On General Paresis.

To the Dean of the Medical Faculty,
University of Edinburgh.

By
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Gloucester County Asylum
On General Paralysis of the Insane

Introduction

Having had some experience, or more properly speaking, opportunities of studying different cases of General Paralysis of the Insane, whilst Assistant Medical Officer at Somerset County Asylum, and also since my appointment to Gloucester County Asylum, I thought I might venture on that disease as the subject of my thesis.

General Paralysis of the Insane has only been lately fully described, and even now authorities have not entirely agreed as regards some of the minor points, and among Asylum Superintendents especially we find a great diversity of opinion concerning it. Some denying its existence unless there is present the exaltation of manner usually, but by no means always, present, whilst others on the other hand include many cases of mania à potè as General Paralytics - the distinction being often very difficult: I think this accounts for the great difference in Asylum Reports with respect to the number of General
Introduction to Particulars

History
Paralytics dying yearly: of course we would expect more cases to occur in the large Metropolitan Asylums than in Asylums situated in an agricultural district. But if we compare two Asylums receiving exactly the same class of patients we find even there a considerable difference in the number of G.B.'s.

As regards the history of General Parihyosis Bayle in 1822 was the first to describe a disease combining mental unsoundness and Paralysis to which he gave the name of paralytkis chronique — being under the impression that it was a chronic inflammation of the brain.

From this date, the disease has been mentioned and commented upon in most books on Insanity under the different names of "Paralytic Demence," "Paralytic Insanity," "Paralysie generale progressive," "Renencaphalite chronique," etc.

It is to the French however that we owe the first and best descriptions of the disease, especially to M. Calmeil, who published a work entitled "De la paralysie considéréée chez les aliénés" in 1826 and another in 1839.

In England, Austin, Bucknill, and Crichton Browne, have written most on this important subject.

At first the Paralytic symptoms appeared when first looked upon as a mere coincidence, but as the disease got better known and after several cases had been collected it was then concluded, of rightly, that they were part of the disease.
Etiology

Except of all kinds is the commonest and most prevalent of this awful disease.

Of 25 cases admitted into the Gloucester County Asylum

11 were the result of excessive drinking
3 had hereditary fainting
3 had history of injuries to head
6 were apparently the result of excessive sexual indulgence.
1 was the result of syphilis (?)
1 was from excessive religious excitement

The except may be in the indulgence of stimulants, sexual appetite, religious fervor, work, especially mental, or what which involves a good deal of anxiety to worry, in fact the except may be either bodily or mentally. When we think of the abnormal strain on the nervous system consequent upon the high pressure style of living in the present day - we do not wonder at the great increase of general Paralytic since the days of our forefathers when men lead much quieter and steadier lives.

In Paris especially (where I had opportunity for two months of visiting the chief Asylums) we see a large proportion of the new cases admitted into the Asylums to be general paralytic and this is not surprising when we remember the kind of life that Parisians lead - the constant whirl of excitement every day of the week - the craving for pleasure - the hours spent in Cafes, Ballrooms, Theatres &c - the late exit
Etiology (continued)
to bed & (among the lower classes) the remarkably early rising - thus not leaving sufficient time for the exhausted nervous system to recover itself - & in fact the constant excessive wear & tear of the system or - has been shown that 78 percent of G's are from large towns & only 29 per cent from the country - thus clearly proving that it is the 'faster' life in towns, that conduce to its production.

The abuse of good living, excessive indulgence in tobacco - & violent tempers are important accessories likewise. In fact this is the reason why the disease is more common to men than women, being about in the proportion of 50 males to 15 females. It also why it is that it invariably attacks men whilst in the fullest enjoyment of their lives - & also the fact that the women who are attacked are nearly always those who have lead loose & profligate lives: the disease is almost unknown among ladies which speaks volumes for itself as regards correction.

Proscriptions & Climate also exercise their influence - but only in the fact that such & such a profession is more likely to encourage such & such an excess - & that climate makes a man live such a life - among professions might be named Customs, Stockbrokers, Matronas, Cooks, as eminently predisposing to the disease: also as regards climate - a cold we
Etiology (continued)
being more conducive to intemperance than a hot one & the latter to search
insults rather than the former.

Hereditary as a cause of G.P is denied
by some & admitted by others. M. Dargent
physician at St. Arnaud Asylum Paris
in a work entitled " Nouveau Traité
des Maladies mentales " says " Heredity
appears to stand pretty high among
the causes of General Paralysis - it is
not uncommon to meet in the family
of those attacked with the disease,
individuals affected with Paralysis,
dementia, or one or other of the different
forms of mental alienation. In fact
nothing is so common as to meet G.Ps
whose relations have suffered from some
mental mischief, such as apoplexy,
epilepsy - or who have a brother
or sister demented.

According to the French Physicians heredity
is given a very prominent position
among the causes. & they go so far as
to say that 29 out of every 50 cases
are the result of hereditary taint. As has
been already said 3 out of the 25 cases
admitted there were distinctly traceable to
hereditary influence; it is a very difficult
indeed to point out the predisposition of
any patient in the family as a rule.
We are very chary of giving information on this
point - but when the information is got
we usually find some hereditary taint
in the family.
Etiology (continued)
Wounds & blows on the head are other predisposing causes - acting, I presume, in the same manner, as if he had inherited a congestive tendency. Convulsion (as noting special temperament) has been put down as a predisposing cause. The majority of patients I have seen have been florid & pale complexion - the sanguine temperament being more susceptible to external influences - people also with this temperament having very high strung nerves, a very little exciting them.

When we reflect that this disease attacks the unfortunate victim, whilst in the very prime of life, we may conclude that the ages of general paralysis are not very far advanced. Of 28 cases admitted here

2 were between the ages of 25 - 30  
8 " " " " " " " " "  30 - 35  
7 " " " " " " " " "  35 - 40  
6 " " " " " " " " "  40 - 45  
3 " " " " " " " " "  45 - 50  
2 " " " " " " " " "  50 - 55

Thus we see that there were more attacked between 30 - 35, than between any of the other ages.

We find too that the proportion are married - which might be expected when we think of the grave anxieties & cares connected with the married state; in the 28 cases referred to, 21 were married, 3 widowers & 4 unmarried.
Symptoms
Symptoms

General Paralysis has been divided into three stages:

1. Stage of mania.
2. Stage of excitement - amounting to acute mania in some.
3. Stage of chronic mania - gradually with dementia.

The symptoms, of course, will vary according to the stage the patient has reached. In asylums we seldom see the patient in the 1st stage but according to the history, we usually find that an entire change in character has just been noticed in the individual, for example an industrious, steady man begins to neglect his work and indulge in excesses that formerly he would not have dreamt of - a silent, morose person will become lively and garrulous, a cheerful person often becomes very depressed or else very gay - pushing the bounds of propriety - in my opinion usually the former. At the same time they all appear to get restleep or careless in everything they do - in fact this forgetfulness appears to me one of the most important symptoms of this the Initial stage: they forget the most simple things such as the time for meals, bed &c.

One of the best descriptions of the very early stage of this disease, before any
Symptoms (continued)
Paralytic symptoms have appeared, and the friends of the patient even have suspected anything wrong, has been given in Arnold's work on General Paralysis (1859).

In these persons, all of whom became subsequently paralytic, a very singular circumstance was remarked viz, a contraction of the pupils to a point - the complete permanent destruction of their mobility without as far as could be judged any diminution of visual power. The next time these people were seen, frequently after months had elapsed, he observed a notable change in their manner of speech. They had become more vivacious and seemed to overflow with animal spirits - they had a greater notion of their own importance or talents. Many sane men have as much vanity as great a self-complacency as these people exhibited, coincident with their shrivelled pupils; it was the change from their usual quiet demeanour which particularly struck him. After another long interval he was again brought in contact with them. Their exuberance and self-satisfaction had increased - their ramorous reached him of their extravagancies, or blunders having been committed in their various employments which at length became so marked and numerous, as to interfere with the proper carrying on of the business. Now arose entreaties on the part of those interested in their affairs - no avail however, as the incipient paralytic, had now become
Symptoms (continued)
irritable & headstrong - more than even con-
mviced of his own talents & in a word com-
pletely impracticable."

I may here remark that there are two or
three cases on record, in whose there were
apparently no mental symptoms whatever,
during the whole course of the disease
-simply paralytic ones - of course I have
not had any experience of this class.

It is about this time that the physical
signs of the disease appear - & these are
at first a peculiar tremulousness of the
lips & also naso - the tongue on protrusion
is also tremulous & is put out in a
peculiar jerking manner, & drawn into a
like manner: there is no slurring in
the ordinary sense of the word, but may
a hesitation - as if the patient were bring-
ing all his powers to bear in the formation
of the sentence - & then the words are
brought out in a jerky fashion, as it were.
The conduct of the patient has become
so outrageously extravagant, as to require
removal to an Asylum.

The symptoms at this period may be di-
vided into two divisions viz Mental & Physical.
Mental. We usually find the patient quite
restless & excitable - expediing himself in
a childish, semi-incoherent manner - the
feeling of being élite appears generally well
marked. They often begin to talk about
their wealth, or the splendid health they
enjoy - or anything connected with them
-selves - invariably in a boastful manner.
Symptoms (continued)
They are beaming with smiles — altogether appear well contented with themselves & everybody else; out of the 24 cases already referred to, 23 out of that number expressed themselves in much the above manner, whilst the other five appeared to entertain delusions of suspicion, & spoke about how they were about to be robbed of their money, or that they were going to be killed or delusions of a similar nature; these cases simulating melancholia differ from that form of insanity in the fact that the patient's countenance does not express the same amount of grief, as would be present in a true melancholic — that there is seldom a history of the patient refusing food, & also that usually there could be detected a certain boastful & familiar manner underlying their apparent dismal conversation.

After a few days' residence in the asylum all general paralytics invariably begin to brighten up — they become cheerful — laugh at trifles — & speak about something they have done or intend doing sometimes (as I have found, as a rule) they begin to talk of their wealth — & are extremely lavish in their promises; these delusions of grandeur may be distinguished from those of an ordinary lunatic (1) a general paralytic never keeps to one special delusion or train of thought — but changes constantly —
Symptoms (continued)
he thinks he is a King - a Prophet - the strongest & healthiest man in the world - apparently inventing as he goes on - whereas if an ordinary man thinks he is a King, all his actions are regulated accordingly - he will still think himself one, weeks after week.

(2) By their utter improbability - their inability to argue in their favour, or give any reason for them, a case admitted here - a short time since - said that he was worth millions of money - that he had built all the churches in the world - that he had thousands of children - that he was stronger than all the men in the world - that he could drink the sea dry - & so on - all this during a few minutes conversation. Another stated that he had £20,000 - I had put £5,000 in the Bank of England - another that he had 8,000 soldiers under him - another used to promise the attendants horses & as many Billiard Tables as they wanted: one patient had hallucinations of hearing - hears voices addressing him from above - very unsettled & violent at times - also some curious delusions. Thinking his bowels have dropped into his legs etc. These patients that have been admitted with delusions of suspicion have slowly changed - gradually becoming more cheerful & boastful - the paralytic symptoms meanwhile increasing in a marked degree.
Symptoms (continued)
Nearly all paralytics at this stage are subject to violent bursts of excitement — amounting in some cases to acute mania — in which the patient is extremely dangerous and destructive, tearing up their clothes, bed-clothing, etc. These attacks often come on during the night — the patient calming down before morning.

Physically, in all the cases I have seen a distinct difficulty in speech has been perceptible gradually increasing. In some there has been only perhaps a slight hesitation, with quivering of the lips and also nares, while at others an almost total loss of speech — the patient making attempt but owing to the loss of the co-ordinating power over the muscles of the tongue and lips, no formation of words was apparent. The speech in general paralytics gradually gets worse as the disease advances, and you find different degrees of it from mere hesitation to total aphasia.

There have been eight alterations or changes in the speech of my cases noticed:

1. Incomplete pronunciation of a syllable.
2. A syllable is omitted from a word.
3. Incomplete repetition of a syllable.
4. One or more complete repetitions of a syllable.
5. Sudden arrest of speech at commencement.
7. Uniform slowness of speech.
8. [Undecipherable]".

The first four are due to the paralysis of the lips, and are very commonly noticed in Asylums.
Symptoms (continued)
Along with the difficulty in speech, we usually find difficulty in swallowing.
A stiffness of the upper lip is usually perceptible - and we find that the natural curves of the lips are less marked than normal - the lips becoming flattened out - as it were - changing entirely the expression of the patient's face.

On asking a patient to put out his tongue at this stage, he invariably does so with a jerk - a peculiar manner is perceptible.

He cannot keep it out for any length of time and when retracted - it is done so suddenly, as with a jerk.

The facial muscles, also, are subject to twitchings and tremors. Owing to this diminution or loss of nerve power - his countenance is generally heavy and stupid.

The gait of a general paralytic is also peculiar - the patient walking, as a rule, with his legs further apart than is usual as if to preserve his balance - then feet appear to lose gradually their elasticity and the step becomes tottering and full.

The arms become stiff in their movements and the patient becomes unable to perform any action, that requires delicacy in its execution.

The handwriting changes as the disease progresses, until finally the letters becomes entirely indistinguishable - the writing consisting merely of a series of crooked strokes.

The muscles lose to a considerable extent
Symptoms (continued)
Good their sensitivity irritability to electricity. In the later stages reflex action is, in a degree, lost— the soles of the feet being tickled without any apparent effect.

The changes in the pupils are nearly constant in general Paresis. In the majority of cases I have seen the pupils have been unsymmetrical— the one being considerably larger than the other. One pupil is often seen to contract readily on exposure to light— the other remaining dilated & then slowly contracting, but not to such an extent as the unaffected one. I have not seen a case yet, in which the pupils did not become affected at some stage— in the early stages a pin-point contraction of the pupils is as a rule noticeable— this condition remaining in some cases, especially rapid cussed ones, through the whole disease— but usually is followed by the dilating of one of them the other remaining contracted & fixed.

Austin says (p. 36) that an affected right pupil usually coexists with melancholic delusions— an affected left pupil with maniacal excitement— At a slight & equal pupillary contraction with a freedom from delusions. For my own part I have not noticed these coincidences— in fact there are in the Asylum at present two paralytics with well marked affected right pupil who are also at times very excited & destructive— I with delusions the reverse of melancholy.
Symptoms (continued)
Congestive Attacks. The fits that we see at some time or other in the course of General Paresis, may be divided into the Epileptiform and Apoplecticform—just as the congestive attack simulates epilepsy or apoplexy. In a recent case, I have had an opportunity of seeing a most typical example of the epileptiform congestive attack. The patient was about to sit down to tea when he suddenly became unconscious—was convulsed, especially on the right side—the pupils were dilated—limbs became perfectly rigid for quite two minutes—this rigidity being succeeded by violent twitchings of the whole body, especially marked on the right side. When the convulsion was passed he became almost completely comatose. The patient (as usually happens) has lost considerably mental strength since the attack; the twitchings & rigidity of the limbs continued for about three days afterwards, when the patient gradually revived & died.

These congestive attacks, however, do not come on exactly the same way in every case—they may come on suddenly by a sleepiness or great dizziness, or more slowly. The patient sinking into a state of complete coma; the muscles may lie in a state of relaxation—sometimes hemiplegia follows the attack—This hemiplegia has been noticed to have from one side to the other—sometimes it quickly disappears. Occasionally the congestive attack shews itself under the form of vertigo & dizziness—but more often
Symptoms (continued)
as we have seen it simulates epilepsy or apoplexy.

Dr. Harington Duke in a contribution to the "Journal of Mental Science" says that "I do not believe that General Paralysis runs through its course without producing or exhibiting the phenomena of these epileptoid fits".

The fact that these epileptoid attacks may be so rare, so slight, as to render very close observation necessary, accounts for the fact that their presence is often undetected. The majority of the fits I have seen have been of the slight epileptoid variety - the patient being consulted for only a few seconds - the tongue not being bitten - not followed by the heavy sleep so commonly following an ordinary epileptic attack.

In the epileptiform category may be also included those patients, who without any definite fit, are attacked by twitchings of the limbs lasting sometimes for days - the patient at the same time becoming very demented.

In the apoplectic form variety - the patient falls into a complete comatose condition. The pupils are dilated - limbs rigid - when sensibility returns, we usually find the patient hemiplegic; there is not usually the stertorous breathing & puffing out of the cheeks so noticeable in common apoplexy. One case that had an apoplectic form attack was found, after the fit, lying on his back
Symptoms (continued)
with the right arm rigidly forced to his side & fingers incurred. He kept attempting to move in a restless manner. I had spasmodic twitchings of the right leg - took no notice of those around him - mouth was slightly drawn to the left side - eyes closed as a rule - but occasionally opened when the eyeballs were rolled about: pulse 102, temp 102.5 right side, 101.2 left.

The next day he was much the same - unable to swallow - right leg still being drawn up in a jerky manner - temp right as previous 102°, left 101.2. Pulse 100.

The second day after the attack: the pulse was very feeble & compressible - cheeks flapped in respiration - temp right 102.6, left 101.

On the third day after the seizure he was found to look much better - took notice of people around him, but unable to speak - deglutition improved: pulse 100: temp right 99°, left 98.5.

From this date he gradually improved, but remained paralyzed right side. Two months after he died. On post-mortem examination the Dura mater was found to be adherent - arachnoid cloudy & pia mater much infiltrated with serum - the ventricles contained much serum - the convolutions were wasted but the substance was of normal consistence.

These &c. may be said to divide General Paralysis into stages, as after each fit the patient loses a certain amount of ground, which he never seems to regain.
Symptoms (continued)
Patients from the 2nd stage either pop into the 3rd (or state of dementia + insanity) or else appear to improve: this improvement lasting, however, only a short time. As a rule, the unfortunate victim gliding sooner or later into the 3rd or last stage. One patient who had been discharged much relieved in the spring of last year (1849) returned this January after following his employment more or less in the interim — his speech is more embarrassed — delusions more prominent; otherwise he appears much the same as when he left (as seen by the Case Book).

Patients in the 3rd stage become very often stout — from an accumulation of unhealthy fat, which very soon disappears when they have to take to their beds. Their delusions are still present — in fact we often see the delusive ambition increase, as the strength diminishes; their excitement has gone — the countenance becomes a complete blank — they appear to be perfectly happy & try to express their satisfaction at things in general. I have noticed that those cases that commence with the ordinary delusions of the chronic manic — have gradually developed the peculiar delusions of G.P. & from being the most miserable of men, have been transformed into the happiest of mortals.

The appetite invariably keeps very good in the majority of cases bordering on mania.
Symptoms (continued)
The memory becomes worse and worse - congestion attacks often occur at intervals until at last the patient becomes perfectly demented. If he has to take to his bed it is surprising how fast he loses all his fat, becoming in some cases where the death is prolonged a perfect skeleton - awful to look upon - about this time he will be paying both pieces of water in bed, having no control whatever upon himself - bedsores begin to appear, however much care has been taken with the patient; partly from the above fact; partly from deficiencies of nerve power; partly from the pressure of the bones, on the skin and tissues, due to the loss of the natural padding of the body by the fat.

In this state they continue for variable periods - apparently feeling no pain - if asked how they are, will answer (if able) very well, or words to that effect; grinding of the teeth is noticeable in many cases about this period - keeping it up most of the day - and making a most discordant noise: this is supposed to be pathognomonic of the disease, but as it only appears at a late stage, is not of much use in the diagnosis: I remember a patient particularly whilst at Somerset County Asylum, who ground his teeth incessantly morning and night for about a month, before his death, but who had not exhibited any signs of general Paresis.
Symptoms (continued)
Urine. There is as a rule in the early stages of General Paralysis an increased quantity of urine secreted - in the later stages the amount diminishes - sometimes so much an extent, that barely a couple of ounces is passed in the 24 hours - the specific gravity & turbidity due to urates increase; after removal it soon becomes very alkaline.

Dr. Rabon in the Archiv für Psychiatrie, translated by Dr. McEwen, gives several cases of General Paralyses, in which the urine was closely examined.

**Case I**

A strong man, aged 41, Paralysed for a year. Marked psychical euphoria.

<table>
<thead>
<tr>
<th>Date</th>
<th>Quantity in 24 hours</th>
<th>Colour</th>
<th>Reaction</th>
<th>Acid</th>
<th>M.P.</th>
<th>Chlorides</th>
<th>Percent Lost</th>
<th>M.E.</th>
<th>P.E. Total</th>
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<tr>
<td>March 28th</td>
<td>22.00</td>
<td>golden yellow</td>
<td>fresh</td>
<td>1020</td>
<td>1.9</td>
<td>41.8</td>
<td>11.4</td>
<td>37.4</td>
<td></td>
</tr>
<tr>
<td>&quot; 29</td>
<td>2500</td>
<td>Po</td>
<td>Po</td>
<td>1015</td>
<td>1.5</td>
<td>37.5</td>
<td>12.2</td>
<td>30.5</td>
<td></td>
</tr>
<tr>
<td>&quot; 30</td>
<td>2000</td>
<td>Po</td>
<td>Po</td>
<td>1017</td>
<td>1.7</td>
<td>34.0</td>
<td>11.5</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>&quot; 31</td>
<td>2200</td>
<td>Po</td>
<td>Po</td>
<td>1016</td>
<td>1.6</td>
<td>33.0</td>
<td>11.4</td>
<td>30.5</td>
<td></td>
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</tbody>
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**Case II**

A male, much reduced, aged 53, Paralysed for 5 years. Extreme degree of dementia.

<table>
<thead>
<tr>
<th>Date</th>
<th>Quantity</th>
<th>Colour</th>
<th>Reaction</th>
<th>Acid</th>
<th>M.P.</th>
<th>Chlorides</th>
<th>Percent Lost</th>
<th>M.E.</th>
<th>P.E. Total</th>
</tr>
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<tr>
<td>April 11th</td>
<td>975</td>
<td>reddish brown</td>
<td>fresh</td>
<td>1024</td>
<td>2.2</td>
<td>21.4</td>
<td>22.2</td>
<td>22.2</td>
<td></td>
</tr>
<tr>
<td>&quot; 12</td>
<td>900</td>
<td>Po</td>
<td>Po</td>
<td>1025</td>
<td>2.2</td>
<td>19.5</td>
<td>24.7</td>
<td>19.5</td>
<td></td>
</tr>
<tr>
<td>&quot; 13</td>
<td>975</td>
<td>Po</td>
<td>Po</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Symptoms (continued)
Sphygmograph. Tracings all indicate a low arterial tension. I will give a few tracings taken by myself in well marked paralytics.

Case of H.D.: well marked G.O.

Case of M.G. who was discharged recovered 1877. Brought back 1879 (January). Good case. Taken in 1879.

Taken in 1879. Pulse very weak.

Other cases (all well marked)

Taken by a painter.

Case of M. G. on 9 months London.

G.O. on 4 months.

G.O. 2 years.
Symptoms (continued)
Ophthalmoscope. InGalen's time, after numerous researches at the Salpetriere Asylum, it has been found characteristic of amaurosis and progressive atrophy of the optic disc. Since that time, the ophthalmoscope has shown swelling around the optic disc, like a brownish circle. There are several changes to be noted: (1) a yellowish border is noticed on each side of the vessels entering the eyeball. This border shows itself only in the vessels entering the eyeball. The border shows itself only rarely in the vessels. The border differs from that seen in senile dementia, by its more regular course and by not having interruptions in its course. A sclerosis in general, senility - arterio-sclerosis in senile dementia. When this border exists in my eye, it is found usually in both eyes, sometimes however only in one. The vessels around the optic disc show also peculiar characteristics. It does not obscure the eye as a rule, but does not quite surround the disc. The vessels form a little hook, but to a certain extent masked. Sometimes a congestion of the disc is seen - dilatation of the veins & arteries especially in the early stages.

Dr. Clifford Allbutt, in the West Riding Reports, noticed atrophy of the optic disc in 41 out of 53 cases, examined by him, especially among the female patients. I in the left eye. Those cases that I have examined - 9 found in all but one, hyperemic of
Symptoms (continued)
the retina, with atrophy & paleness of the discs. In an advanced cases, the retinal vessels were extremely small & attenuated. In one case, the disc was very ill defined & appeared to be edematous.

Temperature. Chvostchin published in 1868, a series of articles in the Journal of Mental Science, on the temperature in chronic general paralytics. He found that it is below the normal, & that it oscillated between 96.4°F & 99.3°F.

M. Vouini in the "France médicale" of 1899, in a series of articles, describes four symptoms of importance in general Paralysis, viz.

1. Drop in elimination of sweat.
2. Nervitating speech - trembling lips & face.
3. Irregular pupils.
4. Fever.

This fever he says is a symptom of the highest importance - it is present at the beginning & is continued to the 2nd period; he comes to the following conclusions:

1. Among general paralytics the temperature is below normal.
2. Every 6th 11th rises above normal.
3. The temperature rises occasionally, & is accompanied with excitement & bad temper - exaltation - rarely with perspiration.
4. This condition of high temperature may last only for a day, but if longer, the evening temperature is higher than the morning.
Symptoms (continued)
(5) The temperature rarely gets very high rarely above 102.1 and oscillates between 98.3 and 100.2.

"Michele came to the following conclusion (Mental Science 1842)

(1) The rise of temperature accompanies often maniacal paranoia: this rise precedes often announces the approach of an apoplectic attack or convulsion.

(2) When the maniacal attack or congestion is continued, rises the temperature.

(3) The fall often foretells the return to a normal condition.

(4) Maniacal or apoplectic attacks of medium strength are not so often accompanied with a rise of temperature.

(5) A transitory rise of temperature may come on without the explanation of an apparent change in the mental or bodily state.

(6) The evening temp is higher than the morning.

(7) A rapid case may show a high temperature before any complication has shown itself.

(8) The gradual wasting which leads to death may exist with an almost normal temperature - the exceptions being the complicated, to which paralytics are liable.

(9) The commencement of choreomania or hectic fever, caused by the bed-sores is distinguished by an extreme degree of heat - sometimes the temp falls whilst the breathing becomes very rapid.

So sum up we find that the temp usually lies between 98.3 and 100.2 rarely exceeding the latter: the temp rises falls rapidly."
Symptoms (continued)
First Case of M. Nanton

Second Case of M. Nanton

Third Case of M. Nanton

Temperature (Fahrenheit):

- Normal Temperature of Body: 98°
- 97°
- 99°
- 100°
- 101°
- 102°
- 103°
- 104°
- 105°
- 106°
- 107°

Days of Disturbance:

- Pulse:
- Resp.
- Date:

1 hour or half an hour after the attack.

4 hours after the commencement of the attack.
The mental symptoms that are noticeable, as connected with high temperature, are usually those of excitement, face being red - tongue coated - mouth in Union, goes so far as to say that, if a lunatic is brought before him, with high temperature, that lunatic is a F.P. (Provisional if no visceral complications). High temperature in cases attacked with apoplectic or congestive seiges has been investigated by M. Hamor in the Gazette médicale de Paris 1873 N. 12, in which he published 6 cases.

In the 2nd case, the thermometer made 104° 4 and died after 4 days with a temperature of 104° 8.

In the 3rd case (4 hours after the attack) the temp was 100° 4 and mounted in the following days to 101° 8 - 102° 6 and finally to 103° 4 when the patient died, pulse being 114 on last day.

In the 5th case the temp 2 hours after the attack was 102° 2. Pulse 114 to 116; it then rose to 103° 4; it rapidly fell to normal the patient recovering from that attack.

In Chart 1 (over), we see the temperature rising to 100° 2 on the day (evening) of the convulsive attack, and then falling rapidly below normal. Again on the occasion of the next attack it rose from 97° 2 in the morning, to 100° 6. The following morning - evening 102° 2 - next day (morning) 102° 6. Falling rapidly.

In Chart 2 - the higher evening temp
Charts
DISEASE.

General Paralysis

W. C.

Notes of Case.

Name: W. C.
Age:
Diet:

Case Book No.

Cerebral at
intervals. Had
a convulsive
attack. No 20
month drawn to
left side. Clonic
contraction of right
arm and leg. Convulsions
last about 5 minutes.

A well marked
case of E.P.

Date of admission.

Result:
Disease:
General

Notes of Case:
Name: R.
Age: 48
Diet: (Cirrius)

Case Book No.
This patient was very low spirited, but used vigorous action without excitement at times — feeling of "dread" became gradually developed. Muscular weakness increased. Patient had a convulsion at 305 A.M. May 25th, 1848.

Date of admission: April 25th, 1848
Result: Died

Chart 2
From Case Book 48A

<table>
<thead>
<tr>
<th>Time</th>
<th>Bowels</th>
<th>Temperature</th>
<th>Pulse</th>
<th>Resp.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>107°</td>
<td>82</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>106°</td>
<td>76</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>105°</td>
<td>87</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>104°</td>
<td>72</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>103°</td>
<td>60</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>102°</td>
<td>74</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>101°</td>
<td>68</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>100°</td>
<td>66</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>99°</td>
<td>70</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>
so well shown : the temperature for ten or five days was remarkably low - 96.5 only on two days.

Chart III shows the usual temperature of general paralytics, when there are no convulsive attacks present; only on one day was it about normal. The average temperature being about 99.5.

Chart IV shows the temp of a girl who had convulsive attacks & in whom the temp did not rise to any height, although to a certain extent; the highest being 99.4.

The result of these observations is that the temperature, in cases of epileptic convulsions, is also in the epileptiform variety, rises rapidly, likewise the pulse, & that it keeps usually between 101 & 104, that if the case is going to end fatally, the temperature remains high, & death follows in about 2 to 6 days, but if recovery is going to take place the temperature falls rapidly to about, or below normal.

Since the researches of M. Charcot we know that an epileptic attack, due either to cerebral hemorrhage or cerebral congestion, may be divided into three periods - as regards temperature. In the first: the temp falls - in the three following hours, it rises between 99 & 100, & remains stationary in the
Name: J.
Age: 35
Diet: Ordinary

This patient came in with convulsions, inability to speak, hoarseness of voice, wandering muscular movements, and grand mal seizures. The seizures were destructive.

He remained in the same condition until July 10 when he had two convulsions. After that, his condition rapidly improved. He was discharged and died on July 11.

Date of admission: June 25, 1879
Result: Died
Name: H. G.
Age: 36
Diet: Carbohydrates
Case Book No. 6
Admitted Oct. 5, 1876

Dec. 10: had delusions of suspicion.

Dec. 19: had convulsive attacks - completely speechless, mute, with excretion.

Nov. 20: feeling of pain developed can say a few words.

Dec. 20: had two more fits, speech aphasic.

Mar. 20, 1877: feeling of pain in the thighs, much difficulty breathing, allodynia, very good - could do well. Pupils unequal.

Date of admission: Oct. 5, 1876.

Entered at Stoker's Hall.

Printed and Published by Woodruff & Shave, 7, Serle St., London.
2nd period for a variable time. If death follows, we observe the 3rd period - characterized by a rapid rise in the temperature.

The distinguishing mark between the apoplectic attack resulting from cerebral haemorrhage or congestion, and that of General Paresis (as regards temperature) is that in the latter there is no initial falling of the temperature and no stationary period, but at once a rapid rise, which continues until death.

The high temperature, resulting from some vesicular complication, or from gangrene must be distinguished from that occurring in General Paralysis without any complications. These complications are more likely to occur when the disease runs a rapid course, and also during the last stage of the illness. The most common is a low form of rheumatics. It has been shown by some observers that the temperature of patients dying of General Paresis, or some pulmonary complication - falls a little before death.

As will be seen by the chart - the temperature of those dying from this disease, is invariably high - in one of M. Nand's, being at 104°. In most of them being from 103° to 104°.
Varieties
Varieties of Paralysis

It is a well-known fact that all general paralytics do not present exactly the same characteristics, nor run the same course; so it happens that the disease has been divided into several varieties or groups by different authors. Dr. Julius Michele, in the "Journal of Mental Science," for April 1848, papers in review the different ideas entertained by French authors as regards the subdivision of General Paralysis. He tells us that Billet, in 1850, mentions 6 groups distinguished by their several mental symptoms (1) Ambitious monomaniac (2) Opious satisfaction, an exaggerated or emphasised statements by the patients as to their surroundings or condition. (3) Failure of intellect and of sensibility, with alteration of will and agitation. (4) Hypomania (5) Erotomania, with dementia and failure of memory.

Breine de Buismont (1857) held to two great subdivisions viz.
(1) Insane general paralytics with delirium maniacal (2) Aged patients, with symptoms of dementia.

Falset described three forms of the disease - the expansive, the depressed, the maniacal. Breine de Buismont described afterwards four varieties of the expansive form.
(1) Mania of riches, grandeur, of wealth, only at long intervals.
(2) Same as no 1 only predominant and persistent.
Varieties
(3) Exaggeration of the ego - contentment - satisfaction - occasional ideas of wealth +
of grandeur.
(4) Double form: expansive + oppressive, with ideas of wealth + grandeur.
Calmet (1859) divided it into simple + complicated - the mental + nervous symp-
toms being the distinctive features.
A subdivision into manic-paralytic, melancholic-paralytic + dementia +
also acute + chronic - have been proposed + adopted by many different authors.
All these divisions are founded upon the mental aspects alone of general
paralysis + must necessarily be faulty, as the mental condition of the patient
is continually changing. For example there is a patient in this asylum although only admitted about
three months ago, who has passed through different mental stages - on admission he
was very silent + depressed - melancholic + then entertained delusions of suspicion
thought he was going to be killed + c. he then became more cheerful + chatty - his
memory meanwhile slowly breaking down gradually became boastful + seemed
to be in the highest stage of enjoyment -
ment of his life - he then became less
cheerful, until he presented the very picture of misery + embodiment
of fear + despair, when death came. He showed all the physical symptoms
Symptoms

Varieties
of General Paralysis, the usual pm appearances, afterwards to be described. Dr. Micheke has grouped cases according to the pathological appearances thus:

1. The changes are symmetrical in the two cerebral hemispheres, affecting the grey cortex chiefly, but also parts of the whole encephalon more or less.

2. The changes being principally hyperemic or softening both of the grey matter substance of the cerebrum, to a less extent, the cerebellum. There is adhesion of the meninges to the decapsulation of the cerebral hemispheres. The meningeal changes are increased thickness, density, opacity, and vascularity.

3. Those cases are short-lived, average time being 15 months from commencement. The intellectual symptoms are varied from mental depression to most extravagant delusions. The muscular incoordination and paresis are not very well marked. Some of these cases suffer from a proleptiform or epileptiform attacks.

Group II. Include cases in which the lesions are of a very chronic nature. Atrophy of the brain is considerable. The amount of serum in the ventricles is usually great. The meninges are markedly thickened and opaque. Both over convexities and base: cortex in place softened, or in others retracted; basal ganglia

1deficiency.
Symptoms
&
Varieties
Patients in this group are long lived—
the average duration being 4 years.
Intellecually they vary a good deal
in the early stages, but always end
in a protracted stage of speechless
and incoherent dementia—with at times
attacks of intercurrent excitement. These
patients are usually free from the
epileptic + apleptic form attacks so
common in general Paralyses.
Group III include cases in which one
cerebral hemisphere is, as a rule, only
affected & may be subdivided according
to which hemisphere is affected.
The meningal thickening & opacity
are more marked on the base, than
in the other groups; adhesion & decalci-
ation more on left side—there is
usually atrophy of the cortex—most
marked in the frontal lobes—the grey
substance being pale, or pale & mottled
with vascular redness—while substance
vayering in consistence & vascularity.
Clinically alteration in character is well
marked before the outbrak of the Deter-
mentia is early & well marked.
Melancholic delusions are very frequent
with occasional outbreaks of maniacal
excitement—muscular ataxia + taresia
are well marked & epileptic form attacks
& muscular terrors are very common.
Apleptic form attacks sometimes noticed.
Group IV In this group the lesions are
most marked on the right side of the Brain.
Symptoms

Varieties
general changes much the same as in last group. Clinically the out-
break usually commences with ambi-
entious delirium - with or without-
amnésia - later on the excited state
alters with one of irritability +
depression - epileptiform attacks are
common - often followed by hemiplegic.
Dementia with destructive tendency in
last stage common.

Group V. In which there is found local
induration of the cortex - which is
generally of a reddish colour + atrophy.
White substance slightly indurated
may be pale or fairly vascular. Ad-
hesion + cicatrization usually unguar.
mostly on the parietal surface - some
meningeal changes well marked.
Clinically - mental symptoms very
considerably - some are elated - others
depressed - some excited - others calm.
Muscular ataxia + paralysia well marked.
ending usually in contracted limbs.
Epileptiform seizures common - often
followed by epileptic hemiplegic.

This subdivision appears to me to be
based too much upon the pathological
appearances - therefore cannot be of
much use in classifying patients - the
mental symptoms of each being very
variable - no distinction being between
groups III + IV. Group V being so variable
in its intellectual symptoms that practical
it is useless.
Symptoms

Varieties
The best classification in my opinion is that adopted by a French author named M. Guénot in a monograph entitled "Des Variétés de la Paralysie Générale dans leurs rapports avec la Pathogénie." He divides the disease into three varieties viz.
(1) General Paralysia of Individual Origin
(2) " Congestive ".
(3) " Hereditary ".

A General Paralysia of Individual Origin.
In this category are included the patients who owe their illness to them-selves, viz those who have indulged in some sort of excess either physically or mentally, the usual causes being excessive drinking or sexual excitement. The period of incubation in these cases is shorter than in the two others. They do not remain long semi-insane - the attack coming on quickly often when least expected. The first sign of decadence is mental rather than physical. The alteration in the mental condition may be simply an emaciation of spirits or grandiose ideas. The patient becoming more and more elevated - neglecting his world - squandering his money - committing no end of extravagant acts. If the attack commences with a condition of acute mania or melancholy, as is often the case, the delirium ambiens does not exhibit itself until a later period. There is usually an incoherence...
Symptoms of Narcreas
of speech - but at the same time an inexpressible eloquence - the patient is usually sleepy, but has a good appetite as a rule, appearing happy & contented. The difficulty in speech now comes in - strength diminishes - the grand ideas multiply & the patient sinks into a demened condition. There is no remission or break in the course of the disease - it is a true progressive general Paralysis. The patient slowly but surely becoming worse. The duration of the disease in these cases is about from 1 to 4 years: the average duration of patients, clapped in this group, at Gloucester County Asylum being about 1½ years.

It has been remarked by M. Falut in his course at l'Ecole Practice - that general Paralytics have given birth to children themselves affected. There have been two Paralytics here - who have had - their youngest child here demened - & one who died here was followed by his wife, suffering likewise from the disease - who also died in the Asylum. In these cases there were no evidences of hereditary taint whatever.

Thus it seems probable that these patients who cannot be accused of having any constitutional predisposition can promote the disease without descen...
Symptoms
&
Varieties.
B. General Paralysis of Congestive Origin.

This group includes those cases who are attacked at some period or other of the disease, with congestive attacks, sometimes resembling apoplexy or epilepsy. These patients are usually the children of parents who have died of some cerebral affections; or else are patients who have suffered from some stroke, or from a blow on the head - the shock in the latter acting in the same manner as if he had inherited the congestive tendency. These patients are usually of sanguine temperament - pellagric, and with the apoplectic predisposition. They are strong, stout men - large chests, broad shoulders, fresh colored complexions, easily irritated. This class of patients far excelence who suffer from high temperature.

The disease usually commences with them by a congestive attack - then there is an interval of comparative health - the patient being only noticed as a little "strange." When a man about middle age has what is called an epileptic attack for the first time in his life - it will be the safer plan not to put him down as an epileptic at once - as he may be a general paralytic of congestive origin in the first stage.
Symptoms
of
Varieties
Patients of this clap show physical symptoms as a rule first — they have a certain difficulty in their speech. They afterwards become incoherent — their writings often betray the condition of their minds — words being left out & sentences jumbled together. The delirium that follows is usually of the rigorous character. During the course true remittent take place — the patient gaining strength & losing most of their extravagant manner: unfortunately however a fresh congestive attack usually comes on & puts the patient in a worse condition than ever — the delirium returning — paralysis increasing & the patient dies in one of the attack or else lapses into a state of complete dementia.

The length of life of patients belonging to this clap depends upon the violence of the fits & also their number. Sometimes they die suddenly, at others live much longer than those general paralytics of individual origin. Owing to their periods of remission that are so often present. These patients may last for six or eight years. The prognosis, in this clap, is not more favorable than in the others — so caution ought to be exercised in giving an opinion, after an apparent cure.
Symptoms & Varieties
C. General Paralysis of Hereditary Origin.

These patients all have an hereditary taint of insanity; they either have or have had a relation, relations who have been mad. As a rule among the male patients we usually find that it is the Father, who has transmitted the germ of insanity to his offspring, and among the female patients that it is the Mother, in the Mother's relations.

This clap of patients commence with mental changes - at first perhaps merely a slight alteration in character - gradually deepening until, at last, the mental symptoms common to all general paralytics are manifested. There is perceptible a long time before the commencement in this clap, a perversion of the moral faculties - those of the affections, which hinder them from fulfilling their duties in social life; this change in the disposition had been noticed, in a patient belonging to this group, recently admitted, for upwards of two years, before the actual outbreak. This change in disposition is more noticeable in some steady men, than in others, as they become restless, excitable, eager for pleasure - a strong man usually becomes immoral - indulges in every kind of vice - quite foreign to
Symptoms

Varieties.
his nature & thus all the more conspicuous. The mental capabilities for work among this class in the 1st stage, is said by some to be increased - they acquire the aptitude of learning languages &c. Their memory at this time is good & their minds now unnaturally active are in a state of perfect remembrance with ideas, some absurd, others useless & applicable. Machines are said to have been invented by patients in this early stage, which, were their intellects healthy, would have been a perfect impossibility for them to have done so. Of these patients however are closely examined - their memory will be found to be not so good as to the casual observer, it may appear, as their ideas so feasible & connected.

All the cases admitted into this Asylum, belonging to this group, were in a state of melancholia, developing into a maniacal condition after a short residence. These bursts of excitement appeared to alternate with the melancholic state. They were all destitute in their habits - the feeling of bien-être did not appear to be so marked in these cases, as in those of the first variety. Reminiscences often occur, during which the patient appeared wonderfully to recover
Symptoms
of
Varieties
The patient gradually expresses more and more ambitious delusions—talks not only of millions of pounds, diamonds, and jewels, but also of himself as King, Emperor, etc. As has been already observed, these present alternately depredation and agitiation. The so-called 'police circulars' may be so called; these circulatory changes and periodical attacks are characteristic of heredity.

In the remissions the patient is variable and changeable—he attacks importance to trifles, whilst forgetting the main points. He is what must be termed 'silly'—easily lead and flattered—no slumbering of character! He talks differently to what he used to. It has been said that these remissions may last 1 or 2 years, rarely longer, and are best marked in those cases of syphilitic origin. The only case I could decidedly say was due to syphilis as a primary cause—was admitted two years ago with paralysis of the 3rd nerve, and presented all the symptoms of general Paralysis. He has had several congestive attacks, ending in transient hemiplgetic, at times he appeared to improve, then kept pretty well for about a couple of months would then have another congestive attack and fall back again. Among patients of this group we usually only notice the congestive
Symptoms

Varieties

Prognosis
attacks coming on in the very last stage — usually in fact causing the death of the patient — it thus often occurring suddenly.

These patients live as a rule longer than those of the other two groups owing to the reminisms being so well marked — sometimes to 10, 12 or even 15 years.

The prognosis in this group is no less unfavorable than in the other varieties.

Prognosis

In unfavorable cases, however, much the patient appears to have got over the effects of the disease, notwithstanding the publication of two or three cases (1) when a patient is apparently almost cured, and sent home — we cannot possibly prophesy how he will bear the cares and worries of private life, and how long the reminisms may last — but if he can retire to some quiet country house, where excitement and worry may be reduced to a minimum. Then a relapse may not be so much dreaded: the patient, however, cannot properly speaking be called ‘cured’; as a rule the patient dies within three years from the real commencement of the attack. When the maniacal stage comes in suddenly it is of a very acute character (especially in groups II and III) we may look for a reminism of considerable extent.
Diagnosis
Diagnosis.

Considering the prognosis of this awful disease - it is of the very highest importance that a correct diagnosis be made, & this is a matter of no little difficulty in some cases. The enlaced delusions some chronic maniacs resemble somewhat those of a general paralytic, but differ (as has been already said) in that a paralytic does not keep to one delusion or one special train of thought, but shifts about continually from one to another, & secondarily by utter utter impossibility - the gap "crowding" in his lunacies, riches, strength &c to the utmost limits of extravagance. We sometimes see one or other of the physical symptoms of general paralysis, especially in the maniac pots so common in Asylums, but never the whole.

Dr. Batty Bailey in the Edinburgh Medical Journal, April 1844, speaks of several patients in whom there was impairment of speech, memory & gait, or enlaced delusions & well marked optimism: of these two recovered, three remained stationary, & one died of Bright's disease: the one symptom that was absent was that the pupils were equal & unaffected, also they all had anemic pupils.

On those patients that I have seen
Diagnosis
at all resembling general paralysis - the tremulousness of the lips was absent - also the lip of the natural curve - although the tongue was affected - not however in the "jerky" manner so noticeable in paralytics - neither was the stutter so well marked being more a "slurring" of the words than an actual stutter; the delirium were not so extravagant - nor were the pupils affected.

Syphilitic brain disease resembles somewhat general paralysis; there is at present in the asylum a patient, a young man, with brain disease evidently of syphilitic origin - with stutter - tremulous tongue & lips - gas - tottering - pupils extremely sluggish - slightly irregular - but with mental symptoms of melancholic & complaint of headache. Thus, this form may comparatively easily be diagnosed if notice be taken (1) of the history of syphilis (2) the preceding & accompanying intracranial pain - coming on worse at night (3) the exaltation, being kept marked - & the course of the mental symptoms very irregular. (4) of the effect of anti-syphilitic remedies.

This last, especially being of the utmost importance: the patient above referred to is gradually losing, his impediment of speech. A quivering of his tongue, under Eudice & Potasnum.
Diagnosis
Senile dementia occasionally exhibits some -what the same mental symptoms, as those of General Paresis - viz. loss of memory, extravagant conduct & delusions, but the age of the patient will guard us against forming a wrong diagnosis - Paralytics over 60 years of age being very uncommon - at least I have never met with one - also most of the physical symptoms are absent. Locomotor Ataxie can usually be distinguished by the absence of mental symptoms - there are however two cases recorded by Dr. Recknor M.R.C.S. in the "Journal of Mental Science" for July 1877 - in both of which the delirium ambiencie was the chief mental symptom - the pupils in one case were equal & contracted - in the second very unequal - the physical organs were purely those of locomotar ataxie - they both died comatose. On the 1st there was found no adhesion of the brain to vertebra in either case - which we shall see is characteristic of far advanced general paralytic - the spinal cord presenting the usual appearances found in cases of locomotor ataxie. The maniacal excitement & dementia following epilepsye might be confounded with it, but can be distinguished

1. By the history of the case previous to the fit.
2. By the absence of any well marked optimism,
3. By the fact that epileptics do not show any
   bad after-effects of the attack as G.P's do.

No other disease can very well be confounded with
Pathology
Pathology

Concerning the pathological anatomy of General Paralysis, there has been a great diversity of opinion among authorities. According to a French author, Marcel Grellier, who has written a small work on "L'Atrophie Musculaire dans la Paralysie Générale des Âlités," it is to me Calmed that we owe our first anatomical-pathological description of the disease—be it known that there was a chronic inflammation of the meninges, & of the cortical substance of the Brain. The Dura Mater, he described as more or less thickened, sometimes even completely transformed into a fibroid tissue—principally over the Frontal Lobes. Many capillary networks being seen here there. One of the macroscopical appearances, said he, of the greatest importance, is the intimate adherence of the Dura Mater to the subjacent cerebral tissue—it being impossible to raise even the smallest portion of this membrane without dragging with it some of the underlying cortical substance." Author in his work on General Paralysis, gives the necroses of 26 cases that died of 60. The Dura Mater was never structurally changed—being in a small proportion of cases adherent to the Calvarium; the Arachnoid that in nearly every case its opposed surfaces adherent along the sup longitudinal fiber—viomars in a few cases—The Dura Mater, with only one exception, stripped of
Pathology
readily from the convolutions, it in no case was there any false membrane developed. The epyema substance was saddened by a marked buff tint - in a few cases however, it was found blooded. The medullary substance was found to present its usual appearance - the processes being extremely numerous in the recent cases of a very bright colour.

Dr. Blandford says, that in 1861, he saw the Brain of a Paralytic, whose illness was only of a few weeks duration - there was thickening of the Cranum & slight opalescence of the Arachnoid - there were no adhesions, but simply evidence of great hyperemia, & nothing else.

My experience in pm appearances, do not entirely agree with those given in Austin's work. In 10 post mortems held here, the Dura Mater was only adherent in one case - in all the others, being healthy, the Arachnoid was milky & opalescent. In 8 out of the 10 - the Dura Mater was only found healthy in one case - the usual condition being one of adherence to the convolution immediately underlying the membrane - especially near the Fissure of Rolando - these adhesions are usually confined to the summits of the gyri - or only adhering to a short distance down the sulci.
Pathology
found enlarged & well marked. On trying to raise the Dura Mater from the cortex it was always found impossible -without tearing & bringing away portions of attached gray substance. The cortical portion was always found atrophied—especially over pre-frontal lobes; that part having the pia mater adherent to it, being of a darker & more vascular appearance, than the other. Strains are often to be noticed on the surface—shewing that the hyperemic has been such, as to have produced small abscesses. The medullary substance, I have usually noticed to be softer than normal especially in old standing cases & present to the naked eye, small holes in spaces, here & there, which Dr. Ebbhard Clarke attributes to the destruction & absorption of the vessels, leaving the canals which used to contain them empty. In close examination of the little spaces I have always been able to detect some trace of the vessel, usually in the form of a minute tube. These spaces are best seen in cases who have lived some time—rarely in recent ones. The nerve cells may either be atrophied, the wall being closely applied to the nucleus, or what is known as inflated—the size not being altered, but the cell wall having an irregular, inflated appearance, or lastly may be hypertrophied the cell being considerably increased in size & of a pyramidal shape. Fatty
Pathology
Pigmentary degeneration of the nerve cells, with atrophy of the nuclei, is also common, especially in the later stages. In Tardy's in a small work "Sur les altérations des Nerfs Craniers dans la Paralysie Générale" gives Meynier, as his author, the following changes in the nerve cells:

1. Changes in the nucleus.
2. Nuclear division - simple and compound.
3. Cylindrical swelling of the ganglionic cell, which is shown by increase of its size - by its waxy appearance, and the black outline of the nucleus in its centre.
4. The swollen cell having changed to a black colour. The protoplasm considerably increased, has become homogeneous, returns light strongly. The whole cell presenting a well marked contour, which is sometimes angular or dentated.
5. Molecular destruction of the protoplasm which becomes filled with granules of different sizes, which reflect light strongly. The protoplasm is separated from the nucleus, by a hyaline gauze. The edge of the protoplasm have the appearance of a shapeless débris, which imperfectly surrounds the swollen nucleus in the shape of a bellows.
6. The shrivelling of the ganglionic cell is accompanied by the decrease in the size of the cells. Some authors have noted atrophy of the nerve fibres of the medullary portion, or also a varicose condition of the vesicles.
Pathology.
these I have not — but I have noticed in several cases a considerable thickening of the vascular walls.

Spinal Cord. A diseased condition of the spinal cord has been noticed, by several authors, especially Westphall, in which there was thickening of arey of the dura mater, with atrophy of the posterior columns; an increase in the connective tissue, also an atrophy of the nerve fibres of the posterior section of the lateral column, which he looks upon as a chronic myelitis.

In a recent cadaver I performed, a short time ago, on a general paralytic I found this condition of the Cord — the patient had suffered from several epileptic attacks, ending in severe tetanic spasms of the limbs. In other cases I have noticed a softening of the Cord, the membranes being apparently healthy.

Changes of an inflammatory character have been noticed also in the optic thalamus and corpora albicantia, by a few authors, but for my own part I have not noticed any in the necrospy I have done.

Some of the Cranial Nerves, notably the olfactory and optic, I have noticed, especially in old standing cases, to be more flattened out than normal, and to have undergone a certain amount of fatty changes. On examining microscopically, the olfactory nerves of a paralytic, who had apparently lost entirely the sense of
small, the nerve fibres, being apparently replaced by a greyish amorphous substance. In a translation of the Annales Médico-Psychologiques in 1846 & 1847 by J.C. McDowell M.B. in the Journal of Mental Science April 1876: M. Gallopin thinks that the difficulty of speech caused by the lesion of the fifth cranial paralytic is produced by disease of the ganglia at the floor of the 4th ventricle especially from which the hypoglossal & facial nerves arise. In 16 cases examined he found the membrane covering the 4th ventricle covered with granulations, formed by connective tissue. The grey matter is soft & semi-gelatinous microscopically the grey matter was found to contain amorphous matter - isolated fatty patches altered blood corpuscles, & particularly cells of different sizes & shapes. The nuclei of the facial trigeminalal nerves contained cells with nuclei & nucleoli also pyknotic - shaped as a rule. In only two cases have I noticed this granular condition of the floor of the 4th ventricle - one of whom was completely aphasic for about a month before death.

Ferrier in his work on the "Functions of the Brain" describes several experiments made on monkeys - he found that removal of the anterior frontal portion of the brain caused no paralysis whatever, but produced a decided alteration in the character of the animal - it becoming apathetic & at times irritable - the appetite however was not altered - neither were there any signs of physical prostration at all.
Pathology
In the celebrated Crown-Bar Case (mentioned in Ferrier's work on "Localization of Cerebral Diseases") where an iron bar entered the skull anteriorly external to the angle of the left maxilla—proceeding obliquely upwards-entering the base of the skull at the juncture of the lesser wing of the sphenoid, with the orbital process of the frontal bone—leaving the poster near the sagittal sulci on the frontal region—thus apparently only wounding the post-frontal lobes. The man lived 12½ years afterwards—no paralysis followed, but his mental condition had considerably altered—the balance between his intellectual faculties and animal paprnns appeared to have been destroyed—she became restless, irritable—very profane at times—exceedingly changeable, and capricious—unreverent—and altogether very different to the man he once was. These symptoms corresponded, almost in their entirety, with the premonitory signs of General Paralysis.

On affections involving the motor area, as the ascending Frontal—Ascending Parietal—Superior Parietal lobes—there is paralysis of the leg, hand, face and tongue, according to the extent of the disease. This region is supplied by the Sylvian artery by its five branches, each nourishing a special area. The paralysis attacks the opposite side of the body, and is frequently associated with rigidity and convulsive spasms of the affected part.

These spasmodic twitchings and rigidity of paralyzed limbs, as already remarked, is
Pathology
Exceedingly common in general paralyses: in a recent post-mortem on a paralytic who had hemiplegia, with marked rigidity of the arm (not so much of the leg) the part principally affected was the motor tract—in this case the Dorsal Lobes were very much atrophied—the patient, during the later stages, was much demented. According to M. Sépine—the centres for the movements of the upper and lower extremities (of the opposite side) occupy the two upper thirds of the ascending parietal convolutions.

In the posterior part of the 1st Frontal Convolution is the centre for the movements of the head, neck; in the posterior part of the 2nd Frontal Convolution is the centre for the jaws, lips, & tongue; the motor centre for the eyeball & pupils being in the gyrus angularis. Grinding of the teeth may therefore be considered as due to lesion of the post-part of the 2nd Frontal Convolution.

Broca has localised the faculty of speech in the 3rd Frontal Convolution of the left side—it is usually noticeable that when the aphasia is well marked, that this convolution is affected with the rest.

The congestive epileptiform attacks are said by some to be due to stasis of the blood in the meningeal veins, the congestive apoplecticiform attacks to extravasation of blood into the arachnoid cavity. This view is especially brought forward by Griesinger in "Mental Pathology" (New Sydenham Society).

To sum up, there seems little doubt, but that the symptoms of general Paralysis are
Summation

Pathology
due to a chronic progressive inflammation of the Cortical Substance of the Brain—commencing, in my opinion, in the Pre-portal convolution & gradually spreading backwards, the membranes becoming involved secondarily, until in some cases, it may involve the Pons Varolii, Crus cerebri, pyramids of the medulla oblongata & even the spinal cord.

This inflammation commences with hyperaemia, due to diminished arterial tension, owing to relaxation or paralysis of the vascular walls—this relaxation or paralysis being in its turn due to paralysis of the vasomotor centres—produced by the very causes, that are essential in the production of General Paralysis.

Dr. Buckmiller in the "Report of the Devon Asylum" 1851 expresses his opinion that it is a disease of nutrition affecting the whole nervous system, misconceived as in general Paralysis the irritability of the muscles & excito-motoric functions of the nerves, are lost; tending to show that the cause is not localised in any one portion of the cerebro-spinal axis, but consists of some morbid change pervading the whole nervous system. This hyperaemia probably causes dilatation with acceleration of the flow of blood, (frequently followed by leucopenia & leucodysprophasia) & afterwards by retardation—The nerve tip becomes infiltrated with young cells—probably emigrants from the septum; leucomansini being also proved in; the subsequent changes have been given.
Treatment
Treatment

Considering the remissions that occur in the course of the disease, how some patients appear to improve under treatment, for a time—it is sad to think how little permanent good can be done for them.

When patients are brought in during the maniacal stage—the best medicine in my opinion is Digi-taleis in a dracon doses given until the excitement has abated, then kept on in small doses, to act as a cardiac tonic & sedative. This drug acts wonderfully with delirious & destructive patients. In some cases entirely putting a stop to their offensive habits. In every case modifying them: whilst taking the medicine, their mental capabilities appear to be increased—they do not talk so incoherently, nor act so extravagantly as before.

Digi-taleis seems to do good, not only by its action on the heart—slowing the pulse, whilst increasing its volume & tension—but also by its stimulating action on the sympathetic & the vang. If carried to excess, it produces paralyi of these nerves—so great caution has to be exercised in its use.

In the later stages steel is about the best drug to give—either alone or combined with Raphia: Cool Sulfur Oil. I have found of the very highest importance—it being quite propitious to prolong life for months by its judicious
Treatment  (continued)
use : to commence with small doses increasing them, I have found to answer best. Hyposympathomia is much used, but I have not found much good arising from its use except in the maniacal stage used as a calmative: when long continued it appears to have a very weakening effect on the patient. Calabar bean has been much praised, but my experience of its action on paralytics is too limited to speak with any certainty as to its good effects: from those that have used it, I have not heard very encouraging accounts of its action: in fact it did not appear to exercise any influence whatever on the course of the disease.

Chloral & Bromide of Potassium are useful sedatives - the latter especially being useful owing to its stimulating action on the vaso-motor nerves.

Opium & Morphine are much used in the last stages when there is insomina.

Bergot (in the form of the powder) I have tried, but apparently with no result - the cases I tried it upon where pretty far advanced ones - so perhaps that may be the reason of its non success. I should imagine from its physiological effects that it would be of great use in the initial stages of general paralysis.

The diet must be nutritious - & when paralysis has appeared, must be of the "stop" or "mince" variety - a little often being the rule - instead is very good for them - may be given at night: The tendency to choking
Treatment (continued).

Finis
owing to their partial inability to swallow, and their usual voraciousness, must be carefully
prevented against. When confined to bed, they soon lose flesh, contract bedsores - when these are threatening
(though careful the patient may have been kept - they invariably do occur) a solution of
Trical Sulphate at 1 dram to the ounce, or equal parts of Liquor Plumbe, Sulphur & Briar Catechu - applied
to the part on the best preparations. A saturated solution of AgNO₃ in NH₃, wet cotton is also a very
useful application: cotton wool used as a pad acts well too. When the sputa is formed - but
limed seed poxicles, sprinkled with charcoal fused until the slough separates & then followed by a
weak solution of Carbolic Acid, appears to suit the part best. Trical Oxide & Starch Powder are also a
very useful agent.
General Paralytics should be kept from bed, as long as possible, be changed immediately,
it dry or wet. Plenty of fresh air should be allowed - in fact, they should spend as
much of their time as possible in the open
air, if weather at all permits.
Diarrhoea is present, I have found best
controlled by 1 gr. Coprin pills.
A low form of Bronchitis is a very common
complication of general paralysis, and must be
treated with stimulating expectorants.

Finis