Some Observations on the
Weight of the Brain in the Insane:
A Record of Five Hundred Cases.

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Some Observations on the Weight of the Brain in the Insane: A Record of Five Hundred Cases.

The weight of the brain in persons who have died insane has been extensively investigated by many anatomists and specialists both on the Continent of Europe and in this country. The observers who have recorded the largest number of observations in this country are probably: Dr. Boyd who published his results in the Philosophical Transactions in 1861; Dr. Thurman, who subsequently analyzed, retouched, and greatly extended them in his paper in the Journal of Mental Science, Vol. 1, 1866; and Mr. Crockley Clapham, formerly of the West Riding Asylum, Wakefield, who wrote a paper on the subject published in the "Reports" of that Asylum for 1876.

As every contribution to the subject may prove of some interest or value to investigators in
This field of research, I have in this paper collected & partially analyzed the brain weights of five hundred persons who have died in the Kent County Lunatic as Manciston during the past four years.

For the sake of convenience and comparison I have taken around number of either sex (250). These cases have not, however, been selected in any way, but merely taken in the chronological order of their death. In the large majority of the cases the post mortem examinations have been made within twenty-four hours after death. I am very few, if any, have the time elapsing between death & examination exceeded forty-eight hours.

The method of examining the brains has been the same in all cases, viz., on removal, the cerebrum was separated from the cerebellum, & in its turn from the brain the medulla. The organ was then sliced from above down, rounds in the usual manner,
and the several parts weighed with the usual manner and method. The weights were taken in ounces avoirdupois, smaller fractions than quarter ounces being disregard. This standard is necessarily less exact than if specimens had been adopted, but is, I think, sufficiently accurate for most practical purposes.

Before entering fully on this subject it will be as well to make a few remarks on the normal weights of the brains of some persons, with which to compare them briefly with the results I have obtained.

Most observers have agreed that the average brain weight in Europeans of sound mind is 4.9 oz. in the male, and 4.5 oz. in the female, and I have adopted these figures as a standard for comparison. This is however a very wide range of difference between the weights of the highest known cases that have been recorded; according
to Sharpey (Lucas's Anatomy Vol. II) from 34 oz. to 65 oz. in 278 adult male brains; and from 31 oz. to 56 oz. in 191 adult female brains. It is thus seen that the average male brain exceeds that of the female by about 10 percent. To a certain extent this difference may be accounted for by the relative stature of the sexes, but this will not account for it all, as it has been ascertained that whereas the average female brain weighs 10 percent less than the male, the average stature is only 8 percent less. Therefore, it is not only relative but absolute.

The weight of the brain appears to bear some relation to the amount of intelligence in the individual, as the ascertained weights of the brains of many great men have been found to be exceptionally high, but there is no control those of many distinguished men...
have been found to be materially below the average. Again several remarkably high weights have been recorded in idiots & insane persons. Perhaps the heaviest brain on record being one mentioned by Clapham (loc. cit.), which was that of an idiot who died in the Kent County Lunatic asylum, whose brain, weighed by Dr. Herenius, reached the enormous figure of 90½ oz.

The evidence is therefore very conflicting, but, taking the average 'brain-weight' of twenty-three distinguished Europeans as 33 oz., it is found to exceed the average European brain, 19 oz. by a little over 10 per cent. On the other hand, there appears to be a limit below which it is impossible that ordinary intelligence can exist. This appears to be about 37 oz. in the male & 32 oz. in the female...

In the first hundred cases which I have collected and
analysed I propose briefly to de-
scribe the question I result under
these headings viz. Sex, Age &
the Form of Mental Disorder
at the time of death, and I
shall therefore begin with a few
general remarks on the vari-
ations in weight in some of
that cases. The lowest brain-
weight of the series was that of
a case of Enile Dementia, aged 60,
in a male patient who had only
been about six months an in-
mate. It was extremified to a
most remarkable degree, the
lateral ventricles being enormous:
by dilated at the expense of
the brain tissue; the whole organ
only weighed 18 oz. The Cerebellum
with the Pons & Medulla weighed
5 oz. & the Cerebrum 13 oz. The
patient was almost totally de-
void of intelligence, I defy &
depended on this habit, but
there was nothing to distinguish
him in this respect from
the usual condition of that
only too common class in
all symptoms. The heaviest male brains in the series were two of 55-9/4 oz., one a case of Dr. Liddon with Epilepsy, aged 24, who had been an insane for about nine months, and who died of Phthisis. The other a case of melancholia, aged 44, who had been an inmate for about one month only, who died of Valeriean Disease of the Brain. These two, although considerably above the average, are by no means phenomenal when compared with cases that have been met with in several other asylums.

The lowest weight amongst the females was 25 oz. This was in Epileptic West, aged 12, an inmate for about one month, who died after a severe succession of Epileptic Seizures. The Corbellum with the Pons & Medulla weighed 6 oz. & the Lobes 19 oz. Another, a case of Chronic Manic, aged 60,
fifteen years on account, was only 26½ oz., the Cerebellum with the
Pons & Medulla being 4½ oz. The brain showed a very great de-
gree of atrophy. The heaviest (final) weight recorded was 63½ oz.,
occurred in a case of Secondary Demerit, succeeding Chronic
Manic, aged 46, in somnolent for
ten years. The Cerebellum with
the Pons & Medulla weighed 5½ oz.
and the Cerebrum 49 oz. This was
a remarkably large brain for a female, not many large
brains having been recorded. There was
nothing very remarkable about
the brain beyond its great size
and weight, but the convolutions
drew a degree of atrophy.

Having made these few ob-
ervations, I shall pro-
ceed to review the total cases
in this manner before men-
tioned.

I. Sex.

As formerly stated I have adopted
49 oz. as the average weight of
the male brain in the normal
some condition, & 44.02 as that of the female as a standard for comparison.

On comparing these figures with the uncorrected average on 250 male & a like number of female insane persons we find a very considerable reduction in weight in the insane. The average, which was here obtained by carefully adding together the total weights in each & then taking the mean, was found in this series to be 144.5 oz. in the male, and 140.7 oz. in the female. From this we observe that the difference between the average weight in the two sexes is less in the case of the insane, the female being only 8½ per cent. less as compared with nearly 10 per cent. in the same. In the following table (after Sharpay, et al.) I have shown disfavoured to give an analysis of the weight which compose this average. For the sake of convenience fractions of ounces are disregarded.
We have found that of the 230 males only 63 attained or exceeded the mean average, whilst 60 females did so.

If, however, we take the mean average weight as a standard, we find that 15.2 males as compared with 14.4 females either very nearly attained or exceeded the average of 44.5 oz. and 40.7 oz. respectively.

It is thus interesting to note that of the female brains 22 per cent. exceed the same average as compared with 17.2 per cent. in the male, whilst, on the contrary, the male brains exceed the insane average in the proportion of 60.8 per cent. to 57.6 per cent. in the female.

The consideration of these figures appears to point to a sort of lowering process which is downward in the male & upward in the female.

This may be shortly stated thus:

<table>
<thead>
<tr>
<th>Male Same Brain</th>
<th>Female Same Brain</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 oz</td>
<td>44.4 oz</td>
</tr>
</tbody>
</table>

or a difference in favour of the male of 10.2 per cent.
Male Insane Brain \{ \begin{array}{c} 44.5 \\ 40.7 \end{array} \} \quad \text{Female Insane Brain} \begin{array}{c} 100 : 97.4 \\
\end{array}

or a difference in favour of the male of 8.6 per cent.

Then taking the difference between 10.2 and 8.6 we find that the female insane brain loses less by 1.6 per cent than the male.

**Table II.**

<table>
<thead>
<tr>
<th>OZ. Covered.</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td>Rate p. cent</td>
</tr>
<tr>
<td>From 30 to 35</td>
<td>12</td>
<td>4.8</td>
</tr>
<tr>
<td>35 to 40</td>
<td>36</td>
<td>14.4</td>
</tr>
<tr>
<td>40 to 45</td>
<td>107</td>
<td>42.8</td>
</tr>
<tr>
<td>45 to 50</td>
<td>75</td>
<td>30</td>
</tr>
<tr>
<td>Upwards of 50</td>
<td>20</td>
<td>8</td>
</tr>
</tbody>
</table>

|              | 250 | 100 | 250 | 100 |

Table II is a sort of summary of Table I & takes 45 or as a common stand-point for both sexes, showing that whilst 45 (or 38 per cent) speed it in the male, only 21 (or 8.4 per cent) do so in the female. It also shows the number of cases in each age
in series of 5-oz. increase, with the
four centage each bears to the whole.

The averages I have obtained

full considerably below those given
by Flammarion as the result of
his observations in three English
asylums. Many of these cases,
however, were of a much higher
social status than that oc-
served by the inmates of most
County Asylums. It is an
unembellished fact that the
intellectual development of
average brain-weight in the
middle classes and the middle
classes are considerably higher than
they are in the lower

The large majority of the
cases I have examined cases
belonged to the agricultural
labouring class, or, in the case
of those coming from the towns,
to the ordinary labouring class,
very few belonging to that
of skilled artisans. Thus, even
at their best, are by no means
remarkable for superior intelli-
gence. Yet it is highly probable that
the average brain-weight varies less
in the same as well as in the
animal. It has already been ob-
served that the average weights
vary considerably in different
County Asylums.

As to the other causes which
bring about the lowering of the
average: it is doubtless to a great
extent due to the general atrophic
process which is constantly taking
place in the whole organ, and
more especially in the cerebral
convolutions of persons who
die insane, but it is an am-
doubted fact that many of
the brains are congenitally
small & badly developed. Dr.
Thomann says, "The average
brain-weights of those dying in
asylums is made up of weights
which are above the average of
the healthy brains, & of others
which are materially below it.
This is one doubt. The end to
a certain extent, but, as far as
any observations go, I find that
advances a considerable number
full but below the average, a very much smaller number are above it.

This becomes apparent, by reference to Table III, which is one used by Hyman. He takes the medium brain weight as ranging from 40 to 52½ oz. in the male, and from 35 to 47½ oz. in the female, classifying those that fall below these figures as more or less microcephalous brains, while those that rise above them as more or less megalencephalous. The table shows the great difference in weight that may exist between the two extremes.

Table III.

<table>
<thead>
<tr>
<th>Microcephalous</th>
<th>Medium</th>
<th>Megalencephalous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incipient</td>
<td></td>
<td>Incipient:</td>
</tr>
<tr>
<td>Female: 32 oz.</td>
<td></td>
<td>Female: 47½ oz.</td>
</tr>
<tr>
<td>Decided</td>
<td></td>
<td>Female: 50 oz.</td>
</tr>
<tr>
<td>Male: 24</td>
<td>5</td>
<td>Megalo: Female: 55 oz.</td>
</tr>
<tr>
<td>Female: 19</td>
<td>19</td>
<td>Decided:</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>
It also demonstrates the fact by: you noted that many fall below whilst few exceed the medium. It is also noteworthy that more than double the number of males as compared with females fall under the microcephalous clan, whilst the number of megaloccephalous brains is equal in the two sexes. Again, of the medium weights, I have noticed that taking the mean between 4.0 and 5.2 oz. more than double the number of cases fall below it in the male (136 below to 61 above); whilst in the female taking the mean between 35 and 47½ oz. the proportion of those falling lower is considerably lower (135 below to 65 above).

With regard to these brains which are conjecturally small and undeveloped the only class of cases whence any satisfactory deductions can be drawn is that embracing Imbeciles and Idiots. Of the latter there are
15 males and 8 females in this series of cases. The averages of these are very low, being about 37½ oz. in the male and about 36½ oz. in the female. The latter being a very small collection. The average is, no doubt, materially affected by one very low weight — 35 oz.

Consideration of the few megalencephalic brains in this series brings out no very striking facts. The numbers are small on both sides, but here again the number of the female brains that attained the higher standard is much higher than on the opposite side. None of the male brains attained the weight of 36 oz. This is a very low maximum as both Thurman and Humphrey found that about 10 p. cent. in the male and 7 p. cent. in the female could be classed as megalencephalic, 3 to 4 p. cent. in both cases as decidedly megalencephalic. colonies.
Having considered these fluctuations in the weight of the entire brain, it may be as well to inquire what portion or portions of the organ appear to suffer in the general deterioration. The loss in weight—in the insane—appears to take place in the whole organ, each portion suffering in almost equal rate. On comparing results in the two sexes, the fluctuation in weight appears to take place almost entirely in the Cerebrum, there being only a difference of 0.4 oz. in the average weights of the Cerebellum with the Pons and Medulla, thus:

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebrum</td>
<td>38.8</td>
<td>35.4</td>
</tr>
<tr>
<td>Cerebellum, Pons, &amp; Medulla</td>
<td>5.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Total Encephalon</td>
<td>44.5</td>
<td>40.7</td>
</tr>
</tbody>
</table>

All these points would therefore appear to show that diseased conditions of the brain, such as are met within the cases now under consideration, seem to affect not only the
weight but the general condition of the male brain to a considerably greater degree than the female. This appears to be borne out by the conclusions from the fact that the male ears do not attain so high an age as the female. The disease of the brain seems to run a more acute course, to cause a greater degree of atrophic change to take place in the former, also again to react on the vital conditions and cause a shortening of life.

II. Age.

According to Boyd & Renucci (loc. cit.) the human brain attains about 5/6 of its ultimate weight by the end of the seventh year of life. In the male it is, in the female about 8/10 of its ultimate weight by the same period. It, however, undergoes a gradual small increase till between the ages of 30 & 40 in the former, & 20 & 30 in the latter, after which a gradual diminution takes place, being slight from 40 to 50.
greater from 50 to 60, though pro-
imended still after 60 to between
70 & 80 when the average dose a-
mounts to a little more than 3 oz.

In the case of the insane this
apparently is very much less notice-
able, to judge from our observa-
tion of the average weights. But
those are apt to be very much:
more in the present instance.
A very large number of idiots
who from weight fall very
much below the average die in
early life; only three of the
twenty-three cases I have col-
lected exceeded thirty years of
age, & thirteen of them died
under the age of twenty. As a
matter of fact, all the cases
I have calculated as dying
under twenty were idiots with
the exception of three. For
purposes of comparison, therefore,
those dying under twenty may
be left out of the question.
I have arranged the cases in
Tables II, A, & B. in decimals
### Table IV. A

<table>
<thead>
<tr>
<th>Males.</th>
<th>No. of Cases</th>
<th>Maximum Weight</th>
<th>Minimum Weight</th>
<th>Average Weight</th>
<th>Ratio of Cerebrum, Pons and Medulla to Encephalon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 20 years</td>
<td>8</td>
<td>47.5</td>
<td>30</td>
<td>36.81</td>
<td>1 to 4.82</td>
</tr>
<tr>
<td>From 20 to 30 years</td>
<td>23</td>
<td>35.75</td>
<td>36.5</td>
<td>35.9</td>
<td>5.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40</td>
<td>45</td>
<td>52.5</td>
<td>33.5</td>
<td>37.83</td>
<td>5.64</td>
</tr>
<tr>
<td>40-50</td>
<td>54</td>
<td>55.75</td>
<td>35</td>
<td>39.33</td>
<td>5.7</td>
</tr>
<tr>
<td>50-60</td>
<td>40</td>
<td>52.75</td>
<td>35</td>
<td>38.36</td>
<td>5.71</td>
</tr>
<tr>
<td>60-70</td>
<td>33</td>
<td>51.5</td>
<td>18</td>
<td>37.64</td>
<td>5.49</td>
</tr>
<tr>
<td>70-80</td>
<td>34</td>
<td>53.5</td>
<td>32.75</td>
<td>38.08</td>
<td>5.36</td>
</tr>
<tr>
<td>Above 80</td>
<td>5</td>
<td>46.25</td>
<td>39</td>
<td>37.6</td>
<td>5.6</td>
</tr>
</tbody>
</table>

### Table IV. B

<table>
<thead>
<tr>
<th>Females.</th>
<th>No. of Cases</th>
<th>Maximum Weight</th>
<th>Minimum Weight</th>
<th>Average Weight</th>
<th>Ratio of Cerebrum, Pons and Medulla to Encephalon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 20 years</td>
<td>9</td>
<td>46.5</td>
<td>25</td>
<td>32.08</td>
<td>4.69</td>
</tr>
<tr>
<td>From 20 to 30 years</td>
<td>16</td>
<td>44.75</td>
<td>32.5</td>
<td>36.92</td>
<td>5.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40</td>
<td>38</td>
<td>32.5</td>
<td>34</td>
<td>35.08</td>
<td>5.3</td>
</tr>
<tr>
<td>40-50</td>
<td>48</td>
<td>28</td>
<td>53</td>
<td>36.59</td>
<td>5.4</td>
</tr>
<tr>
<td>50-60</td>
<td>40</td>
<td>36.5</td>
<td>30</td>
<td>36.54</td>
<td>5.4</td>
</tr>
<tr>
<td>60-70</td>
<td>60</td>
<td>26.5</td>
<td>54.25</td>
<td>36.51</td>
<td>5.3</td>
</tr>
<tr>
<td>70-80</td>
<td>34</td>
<td>36</td>
<td>50.75</td>
<td>35.54</td>
<td>5.2</td>
</tr>
<tr>
<td>Above 80</td>
<td>5</td>
<td>35.75</td>
<td>43.25</td>
<td>32.2</td>
<td>5.05</td>
</tr>
</tbody>
</table>

0
 periods, giving the maximum and minimum weights in each group to show the range of difference, than the average weight of the Cerebellum, of the Cerebellum with the Pons and Medulla and of the total Encephalon. I have also added a column to show the ratio which the weight of the Cerebellum Pons and Medulla bear to the total Encephalon. On examining these tables we find that the highest average is found between the ages of 20 and 30. From 30 to 40 there is a remarkable drop of 2 oz. in the average of both sexes, this is followed by a rise of 2 oz. in the following decade. This sudden drop and succeeding rise is difficult to account for. The fact of its occurring in both sexes would point to its being no mere coincidence. Besides, I have noticed that the same thing occurs in the cases tabulated by Virchow, though to a less degree. Perhaps it may
to some extent be accounted for by the fact that a considera\:
ble proportion of General Paresis, & notably those whose \:
brain-weights are lowest, died between their ages. There is also\:
a large proportion of those lowest recorded weights to be found\:
among the number. I this sug\:
gestion may be made that probably many of those cases\:
which have a hereditary pre\:
disposition to insanity, & which\:
are likely to have congenitally\:
small & poorly developed brains,\:
& to be at the same time of very\:
inferior physique, succumb at\:
this comparatively early age.\:
We may naturally infer that\:
such cases would be least able\:
to support the struggle for ex\:
istence & to die before reaching\:
middle life. Their weaknesses so\:
to speak falling out on the\:
third decade, the doctrine of the\:
survival of the fittest comes into\:
play & causes the average to rise\:
again in the succeeding decade.
These tables also show very distinctly a fact noted by others, that the average weight differs very much less at these several periods in this mean than it does in the same. This may probably be explained by the fact that in the increase a greater or less degree of atrophy takes place at a comparatively early age, so that this only increases slowly as age advances.

With regard to the duration of life we find that it is longer in the female than in the male. On calculating the mean age, I find it to be 48.8 years for the male and 52.1 for the female. Although the average duration of female life exceeds that of the male in the general population, the ratio is not nearly as high as that here mentioned. Of the cases, 174 males attained the age of 40 as compared with 187 females: 117 males to 135 females.
reached the age of 50; and 97 males to 99 females that of 60. It would, therefore, seem to be the case that in those suffering from brain disease death takes place at a relatively earlier age in the male than in the female.

III. Form of Mental Disorder.

This table is necessarily an incomplete one, as I have been unable to divide the cases of Mania, Maniahoid, into their proper subdivisions of Acute & Chronic, or to separate the cases of primary & secondary Dementia. Even in its incomplete state, however, it is a record of facts, and some information may be gained by analyzing it.

I have given the maximum & minimum weights in each group, as well as the average, in order to show the wide range of difference between the two extremes.
### Table V. Males

<table>
<thead>
<tr>
<th></th>
<th>Mania</th>
<th>Melancholia</th>
<th>Dementia</th>
<th>Sen. Paralysis</th>
<th>Idiocy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Cases</td>
<td>34</td>
<td>34</td>
<td>9.8</td>
<td>6.9</td>
<td>15.4</td>
</tr>
<tr>
<td>Maximum Ht</td>
<td>54 oz.</td>
<td>55.75 oz.</td>
<td>55.75 oz.</td>
<td>53.75 oz.</td>
<td>45.75 oz.</td>
</tr>
<tr>
<td>Minimum</td>
<td>41.5</td>
<td>36.75 oz.</td>
<td>18</td>
<td>33.5</td>
<td>30</td>
</tr>
<tr>
<td>Average</td>
<td>46.8</td>
<td>46.8</td>
<td>44.8</td>
<td>43.7</td>
<td>37.8</td>
</tr>
</tbody>
</table>

### B. Females

<table>
<thead>
<tr>
<th></th>
<th>Mania</th>
<th>Melancholia</th>
<th>Dementia</th>
<th>Sen. Paralysis</th>
<th>Idiocy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Cases</td>
<td>3.8</td>
<td>3.5</td>
<td>12.7</td>
<td>2.2</td>
<td>8</td>
</tr>
<tr>
<td>Maximum Ht</td>
<td>51.75 oz.</td>
<td>50.25 oz.</td>
<td>55.25 oz.</td>
<td>45.75 oz.</td>
<td>41.25 oz.</td>
</tr>
<tr>
<td>Minimum</td>
<td>26.5</td>
<td>34.75 oz.</td>
<td>30.75 oz.</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Average</td>
<td>41.4</td>
<td>41.7</td>
<td>41.5</td>
<td>38.2</td>
<td>36.7</td>
</tr>
</tbody>
</table>

We here find that in the males of the average in the classes of Mania and Melancholia are a good deal higher than in the others & considerably exceed the general average; that there is a marked falling off in the
cases of Dementia, that this
same thing is noticeable, altho'
to a less extent in the next
class, that of Central Paralyses.
and it takes place in a
much greater degree in the
cases of Idiocy.

In the female sex this grade
of deterioration does not ap-
pear to take place. The are:
cases in the first three classes
are very nearly equal & they
also show a considerable in-
crease as compared with the
general average. Then in the
cases of Central Paralyses, we
get a sudden falling off which
is more marked than the dif-
fERENCE BETWEEN THE CORRESPOND-
ing classes in the male. If,
however, we compare the average
in Central Paralyses in the
male with the higher averages
in the first two classes, we
find that the average loss is
very nearly the same in both
cases, being a little over 30.

In the female the drop between
General Paralysis & Devey is much less marked than in the male.

It is thus indicated that General Paralysis & Devey are very important factors in bringing about the lowering of the general average as if these two classes be left out of consideration, we find that the general average rises to about 46 oz. in the male and 41½ oz. in the female.

When these figures are compared with those of Dr. Boyd for the average same brain, viz. 47½ oz. in the male & 43½ oz. in the female we find that the average loss in the great majority of the cases is not nearly so great as would at first sight appear to be the case.

These figures of Dr. Boyd's are deduced from a large series of examinations made on the brains of a class of persons whose social status
and intellectual development are pretty nearly on a level with the same in the class which furnished my cases. My averages may therefore, I think, with more justice be compared with Dr. Boyd's than with those higher ones which represent the average European brain weight in all classes combined.

Thus, leaving General Pan.:ahips 9. I bring out of this question, we find that:

\[
\begin{align*}
\text{Male Same Brain} & \quad \text{Male Insane Brain} \\
(\text{Boyd}) 47.8 & \quad 46 \\
\end{align*}
\]

or a loss of 3.7 p. cent. in the Insane.

\[
\begin{align*}
\text{Female Same Brain} & \quad \text{Female Insane Brain} \\
(\text{Boyd}) 43.1 & \quad 41.3 \\
\end{align*}
\]

or a loss of 4 p. cent. in the Insane.

This is in striking contrast to the percentages noted in the first part of this paper; but then we must bear in mind that this is a comparison of a lower standard.
of brain weight in the same with a higher one in the insane, viz. with the cases of Mania, Melancholia, & Dementia, & three others, although equally in the majority, have less influence than the other two on the average brain weight.

Finally, if we compare the general average of these two hundred cases with Dr. Boyd's averages, and obtain a result that is probably a nearer approach to the true relation which the weight of the brain in the same bears to that in the insane (in all classes of the community) than that mentioned in the former part of this paper. Thus:

Male Same Brain \{ Male Insane Brain \}
(Boyd) 47.8 \{ 44.5 \} \{ 100 : 94.5 \}

or a loss of 5.5 p.c. of the insane.

Female Same Brain \{ Female Insane Brain \}
(Boyd) 43.1 \{ 40.7 \} \{ 100 : 94.6 \}

or a loss of 5.4 p.c. of the insane.
Kent Country Confinm.
Maidstone. 29th April 1885.

I hereby certify that this thesis has been composed by myself.

Will. Murdoch, M.B.C.M.