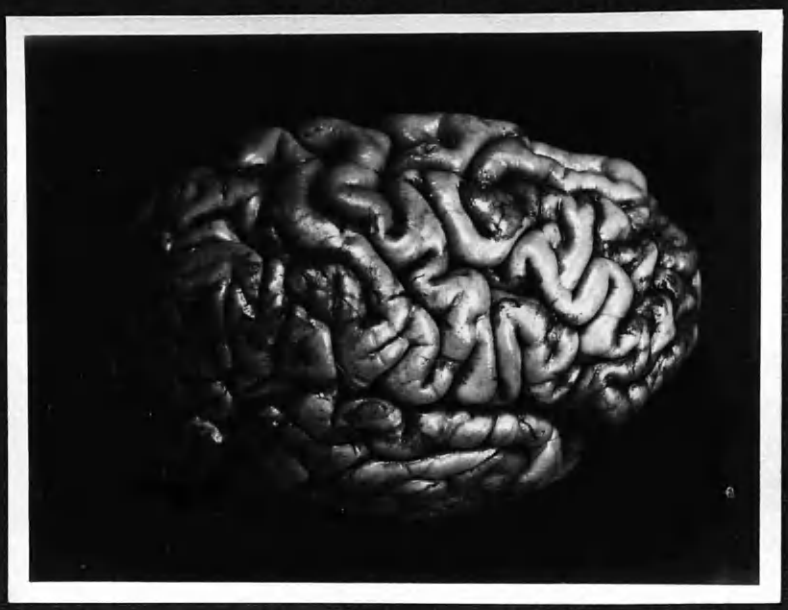


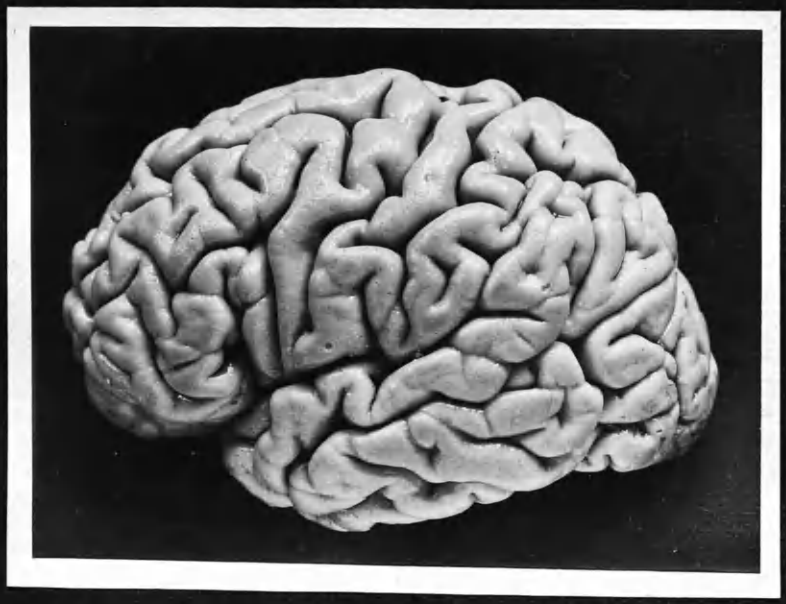
Fig.10.

(1) Right cerebral hemisphere from the case of a young woman aged 30 who died in the Glasgow Royal Infirmary of abdominal (and ultimately general) tuberculosis. There is a good deal of wasting affecting the same areas as in the two previous cases.

Fig.10.

(2). Left cerebral hemisphere from the case of a young man aged 23, dying insane (maniacal) of advanced wide-spread tubercular disease. The wasting is rather more conspicuous in this case than in the one above, but the condition of the soft membranes in the two cases differed very markedly. In the case of the youth they were very thick and stripped very readily and in a sheet. This condition of the membranes was in all probability due to alcoholism. The parents gave a very definite alcoholic history. The patient drank to excess upon every opportunity and for the three years previous to his admission to the asylum - at the age of 21 - had only been 31 days out of prison. Tubercular ulcers of the stomach and oesophagus were present in this case. (See Figs. 23 and 24.)





CEREBRAL WASTING.

The degree of wasting in the insane varies directly with the amount of dementia present - but it must be borne in mind that wasting of the brain takes place in old age (Fig.8) and as a part of the general wasting that occurs in severe illness (Figs. 9 and 10) - apart altogether from dementia. There is no difficulty however in distinguishing between the two, because in gross dementia the condition of the soft membranes as regards thickness and opacity is quite characteristic; and, moreover, the wasting is very much greater than is ever seen in the sane.

Wasting may be masked by oedema or anything else that causes flattening of the convolutions.

Among the insane there were a few cases in which wasting was inappreciable: these were young patients (aged about 20) and were cases either of epilepsy, acute insanity or of amentia (excluding cases in which wasting was marked by oedema, etc.).

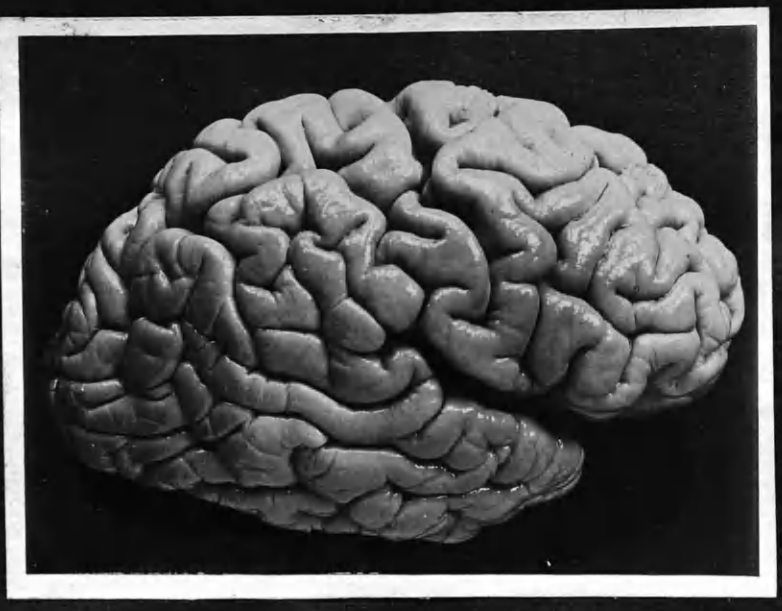
In a small proportion of cases wasting was more apparent in the upper central and superior parietal/

Fig.11.

Right cerebral hemisphere from a case of amentia (imbecility). The patient (a male) was 31 years of age and the immediate cause of death was phthisis pulmonalis and empyema. (The mesial surface of this hemisphere is shown in Fig.5.) There is apparent a slight degree of wasting, and there was some thickening of the membranes. Observe that the frontal region of the brain occupies a smaller portion of the hemisphere than in a normal brain, and that the fissure of Rolando is consequently more vertical and shorter. The thickening of the membranes probably indicates the occurrence of a slight degree of dementia.

Fig.12.

Left cerebral hemisphere from a case of mild dementia - a woman aged 56. Observe that the convolutions of the frontal lobe are of a fair size, that the sulci are not very wide, and that the membranes have evidently not been greatly thickened and have not stripped from the hinder part of the brain.



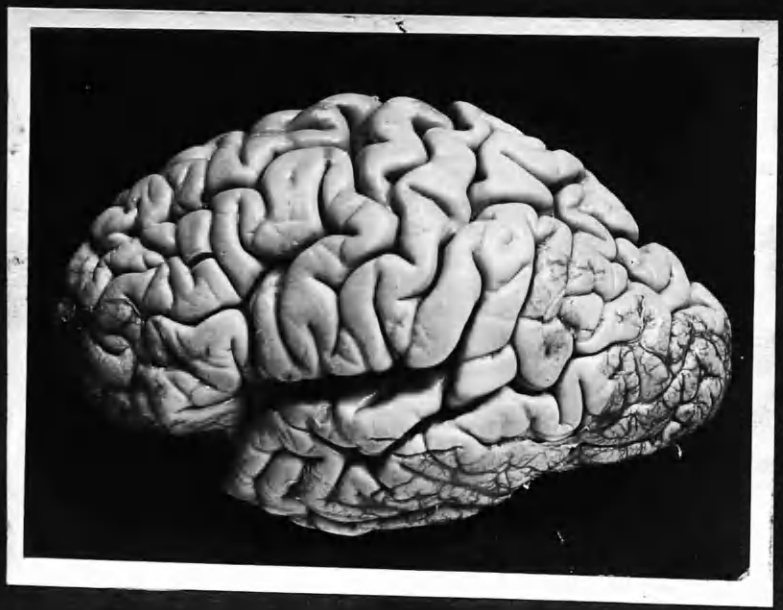


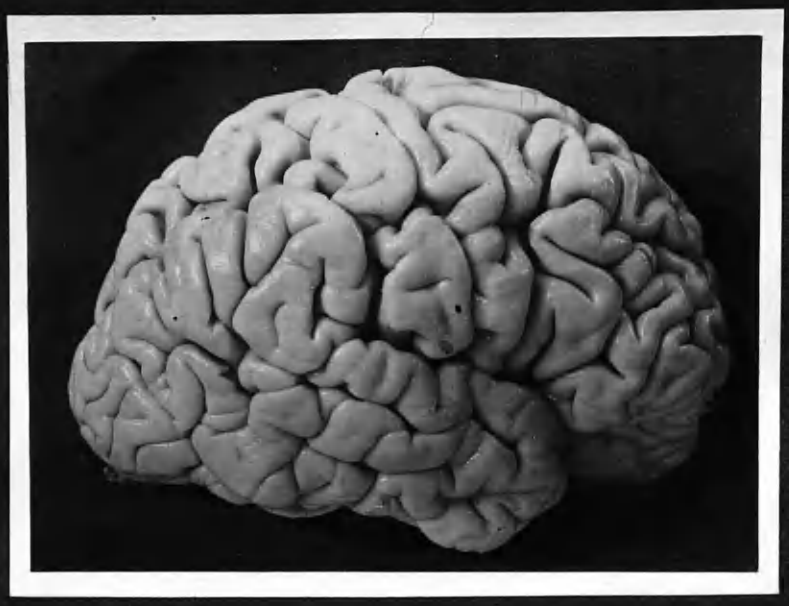
Fig.13.

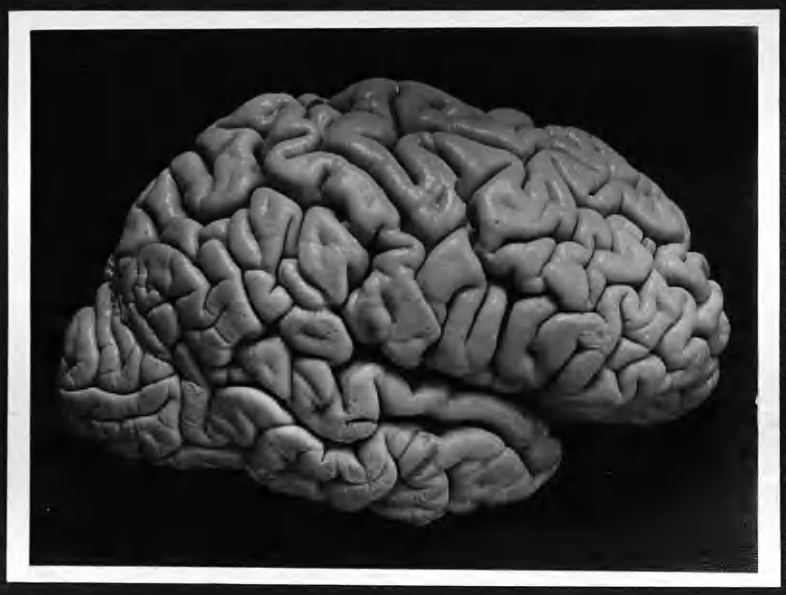
A cerebral hemisphere from each of three cases in which dementia was present:

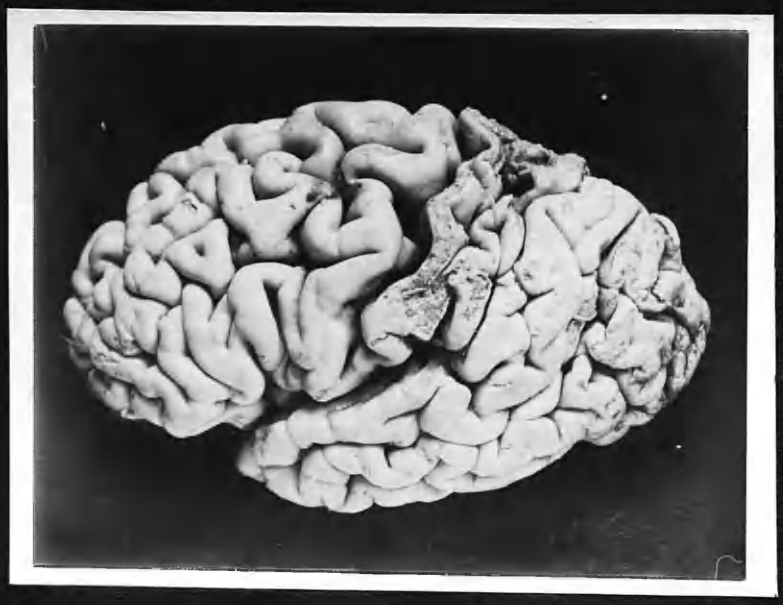
(1) from a man who died of general paralysis at the age of 36. This brain was oedematous and the wasting is consequently masked somewhat (See Fig.22 for the mesial aspect of the hemisphere). Observe how small the frontal gyri are:

(2) is from a man of 56 with melancholia, and some dementia:

(3) from a woman aged 68 with dementia. Decortication in this case was due to the presence of multiple cortical softenings.







parietal regions than it was frontally. These numbered 17 (7.8%) and included patients who were only very slightly demented (Fig.11), or were young, and also some cases of amentia (Fig.12), melancholia and mania. The wasting in these cases was probably the result of the terminal illness and not of the mental condition.

In most cases wasting affected the frontal, central and superior parietal regions - being most marked anteriorly and diminishing posteriorly (Fig.13). In more advanced cases the first temporal convolution was wasted also, and in cases more advanced still, the inferior parietal and occipital lobes - the corresponding mesial areas being similarly affected. But in all of these the wasting was most marked anteriorly, diminishing posteriorly.

Among the sane, cerebral wasting occurred to a greater or less degree in 62 cases out of 124 (50%) - the ages ranging from 28 to 79 (average 46). In fact it is present to some extent in all cases of prolonged or severe illness, sometimes also in cases of/

of sudden death from accident, and in these it is often due to chronic alcoholism.

The degree of wasting attained is never so great as in severe dementia, and the soft membranes are not thickened and opaque to anything like the same extent. As a rule the areas affected are the same as in dementia. (See Fig.10).

ASYMMETRY/

ASYMMETRY OF THE CEREBRAL HEMISPHERES.

A distinct difference in size between the two hemispheres (in the absence of obvious cause) was noted in 12 cases - the difference being apparently due to greater wasting of one hemisphere, and varying in degree between 9 and 46 grammes:

8 were cases of general paralysis,

2 of acute mania, and

2 of dementia.

In 10 the left hemisphere was the more wasted.

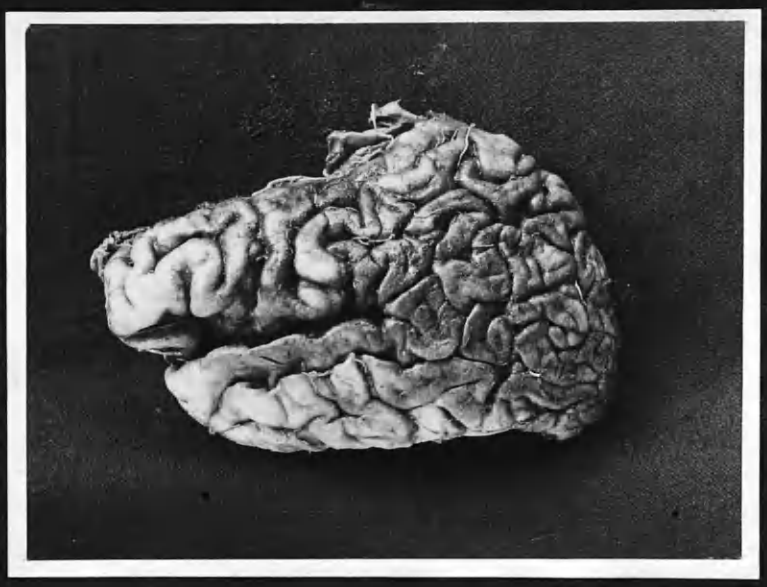
Asymmetry of the cerebral hemispheres was not observed among the sane - but the hemispheres were not weighed separately.

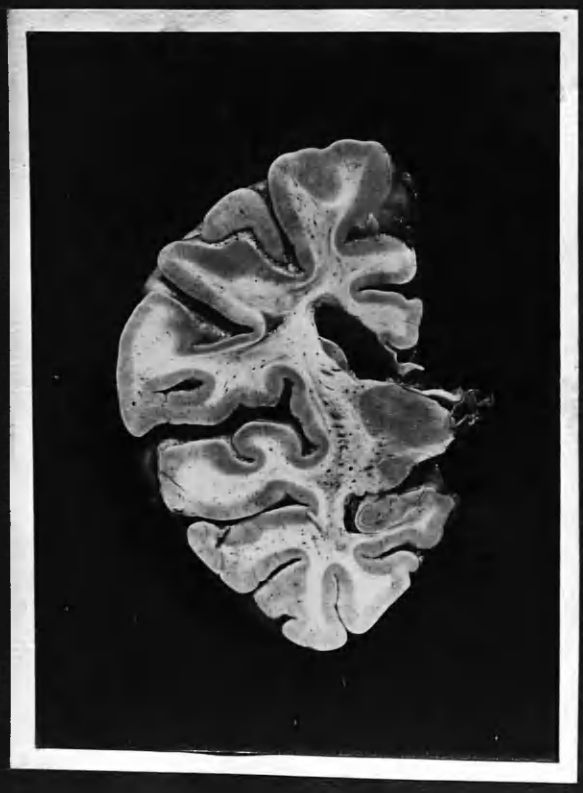
Fig.14.

Left cerebral hemisphere, greatly compressed by subdural clot, and partially destroyed by softening - the first and second frontal gyri being almost completely destroyed.

Figs. 15 and 16.

Vertical sections of the right and left cerebral hemispheres. Observe that in the compressed one the internal capsule is greatly reduced in size and that there is compensatory dilatation of the lateral ventricle. In the other section there is a small cyst just below the cortex in the depth of the second frontal sulcus





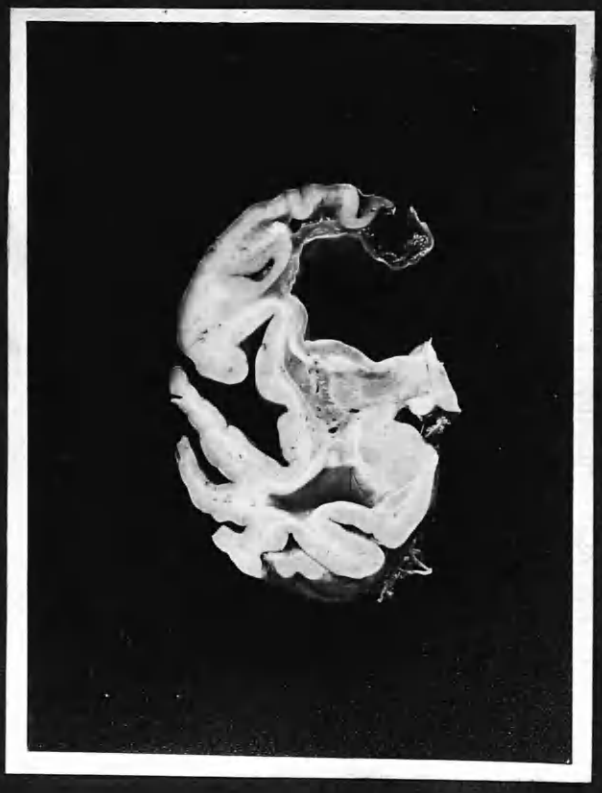


Fig.17.

Vertical mesial sections of the cerebellum in the case from which Figs. 15 and 16 were taken. Observe the wasting that is present in one of them - the right hemisphere - i.e. the side opposite to that on which the cerebrum was compressed.

Fig.18.

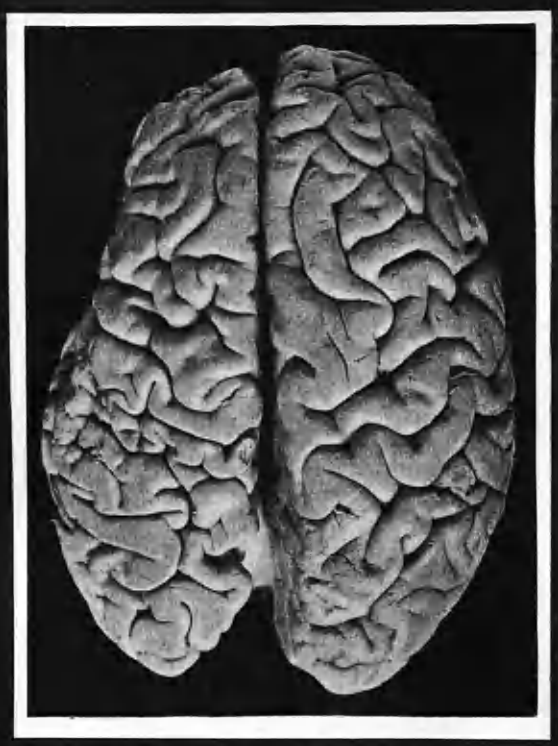
The brain in a case of true porencephaly.

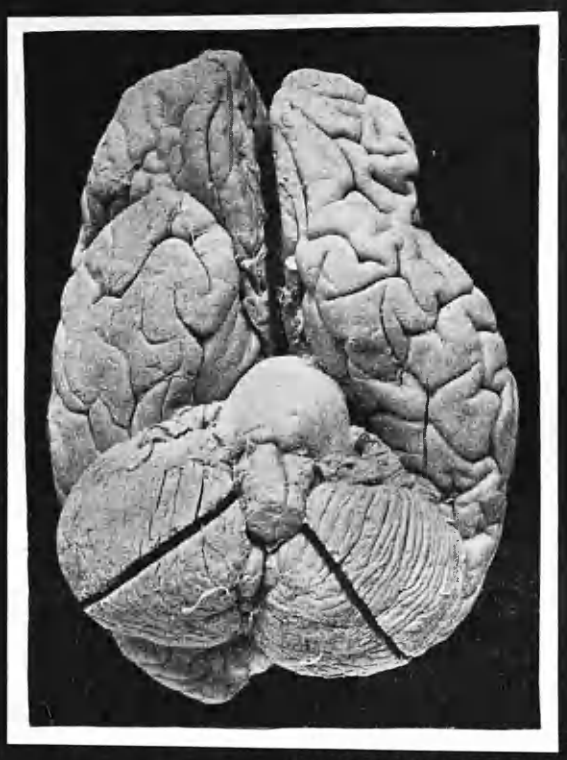
(1) Shows asymmetry of the cerebral hemispheres and hypoplasia of the central gyri:

(2) shows that the cerebellar hemispheres are not asymmetrical.

Fig.19.

The outer surface of the left hemisphere - showing deformity.





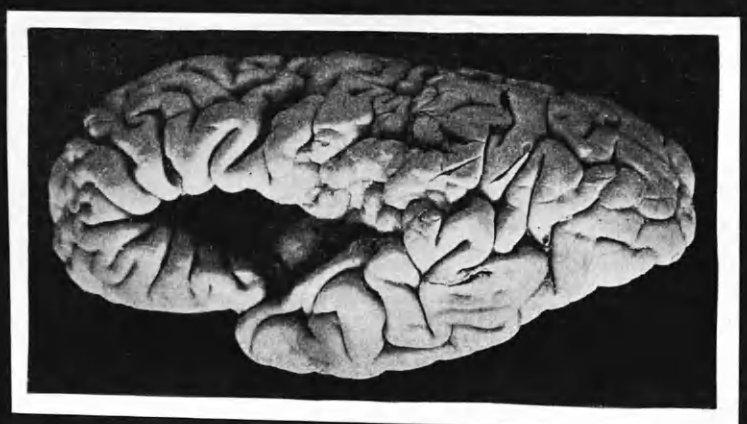


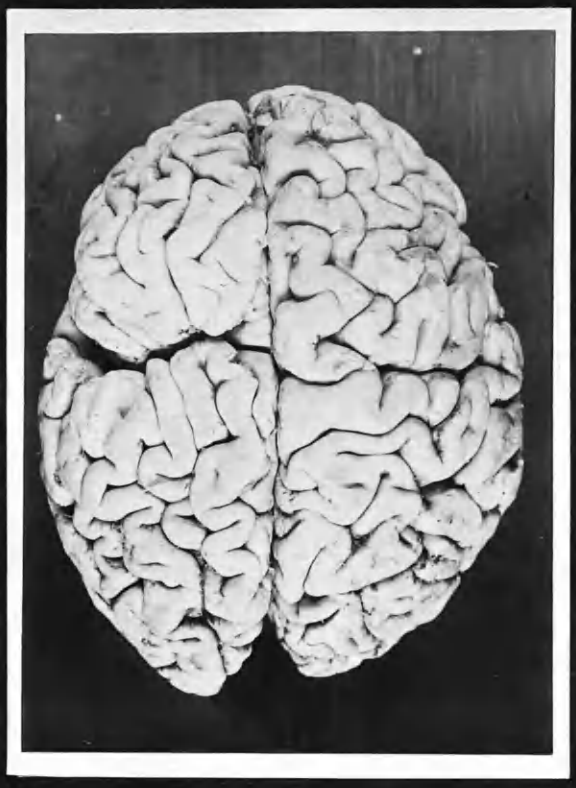
Fig.20.

Another case of true porencephaly.

(1) Brain viewed from above. Observe the cleft in the left hemisphere and the radial arrangement of gyri in its vicinity: also that in the right hemisphere the ascending frontal gyrus is reduplicated. Both gyri contiguous with the accessory sulcus thus formed, were found with the microscope to be motor in character.

(2) Base of same brain.

A bristle has been passed under the left hypoglossal nerve. Observe that the right pyramid in the bulb is unusually large and that on the left side there is a depression where the pyramid should lie.



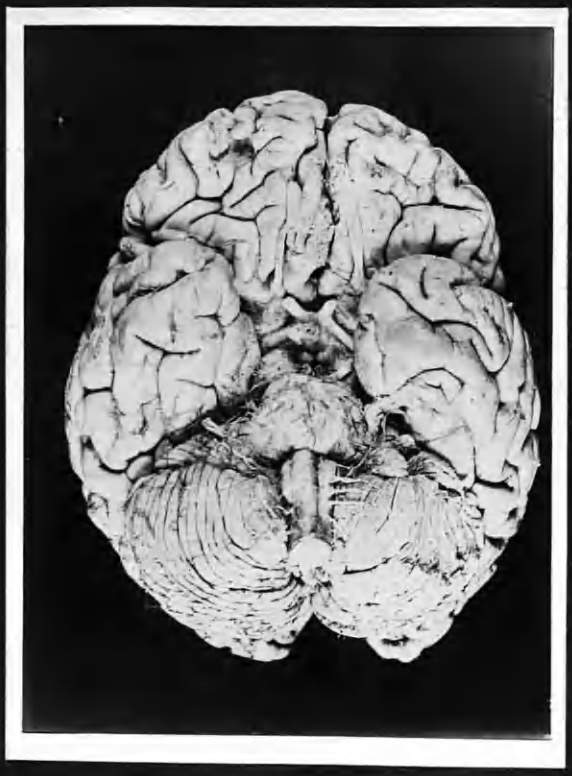


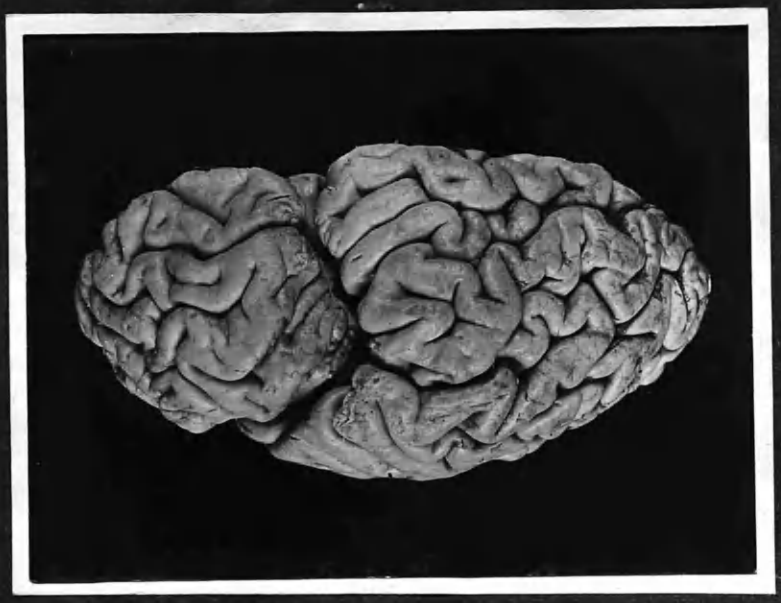
Fig.20.

(3) Left cerebral hemisphere of the same case, outer surface, showing deformity.

Fig.21.

Vertical sections of the cerebellar hemispheres of this case.

The asymmetry is due simply to the difference in pressure to which the two had been subjected. The more slender is the right one and underlay the heavier cerebral hemisphere. The two halves of the cerebellum were identical in weight and no difference could be detected between them upon microscopical examination.



ASYMMETRY OF THE CEREBELLAR HEMISPHERES.

Excluding cases of tumor, softening and congenital defect, this occurred only once among the insane:-

One cerebral hemisphere was partially destroyed by softening and was greatly compressed by a subdural haemorrhage which had occurred 18 years before death. The cerebellar lobe on the side opposite to that on which the haemorrhage had occurred was markedly atrophied. (Figs.14-17).

(In two cases of true, i.e., congenital porencephaly which I have had the opportunity to examine, with extensive defect of one hemisphere - the motor area in both cases being deficient or absent, there was no asymmetry of the cerebellar lobes - except what was apparent only - i.e. the result of differences in pressure. (Figs.18 to 21). The first case was published in the "Glasgow Medical Journal" for March 1904 and for permission to make use of the second, I am indebted to Dr.Oswald, Gartnavel.)

Asymmetry of the cerebellar lobes did not occur in the sane.

CYSTIC/

CYSTIC DEGENERATION OF THE CHOROID PLEXUS OF THE LATERAL VENTRICLES.

This was present to a greater or less extent in 43 out of 100 insane cases - the ages ranging between 33 and 78 (average 55).

24 were cases of dementia;
7 of general paralysis,
6 of mania,
4 of melancholia,
2 of epilepsy.

In the sane it was present in 8% of the cases, the ages ranging between 25 and 66 (average 48).

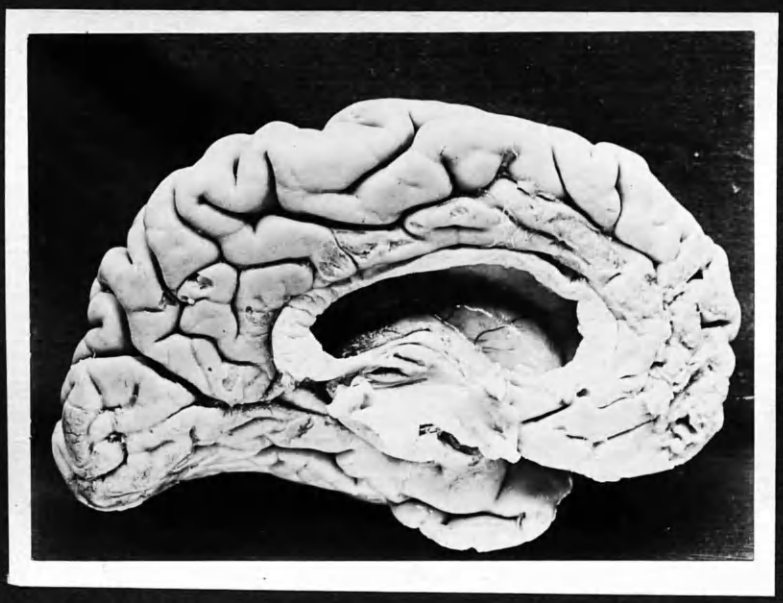
In 3 cases small symmetrical psammomata - about the size of cherry stones - were met with on the choroid plexus of the lateral ventricle. (Similar small tumors were also seen in a child of 12. In a brain which we obtained from a horse, the ventricles were entirely filled by a psammoma which had evidently/

evidently originated from the choroid plexus. The animal killed itself by running its head against a wall.)

DILATATION./

Fig.22.

Mesial aspect of left cerebral hemisphere from a man of 36 who died of general paralysis (See Fig.13 (1).). Observe the dilated lateral ventricle, atrophy of the corpus callosum, and decortication the result of pre-frontal adhesion.



DILATATION OF THE LATERAL VENTRICLES AND ATROPHY OF THE CORPUS CALLOSUM.

In the insane dilatation of the ventricles is invariably present when wasting is at all well-marked. It varies greatly in amount however. Where cerebral wasting is great in amount, the loss of substance is compensated for by an accumulation of cerebro-spinal fluid in the subdural space, the pia-arachnoid, and the ventricles, but the relation of the first and last of these accumulations to one another varies - the dilatation of the ventricles being sometimes a very striking feature, at others much less evident. (Fig.22).

When cerebral wasting is a marked feature there is also distinct thinning of the corpus callosum. (See Fig.22).

Among the sane the above evidences of cerebral degeneration are only appreciable to a slight degree. They are present to some extent in old age as well as in cases in which cerebral wasting has occurred from other causes.

PITUITARY BODY./

PITUITARY BODY.

Apart from variations in size, the only abnormality met with in the insane was the presence of cysts - which occurred in 1 case of general paralysis.

In the sane, no abnormality of this gland was encountred in 124 cases.

PINEAL GLAND.

In the insane, apart from slight variations in size, the only abnormalities were the presence of sand in 15, cysts in 8, and sand and cysts combined in 2. The ages ranged between 30 and 84 (average 51).

In the sane, calcareous particles were observed in 1 case (aged 54) and cysts in 2 (ages 48 and 45).

INTRACRANIAL TUMORS./

INTRACRANIAL TUMORS.

In the insane the following occurred in 217 cases:-

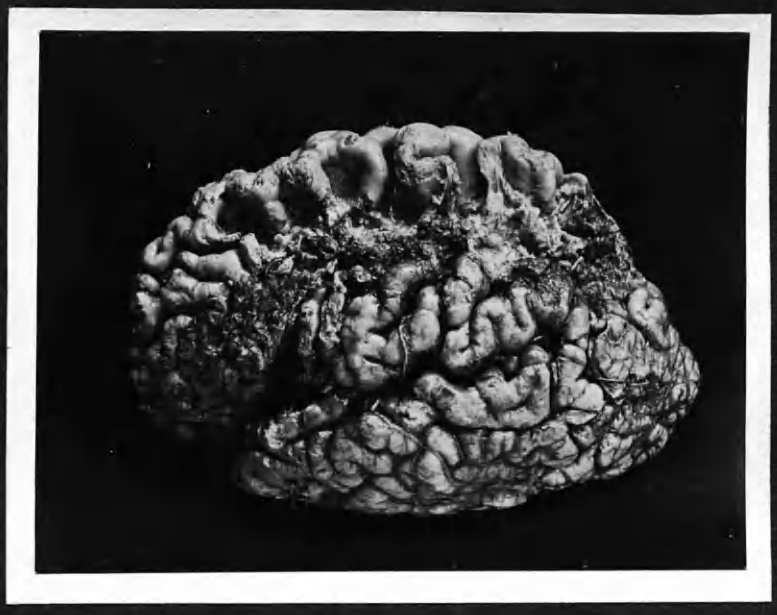
1. Myxoma (1 case) the size of a large pea, in one corpus albicans.
2. Glioma (2 cases) one in the cerebellum and one attached to one optic nerve. The former - the size of a marble - gave rise to symptoms whatsoever (I examined this patient myself).
3. Tubercular nodules (3 cases) in the cerebrum.
4. Secondary cancer (1 case) primary in the lung: 2 intracranial tumors were present, oneat the tip of the left temporal lobe and one in the left cerebellar hemisphere.
5. Fibroma of dura mater (1 case) - the size of a split pea.
6. Angiosarcoma of dura mater (1 case) the size of a cherry.

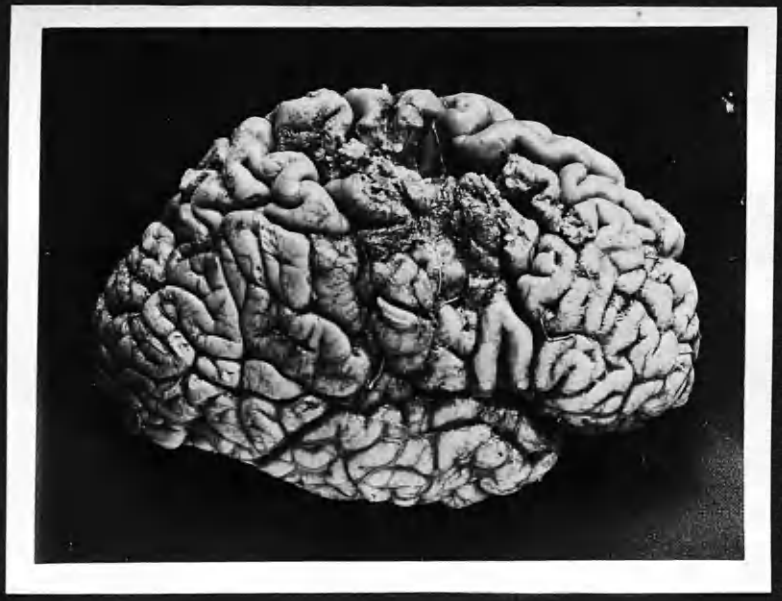
Cerebral abscess was met with in 2 cases (without local cause).

In/

Fig.22½.

Right and left cerebral hemispheres from an asylum case, showing the extensive cortical softenings that are sometimes met with.





In the sane in 214 cases the following occurred - in addition to the psammomata already mentioned:-

1. Glioma (1 case) replacing the whole of one occipital lobe.
2. Sarcoma- primary (1 case) and secondary (2 cases).
3. Tubercular nodules (2 cases).

Abscess was not met with, in the absence of local cause.

MICROSCOPICAL EXAMINATION OF THE BRAIN./

MICROSCOPICAL EXAMINATION OF THE BRAIN.

In the insane this was carried out in 85 cases. Formalin (5%) was used for fixing and the tissue was embedded in paraffin. The stains used were Unna's polychrome methylene blue and Heidenhain's haematoxylin. Staining with the former was carried out by Nissl's method. The latter stain was used for the examination of the neuroglia. It may be mentioned here that polychrome methylene blue is to be preferred to Nissl blue, firstly because it does not fade readily, and secondly because it is a selective stain. In order to demonstrate the presence or absence of hypertrophy of the neuroglia, I have found Heidenhain's haematoxylin quite satisfactory - using eosin as a counter-stain.

PERIVASCULAR PROLIFERATION.

Proliferation of connective tissue cells in the peri-vascular lymphatic space was present in 30 cases, and in 11 of them to an extreme degree. It may safely be affirmed that 29 of the 30 were cases

of/

of general paralysis - two of them, however, had not been recognized as such clinically: in one the macroscopic appearances of the brain were quite characteristic of general paralysis: the other was a case of acute mania and had been in the asylum for only 1 month, and had to be kept continuously under sulphonal. (It may be mentioned here that in 6 of the 29 cases, granularity of the floor of the fourth ventricle was absent and in a 7th was hardly visible).

The doubtful case was that of an idiot(Fig3) aged 53. In it the perivascular proliferation was slight - but distinct - round a few of the vessels.

In 5 of the 29 cases, perivascular proliferation was not well-marked in the motor area but was well seen in two of them in the frontal lobe, in one in the medulla and in one in the membranes.

In only 2 cases of general paralysis - regarded as such clinically, and the macroscopic appearances of the brain post-mortem supporting the diagnosis - was this perivascular proliferation quite absent. One was a case of tabic general paralysis: a male aged 47, insane for 4 years, with grandiose delusions and subsequent dementia: post-mortem there was evidence of dementia, marked granularity of/

of the calamus scriptorius and slight prefrontal adhesion. The other case was that of a woman aged 65: she was admitted acutely maniacal with resistiveness and died the following day: post-mortem there was evidence of dementia, subdural false membrane, slight prefrontal adhesion and marked granularity of the calamus scriptorius.

Perivascular proliferation was not seen in any sane case - comprising about 30. The perivascular space in the vicinity of an abscess may be packed with cells - but these are leucocytes.

It will be seen that cellular infiltration of the perivascular space is an almost constant occurrence in cases of general paralysis. It would probably be found in all cases, if the examination were sufficiently thorough. (It was my practice to examine cortex from the mid-frontal and upper motor regions only.) It is said to occur in sleeping sickness, rabies, and dourine - but of this I have no personal experience. My own observations led me to conclude/

conclude that the cells were not leucocytes: their presence is not necessarily associated with a leucocytosis in the vessels; moreover leucocytosis occurs in the cerebral capillaries without perivascular infiltration. Mott, however, regards them as lymphocytes and plasmacells. The same agent that gives rise to granularity of the ventricles is probably responsible for the perivascular proliferation.

PERICELLULAR INFILTRATION.

In 61 out of 81 insane cases (75.3%) there was apparent an excess of cells in the pericellular space. These cells are round, rather larger than leucocytes, mononuclear, and are often seen invading the pyramidal cells when the latter are undergoing disintegrative changes.

In 45.4% of the sane a pericellular infiltration was observed. A number of these cases however died as the result of accident, consequently one would expect little, if any, evidence of cellular destruction.

HYPERTROPHY/

MICROSCOPICAL EXAMINATION (CONTD).

HYPERTROPHY OF NEUROGLIA.

This occurred in the insane in 26 out of 85 cases (30.5%): 22 of these were undoubtedly cases of general paralysis (the clinical signs and the post-mortem appearances being in agreement).
The remaining 4 were respectively cases of alcoholic mania, idiocy, epilepsy and chronic alcoholism. In 15 out of the 26 the calamus scriptorius was more or less granular.

Sometimes the hypertrophy is best seen in the molecular layer of the cortex, at others it occurs in its deeper layers and in the subjacent white matter.

Hypertrophy of neuroglia did not occur in any of the sane cases.

(A purely local hypertrophy as is often seen in the vicinity of cerebral softenings, is not included in these observations.)

DISINTEGRATION/

MICROSCOPICAL EXAMINATION (CONTD).

DISINTEGRATION, DESTRUCTION AND DISAPPEARANCE OF THE PYRAMIDAL CELLS OF THE CORTEX.

We have seen that wasting of the brain is characteristic of dementia, and that it also occurs - though not to anything like the same extent, in cases of severe or prolonged illness, in cases of chronic alcoholism and as an accompaniment of old age. In most cases it is principally the forepart of the cerebrum that is affected.

In examining microscopically the cerebral cortex in cases of insanity, I found that a very constant and sometimes a very striking feature of the sections was evidence of disintegration, destruction or disappearance of ganglion cells.

The changes that affect pyramidal cells of the cerebral cortex that are in process of degeneration have been often described - including the action of the so-called "neuronophagen", and it is unnecessary to describe them again. As a result of these disintegrative and destructive changes, many of the cells affected ultimately disappear altogether, leaving/

leaving at first mere fragments of themselves, and then only empty spaces to indicate their late situation. It would seem that these spaces subsequently become occluded and that the collapse of the cerebrum involved in the closure of an innumerable number of them, as well as the loss of substance occasioned by the disappearance of the cell branches, and, presumably, of intercellular substance, contribute to the wasted appearance of the cerebral surface.

When the cerebral cortex of the sane was examined microscopically, it was found that evidences of disintegration, destruction and disappearance of ganglion cells were also an almost constant phenomenon and were not infrequently an even more striking feature than in the case of the insane. May it not be that it is the extent to which destruction of cortical pyramids has advanced that determines the fatal issue of some illnesses?

I had hoped that,by a comparison of the cerebral cortex from cases dying after a severe illness with that from cases dying as a result of and shortly after an accident, it might have been possible to ascertain the significance of this cellular destruction./

destruction. It must be borne in mind that the insane do not often die as the direct result of mental illness. Other factors can almost always be recognized post-mortem as accountable for death - e.g. cardiac failure in cases of acute mania, broncho-pneumonia in cases of general paralysis.

I have been unable to obtain brain cortex from cases of suicide in which the patient was in a healthy state of body. Furthermore, in most cases of accident that are admitted to an institution like the Glasgow Royal Infirmary, alcoholic excess has been the cause of the misfortune. I have only had one case in which sudden death occurred, and in which alcoholism could be excluded - but there were signs of Syphilis on this body so that the value of the case is impaired. It is very difficult, therefore, to gain reliable information when many different contributory factors have to be considered.

Ford Robertson and Orr have estimated that in many cases of secondary dementia, 50% of the ganglion cells have disappeared from the cortex.*

It is probable that in dementia the actual number/

* Path. Ment. Dis. p. 252.

number of cells is greatly reduced. If this reduction has taken place long before the fatal illness occurs, then one would expect that shrinkage of the cerebrum should have masked - to a degree varying with the duration of the mental illness, the evidences of disappearance of cells. But as a result of the fatal illness, further disintegrative changes will have occurred.

If the convolutions of a given area did not vary so greatly in size in different individuals it might be possible to form an estimate of the amount of disintegration that had occurred, but varying as they do, wasting can be estimated only by the width of the intervening sulci.

Sections from corresponding areas of cerebral cortex in the sane and insane - of the same age and sex - prepared in the same way, have been examined, and it may be stated generally that disintegration, destruction and disappearance of pyramidal cells are processes that are not peculiar to the insane brain. An attempt was made to count the actual number of cells present in a given area. It was found impossible to do this with any degree of accuracy on account/

account of the difficulty of knowing what to include and what to exclude of the fragments of cells present. The sections were, on this account, photographed, but it was difficult even then to obtain a satisfactory result owing to the method of staining employed, and to the amount of disintegration that was sometimes present.

Is it possible then to recognize by means of microscopical examination of the cerebral cortex, cases of insanity?

I think it is sometimes possible*, but the point I wish to emphasise is, that the mere presence of a large number of disintegrating cells and of evidence of disappearance of many is not to be taken as an indication of mental unsoundness during life. In cases of dementia, the wasted, highly pigmented Betz cells are a characteristic feature, as also the remarkable paucity of cells that is often present. In chronic alcoholism, pigmentation of these cells - in the absence of senility - is a striking feature. I do not think it would be possible to recognize a case of acute insanity by these methods. It is possible that a certain number of disintegrating pyramids may be present normally. Lamb and Hunter in their investigations/

* See page 68: Case 32.

investigations into the action of snake venoms on the nervous system in monkeys, found some degenerating ganglion cells in their control animals.*

I have found that evidences of disintegration and disappearance of ganglion cells were most marked in the deeper layers of the cortex, i.e. among the largest pyramids and in the polymorph layer.

The pieces of tissue were taken from the second frontal gyrus near its middle, and from the top of the motor area (ascending frontal gyrus). The latter only were photographed, because of the larger size of the cells of this region and in order to avoid the layer of granules - although the changes were often more marked in the frontal cortex. Sections were cut at 8 micromillimetres, and it may be worth mentioning that it was found more difficult to obtain satisfactory specimens in the sane than in the insane.

The disintegrative changes described were not due to any of the following factors:- (1) post-mortem change, (they were found in cases of sudden death that had been examined immediately afterwards), nor were they due to faulty fixation, nor to the action of water before fixation: (2) prolonged heating in the paraffin stove;- control sections were cut in celloidin and also by freezing and the appearances were similar/

* Lancet, Jan 2, 1904

similar to those cut in paraffin: moreover no amount of cooking could give rise to the presence of"neuronophagen" invading the pyramidal cells.

The following table gives details of the cases compared.

	AGE.	SEX.	MENTAL STATE.	DURATION * OF ILLNESS.	HOURS OF P-M. after death.	CAUSE OF DEATH.	MICROSCOPIC * APPEARANCES.
1.	23	M.	Epileptic idiot.	Congenital	9	Cardiac failure.	Cortex narrow: cells remarkably few: evidence of disappearance.
2.	21	M	Mania	8 months.	16	Phthisis pulmonalis.	Cells rather few: evidence of disappearance.
3.	22	M	Sane	8 days	21	Lobar pneumonia.	Cells rather few: distinct evidence of disappearance.
4.	24	M	Sane	Accident	10	Fracture of skull	Cells distinctly few: wide spaces: some pigmentation.
5.	29	M	Alcoholic mania	1 year	88	Cardiac failure	Number of cells fairly good: some evidence of destruction.
6.	31	M	Imbecile	Congenital	55	Phthisis pulmonalis.	Cortex narrow: cells very few and badly formed: well marked evidence of disintegration and disappearance.
7.	28	M	Sane	?	38	Diabetes.	Cells few: marked disintegrative changes.
8./							

* In the case of the insane this refers to mental illness

* As regards cortical pyramids.

AGE.	SEX.	MENTAL STATE.	DURATION OF ILLNESS.	HOURS OF P-M after death.	CAUSE OF DEATH.	MICROSCOPIC APPEARANCES.
29	M	Sane	?	20	Alcoholic poisoning	Cells few: well-marked evidence of destruction.
29	M	Sane	Accident	55	Fracture of skull	Cells few: distinct evidence of disappearance.
31	M	Sane	1 week	20	Epidemic cerebro-spinal meningitis	Very marked disappearance of cells: pigmentation.
30	M	Sane	A few days ?	8	Pyaemia	Cells exceedingly few: very marked evidence of destruction: pigmentation.
30	M	Sane	Sudden death	1	Rupture of cerebral aneurysms	Cells few: distinct evidence of destruction.
28	F	Imbecile	Congenital	21	Colitis, etc.	Cells rather few: distinct evidence of destruction: pigmentation.
30	F	Alcoholic dementia	16 months	18	Enteritis	Cells rather few: disintegrative changes extreme.

AGE	SEX	MENTAL STATE.	DURATION OF ILLNESS	HOURS OF P-M after death.	CAUSE OF DEATH.	MICROSCOPIC APPEARANCES.
30	F	Acute mania.	10 days	5	Phthisis pulmonalis.	Cells distinctly few: distinct evidence of disappearance.
30	F	Sane	3 months	14	Tuberculosis(general).	Cells remarkably few: evidence of disappearance well-marked.
31	F	Sane	?	7	Pernicious anaemia	Cells remarkably few: evidence of disappearance: pigmentation.
35	M	Acute melancholia	2 months.	7½	Septicaemia.	Cells few: distinct evidence of disappearance.
36	M	General paralysis	6 months	27	General Paralysis	Number of cells appears good: marked evidence of disintegration and destruction.
33	M	Sane	?	30	Phthisis pulmonalis	Cells very few.
33	M	Sane	5 days.	14	Septo-meningitis. (accident)	Cells rather few: some evidence of destruction.

AGE.	SEX.	MENTAL STATE	DURATION OF ILLNESS.	HOURS OF P-M after death.	CAUSE OF DEATH.	MICROSCOPIC APPEARANCES.
34	F	General Paralysis	2 years	36	General paralysis.	Cells few: little evidence of destruction.
33	F	Sane	4 days.	20	Lepto-meningitis. (accident)	Cells very few: distinct evidence of disappearance.
36	F	Epileptic dementia	3 years: fits for 23 years	23	Broncho-pneumonia	Cells few: well-marked evidence of destruction.
36	F	Mania	1 week	28½	?	Cells rather few: some evidence of destruction.
38	F	General paralysis	4 years	4½	Phthisis pulmonalis and general paralysis.	Cortex exceedingly narrow: great disintegration.
38	F	Dementia	?	25	Cardiac failure	Number of cells seems fairly good: some evidence of destruction.
37	F	Sane	12 days	26	Lobar pneumonia, etc.	Cells distinctly few: distinct evidence of destruction.

AGE	SEX	MENTAL STATE	DURATION OF ILLNESS.	HOURS OF P-M after death	CAUSE OF DEATH.	MICROSCOPIC APPEARANCES.
49	M	General paralysis	1½ years	20	General paralysis	Number of cells fairly good: marked destruction in deep est layer.
49	M	General paralysis	6 years	38	Cardiac failure	Cells remarkably few: marked evidence of destruction.
50	M	Sane	?	54	Cancer of stomach	Cells very few.
49	M	Sane	Accident	36	Fracture of skull.	A great many empty cell spaces: cells very few.
52	M	General paralysis	3 years	18	Cardiac failure, acute bronchitis	Cells very few: considerable evidence of disappearance.
53	M	General paralysis	14 days	12	General paralysis	Cells distinctly few: distinct evidence of disappearance.
53	M	Imbecile	Congenital		Chronic nephritis cerebral haemorrhage.	Cells remarkably few: well-marked evidence of destruction.

AGE	SEX	MENTAL STATE	DURATION OF ILLNESS	HOURS OF P-M after death.	CAUSE OF DEATH.	MICROSCOPIC APPEARANCES.
54	M	Alcoholic dementia.	9 months.	54	Cancer of stomach.	Number of cells seems good: well-marked active destruction.
51	M	Sane	2 months.	17	Sarcoma	Very few cells: marked evidence of destruction.
51	M	Sane	6 weeks ?	36	Sarcoma (operation)	Cells distinctly few: distinct evidence of destruction.
54	M	Sane ?	-	12	Suicide	Cells very few: well-marked evidence of destruction.
54	M	Sane	?	7	Nephritis, cerebral haemorrhage.	Cells very few: very marked evidence of destruction.
57	M	General paralysis	2 years	10	Cardiac failure & general paralysis.	Cells very few: evidence of great destruction.
58	M	Dementia	?	3	Cardiac failure	Cells remarkably few: well-marked evidence of disappearance.

AGE.	SEX	MENTAL STATE.	DURATION OF ILLNESS	HOURS OF P-M after death.	CAUSE OF DEATH.	MICROSCOPIC APPEARANCES.
58	M	Melancholia.	2 years.	38	Phthisis pulmonalis	Cells rather few: marked evidence of disappearance.
59	M	General paralysis.	3 months.	9	Acute nephritis	Cells very few: great disappearance
57	M	Sane	Accident	55	Accident	Cells very few: distinct evidence of disappearance.
59	M	Sane	Accident	12	Accident	Cells few: very marked evidence of destruction.
68	F	General paralysis	7 years.	10	General paralysis.	Cells very few: marked evidence of destruction.
70	F	Sane ?	—	21	Carbolic poisoning (swallowed)	Cells few: distinct evidence of destruction.
76	F	Sane	1 year	6	Sarcoma.	Cells very few: distinct evidence of disappearance.

R E M A R K S.

CASE 2. History of alcoholism.

CASE 3. Temperature 107° before death.

CASE 4. Fine physique: drunk at time of accident: lived 6 hours.

CASE 8. Alcoholic excess for 8 years: coma for 6 days before death.

CASE 9. Drunk at time of accident: lived 3-4 hours.

CASE 10. Had been drinking hard for 3 weeks before death.

CASE 12. Total abstainer: died 3 hours after onset of symptoms: was in good health: scar on penis.

CASE 25. Chronic alcoholism and syphilis.

CASE 30. Intemperate.

CASE 32. Lived 5-6 hours: alcoholic.

CASE 37. Alcoholic.

CASE 39. Alcoholic.

CASE/

CASE 45. Alcoholic: lived 9 hours.

CASE 46. No history :lived 3 hours.

CASE 48. Lived $1\frac{1}{4}$ hours: no history.

CASE 49. A refined and cultured lady: alcohol absolutely excluded.

In case No.12, the patient was at work and in his usual health, and was seen to fall down suddenly. He was immediately brought to hospital and died within 3 hours of the onset of the symptoms. Death was caused by rupture of an intracranial aneurysm. The post-mortem was done immediately after death. The disintegration of cortical pyramids that was seen to be going on in this case must have been due apparently to the action of the syphilitic poison- or else it is a normal appearance.

It will be seen that even in the case of aments, active disintegration of cells had occurred before death: also that in some cases of dementia the number of cells appeared to be good - but in these cases the brain was of course wasted.

In case No.48 there was marked cerebral wasting: no history was obtainable regarding alcoholism.

No.49 was the only case included that did not belong to the hospital class of patient. It was examined because in it alcoholic indulgence could be excluded absolutely.

In/

MICRO-PHOTOGRAPHS.

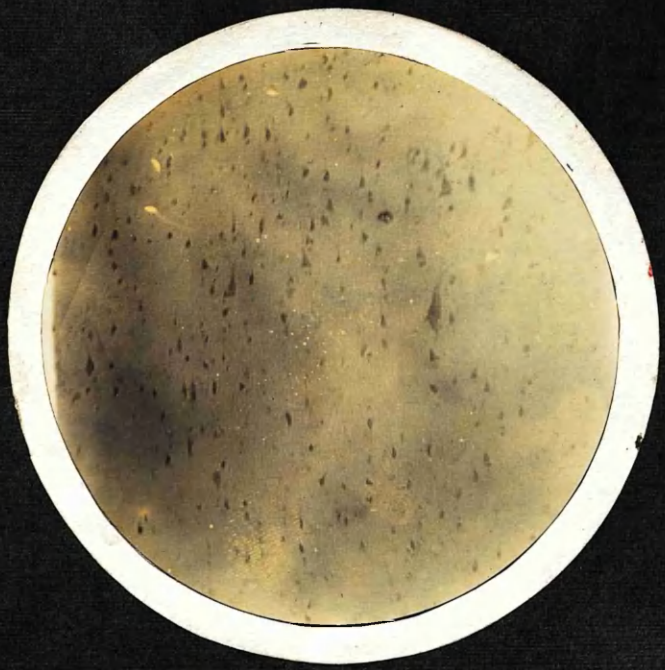
The photographs are of the deeper layers of the motor cortex (leg area). The region between groups of Betz cells was taken and one or two of these were included when possible as landmarks.

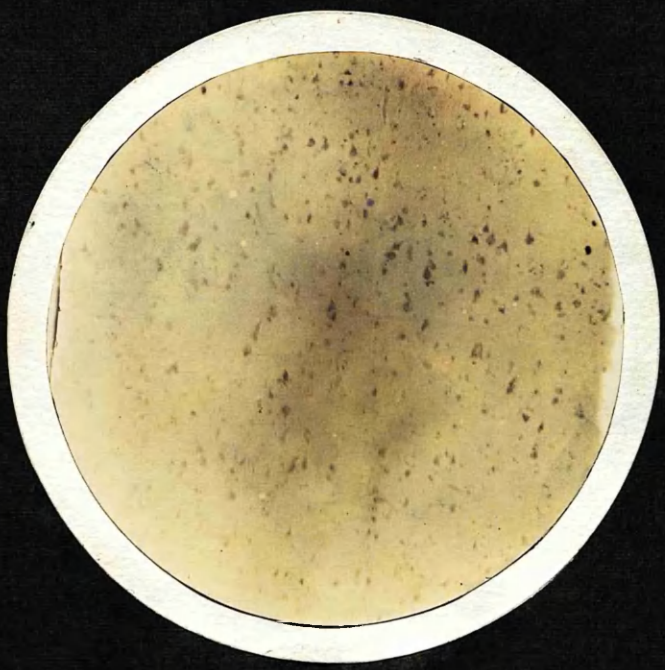
A. From a woman of 30 who died in the Glasgow Royal Infirmary of tubercular disease (See Fig.10 (1) and Case 16 in the Table).

The pyramidal cells are remarkably few and in the wide spaces between them there is - with the microscope, abundant evidence of disappearance of cells, and the remains of many are apparent even in the photograph.

B. From a woman of 30 who died in Gartloch of enteritis. She was a case of alcoholic dementia. (Case 14 in the Table.)

The pyramidal cells are rather few: disintegrative changes are extreme: in the deepest layer of the cortex hardly a complete cell could be found.





C. From a woman of 37 who died in the Glasgow Royal Infirmary of lobar pneumonia. (Case 28 in Table.)

Cells distinctly few: evidence of destruction well-marked.

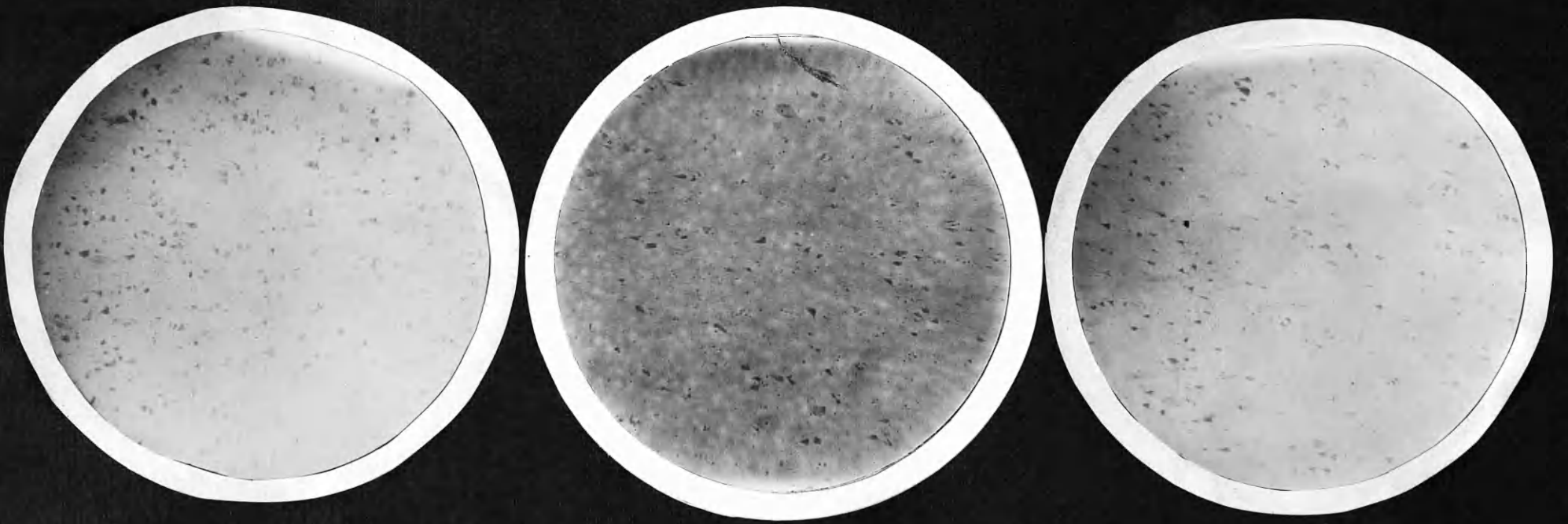
(In saying that the cells are few, I refer to healthy-looking cells. There has obviously been a good proportion of cells here but a large number are undergoing destruction. The same remarks apply to E.)

D. From a woman of 36: an epileptic dement. (Case 24 in Table).

Cells remarkably few: well-marked evidence of destruction. (There was probably a congenital deficiency in this case.)

E. From a woman of 36 - a case of mania. (Case 25 in Table.)

Cells rather few: some evidence of destruction, especially in deep layers.

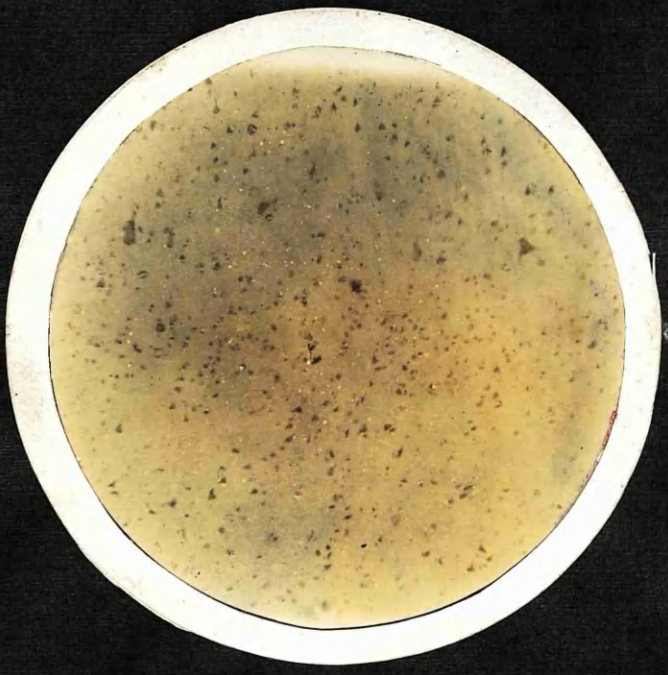


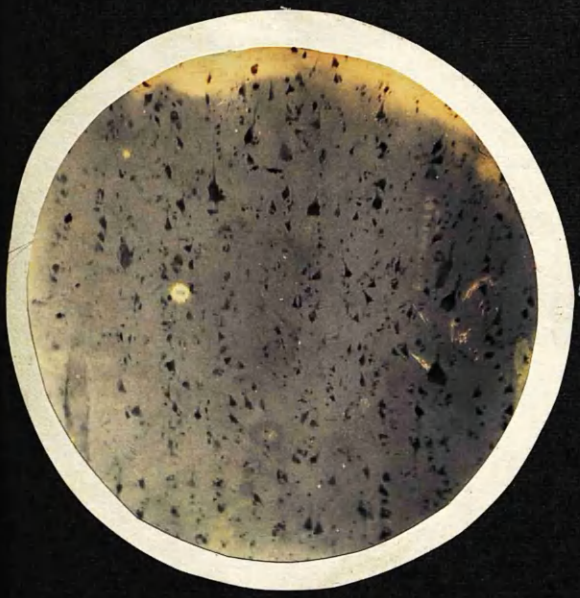
F. From a man of 54 who died in the Glasgow Royal Infirmary of cerebral haemorrhage and chronic nephritis. (Case 40 in Table).

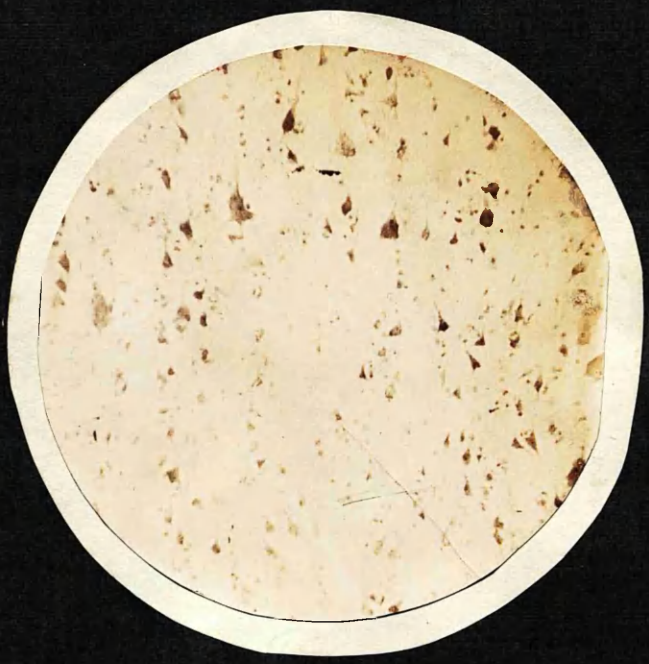
Cells very few: evidence of destruction very marked. There is a layer of granules here which must be overlooked. The tissue must have been taken from just where motor and sensory cortex join one another.

G. From a man of 54 - an alcoholic dement - who died of cancer of the stomach. Case 36 in Table).

Number of cells appears good: well-marked active destruction. Observe that the cells have a crowded look as if the brain had shrunk.







In No.14 the disintegrative changes were a most remarkable feature. This young woman when admitted was a stout,robust-looking patient - but persistent diarrhoea led to rapid and great emaciation. (See illustrations.)

In Case No.32 the appearances were those that are described as characteristic of dementia - the cells extremely few and greatly shrunken. Judging by the microscope alone one might have affirmed this to be a case of dementia. I have no information about the case beyond that given in the Table. It is perhaps going too far then to say that it is sometimes possible to recognise cases of dementia with the microscope alone.

INCIDENCE OF TUBERCULOSIS IN THE SANE AND INSANE.

In the insane in 213 cases there was evidence of pulmonary tuberculosis in 104. In 46 it was active, and in 58 healed or quiescent.

In 2 other cases there was tubercular peritonitis and in 4 others the mesenteric glands were tubercular. In 1 case there was renal phthisis.

In 8 other cases the mesenteric glands were caseous or calcareous - but there were no other evidences of tubercle. In only 1 of the 8 was it known that the patient had had typhoid fever.

Excluding these last 8 cases, there was evidence of tuberculosis in 111 out of 213 cases - giving the high percentage of 52.1.

When the later of these examinations were made the sanatorium treatment of phthisis pulmonalis in the asylum had been instituted - previously there was no segregation of tubercular cases.

In the sane in 220 cases, there was evidence of pulmonary tuberculosis in 55. In 17 it was active, and in 38 healed or quiescent.

In/

In 6 other cases there was active tubercular disease in different parts of the body. In only 1 case were calcareous mesenteric glands met with in the absence of other tubercular manifestations. (Many cases of tabes mesenterica occurred in children - but these are of course excluded.)

Thus in 61 out of 220 cases there was evidence of tuberculosis - giving a percentage of 27.7.

RELATION BETWEEN BODY WEIGHT AND THE WEIGHT OF THE DIFFERENT ORGANS IN THE INSANE./

RELATION BETWEEN BODY WEIGHT AND THE WEIGHT OF THE DIFFERENT ORGANS IN THE INSANE.

The weight is given in grammes - the number in brackets is the number of cases upon which the calculation was based.

BODY WEIGHT,(male and female)	51389 (184)		
LIVER "	1239 (172)	$\frac{1}{41}$	of body weight.
SPLEEN "	123 (176)	$\frac{1}{417}$	" " "
PANCREAS WEIGHT	88 (178)	$\frac{1}{519}$	" " "
KIDNEYS "	252 (163)	$\frac{1}{203}$	" " "
ADRENALS "	21 (155)	$\frac{1}{2442}$	" " "
TESTES "	42 (90)	$\frac{1}{1218}$	" " "

These calculations were not made in the sane as the body weight was unobtainable.

THYROID GLAND./

THYROID GLAND.

In the insane 210 cases were examined.

In 4 cases it was markedly enlarged - these comprised melancholia (1), general paralysis (1), dementia (2).

In 1 case of melancholia the gland was so small as to be found with difficulty, and in another case - also of melancholia, it could not be found. Both of these were females: in neither was there myxoedema.

Fibrosis occurred in 2 cases - of melancholia.

Cysts were present in 8, and small calcareous nodules in 5.

In 10 cases the gland was smaller than usual (excluding the 2 cases mentioned above) - 7 of these were women.

In 3 cases it was slightly enlarged (excluding the 4 cases mentioned above).

Abnormality occurred in 30 cases (14.2%).

In the sane the neck organs were not often examined in order to avoid disfigurement.

LARYNX/

LARYNX.

In the insane in 211 cases, there was ulceration in 13. In 10 of these it was associated with phthisis pulmonalis. Two of the others were cases of general paralysis in men, and the third a case of mania in a woman aged 48.

Erosions were seen in 4 cases - 3 of them cases of general paralysis.

TRACHEA.

In 212 insane cases the only pathological changes met with were inflammation and congestion.

SALIVARY GLANDS.

In 213 insane cases, suppuration in the submaxillary glands occurred 3 times - once on both sides.

TONGUE.

In 212 insane cases the only abnormality met/

met with was hypertrophy of adenoid tissue at the base in 7 - including 2 imbeciles, 2 epileptics, 1 case of chronic mania, 1 of dementia and 1 of general paralysis.

PHARYNX.

In 212 insane cases, enlarged tonsils - apart from tonsillitis - were found in only 3 - two of them imbeciles.

OESOPHAGUS.

In the insane, the only abnormalities met with in 212 cases were:-

1. Thickening - as a result of poison that had been swallowed, in 2.
2. Diverticula in 2 cases - one at the bifurcation of the trachéa, the other 2 inches from the cardiac orifice.
3. Shallow ulcers or erosions in 3 - only 1 of these was tube-fed: the others were cases of chronic bronchitis.
4. Deep ulcers in 2: one was a sarcoma which penetrated the aorta causing fatal haematemesis/

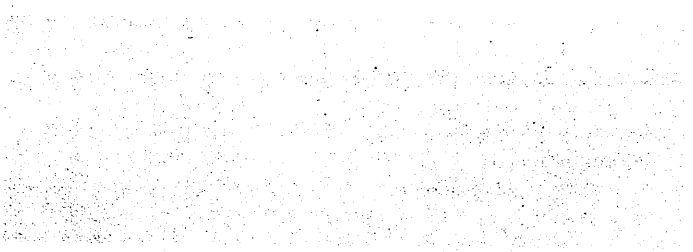


Fig.23.

Tubercular ulcers of the oesophagus from the case described under Fig.10 (2).

Microscopically these ulcers were characteristically tubercular.

There were numerous caseous glands in the neck and the ulcers were produced by infection from them. The patient had phthisis pulmonalis however.

haematemesis: the other was tubercular. (Fig.23).

5. A lipoma the size of a horse-bean in 1 case - lying behind and about the middle of the organ.

(A tubercular gland was seen ulcerating into the oesophagus once in the case of a child at the Glasgow Royal Infirmary.)

PERSISTENT THYMUS.

In the insane in 213 cases, this was once observed.

The case was one of general paralysis (male: aged 39): the immediate cause of death was bronchopneumonia. Each lateral lobe was 7.5 centimetres long and 1-2 centimetres broad. It weighed 9 grammes.

In the sane in 214 cases, a persistent thymus was once observed.

RIBS AND CARTILAGES./

RIBS AND CARTILAGES.

In 211 insane cases, the ribs were unduly soft in 83 (including 19 cases of general paralysis) and in 42 of the 211 the softness was associated with undue fragility. The ages ranged between 20 and 85 (average 52).

They were hard and brittle in 59 cases - the ages ranging between 32 and 98 (average 60).

There was evidence of fracture of ribs in 13 cases.

In 67% of the insane the ribs were either soft or brittle - the average age 56.

Calcification of the cartilages was present in 76 cases (36%), the ages ranging between 31 and 85 (average 59).

In the sane, softness or fragility of the ribs occurred in 28.7% of the cases (average age 51).

Calcification of the cartilages occurred in 12.7% (the average age 51).

LUNGS./

LUNGS: Pneumonia etc.

In the insane in 214 cases lobar pneumonia occurred in 11, broncho-pneumonia in 19.

Gangrene occurred once: abscess 8 times. Fibrosis was met with twice.

(Tubercular cases are excluded.)

In the sane, lobar pneumonia occurred in 30 out of 203 cases, broncho-pneumonia in 3, gangrene in 5, abscess in 4, fibrosis in 1. (Tubercular cases excluded.)

Chronic bronchitis and emphysema were of such frequent occurrence in both sets of cases that it may almost be said that they are universal in town-dwellers.

Evidence of acute bronchitis post-mortem is very much more common in the insane than among the sane, and is probably the result of defective swallowing in the former, occurring shortly before death.

PERICARDIUM./

PERICARDIUM.

In the insane in 213 cases, there was evidence of pericarditis in 13 (6.1%). In 5 it was almost certainly tubercular, in 1 it was associated with malignant disease of the lung and in 7 it was probably rheumatic - being associated in every case with valvular disease of the heart.

Milky patches were present in the visceral pericardium in 19 cases (6.1%) - in 13 of which there was valvular disease of the heart.

In the sane, there was evidence of pericarditis in 5 out of 214 cases (2.3%) - in 2 of these it was probably tubercular and in 3 rheumatic.

Milky patches were present in 10.9% of the cases.

HEART./

HEART.

In the insane in 213 cases, chronic valvular disease occurred 78 times (36.9%). The aortic valve alone was affected in 39, the aortic and mitral in 22, the mitral alone in 15, the aortic and tricuspid in 2.

In only 3 cases was fatty degeneration of the muscle visible to the naked eye.

In 1 case there was a large patent foramen ovale, circular and about 1 centimetre in diameter. The patient, a woman, at death was aged 43.

In 1 case there was considerable extravasation of blood into the wall of the right ventricle. (The patient had attacks of screaming which lasted until she was exhausted.)

In the case of an imbecile the left auricular appendix was 6 centimetres long.

In the sane in 214 cases, chronic valvular disease/

HEART - Contd.

disease occurred in 47 cases (21.9%) and acute endocarditis in 5. The aortic valve alone was affected in 33 of the 52, the aortic and mitral

in 13, the mitral alone

in 3, the mitral and tricuspid

in 2 and the aortic, mitral and tricuspid

in 1.

Fatty degeneration was visible to the naked eye in 6.

Fatty infiltration occurred only once in these cases.

Abscess of the heart wall was twice met with (in pyaemia).

In 2 cases the pulmonic valve had 4 curtains and in 1 the aortic had 2.

CORONARY ARTERIES./

CORONARY ARTERIES.

In the insane these were healthy in 97 out of 217 cases (44.7%). Rarely they were diseased when the aorta was healthy: more often they were healthy with a diseased aorta.

In 1 case the right artery had 3 orifices, and in 1 the left had 2.

In 1 the right vessel was only about half the normal size, while the left was unusually wide, and in 1 the left was impervious while the right was abnormally large.

In the sane, the vessels were healthy in 45.6% of the cases.

In 1 case the right artery was impervious.

AORTA./

AORTA.

Thoracic.

In the insane the vessel was quite free from atheroma - including fatty degeneration of the intima - in 31 cases out of 220 (14%) - the ages ranging between 17 and 58 (average 34).

1 was under 20 years of age,
12 were between 20 and 30,
9 " " 31 and 40,
5 " " 41 and 50,
4 " " 51 and 58.

Aneurysm was met with 4 times: 2 were fusiform dilatations of the arch, one a dissecting aneurysm, and the other saccular, in the concavity of the arch.

Laceration of the vessel occurred once: the tear was 3 centimetres long, its inner end just above the left subclavian.

In 1 case there were 4 branches springing from the arch.

In/

AORTA

Thoracic - continued.

In the sane it was free from atheroma (and fatty degeneration) in 58 out of 172 cases (29.6%) - the average age 35.

5 were under 20 years of age,
15 were between 20 and 30,
18 " " 31 and 40,
14 " " 41 and 50,
6 " " 51 and 57.

Abdominal aorta.

In neither sane nor insane was the condition of the abdominal aorta noted with sufficient frequency to make the results of interest. (This illustrates the importance of having printed headings in making notes of a post-mortem examination. The abdominal aorta was not entered on the sheets and consequently, although always examined, the note was frequently omitted).

In the insane, in one case there was a large adherent/

adherent thrombus, in another a dissecting aneurysm and in a third case - that of a woman, a saccular aneurysm midway between the renal arteries and the bifurcation of the aorta. Its orifice would admit an ordinary lead pencil, and the cavity had a diameter of $\frac{3}{8}$ inch.

In one case among the sane there was a large thrombus at the bifurcation of the aorta.

LIVER AND GALL BLADDERS./

LIVER AND GALL BLADDER.

In the insane, fatty infiltration was visible to the naked eye in 50 out of 213 cases (23.4%).

Amyloid change	occurred	in 3.
Secondary cancer	"	" 5.
Tubercular nodules	"	" 5.
Gummata	"	" 1.
Old encapsuled abscess	"	" 1.
Biliary suppuration	"	" 1.
Acute suppurative hepatitis	"	" 1.
Cyst -the size of a marble	"	" 1.
Small extravasations of blood	"	" 4.

A slight degree of fibrosis was met with 4 times.

An accessory liver was once seen.

Gall stones were found in 22 (10.3%).

In/

LIVER AND GALL BLADDER - Contd.

In the sane, fatty change was visible in 55 out of 226 cases (24.3%).

Amyloid change	occurred in	2,
Secondary cancer	"	" 4,
Primary cancer	"	" 1,
Secondary sarcoma	"	" 2,
Miliary tubercles	"	" 2,
Gummata	"	" 2.

Cirrhosis was present in 11 cases.

Gall stones were found in 18 (7.9%).

SPLEEN./

SPLEEN.

In the insane in 213 cases, there was more or less fibrosis in 43 (20.1%) - 18 of these were cases of general paralysis.

There was evidence of old perisplenitis in 10 (4.6%),
infarction in 5,
amyloid change in 3,
tubercles in 3.

Accessory spleens were frequently seen - but their presence not always noted.

In the sane in 226 cases, fibrosis occurred 15 times (6.6%).
The occurrence of perisplenitic adhesions was not always noted.

Infarction occurred in 3 cases,
Amyloid change in 4,
Tubercles in 1,
Pyaemic abscess in 1.

The exact frequency of the occurrence of accessory spleens was not noted.

KIDNEYS AND URETERS./

KIDNEYS AND URETERS.

In the insane in 214 cases, there was a degree of fibrosis of the kidneys in 95 (44.3%). In 38 of these there was hypertrophy or dilatation of the cardiac left ventricle - but in 8 of them there was also aortic disease or adherent pericardium. That is to say - in 31.5% of cases of chronic nephritis in the insane, was there hypertrophy of the left ventricle.

Acute nephritis alone occurred in 5 cases,
Consecutive nephritis in 13.

In 3 cases there was atrophy of one kidney and hypertrophy of the other. (In only one of these was the cause of atrophy ascertained - viz. the presence of a thrombus in the corresponding renal artery).

Accessory ureters were observed in 4 cases - once in both kidneys.

Multiple extravasations of blood occurred in one case of general paralysis.

Renal phthisis occurred 5 times: calculus twice.

Hydronephrosis/

Hydronephrosis was seen 5 times - in 2 the cause was not apparent.

The exact frequency of infarction was not noted.

In the sane in 214 cases, there was a degree of fibrosis in 78 (46.4%). In 27 of these (34.6%) there was hypertrophy or dilatation of the left ventricle in the absence of valvular disease or of pericardial adhesions.

Acute nephritis - in the 214 cases, occurred only once.

Consecutive nephritis - in the 214 cases, occurred 7 times,

Renal phthisis 4 times (in one case secondarily involved from psoas abscess),

Calculi were present in 8 cases,

Pyaemic abscesses in 4,

Amyloid change in 3,

Pyonephrosis in 1 (without calculus),

Secondary sarcoma in 1, and

Infarctions in 8.

ADRENALS./

ADRENALS.

In the insane in 213 cases adenoma occurred in 3.

A tubercular nodule was met with once - in a case of phthisis pulmonalis.

In a case of general paralysis they were unusually large - combined weight 44 grammes, but the body weight was 103420 grammes = 16 st. 4 lb.

In 2 cases, one of the glands was unusually small - the left one weighing only 8 and 7 grammes, while the right weighed 12 and 13 grammes respectively.

In one case, the organs had a fibrous appearance. (no pigmentation).

In the sane in 226 cases, adenoma occurred 4 times.

In one case there was sarcoma of both glands (apparently primary) and in one case secondary sarcoma (no pigmentation in either).

PANCREAS./

PANCREAS.

In the insane in 2 cases out of 214, the gland was soft and had a necrosed appearance. One of these died suddenly of cardiac failure, the other of acute suppurative nephritis.

Slight extravasations of blood in the gland occurred in 3 cases - two of them cases of general paralysis.

Intense congestion was observed 4 times - in one of these there was commencing suppuration.

Atrophy occurred once (weight 48 grammes)- the patient was not known to have had diabetes -.

Interstitial pancreatitis occurred once, and cancer of the head once.

In one case the duct of Wirsung contained 2 soft concretions.

In the sane in 226 cases, atrophy occurred once (diabetes).

Secondary round-celled sarcoma was twice met with.

Necrosis occurred once - possibly associated with cancer.

MESENTERIC GLANDS./

MESENTERIC GLANDS.

In the insane in 216 cases these glands were caseous or calcareous or both in 20(9.2%). Only one of these cases was known to have had typhoid fever. In 9 of them there was evidence of tuberculosis elsewhere.

Secondary cancer occurred twice - primary in small intestine and in pancreas.

In the sane, calcareous glands were met with only 3 times in 226 cases. One of the patients had had typhoid fever: in neither of the others was there any evidence of tuberculosis elsewhere.

STOMACH./

Fig.24.

Tubercular ulcers of the stomach - from the case described under Fig.10.

The organ has been opened along the greater curvature and the position of the lesser curvature is seen as a smooth band running across the middle of the specimen. (A cross is drawn in ink in the centre of each ulcer.)

The following note is from the post-mortem record of the case:-

"STOMACH. Along the lesser curvature there are caseous glands: contiguous with these-on the mucous surface- and near the cardiac orifice there is a large shallow irregularly circular ulcer, 2½ inches in diameter, with numerous tubercles in the peritoneal aspect. Near the greater curvature and towards the pylorus is another similar ulcer - 1½ inches in diameter. (These ulcers were examined microscopically.) (The small intestine is so matted it cannot be opened entirely. Ulcers are seen in it and in the colon. There are masses of caseous glands along the aorta and in contact with all the viscera)."

The impression I received from the post-mortem appearances was that the mucous membrane had been invaded from the peritoneal surface, and that, although the patient had phthisis pulmonalis, the mucous membrane was not infected from the sputum. The latter mode of infection might have occurred in the case of the smaller ulcer however.

STOMACH.

In the insane in 216 cases, there was well-marked dilatation in 4 and evidence of past gastritis in 4.

Submucous extravasations were frequent, and haemorrhagic erosions were present in 17 cases.

There was evidence of gastric ulcer in 9 cases: 6 of them were on or near the lesser curvature, and 2 were at the pylorus. Of the 6, 5 were healed or healing: in the remaining 1 there were two tubercular ulcers, one on the lesser curvature near the cardiac end, the other near the greater curvature and towards the pylorus (Fig.24).

Cancer occurred in 6 cases:

Simple polypi in 3.

In the sane in 226 cases, there was evidence of past gastritis in 3.

Haemorrhagic erosions were observed only twice.

Simple ulcer occurred 4 times: 3 of them were on the lesser curvature and 1 on the pylorus.

Cancer occurred 6 times: it was in all cases/

cases on the lesser curvature and had once involved the pylorus.

Simple polypi were seen in 2 cases: in one there were 2, in the other 6.

INTESTINE./

INTESTINE.

In the insane in 216 cases,
Simple polypi occurred in 3 in the small intestine (in 2 there were 6 of them), and in 10 in the colon (in 1 of these there were 10 polypi and in another, 11).

Tubercular ulcers occurred (associated with phthisis pulmonalis) in 19 cases.

In 23 cases there was some evidence of enteritis - including 1 case of diphtheritic colitis.

Carcinoma occurred in 6 cases: in 2 the growth was in the rectum, in 1 in the ascending, and 1 in the transverse colon: 2 were polypoid growths and in one of these - the case of an idiot aged 53 - there were 29 small tumors in 5 ft. of small intestine and one of the growths examined microscopically was cancer : in the other case there were 2 polypoid growths in the small intestine.

Meckel's diverticulum was present in 6 cases.

There was evidence of old appendicitis in 3.

Simple chronic ulcer of the duodenum occurred once.

In/

In one case (of general paralysis) the intestine was unusually short - the small measuring 16½, and the large 3½ feet.

The frequency of enteritis in the insane is the result, no doubt, partly of the administration of purgatives, and partly of rubbish-eating.

In the sane in 226 cases,
Simple polypi occurred in 4 (all in the colon).
Tubercular ulcers associated with pulmonary or laryngeal tuberculosis were met with 7 times.

Cancer of the colon occurred 4 times - once in each of the following situations, middle of transverse colon, ascending colon, splenic flexure and sigmoid flexure.

Secondary sarcomas were seen twice in the small intestine.

Duodenal ulcer occurred twice, and there was simple ulceration of the colon in 1 case.

Meckel's diverticulum was seen twice.

An accessory pancreas in the duodenal wall

was/

was once seen.

Evidence of old appendicitis occurred twice, and in 1 case there was a concretion in the appendix.

URINARY BLADDER./

URINARY BLADDER.

Cystitis - acute or chronic - occurred in the insane in 34 out of 213 cases - 14 of them being cases of general paralysis.

In 1 case of general paralysis there was extensive submucous extravasation.

In 1 case a diverticulum was present at the summit, and in another (an idiot) there were multiple diverticula.

Hypertrophy occurred 5 times - in 3 cases it was due to enlarged prostate, and in 1 to stricture; in 1 case no cause was found.

Tuberculosis occurred once.

Enlarged prostate occurred 5 times in 109 cases - the ages ranging between 50 and 85. Suppuration of the gland occurred once.

In the sane in 226 cases, cystitis was seen in 7 - not including 4 cases in which it was associated with pyonephrosis.

Enlarged/

Enlarged prostate occurred once in 116 cases - (excluding cases that were operated on for the removal of the gland).

Pyaemic abscess occurred once.

UTERUS AND ADNEXA./

UTERUS AND ADNEXA.

In the insane in 104 cases, cancer of the uterus occurred once.

Uterine fibroids were seen in 15 cases - 10 of them nulliparous women.

Mucous polypi occurred in 23 (associated with the presence of fibroids in 6) - 11 of them nulliparous.

Pelvic adhesions were met with in 21 cases.

Tuberculosis occurred 3 times - in 2 cases it affected both uterus and tubes and in 1 the uterus alone.

Hydrosalpinx was met with 5 times - in 3 cases it was double.

Salpingitis (non-tubercular) occurred twice.

In the sane in 109 cases, fibroids occurred 4 times in the uterus and once in the broad ligament.

Mucous polypi occurred 4 times - (associated with fibroids once).

Tuberculosis of the uterus and appendages occurred once.

Placental polypus occurred twice.

OVARIES./

OVARIES.

In the insane, these were cystic on one side in 7, on both sides in 2 out of 104 cases.

In only 5 cases were they of comparatively good size, viz:-

in a case of melancholia aged 34,

in a case of mania aged 38,

in a case of epilepsy aged 23,

in 2 cases of dementia aged 28 and 38:

in most cases they were small and fibrous and in 8 cases whose ages ranged between 20 and 36, they were very small.

In 1 case a dermoid cyst replaced the left ovary.

In the sane, in 109 cases, one ovary was cystic in 3 - both in 2.

A dermoid cyst was present in each ovary in 1 case and in 1 there was a parovarian cyst.

TESTES./

TESTES.

In the insane in 109 cases, the tunica vaginalis was thickened or adherent in 7.

Hydrocele occurred 10 times and was double in 5 cases.

Orchitis - probably syphilitic - was twice met with and tubercular orchitis once.

In 2 cases of idiocy the combined weight of the testes was 14 and 24 grammes respectively. In 1 case of dementia they weighed together 18 grammes.

In the case of 5 men between the ages of 35 and 45, they were very small - the combined weight being between 29 and 39 grammes - 4 of these were cases of general paralysis.

In the sane, the testes were seldom removed: tubercular epididymitis occurred once in 116 cases.

I N D E X.

Degeneracy/

RIBS/

Wasting/