"Observations upon Alcoholism."

Thesis
for the Degree of
Doctor of Medicine
and for
Gunning Victoria Prize
for
Practice of Physic.

Dawson F. Duckworth Turner.
Preface.

The following observations were made by me while acting as House Physician to Ward 6 of the Edinburgh Royal Infirmary under the care of Dr. Andrew Smart, Senior Assistant Physician to the Royal Infirmary. This Ward as is pretty generally known is set apart for the treatment of acute nervous conditions, mainly, however, for those brought on by alcoholism. The arrangements connected with the working of this Ward lately underwent alterations at the hands of the Manager of the Infirmary to the extent that whereas in former years the House Physician of some other Ward took charge of this Ward as an extra duty, they, the Managers, made a new appointment of House Physician especially for this Ward alone and I had, upon the recommendation of Dr. Andrew Smart, the honour of being the first to be appointed to this post. This appointment afforded me
exceptional advantages for the study and observation of cases of alcoholism, and especially of acute alcoholism, under treatment during a period of six months, for I was able to devote the greater part of each day during that time to my duties there and to carry on this work consecutively without the interruption of other engagements. I have thought it right to make this explanatory statement and at the same time to express my grateful acknowledgements of the kindness and courtesy of Dr. Smart in allowing me to make this use of the cases under treatment in the Ward of which he is the responsible Physician.

The Appendix of this Thesis consists of a number of cases that I have selected from the one hundred odd ones that passed under my observation: some of these, especially the ones towards the end, I have had in consequence of the length to which the Appendix grew, to very much abbreviate.
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The cases marked with a red X are the more important ones.
Explanation of methods used and of signs. They refer principally to the examination of the blood and of the urine.

The Blood.

For the examination of the blood, Dr. Haycraft was found competent at my request to come and estimate by means of his especially prepared litmus paper, the reaction alkalinity of the blood both before, during and after an attack of Del. tremens. Owing unfortunately to care coming in suddenly and to the necessity for the immediate examination of the reaction of their blood before the acute condition has passed off, only a few examinations were made but these gave in each case promising the same results which were of a very interesting nature. For the ordinary microscopical examination of the blood, a Zeiss instrument with a D. lens and Dr. Power's quantitative estimating instruments were used.
The urine was in every case obtained as soon after admission as possible and was usually examined twice upon the first day. During a patient's stay in the Ward it was collected daily and measured as carefully as it could be, and if any was spilled unconsciously in bed as sometimes happened, an allowance was made for it.

I estimated quantitatively by fairly accurate methods: the urea, the phosphates, and the glucose, and more roughly the albumen. Chlorides and indies were in all my cases every day.

The urea was estimated by the hypochromite method.

The phosphates:

No regard was paid to the relative amounts of the earthy or of the alkaline phosphates that might be present, but the total phosphoric acid...
was determined by the Uranium Acetate Volumetric Method. This method has the disadvantage of not being reliable if any Iron or Alumina be present in the fluid to be examined, for they will themselves give a reaction with the test solution of Ferrocyanide of Potassium, and as Iron is a constant constituent of the urine, (1-11 milligrammes per litre) Landsis, page 548.

I thought it best before placing reliance in the method to have a selected specimen of urine thoroughly examined by a professional Analyst for the amount of Phosphoric acid present, and then to see how my result agreed with this. In the specimen he examined I had estimated the Phosphoric acid to be present in the proportion of .035 grammes per 50 ccs of the Urine. This specimen was examined by him gravimetrically by the following methods with the following results:

1. The Phosphatidate of Ammonia method gave the amount as .033 grammes per 50 ccs.
2. The Magnesia method as .032 grammes.
3. The combined methods as .034 grammes.

These results warrant us, I think, in concluding that the Uranium Acetate method is accurate enough for clinical purposes.
For Glucose.

I used as a rule Dr. George Johnson's quantitative method performed with his special apparatus & depending upon the comparison of the colour obtained by boiling a fixed quantity of urine with a fixed quantity of Peric Acid and of Leq. Potasse for a definite time with that of a standard test colour, as being not only a speedier but also a more delicate quantitative method than that of Festinger, but from time to time I checked my results by using Festinger's method.

For Indican.

In testing for this substance I used Taffer's method which I had learnt when working in Prof. Notthnagel's wards in the Vienna General Hospital. The method consist in adding about an equal quantity of Hydrochloric acid to the Urine, then some Chloroform, and then a drop at a time of a solution of Chlorine water.
well after each drop and allowing the Chloroform to settle and continuing until the maximum violet blue colouration is obtained.

As I had no method of determining quantitatively the exact amount of the substance present, I had to rely upon the eye in judging of the amount of colouration obtained by using a fixed amount of urine, and as I invariably did the testing myself and had had some practice with it beforehand both in Vienna and when acting as House Physician to D. Affect in Word XXX. The result may perhaps be accepted as a rough comparative estimate of the amount of indican present in the same and in other urine from day to day.

I should say that in the urines of healthy people the amount of indican found to be present by this method may be practically ignored. The terms I have used in the urine charts for expressing the amount of
Tinctures present are as follows:

- a stroke \( i \) = a trace of Tincture
- a plus \( + \) = a small amount...
- two plus \( ++ \) = a moderate amount...
- three plus \( +++ \) = a large amount...
- four plus \( ++++ \) = a very large amount...

These same signs I have also used in expressing the amount of albumen and the amount of the Chlorides present.

The Chlorides.

I tested for by adding to a definite amount of the urine some nitric acid to hold the Phosphates in solution and then after agitating well—adding one drop only of a solution of Nitrate of Silver and then from the precipitate formed making my conclusions as to the amount present. This is Tyroso's method and he considers that if the Chlorides be present in normal amount, one drop of the...
Solution of Nitrate of Silver should precipitate them in white cheesy lumps which do not further divide themselves; if, however, they be deficient, we get instead of the cheesy lumps a milkiness which becomes less & less as they may be diminished, until, should there be no precipitate whatever, the Chlorides are totally absent.

Using them the same signs as those used in indicating the amount of albumens and of Tonic acid present, a normal amount of the Chlorides present would be indicated by three plus ++++, but if they be somewhat diminished by ++, if much diminished by +, if a mere trace by 1, if quite absent by 0.

These signs apply only to the urine samples where they are for brevity's sake used.
For Albumen.

I used the picric and nitric acid tests and estimated roughly by the eye the amount present by the precipitate obtained.

For Alcohol.

At first I attempted to test for alcohol by the bicarbonate of potash test, viz., one part by weight of sulphuric acid to thirty parts by weight of bicarbonate of potash; and when one or two drops of this are added to wine containing alcohol an emerald green colour should be obtained. But I found the results so unreliable, and so also so influenced by other drugs which the patient were frequently given (Paraldehyde etc.) which give the same reaction that I was, much to my disappointment, obliged to give it up.

The only reliable method I think of for testing for alcohol would be to subject the wine to a series of distillation, which are not very suitable for a clinical method.
Acetone

I tested for frequently at first, for I fancied that the alcohol might perhaps show signs of its presence in the urine in that form. The test I used, which I also learnt in Vienna, is a very delicate one; it consists in adding to the urine a few drops of a concentrated solution of the hydroxide of sodium, adding to this some liquor potasse, waiting until the red colouration diminishes and then a few drops only of acetic acid, when a deep purple, the violet is produced if acetone be present; and by comparing the results obtained by those obtained by adding to the urine a previously a few drops of a weaker solution of acetone, I was able to form a sufficiently accurate opinion as to its presence or absence. I may say now that upon no single occasion was I satisfied of its presence in the urine of the alcoholic patients whose cases form the groundwork of this Thesis.
The Urine Charts.
I have adopted, in drawing up the urine charts, which together with the temperature charts, are appended to each case, a common plan for them all which perhaps requires a little explanation.
I used the ordinary temperature charts sold by Messrs. Macleod & Stewart, but I have headed each chart "Urine Chart" and have drawn a line through the words 'Temperature'.
The spaces originally intended for the daily record of the Pulse I have used for the record of the Indiano.
The spaces intended for the record of the Respiration I have used for the record of the Phosphoric acid (total Phosphate) expressed in grammes per 50 cc's and written always in red ink.

The amount of urine passed in the twenty-four hours is expressed above 50 cc's upon the urine charts and
in ounces upon the Temperature sheets.
The spaces for the Sp. Gr. for the Reaction, for the Chloride & Albumen, I have used as they were intended to be used.
The space intended for noting the day of Discharge, I have used for indicating the urine in grains per ounce of urine and I have used the spaces on the margin beneath there for indicating the amount of glucose in grains per ounce of urine.
In representing graphically the day to day total secretion of urine, I have used a line drawn in blast into obtained by multiplying the grains per ounce by the number of ounces of urine passed, & by placing a dot representing the thus found total amount for that day in the space of that day and then by afterwards joining these the blasts line is obtained.
The total daily amount of urine then for any one day is found by comparing.
The dot for that day with the ordinate running from the figures in black which are written upon the side of the chart which lies to one left hand side.

The graphic line representing the total daily amounts of the Phosphate is written in red ink and is obtained by multiplying the gramones per 50 ccs of each day by the total ccs of urine passed in the corresponding twenty-four hours, and by dividing the result by 50, and then by placing a red dot to represent the thus found total amount in gramones for that day in the space of that day, and by joining these dots afterward the red line is obtained.

The total amount of the Phosphate in gramones for any day is read off by comparing the red dot of that day with the ordinates running from the figures in red, which are placed upon the side of the chart which lies to one left hand side.
For the examination of the Fundus of the Eye, both the Direct and Indirect methods were used and I must tender my hearty thanks to Dr. MacKay for the assistance he from time to time rendered me.

Diet of the Patient.
The acute cases were put invariably upon the following diet:
8 a.m. 1/2 pint of porridge and milk.
11 a.m. 1/2 pint of milk with an egg beaten up in it and a piece of bread.
2 p.m. 1 pint of chicken soup and a good saucer full of rice.
5.30 p.m. 1/2 pint of milk with an egg beaten up in it.
8 p.m. 1/2 pint of milk and a piece of bread.
12 p.m. 1/2 pint of beef tea.
3 a.m. of a warm 1/2 pint of beef tea.

The stimulants and extra articles of diet that the patients were sometimes given are noted in these cases.
Alcoholism

I use as a generic term for the various morbid phenomena, but excluding the acute narcotic poisoning, which are capable of being traced to the use of stimulants containing alcohol.

These morbid phenomena we may subdivide into acute and chronic, and under the heading of acute alcoholism we include Delirium Tremens, Alcoholie Mania, Alcoholie Melancholia and Dinomania, while by chronic alcoholism we mean a multitude of morbid arrangements, affecting all, but especially the nervous system, which are slow in their progress and not attended
Mapnam. on Alcoholism. Translated by Prof. Greenfield.
necessarity with any immediate danger to life.

Delirium Tremens.

Nature. an acute functional disturbance of the nervous system characterized by delirium with tremor and by great activity of the eliminating organs.

Of Delirium tremens there are two main forms:

1. Simple Delirium Tremens
2. Complicated or associated Delirium Tremens.

I will discuss the latter later on.

Of the simple forms there are all grades and degrees. Dr. Magnus makes a primary division into Non-febrile and Febrile, and of the Non-febrile he describes three forms. viz.

1. Slight forms
2. More severe with tendency to relapses, accompanied by persistent
delusions and often by suicidal tendencies.

3. Del. tremors occurring in people with a hereditary predisposition to psychoses, leading to lassitude of the attacks and to imperfect recovery.

Of the Febrile forms the chief characteristics, according to the same authority are— a high temperature reaching sometime, 107.6° F., very severe tremors and commonly a fatal termination.

From the case I have observed, I do not think that any such sharp lines can be drawn between the various degrees; they all tend to run into each other, and I do not think the distinction between the Penfebrile and Febrile forms warranted because the temperature shews, I have appended to the case, shows that in all forms of the disease the temperature tends almost invariably to rise.
Before death, I grant, there may be a high temperature—perhaps of 106° or 107°—but the rise to this point is usually sudden and of ante-mortem causation. The question of the condition of the temperature during the acute paroxysm is somewhat difficult of decision, because from the very nature of the case— from the constant agitation of the patient and from his profuse perspiration—an accurate thermometric observation is difficult, and when we consider that the temperature both before and after the attack is usually subnormal, we can understand how easily the conclusion may be come to that the temperature remains subnormal throughout.
Etiology.
I divide the causes into Pre-disposing.
Essential and Exciting.

Pre-disposing causes.
Heredity certainly plays a part.
D. Arnott at page 70 of Reynolds's System
of Medicine Vol 2: refers to this.
I have found that most of my
Patients on being questioned admitted
a hereditary history. (vide Low's can
Grigg, can etc)
Del. tremen mem appears to create a
Pre-disposition to its own recurrence.
Some patients will in the course of
a few years come into the ward
again and again to go through the
same attack. Some even in the
course of two or three months; I
have observed during my six month
appointment two such cases.
(vide Pridey page and Malcolm page
both of whom having recovered from
very severe attacks returned within
about two months time to undergo
another. This pre-disposition
appears mainly to depend upon three factors:


2. The nerve cells having once gone through the disorder of function whose outward expression we call Deliriums are rendered thereby more liable to go through it again.

3. Increasing derangement of the alimentary and eliminatory system whereby on the one hand ordinary food cannot be digested and assimilated while on the other hand the alcohol cannot be properly eliminated.

On the other hand some constitution appears to be quite insusceptible for how otherwise can we explain the case of men who appear to simply live upon whiskey and who have times out of memory been brought into the ward by the police or by their friends and yet
who never develop an attack. I know of one case who must have been at least fifteen times in the ward during the last six years.

Sex.

It is said that Del. tremens is rarely seen in women. Dr. Broadbent said he had never seen a case. Dr. Gower, Disease of the Nervous System. Vol II. Page 391.

But the proportion between the two sexes is about six to one.


I have carefully examined the records of Ward 6. and I find that during the last 6½ years there have been about 384 males to 56 females or about 7 to one.
It is interesting to note that the total number of cases of Del. tremens, in the 8 1/2 years ending in 1850, amounted to about 400 cases, giving an average of about 49 a year. While during the last 6 1/2 years (more than 30 years later) the total number of cases amounted to about 440, giving an average of about 68 a year, an increase more than fully accounted for by the increased population. But it is gratifying to notice that the proportion of female cases of Del. tremens has not increased pari passu to that of the males, for the proportion in those days of the males to the females was about 5 1/2 to one, while it now appears to be about 7 to one. How insanity due to alcohol is also far commoner in men.

D. I. Lumière referring to the official publications as to the number of cases of Insanity traceable to excessive drinking in France from the years 1861-1885.
point out that the percentage in men was about 21% - while in women it was about 5%. According to Dr. Fritscherin, the proportion in Switzerland during the period of years from 1877 to 1881 was about 21% in the case of men and only about 23.4% in the case of women. Of cases of insanity clearly traceable to drink.

But to be able to decide the question, we must look also at the records of the Inebriates' Homes. From a statistical report of 600 cases of alcoholic Inebriety treated at the Inebriates' Home, Fort Hamilton, New York, we learn that there patients consisted 507 males and 93 females. (Quoted by Dr. Reece. Inebriety, p. 183)

Dr. Reece notes also that in the Colonies, the proportion of male to female admissions to homes officially recognized is probably about 5 to 1.

When we find them that the cases

Quoted by Dr. Bae. Die Intoxication. Wien. 1890.
of families that are traceable to death, drawn from various sources, give a proportion of about six males to one female; and when we find that from the records of Tuberculosis homes the proportion of males to female admitted is also about five to one, we are I think warranted in concluding that there is no special peculiarity of sex to Del. tremens, but that the causes and effects of both sexes are equally liable to it.

Age. I have not seen a case in a person below five and twenty. This seems to emphasize the facts that, although a long protracted ingestion of alcohol is the main element in the production of the disease, yet that the more sedentary habits of mature life, together with diminished efficiency in eliminatory power, are also powerful factors. The disease seems to be commoner
in people of from 40 to 50 years.
The ages of the patient who have been under my observation in Ward 6
gave an average of 47 years.
The youngest was 25 and the oldest 63 years old.

Place.

This is somewhat dependent upon
the character of the alcoholic drink
that is consumed and also upon the
effect of climate.

In France the absinthe drinkers
are liable not only to Del. telemus,
but especially liable to alcoholic epilepsy.
It is an interesting fact that European
settled in tropical countries appear
to be much more liable to Del. telemus
than do the natives.

In the West India Stations the cases
of Del. telemus are almost confined
to European soldiers. The same
fact is found to exist in regard to
our troops at Malta. Of 40,326 troops
stationed there during a period of
nineteen years there were 38 cases of Del. telemus.

Statistical Report on the Mortality of Troops in the
United Kingdom - Mediterranean & British America
While in the civil population there, an aggregate of 1,303,517 souls during a contemporary period of 13 years, there was not one case of delirium recorded. (See Appendix appendix of same report)

It has been said, by whom I forget, that D. Freeman usually attends people of more than average intelligence and this has seemed to me to be the case. This may have something to do with the alleged greater liability of Anglo-Saxons to the disease, but the influence of climate in predisposing to the disease must be very great. The further we go from the Equator the greater do we find the consumption of alcoholic drinks, and the less active the strain as an eliminatory organ.

D. Bowditch remarks that alcoholism is less seldom seen and less often attended with serious consequences in those countries where wine is obtained from natural products, where it is cheap,

Yet Annual report of State Board of Health of Massachusetts 1871-1872
and where everybody is accustomed to drink it from childhood.

Occupation

is a very important factor.

Those, whose calling exposes them much to the weather without at the same time giving them much bodily exercise, are especially liable. For on the one hand such people take stimulants frequently on the supposition that they will enable them to withstand the cold, while on the other hand elimination from the strain is much in abeyance. Such people are commoner drivers, cabmen, etc. Two of the worst cases in Ward 6 this winter occurred in cabmen.

Other predisposing callings are sedentary and monotonous ones. Those who trade in drunk are especially liable, such as publican, brewer, men etc. A brewer's man was one of the very
Few who died this Winter in Ward 6 of Del. treasurer.

We had many there—three, one hairdresser, several commercial travellers, one clerk in an Insurance office (a man of 42 who had been 18 years in the same office & held a very responsible position and who had a very severe attack of Del. treas.) three barbers, one of whom died, a landscape painter etc etc.

Social position partial.

From the enumeration above, it will be seen that it is not so much the poor who suffer, as those who are of fair and sometimes ample means in their own position of life.
Season of the Year.

We should a priori expect that the Christmas and New Year season would furnish the largest number of cases, not only because of the good fellowship, but also because of the diminished action of the veins during the winter.

I have made a careful search through the records of the ward for the last 6½ years with this object in view, and have obtained the following results:

During the last 7 months of March, there were 61 cases.

During the last 7 months of January, October, December, June, July, February, May, August, April, September, November:

- January: 7 cases
- October: 41 cases
- December: 40 cases
- June: 36 cases
- July: 35 cases
- February: 33 cases
- May: 30 cases
- August: 30 cases
- April: 28 cases
- September: 29 cases
- November: 26 cases
It will be seen that March is easily headed the list with 61 cases, while January comes next with 51. In casting about for an explanation of the lesser uneventful portion of March, we must take into account the influence of the East winds and the nervous depression following months of sensless streees.

Previous diseases.

Previous and present diseases have an influence. Many diseases powerfully predispose a patient to take alcohol to excess, but of these, some enable him to carry a large amount off, while others do not, or not to the same extent. In the first group I place the exhausting diseases, such as Phthisis (this however is often, as I shall later point out, associated with various forms of alcoholism, particularly with...
(Alcoholic paralysis), Cardiac disease, etc.

In the second group I would place various functional nervous disorders, Hysteria, Neuralgia, etc. The influence of rearrangement of the menstrual functions, the influence of lactation, etc., etc., are all in women powerful predisposing causes.

Other diseases there are that directly predispose to chronic ailments, to Delirium, such as the diseases of the eliminating organs, Kidney disease, Liver disease, etc.

I have noticed that those patients who have repeated and severe attacks usually suffer from Chronic Bright disease of Pneumonia. I shall speak later.

Mental emotions.

Worry and vexation; business loss, family trouble, etc., are often the
The starting point of a delirium that ends with an attack of the disease.

Essential causes.

Of these two stand out preeminent:
1. Long continued ingestion of alcohol.
2. Absence of other nutrient.

These two form the groundwork of delirium tremens and their influence is so admitted that I shall say no more about them.

Given them the predisposing causes and the essential causes, are there exciting causes? Is there any one factor which will precipitate an attack? What is it that determines the time
If the attacks?

Patients sometimes point to a slight accident or to a trifling ailment or to getting a chill & I believe that all these, and especially the latter, may act as exciting causes, because it tends directly to interfere with proper elimination, while the former only do so indirectly by tiring the patient up; but besides these it has appeared to me that a preliminary abstention from alcohol or from the amount they were previously drinking is an almost absolute essential. In one case I have examined in the Ward the attack has the attacks followed immediately upon a heavy debauch; the latter nearly always precede the attacks but usually by from two to four days. In one case that of T. Harley an illusion occurred after he had been drinking very hard & was still continuing to drink. Though I imagine not so hard, because his stomach was so much disordered, but
The had no well marked attacks of Del. Beerem. He never required restraint. He was rational & did not wander during the day & even during the night his symptoms were not acute or marked.

I will now quote from some of the cases of typical well marked Del. Beerem.

<table>
<thead>
<tr>
<th>Name of Patient</th>
<th>Days of total abstinence from alcohol before D.T. came on</th>
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<tbody>
<tr>
<td>A. Murray</td>
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<tr>
<td>Adamson</td>
<td>3</td>
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<tr>
<td>Wells</td>
<td>5</td>
</tr>
<tr>
<td>Weddell</td>
<td>3</td>
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<tr>
<td>Plenton</td>
<td>3</td>
</tr>
<tr>
<td>Brady</td>
<td>4</td>
</tr>
<tr>
<td>Malcolm</td>
<td>1</td>
</tr>
<tr>
<td>Brady</td>
<td>2</td>
</tr>
<tr>
<td>Lowe</td>
<td>$2\frac{1}{2}$</td>
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<tr>
<td></td>
<td>etc</td>
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</tbody>
</table>

This table gives the average period at about three days.

This subject has been well described.
by various authors of great authority e.g. Amicis, Leyten, Gavard, and Cuming etc. The latter state that he has been irresistibly led to the conclusion that the withdrawal of the alcohol is the cause of the suppression of the delirium. The late Sir T. Watson in his lectures on the Practice of Physic also noted such a correlation in his mention of "The When the grey has been stopped" but it would seem at present as though the preponderance of opinion were against this theory, & when I began this investigation, I was influenced in the direction by the authors I had read, but as it is in my desire to confine myself in this thesis as closely as I can to what I have myself observed, I must say that as every typical case of Del. tremens that I have investigated has given me the same history - a history of having had either no alcohol or comparatively very little for some three days before the paroxysm.

* Dublin Quarterly Medical Journal, 1870, page 62. *
came on, I have formerly been led to the conclusion that the preliminary abstention in the most important determining factor of the disease.

Nor does the fact of a preliminary abstention in the cases quoted above rest merely upon a patient's word; for in several cases (Brady 1st time of admission page 364, Adamson page 377, Malcolm page 361, A. Wells page 361) the patients were in the ward during the whole of the time & were under observation, and they often slept at night & were quite rational; The man Malcolm also repeatedly asked for liquor avowing that he felt he would have an attack of Del. terrors unless it were given him, and that he knew that the Del. terrors was coming on because the drink he had been cut off etc etc.

This question I will return to again in discussing the Pathology.
important exciting or determining cause:
and that is "any interference with
the proper and complete action of the
organs of elimination"
 Anything that causes the patient to
suddenly change the usual habits
for more sedentary ones, anything
a disordered stomach, a cold, etc. which
causes them to stop at home and
especially in to lie up, etc. & then
leads me to speak of associated Del.
Tremens.
 Of this we may say that the main
causes are twofold:
I. Predisposing, a chronic saturation
of the system with alcohol.
2. Exciting, a severe accident--fall
internal disease or pneumonia.

As the Delirium thus excited has
the same characteristics as the Simple
Delirium, and as I shall discuss Pneumonia
under the heading of complications of
Del. tremens: I need say no more
about Associated Delirium, except to
point out that I regard its occurrence as an additional argument in favour of the views I have been urging. viz. The accident the patient has received combines at once both of the determining causes of an attack of Del. Tremens: for it lays him supine motionless in bed and it cuts him off from his accustomed stimulant, & it is not until two or three days have passed as a rule that the acute paroxysm of Delirium comes on.

The preliminary period of abstinence then I call the Period of Incubation. There are as I have mentioned, all degrees of Del. Tremens, and only a typical case can be fully described by me here. I divide the disease into six stages.

1. Period of Incubation.
2. Period of Optical and Auditory Hallucination and illusion.
vide care of Louis... page 621

vide care of Malcolm... page 361

Dundas... 789
4. Period of exhaustion and collapse.
5. Terminative sleep.
6. Period of recovery.

1. Period of Incubation.

This period is of an average duration of three days: the patient has given up the alcohol, either perhaps because his stomach would no longer tolerate it, or perhaps because the first effect of the approaching storm has been to create a terror of taking more, or because through his removal to some place of safety he has been unable to get more; patients often say that they felt ill and screamed and took a disgust to drink, sometimes as in Malcolmi and Dundas care they pray for it. The patient is in a most depressed and feeble state, he is in constant terror and anxiety as to what is to come, he will pray the doctor or nurse to give him sleeping draughts. Care of Lowe p. 619 and many others.
Post Case of Malcolm: page 775
The Temperature is often subnormal and sometimes the pulse too.

During this period they also sometimes have single or repeated epileptic form fits, and in some cases nausea attacks seem to have a mitigating influence upon the delirium that is to follow (Malcolm, 2nd time of admission) and they may, I think, even wholly take the place of an attack when the attack that would have followed would have been of a slight nature.

(Case of D. Finlay, page 551)

But on the other hand, they are sometimes the precursors of exceedingly prolonged and severe attacks.

(Bready, 2nd time of admission, page 561)

Waddell had a very severe attack. (p. 641)

Hematemesis and epistaxis are occasional symptom. But during this period it is of the disordered condition of the alimentary system that patients chiefly complain; they have a fever and tremulous tongue. They have
Vide case of A. Wells, page 381

C. Lowe, 619
absolutely no appetite; vomiting usually
recurs & recurs whether they have
been persuaded into taking a little
food or not; so miserable is their
squeamishness do they often feel, that
they pass both day & night in bed (Low
with a loathing not only often for
alcohol but for food of any description.
Their bowels are usually obstinately
constipated whether previously loose
or not.

In the urinary system.

There are certain constant characteri-
nature of a highly interesting characteristic which
however become more marked as the
stage passes into the next one.
We find the patient has not been
micturating as much water as usual. (Well)
in some cases it becomes almost stopped (Low)
as the next stage comes on, it is of course
difficult to get many observation as to
the condition of the urine during this
stage, because the patients do not usually
come into the Ward until the disease
J. Malcolm. 2nd Time of admission. Page 775

J. Grieve. Page 573.
is more advanced.

The quantity then is diminished.

The colour is as a rule very pale.

The Sph. Gre. is low.

The reaction is either alkaline
or neutral or becomes so as the
next stage comes on. What can
be more remarkable than this?
Here we have a patient who has been
we may say almost living upon alcohol
for the last two or more
weeks; alcohol, it is supposed,
undergoes in the body partial transformation
into acetic acid. This would unite
with the blood of the blood, and
would be eliminated as a carbonate
in the urine, as in the case when
acetae are eaten, and it would
increase the acidity of the urine,
because no alcohol has now been
introduced into the system, but
an acid which has neutralised
some of the normal alkalinity of
the blood. Dr. Parthee expressly
stated that the acidity of the urine
.Parthee Hygiene. pages 323 and 326.
is increased by large amounts of alcohol, but that the other ingredients are unaffected.

But it is not only on this account remarkable that the reaction of the urine should be alkaline or neutral before Del. Termer comes on, but from the further fact that the patient is in practically a starving condition, in a fasting condition when the reaction of the urine is always most acid, that he has taken no proper food to require digestion for days, that there has been hence no alkaline tide of Bence Jones during digestion, there has been no withdrawal of hydrochloic acid from the system.

I do not think that this interesting fact has been noticed before; I shall return to it again in discussing the pathology.
The urea and the Phospho-rates are much diminished, and the Chlorides are below the normal. Certain abnormal ingredients are also present. These characters I will go into more fully in describing the next stage.

In the Hemopoietic System.

The reaction of the blood as briefly ascertained for me by Dr. Haycraft is normal. The blood, however, often exhibits under the microscope certain abnormal characters which I will mention later on.

In the Nervous System.

We see the precursors of the coming storm: the patient is usually quite unable to sleep except in short snatches, sometimes they will say that they can sleep if they have enough alcohol. (Shaw, page 473) He is in a most depressed mental

J. Sampyle ... 671.
condition; he cannot bear to be alone, he needs constant companionship & its stimulating effect. (Forgotten page 457) Sometimes, he faints; that forced exercise will enable him to throw off the condition & he takes a long breath; his limbs tremble; often his legs suddenly fail him & he falls. He has no headache as a rule, no pains etc. He cannot keep his attention fixed, cannot read, cannot interest himself in anything.

After it may be about 4 or 5 hours, he experiences some special sense disturbance; it may be auditory or visual, & it usually appears suddenly; while trying to walk the condition off, perhaps, he will suddenly hear his name called, will look round & seeing no one, will think that he was mistaken & continue on his way; by & by, he hears his name called again & then again.
and after a time purchases additional
remarke as are made to them. These are
usually of a jeering & scoffing character.
The patient cannot escape from them,
however loud the taaffe, the voice
moans itself heard above it. Rarely
sometime patients suddenly hear music
so real in the sensation that it is often
something before they begin to suspect it
is a hallucination.

A visual illusion or hallucination
may be the most distressing of
it may be the last one. He may
see the handle of the jug, towering
curious shapes, may see the picture
moving, may see a face looking in
at the window at him, or objects
that have no definite shape approaching
& enormously increasing in size &
then receding again.

These phenomena, as is well known,
are usually at first present only during
the night & are always intensified
then, & that I think because the
patient is at that time most depressed.
of the ordinary stimulation of life around him that serves in some
measure to steady him. There is perfect quietude - there are no lights etc etc.

He then passes into the Period of Special
Senset illusion & hallucination or
First stage of actual Del. tremors &
It is now that he usually seeks
relief at the Infirmary.

2. Period of Optical & Auditory Disturbance

As it is at this stage that the patient
usually first comes under observation
I will now mention briefly his general
condition and appearance, and in
the description of Chronic intoxication later on
I will not repeat those general
facts about a patient that are
applicable to both conditions and
that constitute the Alcoholic constitution.
The Patient has as a rule a very characteristic appearance; there is a certain undecidedness about him with tremulous movements of the whole body. If asked to do something as to put his muscles into action, he becomes more agitated & the limbs are thrown into irregular, somewhat coarse, tics or tics; when he sits up, the head can usually be seen to be also so affected; on desiring him to look at a fixed object, or on causing him to follow one finger from side to side with his eyes, myotonia usually becomes masked. His lips & arms are often much wasted while his abdomen may be enlarged with the panniculus thick. As Prof. Greening Stewart has pointed out, there are two varieties of the face: it may be pale & flabbly with swollen eyelids & cleared, watery eyes, or it may be peculiarly rubicund with the veins about the nose dilated & with dense rosacea in various spots on the face & forehead; the face...
Muscles usually have a sort of heavy flabbiness about them.
The conjunctiva are invariably watery sometimes a little return & the vessels are usually dilated & congested & a condition of chronic conjunctivitis is common. It is difficult to keep the patient's attention fixed, while talking to you his eyes wander off to the ceiling or to one side & he suddenly forgetting as it were your presence, commences to mutter to himself.

The Alimentary System.
The lips are full & tremulous; the tongue is often tremulous & there are sometimes fibrillary twitchings of its muscles. It is often protruded & withdrawn again with a shrewd look just, while in the late stage a sort of ataxia is often present and the patient makes many spasmodic but ineffectual efforts to protrude it, not
apparently being properly able to coordinate the muscles that open the mouth with those that protrude the tongue. I have often noticed. The tongue is often thinly covered yellow white, especially in its central & posterior parts. Often it becomes cleaner during the acute stage & with recovery the thick yellow furRow again appears. The breath has the foul musty characteristic smell, quite unlike the odour of alcohol, but sui generis & once smelt, not to be easily mistaken. The pharynx is red & congested; articulation is often somewhat interfered with, the speech may be thin & indistinct & the words may be uttered in a mumbbling sort of way. His appetite which was entirely lost before, now may commence to return; he will swallow eagerly & in an agitated sort of way whatever may be offered him. Thirst is common, but often for cold water than for milk; as a rule there is now no vomiting, once though
I have always particularly enquired about it is there any pain or discomfort felt after taking food.
The bowels are, unless Pneumonia be present or impending, usually constipated.

(Forsyth)

The abdomen is often protuberant. (Wedell) often the upper part & costal margin are pushed much forwards & kept there owing, as Dr. Smart has pointed out, to Diaphragmatic spasm.

The condition cannot voluntarily be undone & the abdomen of patient so affected present a very remarkable appearance.

The facies are often Thicker, especially in these obscured cases in Prof. Rothnagel's wards, for there is enormous swelling in Vienna always flabby & the skin has frequently a peculiar whiteness combined with a velvety feel.

Epigastric tenderness & gnawing referred to by Prof. Lagrange. I have only once noticed. (Forsyth's case page 803) but there.

vide care of Weddell, Hope 645
immediate
Horey 415
Noble 767
is sometimes some hepatic pain &
tenderness.
The Liver was in my case usually of
normal or of somewhat increased
percussion dulness.

The Circulatory System.
The only abnormalities I have been
able to detect are a prolonged &
often reduplicated first sound, towards
the apex with irregular & excited
action of the heart.
The pulse during the stage shows
the loss of inhibition, it is large,
soft & diastolic, & from about
80 to 110 in frequency.
Dr. Anstie laid great stress upon the
sphygmographic tracing, but apart
from the great difficulty in getting
a satisfactory tracing when the patient
are in much an agitated & tremulous
condition sometimes also with subcutan
fussurent, I think that most Physicians
of the present day would place far more reliance upon the fingers.

Respiratory System.

As already mentioned, the breath has the characteristic colour; hoarseness of voice & chronic laryngitis may be present. Diaphragmatic strain from time to time; & the breathing may be somewhat irregular in rhythm & is usually quickened. Rinvir & others state that the carbon dioxide in the air of expiration is diminished; but there seems to be some uncertainty about the effects of various spirits.

Apart from the grave respiratory complications, the system seems on the whole to be one of those least affected in Del. tremens.

Hemopoeitic System.
The reaction of the blood is slow, now quoted by Pantzer page 373.

J. Forsyth. page 797
A. Young. 11 603
A. Campbell. 11 475
A. Shaw. 11 etc.

A. Shaw. etc.
more alkaline, it is becoming
hyper alkaline a condition it reaches
in the next stage, this interesting
fact was not so far as I am aware
previously known.
The red corpuscles are not usually
much diminished in number;
the haemoglobin is often about 75%.
The red corpuscles sometimes show
a marked tendency to cremation, on
examining a drop quickly withdrawn
& covered with a cover glass, every red
corpuscle may be cremated; their
shapes are often altered, they may
be globular or oval, others rimiform,
they nearly always show a marked
ductility & on flowing against other in
a stream they will at a touch become
conver elongated or concave on one side, etc.
sometimes they couple in irregular masses
drawn or ten together, at other times
they may by their concurrence form
a sort of mosaic like pavement.
often small globules with highly
reflecting margin may be seen.
Use: case of Charles Lowe. page 626.


Landon's Physiology.

Stuart 2nd Vol. 1847.
and in one case there were quite so numerous as the Red corpuscles. There are mentioned by Parvin and by others, including Landoir, and constitute I suppose what they intend in speaking of excess of fat globules in the blood.

I have not been able to find them after the first two or three days of the Paroxysm.

I have noticed that the spleen is often a little enlarged & that this becomes more marked in the next stage.

The Urinary System.

The urine has now certain characteristic features which have not, I think, been previously pointed out.

Dr. Bence Jones pointed out that the phosphates were remarkably diminished during Del. Frenens, but from an examination of the cases that
he has detailed at some length in
the Lanct, I observe that he only
made a percentage estimation &
not one of the total daily amount
of the Phosphorate & also that in hi
most typical case - that of David D.
both blood & albumen were present
in the urine & that the man had
also a previous history of anasarca;
These there conditions would surely
quite invalidate any conclusion as to
the influence of Del. tremens on the
excretion of Phosphoric acid. The
another mentioned case the quicker, blood
was also present, and ofcium was
given in large quantities to almost
all the cases.
D. Jones summarises his conclusion
in his Animal Chemistry, page 87
& he suggests that the absence of food
may be a factor in the condition.
D. Aitken corroborates his statement
but supplements it by saying that the
Urea and Sulphurate are largely increased.
D. Bristow & D. Pope merely say
That the Phosphates are diminished. How D. Athem could say that the urine is increased, when we know that alcohol is a non-nitrogenous food, and that being easily oxidised, it limits the metabolism of the protids so that consequently less urea is secreted than in starving animals, while at the same time the Phosphates are said to be so much decreased I cannot understand.

I have carefully examined the urine in about from 75 to 100 cases of alcoholism of all kinds, of which some 15 to 20 were cases of various simple degrees of del. tremens, and I find that the secretion of the Phosphates and of the urea almost invariably exactly correspond.

If we examine the urine of a patient at this stage, we shall find the amount diminished often to 100 or so a day, even if the amount were normal during the previous stage it now becomes much
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<tbody>
<tr>
<td>A. Truettaj</td>
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<tr>
<td>A. Wells</td>
<td>387</td>
</tr>
<tr>
<td>C. Lowe</td>
<td>631</td>
</tr>
<tr>
<td>A. Truettaj</td>
<td>403</td>
</tr>
<tr>
<td>W. Adamson</td>
<td>379</td>
</tr>
<tr>
<td>J. Weddele</td>
<td>653</td>
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</tbody>
</table>

*etc.*
The colour which was pale during the Period of Inubation is now becoming of a redder tinge.

No deposits of urea take place in it as a rule.

The Urea is usually higher than it was.

The reaction is not alkaline or neutral before now. Becomes so, but only temporarily for with the advance of the condition it grows more acid from hour to hour.

The Urea & Phosphatase show a marked preliminary diminution, but this is followed by a rapid increase, so that by the commencement of the next stage they are often far above the normal, sometimes an exceedingly high point is reached. See Weddell's curve chart where the total daily secretion of the Phosphatase rose to 8.4 grammes in the very middle of the attack of Del. Termon. The Urea & Phosphatase are in complete correspondence.

There is no antagonism between them.
vide Bradyp. Urire. Chart or Care, page 357

-  Finlay
  - 557

-  C. Lewis
  - 631

etc.
Almost all the urine charts show, I think, this correspondence.

Albumen

is often temporarily present, it commonly disappears after a couple of days, if it persists it is of very unfavourable premonition. Like case of J. Corbett, who died.

Glucose in I may say, an almost constant constituent. The amount varied in the cases I have examined from about 9 to a mere trace per ounce of urine.

Commonly only a small amount is present. About 9 per oz. I find it for a longer time in the urine than I do albumen. It is occasionally before entirely disappearing in absent and then appears again.

The Chlorides.

In uncomplicated cases appear to
vide Finlay's Case, p. 557

Brady's  -  357
A. Wells  -  387

etc
vary less in amount than do the Phosphates & the Urca.

Commonly there is a slight elevation at first followed by a normal or slightly above normal amount.

Tondian.

Is of almost constant presence in the urine of patients. I have noticed, who have brought themselves to this condition, it often increases in amount as the Paroxysm goes on & with recovery tends to disappear; sometimes it is present in very large amount. No doubt its presence depends partly upon the chronic catarrhal state of the patient's alimentary system with the preceding constipation & on disorders of the Pancreas & Liver.

Intestemmary System.

Subjective phenomena are not so far as I have noticed often complained of.
The skin is from time to time bathed with perspiration; it has in been
drained often the peculiar whiteness & velvety feel I have referred to.
Acne Pustacea is often present.

The Nervous System.

Subjective sensations, referred to the ordinary senses, are not so far as I
have noticed common during this stage.
The cramps & pain & feelings of
numbness etc which previously affected
many of them have passed away or are no longer complained of.
The sensibility to touch to heat & pain is in the majority of cases
I find quite normal. Sometimes
hyperesthesia in one or other
to the sense is present.

So far as I have observed the chronic
cases with marked symptoms of Periphereal
Neuritis do not usually leave Del. tremen-
Sight. The Pupils are often a little dilated.
vide E. Lowe, page 625.
A. Boyd.
- Brady - 569

vide Jesus Christ, page 480
Robbi - 767

vide Thompsoni, page 565
E. Lowe - 627
etc.
They are unequal, and in all the cases that I have observed with this character it is the right pupil that is the dilated one. The pupils seem to me to contract invariably to light & for accommodation normally.

To the condition of the Conjunctiva & to the frequent presence of Hydropsyphate I have already alluded. The arcus tenius is often marked. Peru Optikalmoskopie.

The claws in the majority of the cases I have examined are hypovascular & congested & can, to give a colour in a guide, lie with difficulty separated from the surrounding retina. The veins are usually somewhat dilated, but the vessels are seldom observed, occasionally the claw is a little swollen.

Hearing.

Except for the illusion, etc to be mentioned later there seems to be little
vide case of Mitchell, page 701
disturbances of the organ as a rule.

Taste & Smell are with difficulty at this stage investigated but seem to be usually fairly normal. Patients will complain of the bitterness of quinine etc.

Motor Function.

Organic reflexes are not much affected during this stage, but there seems to me to be a sort of cerebellar performance with a kind of spastic difficulty, which become much more marked in the later stages; it is as though coordination were not perfect, & as though the act could not be carried out in an orderly way.

Stein Reflex.

The Plantar & cremasteric reflexes are usually though not invariably exaggerated, the Scrotum is drawn up often in a very lively way, no matter how old the patient.
vide J. Sample, page 681
vide J. Weddell, page 647
vide Shaw, 475
-thompson, 505
-c. Lowe, 625
-t. Hawley, 419
-b. Burnus, 739
etc.

page 769.

vide (c. Lowe), page 627.
-lawrence, 347.
Tendon Reflex.

The Tendon jerk, except when it has been destroyed previously by long continued exposure in those predisposed to Paralytic Neurosis, now becomes, I find, very much exaggerated; a touch to the tendon below the Patella and even sometimes above it causes the leg to be thrown forward violently forwards; it was exceedingly well marked in T. Harley's ease.

Some time the nervous reflex seems to be deviated into other directions, in Noble case on tapping the tendon movements of the four extensor occurred on both sides of the body & this persisted for some days.

Some ankle twinges can often be elicited.

Voluntary Motion.

Besides the tremor which accompanies voluntary motion, there is a sort
Vide case of胰洲。page 701

Vide case of P3___dly。page 587

Vide case of Weddell。page 649
,, 667
of Ataxia present combined with marked Paresis, if asked to do anything, the act is done in a sphemodi or exaggerated sort of way. The muscle I have observed are often kept permanently in a semi-contracted state, which cannot be voluntarily undone; the whole condition seems to me to resemble closely the early stage of Paralytic Paralysis - a condition of Paresis with Sphemoid - as though both Inhibitory & Motor influences from the brain were partially interrupted.

Electric irritability.

To the Paralytic stream there is often hyper-irritability, but the general condition of the patient together with the state of semispasm in which the muscles often are render positive conclusions difficult. The same difficulty occurs in
in attempting to test the reaction to the galvanic stream.

Paroxysmal facial function.
The face may be pale or flushed, it is often pale in this stage and flushed in the next.
The body is from time to time bathed in profuse perspiration, & a sort of clamminess is constantly present most marked, it has seemed to me, in the legs.

Cerebral functions.
In this stage illusions & hallucination of the special senses are very prominent. They have been so often described that I will not go into them in any detail.
They are not always of an unpleasant nature; some patients profess themselves to be perfectly happy, they carry on conversations with their friends.
vide case of Malcolm page 777.

Baylan page 723.

vide case of Weddell page 649.

Wells page 388.
Sometimes they see the steers moving, sometimes the gas describes circles; sometimes, but not so frequently, it seems to me as it is described to happen, they see animals—becks, mice, rats, fish, there are occasionally on the floor, occasionally in or by the side of their beds.

Delusions now follow: there are often very unpleasant, a common notion is that they think they are going to be executed or murdered, & they may imagine that the bystanders have swords concealed about them, etc.

More frequently their delusions refer to their ordinary occupations. The cabmen are on their cabs, they go through the motion of whipping their horses, shouting to them. Hi! Hi! Pachy! etc. These delusions also sometimes take an unpleasant form; their traces are breathing, the door of the cab has come off its hinges—Crash! They have had
a collision. Cabmen seem to me to be especially inclined to leave the task to their ordinary occupations. Sometimes entirely new ideas possess them; they are up in a balloon & are being shared by policemen. Falling over fences is a common idea. Versatility in the special sense disturbances is always a marked feature, but their delusions appear often for a considerable time to remain the same; for the man who thinks he is to be executed will sometime for hours together hold to the same idea; so with those who think they are being pursued & who will on that account avoid taking food, it may be only from some particular person or from some particular vessel. They I have seen last a day, two days, or even through the whole length of the paroxysm.

A characteristic feature of this stage is that under a suitable stimulus,
the patient can for a brief space of time almost entirely throw off his morbid mental state; such a stimulus may be the arrival of the doctor & personal interrogation by him, or a bright light such as reflected from the ophtalmoscopic mirror: I have over & over again noticed that while I was examining the fundus, the patient would remain quite quiet, would keep his eyes fixed in any desired direction & would answer rationally. But the moment the stimulus be withdrawn, or even while it is being continued, if kept up too long, the patient's attention becomes again diverted & his eyes wander off in some fresh direction.

It is for this reason no doubt that patients are so much worse at night when there are no stimuli to help to steady their senses. This fact has too, I think, an important bearing upon the treatment to be adopted.
vide temperature chart of A. Wells page 383

Brady... 353
The memory is always much impaired; he forgets at once what was said to him but a few minutes previously. The Patient is continually restlessness, and the emotional & intellectual faculties are beyond the control of the judgment. Sleep is always wanting & the patient is recurrently worse at night.

Temperature.
An initial depression is often present.

This stage passes sometimes insensibly sometimes suddenly into the next— that of violent Delirium.

3. Period of violent Delirium

The patient is now no longer easily restrained; he sits up in bed or attempts to get out of it & it may require one or two men to prevent him from doing so. The words l
Where there are sometimes several severe
seizure cases in at the same time and
only one nurse there, it is usually
found necessary either to fasten the
patient's arms by the wrists, to either
side of the bed, or else to put
them into the Padded room.

The advantages & disadvantages of
these plans I will refer to when
speaking of the treatment.

It is often difficult now to get a
fairly rational reply from the patient;
he may answer you in a defiant
sort of manner; he will answer
you perhaps, he will say if you
will cut the strap that holds her
wrist. His whole body is in constant
movement; he is continually straining
at something, to pull himself up or
down in the bed, or to thrust his
head to avoid some threatened blow.

As in the last stage, so now, he is
always talking but now more
disconnectedly & it is more difficult
to understand what he is saying.
His face is now usually flushed. The eyeballs may seem to protrude a little, the conjunctivae are much injected; the pupils are not so dilated.

The alimentary system.
The tongue, if the patient be able to protrude properly may still be clean, or it may be more furrowed and not so moist as it was before; it is very tremulous & the tremor is of a coarser kind and uncapable in rhythm. The patient usually drinks eagerly whatever is given to him; upon one single occasion during my six months, appointment have I had to feed a Del. tremens patient by the tube. The hysterical and Insane patients often require forcible feeding; but the Del. tremens patients, so far as my experience goes, do not, & if they do not taste what is offered to them at once as they usually do, a little coating by the nurse is all that is
J. Noble... page 769.
J. Malcolm... page 777.
C. Lowe... page 629
Weddell... 651
etc.

150° in Adamson's case.
150° in Weddell's...
144° in Malcolm's...
108° in C. Lowe's...
etc.
in the great majority of cases required.

The protrusion of the lower costal region has passed off. The bowels are not so constire.

Haemopoietic System.
The reaction of the blood is more hyperalcaline. Its other characteristics remain as they were in the previous period.
The spleen is now often more enlarged.

Circulatory System.
The action of the heart is more rapid, the pulse is full & excited; its frequency varies from about 110 in mild cases to 150 in bad cases.

Respiratory System.
The respiratory movements are more rapid; sometimes fine breathing
is laborious, as though the patient were engaged in some heavy, weary piece of work.

His voice is usually more muffled, but occasionally he will shout at the top of his voice, as in the case of the first要学会。Adamson page who spent his days in crying his wares.

For The Urinary System.

The amount passed in the 24 hours is still small. Though it is often double what was passed in the previous stage. Adamson passed 150z. The first day of the disease, 30z. The second day, and 40z. on the last day.

A. MacKay passed in corresponding periods 330, 350, 330, but A. Lowe passed only 11

a. Brady 11 3X 3X 3X

J. Wedddell 348 340 358

P. Boylan 340 330 360

J. Malcolm 318 330 335

etc. etc.
If the urine chart, or these patients, or others, be consulted it will be seen that these amounts are comparatively small and that after the disease is over the amount of urine passed becomes excessive. An average of such amounts would lie between 60 and 100 ounces; moreover as a rule the table on the previous page shows that there is a steady increase in the amount of urine passed commencing with the first period of actual Delirium Tremens, as I have pointed out there is a tendency to supraversion of urine at the commencement of the attack but that this very rapidly disappears as the attack goes on so that by the end of the attack and during recovery the amount of urine passed is often far above the normal.
The colour is now a bright red; there is no deposit of albumen. The reaction is highly acid. The Sp. Gr. is higher - 1025-1030. Bile pigments are often present.

The Urea and Phosphates are now much increased in total daily amount; sometimes enormously so.

Albumen is not now so often present.

The other constituents remain much as they were in the previous stage.

Nervous System.

Sensory functions are in much the same condition as they were in the last stage, but owing to this the mental condition of the patient are more difficult to investigate. If the optic discs be examined, they
The hypostatic & congested appearance that they used previously but in a more
advanced degree.

Motor functions.
The organic functions of urination & defecation are now often performed
automatically, and the excretion passed in bed.
The superficial and especially the
deep reflexes remain extinguished;
the semi-paralysed condition which is often
present persists and constant straining
efforts are superadded.

Cerebral & mental functions -
are now much more evident
and continually disturbed: The
patient is always wandering - There
are no intermissions, no lucid intervals;
the reasoning powers & judgment are
off duty; what the current of the
patient's thoughts is is with difficulty
ascertained, for his memory during
recovery of this period is always gone;
It has however seemed to me that
The disorders of the special senses do not now so predominate as they did formerly, or if they still continue manifest, the patient is perhaps less able to recognize them. However, this may be. The patient's mind is exceedingly active; he is full of the business or work he is engaged upon, not for one minute is he quiet; the strongest stimulus only engages his momentary attention.

His delusions and hallucinations now seem to be of an ever-blinding nature. There would seem to be a sort of temporary reverie of the brain whereby the incidents of uncivilized and savage life become the most prominent. He is being murdered - he is to be stabbed, poisoned - his wife is being murdered; wild animals are attacking him; he strives to avoid the fatal blow - etc.
102° in Weddell's case
101.6° in Adamson...

etc.

Wilde case of J. Weddell. Page 651
The temperature during this stage usually rises to a point between 100° and 102° and in severe cases higher (vide the temperature charts of the various cases). Of course it is not always possible to take it.

After this stage has lasted perhaps some 24 hours the fever slowly enters the next one, that of exhaustion.

4. Period of Exhaustion.

He now lies more prostrate, does not continue to struggle to get up; when addressed he may make some effort to respond, it may be only with a sort of smile. His face is flushed - often bathed with perspiration. The eyes are much injected - often quite bloodshot.
The eyelids may be lined with mucous
prurulent secretion; a tendency to
cyanosis in the cheeks, ears, & lips
is often visible.
The tongue is now often dry &
cracked & it and the lips may
be covered with sores.
He will taste eagerly and in a
very temulous way whatever food is
offered to him.
Nothing I have never seen.
The tongue may be coated or lose
The first sound of the heart is weak
& faint.
The pulse is smaller & feeble, often
very frequent & it sometime cannot
be felt at the wrist. I have frequently
had to count it by using the stethoscope.

In the Hemopoietic System.
The condition of the spleen is usually
as it was in the previous stage, but the blood though still slightly alkaline, does not so usually present the abnormal character, I have before mentioned.

In the Urinary System.

The amount is now usually increased.
A copious deposit of urea may occur.
It is high coloured.
The other characters remain much the same, & the Urea & Phosphate if not previously increased now become so.
Albumen is rarely present.
Often but not as a rule more.
Indican may be present than was present previously.
The glucose is disappearing.

Nervous System.
Sensory function appear to remain
much the same.

Motor function.

The function of miction and defecation are often carried out unconsciously. The superficial and deep reflexes are not so much exaggerated. The spastic condition has passed off, and the constant struggling is not so marked.

The whole muscular system is evidently very much exhausted.

Cerebral & mental function.

The mind is not so active; in favourable cases a condition of torpor seems inescapably to be coming on. This gradually deepens & in the course of about twelve hours he becomes stiff & quiet; you find him asleep, at first. This is often interrupted, he is uneasy & awakes again, then he sleeps again and again & eventually sleeps on for some 8 to 12 hours when he awakes.
has some food & then often sleeps again.

6. Period of Recovery.

When he awakes after this prolonged sleep, he is sometimes quite rational, sometimes delirious, still persist. The latter condition more often obtains in old & hardened drinkers than in the younger ones.

His temperature now is normal or subnormal. The face is more composed, it has lost its agitated look. The conjunctive are not so injected. The tongue if not furred before now becomes covered with a thin yellow fume; while if furred before or dry & brown it is now moister & cleaner. It is still tremulous. The appetite is good, the bowels act normally.
In the Haemopoetic System.
The reaction of the blood is now normal again; the other characters it had or may have had in the earlier stages have disappeared.
The spleen is not enlarged.

The perforations are normal.

The Pulse has fallen in frequency to perhaps 90 & is more regular.

The Urea.
A much larger amount is usually secreted — perhaps from 360 – 380 in the 24 hours.
It is high colourless. Deficient of weight.

Nervous System.
Sensory Function.

Aching & general soreness are usually complained of; sometimes slight headache which seems to be either Frontal or Occipital in position. The optic ataxia is less congested.

Motor Functions.
The organic reflexes are now under proper control.
The reflexes are less exaggerated.
There is a general paralysis of Voluntary Motor power.
The tremors persist, but are less marked.
The profuse perorations have ceased.

Cerebral & Mental Function.
In most cases, the patient is now rational; if delusion persist the patient can sometimes be talked out of them; he will sometimes acknowledge that they may be delusions but that for all
that he cannot get them out of his head. He feels much exhausted.

How remarkable is the change that some hours' sleep has apparently brought about!

He now progresses steadily & rapidly towards recovery; he will tell you all about the former events of his life, all about his present illness, usually down to the violent stage, sometimes they can remember some of the incidents that occurred even during this period, provided that the fact that they remember had given them a very powerful stimulus, e.g. when the patient A. Lowe, having passed through the preceding stages, had become so violent that it had become necessary to place him in the padded room; I went in some hours later with the male attendant to pay my evening visit. The moment I went in, he screamed...
at me & the attendant had to catch him by the throat to keep him off. After his recovery, though he had totally forgotten all about his being in the padded room I did not even know that he had been there at all, for he was put to bed again when the period of extraction came on, yet he told me that he had a distinct recollection of having been held by the throat by the attendant. This fact, together with other ones that I have already mentioned, seem to me to prove conclusively that there is no period in the dream in which the patient cannot be brought back as it were to his senses, even though it be only for a minute, by a sufficiently powerful stimulus.

They will tell you about their having given up the whisky about then squeamishness, the illusion, & hallucination.
Verse care of Lowe p. 631

Adamson 379

etc
The face has lost its flushed and agitated expression; the eyes are no longer bloodshot. The general tremor is passing off; the tongue is day by day less furred; the alimentary system returns more or less to the normal condition.

The urine returns to the normal, whether diuretics have been given or not. The amount secreted increases, Lowe who passed only ten ounces of urine a day during the acute stage, ended by passing eighty ounces. The colour becomes pale again. The Sp. Gr. falls.

The urea and phosphate diminish, & often with nausea reaction that they become temporarily subnormal. The abnormal constituents disappear.

The Perspiratory System.

The skin returns to the normal. The skin reflexes usually diminish.
The tendon reflexes so far as I have observed (and I am not aware of any other observation upon them) always diminish; at first they become normal but as day succeeds day they become more and more subnormal until eventually they often cannot be elicited at all.

The muscles are flabby, the motor power is weak, some ataxia may be present for the first day or two that they are able to get out of bed.

The deliriums even of the patients have persisted; now usually pass away & the patient seems to be quite himself again.

The temperature not only becomes normal but tends to become & to remain subnormal. The pulse falls day by day usually in frequency until it often beats but 50-60 times in the minute. It recovers its tone.
So far I have endeavoured to describe, from my own observations as much as possible, the course of a typical case of Del. tremens, that has terminated favourably.

Unfavourable cases are usually the complicated ones; when I come to Prognosis, I will mention the statistics as to the percentage of deaths from uncomplicated Del. tremens.

A case of uncomplicated Del. tremens may terminate in the unfavourably chiefly in the following ways.

The Period of Violent Delirium may be much protracted & eventually when the stage of Exhaustion follows the patient is too much collapsed to live. Through it & he dies usually of Heart Failure. Brady.

But sometimes, awfully sudden deaths may occur; Dr. J. O. Affleck has
told me of a case which occurred—
when the brain,商 the of Ward 66,
of a young strong man, who while
sitting up & talking rapidly & loudly
suddenly fell back & died of syncope.

Again during the violent stage the
temperature may suddenly go up
to 104°, 106° or 107° & he dies
it may be after one or more epileptiform
attacks—as in Menton's case. page 543

Complications of Delirium Tremens.

The most frequently occurring and
the most serious complication is
Pneumonia. Others are Bright's
disease. Phthisis. Acute Pneumonitis
Meningeal Haemorrhage.
Hemorrhagic Pericarditis. (I saw two such cases in Vienna & was informed that it was not an uncommon form of death in these cases.)

Typhoid fever sometimes
Cardiac vascular cases seem rarely
to take enough alcohol, or else are too irremediable to its action to take Del.beamens. I could not
find one such case in the books more did one such come in during
my apprenticeship.

With regard to gout.

Alcoholism & gout seem to have
some feature in common.

Gout owes a great origin to excess in alcoholic stimulants & gouty
paroxysms, can be induced in the
gouty by too much strong wine.
The gout intermittent glycosuria, is
sometimes present

In the Paroxysmal state, the
principal ingredients, show a diminution
The uric acid. The uric, the phosphoric
acid are deficient. Traces of Albumen
Scri D. Duckworth. page 306.
may be found. Towards the height of the Paroxysm, or towards its close, green discharges of the various constituents of the urine occur. The epiglottis are much increased; Parthes found a large amount of fluid in one instance.

In Fort a form of Perforated Reversal may occur with sensations of numbness & tingling, with glossy fingers sometime, with loss of power & muscular atrophy, much resembling Alcoholic Reversal. Cramps are also common in the feet.

I have often noticed deposits of uric acid in the urine of patients who have passed through an attack of Del. German. No doubt a parallelism of this nature could, if it were desired, be drawn much further. I do not wish to force it & I have only a passing attention to it, because I believe that the Acute Paroxysms
of both conditions referent the elimination from the body of morbid matter that has accumulated there.

Alcoholic Pneumonia.

Pneumonia is the most fatal complication of Del. tomen. I find on searching the record of Ward 6 that there have been during the last 6½ years in the ward 30 such cases in males of whom 22 died, and 4 such cases in females of whom all died. Though these numbers are too few to draw any reliable conclusion from they yet point very evidently to extreme gravity, for 70% of the male cases died and 100% of the female.

What is the ratio of this complication to uncomplicated (by it) Del. tomen? Of the 440 cases occurring in Ward 6 of all kinds of Del. tomen, 34 were complicated by Pneumonia which gives a proportion of about one
Care of Del. Tremain + Pneumonia to 13 Cases of Del. Tremain not so complicated

The ratio of liability to the complication seems to be about the same in both sexes.

A Pneumonia complicating a case of Del. Tremain is said to seem rather a latent course, but from the cases I have myself observed & from others which I have collected or made inquiry about I have not found the statement justified, except that from the great restlessness of the patient and from the quickened respiration & general febrile condition in uncomplicated Del. Tremain, the superintention of a Pneumonia may be overlooked. The paroxysmal phlegmical signs are just as they are in simple Pneumonia except that the condition seems prone to attach on the apex rather than the base. The breathing is very
vide Chart of P. Baylon, page 719
much quickened, I should imagine even more quickened than it is in simple Pneumonia; 50 & even 60 respirations in the minute are common in such a condition. Coughing need not be attended with pain & is not often muffled except for the freeing of bringing up the expectoration. In my cases the latter was always present & prevented much the same features as does the simple Pneumonic fever; except that it may perhaps be of rather less virulent character.

The pulse is usually much more accelerated than in simple Pneumonia, for the alcoholic heart (fatty or filievid) tends to give way rapidly under this increased strain.

The face is flushed, some cyanosis in the lips & ears is common, the patient bears an aspect of great distress, & if the condition continues he becomes exceedingly prostrate & there is a constant struggle for breath.
under care of Brady jog 571
Herpes in a fully developed case I have not noticed, but it was present on the lips of a patient who died of Delirium Tremens, & in whom on P.M. examination intense congestion of the lungs was found, but no pneumonia.

The attack of pneumonia has in my cases followed the Delirium, or superimposed upon it. No doubt the Delirium often does not show itself until an attack of pneumonia be well advanced. The cases of this description come rather under the heading of Associated D. Tremens, & are not. I should imagine of such gravity as the cases I am treating of. Any chronic alcoholic case who took a Pneumonia would be liable to it, whereas in the other variety the patient has in the first place drunk so hard as to bring on D. Tremens, and a Pneumonia has in the second
Ziemann's Cyclopaedia. Vol 17 page 403.

Vide chart of P. Boylan. page 719.
- - - Mitchell. 695.

Vide C. Bovens' Chart. p. 737.
- M. Croc砭's Chart 749.
- W. Mitchell's Chart 695.

P. Boylan. page 719.
place engrafted itself upon it.

The character of the Delirium is often of a comparatively fierce fulness in these cases especially in the early stages. Ziemsen notes the fever & it was seen in two of the patients I observed.

The temperature seems to be very irregular & to show a tendency to intermit, & it may even fall to normal or subnormal, remain there for a day or two & then rise suddenly again to 103°, maintain this height for a few days but with wide daily fluctuations, sometimes as much as three degrees, & finally rise to before death to 106°.

It may rise steadily for three days & intermit fall by crises upon the 4th. day & not rise again. The condition passing off.

There was usually in the case I have observed, a tendency to a crisis or pseudo crises about the 4th day.
and death seems usually to occur on about the 8th or 9th day whatever may have been the course of the temperature in the meanwhile. Sometimes Delirium seems to take the place of a rise of temperature. In C. Burneis case I noticed that during the intermissions of the fever, he suffered from well marked Delirium, which passed off when the temperature again rose.

It is very important to notice (I do not think it has been pointed out before) that the Chlorides in the Urine were diminished to a trace, or may even be entirely absent, before any physical sign or symptom of the oncoming of a Pneumonia be present & before any rise of temperature has taken place.

This has occurred in every case I have had under observation.
Vide page 737

Vide page 695
In C. Buwenen's case, his temperature did not begin to rise until he had been in the ward 3 days, nor was there any other condition about him except the diarrhoea to give rise to the suspicion that he was going to have a Pneumonia, and yet upon the very day of his admission his Chlorides were found by me to be diminished to the nearest trace.

So too with Boylan, his temperature did not go up until the day after his admission, and yet his Chlorides which I examined for within a couple of hours of his admission in the middle of the day, I found to be scarcely perceptible at all.

In Mitchell's case, the diminution was not so great, but it is apparent.

I am thus led to believe that in pre-pneumonic congestion of the lungs the Chlorides are usually very greatly diminished, and I have
case of C. Bevans, age 74.

Mitchell  711
noticed that when the condition was fully developed, the Chloride, sometimes become more apparent than they were before the condition set in.

They seem also to be much influenced by the gravity of the attack in that is to come on, or that is already present.

In Mitchell's case they were not much diminished & his attack resolved upon the 4 th day.

In Boylan's case they were reduced to the present trace & both before & during the attacks & he died.

Of the truth of these remarks as about the marked diminution of the Chlorides before Pneumonia, I have some corroborative evidence afforded by P. M. examinations; for in two uncomplicated cases in which P. M. examination were granted, and in whose brains during life the Chlorides had shortly before death become
much diminished, the lungs were found to be in a state of intense congestion, pre-pneumonic congestion. I would venture to call it, and yet creptant I with no absolute sign of Pneumonia, although the Pathologist searched very carefully for such.

There facts would lead us to conjecture that the Chlorides may also be much diminished or absent in ordinary cases of Pneumonia before the attack is developed (during the period of Incubation) if we regard a Pneumonia as a Fever, but there are ordinarily no opportunities of ascertaining the fact.

The Chlorides then, I would venture to regret, should be always examined for in cases of Del. tremen, & I have had much reason to regard Their diminution as an omen of the greatest significance.
in fact I made it latterly my rule to send for the friends whenever I have found their diminution marked.

The patient Preston, who had an abscess over the sternum marked in addition to Del. Teemen, did not appear to be very seriously ill or in any danger, when his urine was first obtained for examination upon March 5th. The temperature was between 100° and 102°, pulse 120, Perfusion 24. Yet when I examined his urine I found the Chlorides all but entirely absent. I sent for the Friends who lived at Preston's, & I think I was justified by the course of events for within 36 hours he was dead.

Whatever then a marked diminution of the Chlorides in Del. Teemen, may depend upon, be it due to the oncoming of a Pneumonia or to the simple congestion of the lungs.
vide care of C. Burnees - 743

- - - P. Baylan - 731

- - - P. Baylan - 731

vide care of Mitchell - 709

- - - Baylan - 731

- - - Burnees - 743

etc
That proceeds from a failing heart, it is of very unfavourable augury & is often the herald of the approach of death.

The Phosphatæ become also much diminished during the complication sometimes to an extreme degree, but the excretion does not diminish much until the condition is well established & until expectoration has become free & hence the variations in their amounts are not of much value in a prognostic sense.

The Uræa becomes very much increased.

Albüræna seems to be more constantly present than in simple Del. Tremon. The Uræa otherwise resembles that of uncomplicated cases.
C. Barnes page 737
P. Bayliss - 719
W. Mitchell - 645
J. Bell - 751

Codic care of Corbett page 757
Another point, not I think previously noticed, in these cases is that diarrhea is usually present, at least in all the cases I have observed or have enquired about; P. Bylan frequently had seven movements of the bowels in the day; the condition seems to continue too unless checked by remedies throughout the whole course of the disease, so that the patient has in that another potent source of exhaustion. As the bowels of patients with Del. tetanus are usually constipated, any looseness should put one on one's guard.

Persistent albuminuric in Del. tetanus cases is of serious importance; of two such cases in Ward 6 while I was on duty there both died. Mrs. Brady
also had for some days slight albuminuria and the died.

Epileptiform attacks sometimes occur during Del. tremens, it seem to be unusually of service., if they precede the attack, they may perhaps, to some extent take the place of the attack, which may thus be correspondingly milder. This may have been the case in Malcolm, care upon his second admission. (Pape 777)

About the possibility of typical epileptiform attacks being brought on by excessive drinking, there can I think be no doubt. Bread seems to furnish an example of such a case.

Typhoid fever is occasionally at the breast of an attack of Del. tremens, and its tendency to cause hypostatic congestion of the lungs now seems to become more marked so that the patient has but a poor chance of surviving.

The course of the temperature seems
vedo peace 789
as in the complication of a Pneumonia to be irregular, & in the only case I have had an opportunity of observing, it exhibits a constant tendency to remit. The chief temperature 

* 

The death of heart failure & congestion of the lungs on about the 15th day of the disease. The eruption appeared in the case on about the 7th day, he had three hemorrhages, or rather three passages of very bloody stool on the 10th day & except for the course of the temperature there seemed to be no feature in this case that would not have been characteristic of a simple case of Typhoid fever.

I am indebted to Dr. Affleck for the information that Delirium Fever is sometimes met with in these cases. The urine of the patient varied was interesting.

The excretions of the Urine and of the Phosphates were not tended at all, an average increased in spite of the
waste of tissue going on; the Calciums were much diminished, but the remarkable feature was the very large amount of Indicans that was everyday present, of which forced one to turn one's attention to the Elementary System.

Alcoholice Mania.
Of this condition I shall not say much. Two such cases were admitted to the Ward this Winter. Under expectant treatment the patient recovered sufficiently to be able to go home in about six weeks.
but I have since heard that his
friends have been obliged to send
him to Morriseyide Asylum.
There was no family history of
Insanity or of Nervous disease.
He had been a steady heavy
drinker (10 glasses of whiskey a day)
for the last ten years, but owing
to a correction from his principal
he had been teetotal for the three
weeks preceding his illness, and his
friends ascribed the illness to the

There is no resemblance in the condition
to Del. Tremens; there are no tremors,
no perspiration, etc. The patient
did not sleep for at least a fortnight,
but he did not seem to lose much
strength. Hypnotism only seemed
to make him worse, etc

The other case was that of a man
who had been repeatedly in the
ward before & who had been a
heavy drinker for many years.


etc.
Alcoholic Mania

Of this condition I shall also say very little. There were two such cases in the Ward this winter. They were both brought in for having attempted to commit suicide; they improved more rapidly than did the cases of Mania & I have heard of no relapse. There is no resemblance to Delirium.

Of Circumcision I have no experience.

Pathology and Morbid Anatomy.

Morbid Anatomy. In cases that
die during the acute stage of simple Delirium, venous congestion of the cerebral meninges and of the lungs, also of the Medulla & Spinal cord (Gowers) are the only features commonly present that may owe an origin to the acute affection & to the manner of death. The Liver, Kidneys & Spleen may also their congestion & the latter may be intermixed with hemorrhages.

In the case of Drady who died after a prolonged (6-7 days) attack, a condition of intense & acute fatty degeneration of the organs was found resembling the condition found after poisoning by Phosphorus.

In most cases there are usually found changes that are more probably due to Chronic Alcoholism, such as the thinning of the Duramater, adhesions of it to the Calvaria, the thinning & thickening of the Dura mater, & both Arachnoid & Pia mater; a coa
Magnum Alcestisum. Prof. Greenfield.
Translation page 15.

Reynolds System. Vol 2 page 85.

vide page 127
Certain amount of sub-arachnoid effusion seems to be pretty constant. Peraseisms, my developed Pachymeningitis Haemorrhagic. Interna as resulting from the prolonged use of alcohol in dogs.

The cranial bones are often thickened, as in the case of Peady, page 57, and Dr. Arnot's quoting Bourneaux state that this is not a true hypertrophy, but that the skull case while losing much of its porous texture becomes denser and almost porcelainous.

The convolutions are often somewhat atrophied, the vessels at the base may be atheromatous; in Boylan's case a subtacite leptoma meningitis seemed to have been going on & the 3rd pair of nerves were being pressed upon which may have been the cause of the marked & persistent contraction of the pupils which came on only a few days before death. This was a very interesting feature, for evidence of a meningitis.
Though only subacute, occurring & progressing
during the acute paroxysm of Del.
tremens are not common.

The heart is commonly flabby.
sometimes it may be terribly degenerated
sometimes it is affected with a fibroid
change; evidences of Pericarditis
are sometime seen; I saw two
cases of hemorrhagic Pericarditis
in Vienna in which the Pericardial
sacs were filled with blood which
had oozed from the small vessels.

The values may be normal;
feature of Atheroma are sometimes
present in the aorta, or the
vessels generally show a tendency
either to Atheromatous or to Fibroid
change.

The liver is here more commonly
fatty degenerated than everted.

The Throat, often these fatty changes,
some time. There are evidences of commencing leucosis.

The stomata commonly show evidences of chronic catarrh, its walls may be thickened or thinned; small hemorrhages are sometimes present.

In the Pharynx - Larynx & Oesophagus, there are often epithelial thickening.

In cases, in which Alcoholic Paralysis had been present, changes in the peripheral nerves & sometime, in the muscles are found; much more rarely in the spinal cord & nerve roots I will refer to these changes again in treating of Alcoholic Paralysis.
It is said that alcohol can sometime be found in the brain when the skull cap has been removed & D. Every distilled alcohol from the brain & tested its power of dissolving camphor.

The odour could more probably be detected in those who have died of acute alcoholic poisoning than in those who have died in the collapse stage of Delirium tremens & who have probably had no alcohol, except it has been given medicinally for some three or four days previously. D. Bruce has informed me that he has never been able to detect its smell in those who have died of Del. tremens, nor have I in the few cases I have been present at.

What then is the pathology of Delirium Tremens?

The two essential causes of the condition seem to be - continued & excessive drunkenness of alcoholic stimulants and want of proper food.

It has long been debated whether the Delirium be occasioned by the direct toxic effect of the alcohol upon the brain or by the disturbance of that organ following upon the cessation of an accustomed stimulus.

D. Peddie, Prof. Laycock, D. Hughes, Bennett, D. Saunders, and others support the toxic-mie view, while D. Wood of Philadelphia, D. Cumming, & to a certain degree the late Sir T. Watson hold to the other view.

D. Wood says "This is the delirious affection which follows the suspension of the habitual use of alcoholic drinks. Its essential characteristic consists in the cerebral debility consequent upon the cessation of an accustomed excitement."
Dr. furner points out that when the usage of alcohol is cut off the man in the course of a few hours becomes sober, perfectly rational, often deeply remorseful, & in full & entire possession of his faculties, & during this stage he may take nourishment & even sleep a little. Then at a period varying from 36-60 hours the acute attack comes on.

This description expresses pretty much what I have noticed in the cases which form the groundwork of this thesis. Though the patient's mind may be clear, it is weighted down with a vague fear of what is to follow & with remorse for what has passed, it is incapable of taking any interest in what is passing or even of reading a newspaper & it seems to be wholly occupied in dwelling upon the miserable condition to which the system generally is reduced.
As all writers are then agreed, that excessive use of alcohol, either by its direct toxic effect, or by the nervous disturbance following upon its withdrawal, is the main factor in the production of Delirium Tremens, it will be useful in continuing the study of the subject to endeavour to ascertain the condition of the various systems, and the changes that occur in the organism, both before, during, and after, the acute Paroxysm.

Put briefly. Before the Paroxysm the general condition is one of intense depression. The systems seem all to be more or less disordered, & in the direction of being rendered temporarily functionless. He is miserably ill. His stomach rejects everything; he often spends his time in vomiting; his bowels are exceedingly costive. His heart is sometimes slowed, the pulse
soft & deictotic. The temperature is subnormal. (I am quoting from the case. I have observed only). There is a paresis of the muscular system. The blood exhibits change.

The mind is depressed, incapable of exertion, full of fears. There seems to be a growing irritability of the nervous system; tension increases & is so appreciated by the heart exertion that the patient can scarcely stand; the reflexes (sens. & tendon) become exceedingly irritable, epileptiform attacks sometimes occur, & the brain seems to be working up to its discharge point.

With regard to the eliminatory organs—Elimination by the lungs & skin does not appear to be in any way increased; & judging by the analogy afforded by the kidneys, it may be decreased.

The amount of urine secreted is much diminished; the urea & phosphate, & to a less extent the chlorides, are diminished & when the attack is just
coming on they are often reduced to a minimum. The reaction of the urine is usually alkaline pointing to the great diminution in the solids & to its being a mere separation of the watery element of the blood. due either to a temporary loss of function of the secreting organs in the kidneys or to greatly diminished bodily metabolism. Abnormal elements are also often present - a little albumen, a little sugar (sometimes a fair quantity such as 948 to the oz) etc.

**During the Paroxysm.**

But when the Paroxysm is in full progress, when it is at its height, then what a change has occurred! This general condition is not one now of quietude with intense depression (the calm before the storm) but of excitement and great agitation with continual but disorderly discharges of nervous energy & with increased
Functional activity of the various organs and especially of those concerned in elimination.

His stomach does not now reject food, he will swallow eagerly whatever may be offered him. His temperature rises, his pulse quickens; so far from being incapable of any exertion, he is now often violent, & may require active measures of restraint. One man is often insufficient as a guard. His mind has become exceedingly active, the fever delirium is present; his whole body is in constant movement. The elimination organs act energetically. The skin, which was pale before is now flushed & covered with profuse and constantly recurring perspirations.

The perspirations are increased. The fluid secreted by the kidneys becomes greater in quantity; if not absolutely, at least relatively, considering the large amount of
of water that is escaping by the skin. It was previously pale and alkaline it now becomes a rich red and very acid; its constituents increase greatly; the daily total of the Urea and of the Phosphates rises from the previous minimum by leaps and bounds. That is if the case is going to do well; as recovery comes on the amount of the urine increases very much sometimes from a previous daily total of from 10-20 ounces to a total of from 60-100 ounces. The blood becomes hypercholamine during the acute stage, which I suppose may be partly accounted for by the resumption of gastric digestion. The abnormal characters which it sometimes presents disappear.


After The Paroxysm.
The patient is much exhausted & complaint of muscular fatigue & of
Various aches & pains, but everything returns rapidly to the normal— he requires strength rapidly, his appetite is good, his bowel move.

The mind is clear & he makes many good resolutions; the tendon reflexes return not only to the normal, but often, as I should say usually, become so much diminished that they can no longer be elicited. The temperature & pulse incline also to the subnormal.

Taking then all these facts into consideration, I would venture to suggest that an attack of Del. tremens is the reaction of the system to the accumulation of a poison in the system, which may be either alcohol or its derivatives, or its metamorphosis and to its paralyzing action upon oxygenation, metabolism and elimination, whereby the proper functions of the body being imperfectly performed, waste products...
and imperfectly oxidised materials accumulate, leading in the end to an explosion and to a rot winding off of the materials involved.

To this end then we have the constant movements, the violent straining & muscular efforts, the positive inability to remain still, the sense & quickening of the pulse & respiration, the profuse perspirations and increased elimination by the kidneys. Hence too is the elimination organs act well, the rarity of relapses and the very rapid recovery, and I may add the short and self limited duration of the disease; hence too we can have all degrees of the disease depending upon the amount of matter movable to be got rid of and upon the activity of the eliminating organs; and the probable duration and gravity of the disease can be gauged by observing these activity.
Order Case of John Bedell page 659.

... Adam Freeby ... 403.

... Thomas Harley ... 423.

... John Noble ... 771.

... etc.

Outside Case of Alice Brady page 587

... Mr. Bentin ... 541
The cases appended be consulted & the urine charts be examined it will be found, unless exceptional circumstances were present as when heat or boils were frequently repeated as in Lower case, that in all the cases in which recovery was rapid & the duration of the paroxysm comparatively short, an excessive elimination of the urea and of the Phosphates began almost immediately, whereas in those cases which were prolonged & in which sometimes ended fatally the elimination of these constituents remained persistently low, that is to say, comparatively low.

The occurrence of associated Del. tremens seems to me to furnish a further argument in favour of the theory. A patient who keeps his system more or less saturated with alcohol meets with an accident or takes a pneumonia, which cause him to forsake his usual
habits and to taste to his bed, as we will say, be brought into an Infirmary. In both cases the alcohol is cut off and the influence of the fluid will carry further on, but in both cases he is placed at complete rest and the influences which his previous work and exercise had placed upon the processes concerned with metabolism and elimination are lost and hence those functions are carried on less actively at least in the first case, while in the second case fever & wasting occur, which throw an additional strain upon them and hence we get the Paralysis, & it may be that the Diarrhoea, which seems to me to be a constant symptom of a Del. tremens complicated by a Pneumonia, is but an effort of Nature to aid the process of elimination & to relieve the already overcharged Kidneys & Stomach.
Preliminary abstention

What relation does the outburst of the Paroxysm bear to the cutting off of the Alcohol?

As already mentioned it would seem that before a typical attack there is usually (in all my cases there was) a period of about 2-5 days of abstinence from alcohol.

The old theory was that when the brain was deprived of its accustomed stimulant, it gradually passed into a condition of debility characterized by the peculiar Delirium, & that this depredation was the cause of the delirium.

The explanation that I venture to offer is as follows.

The action of the Alcohol, as I have stated, is to diminish metabolism & to retard elimination, & up to a certain point for so long a time as it is taken, it tends to keep up & to intensify the abnormal condition it has brought about, and it is not
A faintness教练 him himself wrote a note to his not at present. All his notes on writing a letter about it was not to be depended upon. The only mode of recovery was to take a draught of the same agent. It may be that a second draught will come in the proper course.

But if do not believe that it is in any way essential, but that the patient is to recover from the excitement and in that case to recover from the Paralysis, which was formerly the usual way of recovery. They say & to that effect of their own knowledge. Of course no knowledge of the Paralysis can recover the patient sufficiently.
but if he continues drinking, he
will at last induce an attack
& one probably of a very severe nature.
but if we now, before he has
done this, suddenly cut his alcohol
off, we shall induce an attack
but of a milder nature.

The preliminary abstinence when
not induced artificially or by an
accident or intermittent disease
is usually produced naturally as
the first stage in the result of the
system against the unnatural
condition in which it is kept
fastened down.

Another question is Why should
there be Delirium?
Is this due also to excessive functional
activity following upon the state of
suppression and comparative paralysis,
in which they the brain cells have
for so long a time been kept?
But we might suppose it to be due to starvation of the brain. In all malnourishment of the brain we get more or less delirium. In acute disease - in the early stages of mental disease - in fevers (apart perhaps from the influence of high temperature or of toxic agents in the blood), but in all those cases some however small amount of nutritive food is being taken, while in alcoholism there is often absolute nutritive starvation.

Another view which has occurred to me is as follows. Suppose we regard the nerve cells of the brain as a sort of perpetually discharging electrical battery, we know that if we wound the battery...
too would without at the same time providing a preservative depolarising apparatus, that polarisation will eventually occur, our current will stop & if we continue attempting to drive it onwards we shall get, instead of the current we desire, a current set up in the reverse direction & it is upon this principle that electrical accumulators are constructed. This is what perhaps occurs to the nerve cells; they are over driven on and on in one direction by the repeated and persistent stimulation of the alcohol while elimination and downward metamorphosis are being checked - in the end the current that was being evolved from them gradually ceases. They remain for a short time in a semi-paralysed condition (Period of Incubation) & then slowly at first but afterwards at an increasing speed a current in the reverse direction sets in, depolarisation takes place, but the nervous energy discharged
is now emitted in an irregular and disorderly fashion and in excess — hence the delirium — muscular twitchings, etc., while at the same time a sufficient stimulus is nearly always able to temporarily arrest the morbid process going on.

Setting theories aside we know that it is the higher centres a these most specialized that during this affection suffer the most, cerebral control of the lower centres is gradually lost, the organic reflexes of micturition & defecation are in the end usually carried out automatically. The reflexes (Superficial & Deep) are much exaggerated & a sort of spastic condition is often superseded, the cortical motor cells sending down irregular discharges of nerve force setting up the disorderly struggling movements.
Diagnosis.

Simple Delirium tremens is easily recognized, the condition of the eyes and general expression, the tremors, the moist tongue, absence of thirst, fever or headache, the soft pulse and marked insomnia.

The true delirium when the patient is left to himself, all help to distinguish it from inflammation of the brain and its membranes, while the absence of rigors and of delusions and the premonitory hallucinations and illusions serve to distinguish it from ordinary fevers.

It may however be otherwise when it is associated with some other condition complete, where it is masking; the diagnosis may be difficult.

The most frequent & serious underlying condition is Pneumonia; & though when this condition is fully established, it should of course be easily recognized by the marked prostration, by the rapid breathing, by the irregularity...
and height of the temperature, by the physical signs & directions, yet have we nothing to guide us before it becomes fully developed or when it is in its latent stage? This I believe we have & I have already pointed out that it gives in the urine a very reliable index of its approach. Vide page 203.

Whether anything could in this pre-pneumonic stage of congestion be done to cut short the impending inflammation by active local measures, such as poultices & two-jointed slippers to the short wall I do not know, but it might be tried.

Of Typhoid behind an attack of Delirium Tremens we have the condition of the bowels, the watery stools, the haggard aspect of the face, the presence of Indians in very large and constant amount in the urine to aid us, and we also sometimes have Delirium Ascox.
General diagnosis of Alcoholism.

It is an interesting point as to whether we can, when a patient is brought in, it may be insensible, or with the history of having had a sudden epileptic attack or in a violent state, determine with tolerable accuracy, apart from the help that a careful examination of his general condition would afford us, the cause of his present condition.

The urine will, I believe, give us in almost all cases useful information as will enable us to positively exclude strychnine and excessive alcoholism.

We have been told to draw it off and to examine it by the Bichromate of Potash or by the Benzoic Chloride test for alcohol, but as I have already said in the explanation of methods used, there is at present no speedy & reliable test for the presence of alcohol in minute amount, moreover the best authorities are not at one
This Table does not apply to patients who are already in Delirium Tremens.

Vide case of Geddes. page 441.

... Greg... 501.
as to the examination of unaltered alcohol for the urine.

But I would suggest rather the careful general examination of the urine, as a method not only much free from fallacies, but as affording us a much wider and more reliable view of the case, and from the results I have obtained by the examination of the urines of a large number of healthy cases, I should, if I found the it possessed the following characters, feel justified in assuming that the care had at any rate an alcoholic basis. Vide quantitates. p. 529. etc.

1. The reaction should be either alkaline neutral or very faintly acid.
2. It should be pale coloured.
3. The sp. gr. should be low.
4. The excretion of the urea and of the phosphates should be very low.
5. A small amount (goji to the scene) of glucose is commonly present.
6. Indicam is commonly present.
7. Traces of albumen sometimes.
vide care of Anderson. page 691
vide care of Greig. page 499.
... Finley. 557
An important point to note in these cases is the occasional presence of albumen. For if a patient be brought in in a semi-comatose condition and with a history of having thrown fits and albumen be found in his urine, it might be at once concluded that he was suffering from leucemia, while he might only have taken an excessive amount of whiskey, we should therefore be on our guard and should examine further for casts and also for other and general signs of Bright's disease.

Can we predict the occurrence or the non-occurrence of Del. leucemia?

This is a point to which I have from time to time referred in the short commentaries at the end of the cases. Given a patient whose system is saturated with alcohol and who
has Insomnia, Tremors and loss of appetite, and who is in the depressed and nervous condition that usually precedes Del. Tremors, have we any means whereby we can form a fairly accurate opinion as to whether such an attack is likely to come on or not?

I believe that we have and that by means of the examination of the urine, for if we examine it from day to day we find it assuming normal characters, the reaction becoming acid, the excretions of the urine and of the Phosphates increasing etc. we are I believe quite justified in assuming that the acute attack will not come on and in telling the patient that he has for the time escaped, in that we know that the eliminative processes, upon the nonperformance of which in my opinion an attack of Del. Tremens depends, are now going on satisfactorily.
Prognoses.

In considering the prognosis of simple Del. fevers we should be guided by the duration of the attack, by the state of the Pulse, by the Temperature, and by the condition of the Urine.

If the attack lasts more than four days the prognosis is a serious one.
If the Pulse be persistently above 120 in frequency, or if it be irregular and weak, the prognosis is bad.
If the Temperature rise above 102° we should be on our guard, for it sometimes in such cases rises suddenly to 106°, 107°, or 108° and death occurs.
But it has appeared to me that the daily careful examination of the Urine affords one by far the most reliable guide in forming a prognosis.
If the amount of urine passed throughout the attack continues to be much diminished, if the solids do not largely increase, the prognosis is not good and we must at the best expect that the attack
will be a prolonged one; while if the Chlorides become much diminished the case in my judgment is an almost hopeless one.

The mortality of simple Del. Baren has not at the present day appeared to be at all a high one. Of 344 cases occurring during the last 6½ years in this Ward, but ten died - giving a mortality of about 3 per cent.

The prognosis of complicated Del. Baren I have already sufficiently described.

Treatment.

This furnishes us with an instructive history of the progress of medical science. Such cases were at first treated by bleeding & depletion, later on by large to enormous doses of Opium & other me narcotic and stimulants, and last of all since the self limited
Edinburgh Medical Journal
Vol IV. Page 304.
The character of the affection has been recognized by the to a large extent expectant plan combined with a due regard to the support of the strength by strongly nourishing and easily digestible food.

Prof. Laycock was, I believe, the first to introduce the expectant treatment and his tables in the Edinburgh Medical Journal are too well known to need repetition here.

If we put the result briefly we find that the mortality of those treated by the Expectant method varies from about 2% to 10% while the mortality of those treated with opium and alcoholic drinks from 10% to 50%.

The latter is the Glasgow Infirmary from 1842 to 1848 when there were 35 cases and 17 deaths.

Whether the statistics include cases of Pneumonia I do not know.

Looking upon the disease then as one which has a definite course to recur...
one of the main indications is to
deposit the strength and to obscure
the tendency to death by failure of
the heart in the stage of exhaustion.
Trench and egg beaten up in it and
beef tea should form the staple of
the diet. Prof. Laycock pointed out
that a dish of strong and hot beef
tea with wine in it at night
often acted as an excellent soporific.
This was repeatedly tried during my
appointment, without success, but
usually without the wine.
The rejection of food by vomiting I
have never in the acute. But often
in the febrile stage observed, it
should cease no doubt feeding
with peritonized enemas would be the
proper course to pursue.

Of medicinal remedies—The Bromides,
Chloral, large doses of Digitalis. Perahedrine
and Sulphonral have been recommended.
The Bromides & Chloral together in
ten grain doses of each and repeated
every half hour or hour until eight
seventh doses had been given seemed to me
after repeated trials to have only the
effect of weakening and depressing the
patient without producing sleep or in
any way controlling the delirium.
They have also often been administered
in conjunction with Digitalis and Sal
Volatile to avoid their depressing effect
but without any obvious result, but
I believe Digitalis by its increasing
delirium and by its strengthening the
heart's action to be a valuable drug
in this affection.
Caffeine and Antipyrine is another
combination that has been during my
appointment several times tried, the
former because of its Digitalis action
and because it is a sort of counter
stimulant to alcohol and the latter
because of the calming and sedative
action that it usually has upon the
nervous system. This combination I
believe to be of value especially in
mild cases and in those in which
great veritability of the Nervous System without Delirium is a prominent feature. The patients always told me that they felt calmer and steadier after taking it; it must be pushed. Three grains of Caffeine and ten grains of Antipyrexia may be given every half hour or three until six or eight or even more if such doses have been given.

But that it has any abortive influence when the attack is well developed I have not observed.

Begot should I then be tried, it acted magically in one or two mild cases in which it was first given after one or two doses the nervous depression, the irritability, the restless condition and the Insomnia disappeared.

In all cases, I think, an aperient and especially a cholagogue and headache stimulant, fresh as a dose of Calomel or Blue Pill should at the outset be administered. To give appetite the Tincture of Capsicum may be given.
The flat aci bath has seemed to me to have a decidedly quietening and soothing effect, in the case of Malcolm who was very restless at midday and possessed with the delusion that he was going to be executed and who had had several previous attacks and was a bad subject. The hot aci bath given him for an hour in the afternoon produced a most determined sleepiness and soothed him that he slept the same night, although the disease had only begun to be acute some 16 hours before.

To recapitulate the treatment:

The strength should be supported by easily digestible and nourishing food with Cardiac Tonic of necessary and Metabolism and Elimination should be aided as much as possible by giving Aperients, Choleragogues, Diuretics and Diuretics of the latter I believe that the hot aci bath is in this affection the best.
Hypnotics should, I may venture to say, be rather avoided during the acute affection. They have seemed to me to do harm rather than good, and if my theory of the disease be a correct one they are distinctly contra-indicated.

As to alcohol, I think it should be avoided when possible, and that it should only be employed just when it would be employed in other acute affections, viz., when the pulse & strength are failing and that even then other stimulants should be preferred to it, such as Sal volatile.

I should like to point out in conclusion, that there appears to be in Del. fremen, a remarkable insusceptibility to charms of all kinds. This has been claimed for Opium & for Digitalis, but I think the same holds good with other drugs.
A word with regard to restraint. Patients would, it seems to me, be much better without any kind of physical restraint except that of a trained attendant constantly beside them, for anything which hinders their movements during complete elimination & the more exercise stopping short of exhaustion that they get the better it is for them; hence when the undivided attention of a trained male nurse is not serviceable, rather than fasten them down in bed when they are violent, it would be better to turn them into a padded room where such a room is at hand & let them run about in it as much as they choose. The disadvantages of the method are that it is difficult to give them there any kind of treatment or food unless they are willing to take it & accurate clinical records as to temperature and amount of urine passed etc cannot be kept.

On the other hand by confining them to bed by fastening them by the wrists to either side of the bed, they can be kept warm, fed, thoroughly watched and examined.
Chronic Alchoholism.

I will only refer briefly to this part of the subject because I have not had so many opportunities of observing the condition as I have that of the acute.

The symptoms & changes due to chronic Alchoholism are simply postum in their character.

The patient's general appearance I have sufficiently described in the article of Dr. Beermann. (The examinasion of the patient upon his admission to the Infirmary.)

The only system to which I shall refer will be the nervous one, for it exhibits the most important changes.

Patients, especially women who keep their systems more or less perpetually saturated with alcohol are apt to
St. Bartholomew's Hospital Reports. Vol 22.

Papers by Sir Dyce Duckworth.
suffer from a form of sensory & motor paralysis; this is not brought on by any heavy debauch, but from a perpetual soothing, such as a bottle of whiskey a day and especially if food be not taken.

Various chronic changes in the central nervous system have long been known to occur in such patients. I have already mentioned viz. thickening of the membranes, with opacities and subarachnoid effusion and some atrophy of the cortex etc. etc. but it has only been recently pointed out that in cases of alcoholic paralysis changes in the peripheral nerves are present. These consist essentially in chronic inflammatory and degenerative changes in the nerve fibers and Perineurium, a sclerotic change in the fibrous investment leading to or accompanied by a degeneration of the proper nerve elements and they become unable to taste or the skin. They ordinarily will taste on.

Lanceaux, Dressfield, Hadden and
Paralysis from Pernicious Neuritis. Buzzard, page 70.

Pernicious System of Medicine.

Veile, Havley, Page 417

Prep. 489

Veile Paterson 783

Anderson 685
Others have given unequivocal proofs of this.
An intestinal irreguinity with fatty infiltration
and degeneration of the sarcous elements is also often found.

Apparently the earliest reference to this disease was made by D. Letton in 1789. Then in 1822 D. Jackson of New England described some cases of it & since then it has been noticed & described by various writers.

The symptoms begin insidiously and paraesthesiae of various kinds are often first met with. Though the terrors which occur on voluntary movement is commonly in chronic alcoholic patients has usually preceded there. Sometimes weakness pains, tinglings, and almost always cramps occurring in the calves are complained of. Headaches sometime. Frontal sometime. Occipital. Numbness & coldness & a peculiar dead feeling in the toes. The cramps are often very severe. They come on in the night and are often so
Ovide. Anderson. page 685

Ovide. Fruté. page 605

Ovide. Anderson. page 687

Ovide. Paterson. page 785

Ovide. Fruté. page 807

Mæpæn. on Alcoholism. translated by Prof. Greenfield. page 198.
severe as to cause the patient to get up suddenly out of bed, and they may have several attacks in a night.

Cutaneous hyperesthesia is a common phenomenon. This seems in my experience to be usually worst below the knees; after a time this may be followed by anesthesia while the muscles become tender, and it is almost characteristic of the condition to find Cutaneous Anesthesia and Muscular Hypoesthesia and on grasping the muscles the pain elicited usually lasts some little time after the hand has been withdrawn. In Anderson's case there was delayed transmission of stimuli from the thenar, and in Ann Henderson's case under the care of Mrs. Affleck, one could sometimes count seven before the stimulus was felt. Sensibility to temperature may be lost.

Magnum describes a Hemi-anesthesia form affecting both the general sensibility, the special senses, and the mucous membrane, and combined with Hemi-epilepsia, though the latter may not be so marked as the
hemianesthesia, and may sometime be recovered from while the anesthesia persists. Both sides of the body are indifferently affected.
In the optic discs one may find slight distinct: I have not noticed except after great excess.
Hypersemia and congestion of the discus. I have not noticed except after great excess.
The pupils have always in the cases I have observed reacted normally to light and to accommodation. There has been no limit in the field of vision. D. Fragnan describes various colour perversion, blue to black for violet, green for green, etc.
Tinnitus is very common, buzzing and ringing sounds seem to occur most frequently. The hearing is often much dulled. Taste and smell have seemed to me to be usually fairly normal.

To the Motor Functions; The Organ
Vide Grieve. page 491

Fleming. 807

Lawrence. 347

Greene. 521

Farmer. 453

Anderson. 687

Vide Noble. page 767

Anderson. 687

Vide Anderson. page 687
reflexes are usually quite under control. The Tendon reflexes are often very much exaggerated and particularly directly after a drinking bout, or they may be diminished or absent. The difference therefore depends upon the degree to which the tetanus has gone. Though in greeks' cases who had already been in the ward five times, they were very much exaggerated, too, in mutes' cases, and in the majority of the other chronic alcoholic cases that I have had an opportunity of examining. The Plantar and Bemasterói reflexes are sometimes diminished, but often are exaggerated.

Sudden weakness in the lower limbs is next often complained of. The patient while walking may feel his legs suddenly give way under him and may fall. The extensor muscles of the legs are usually the first to be affected; a Paralysis with wasting attacks them often and usually...
vide Greciq. page 491

Anderson. 687

Buzzards’ Preparative Manual. page 93.

Vide Paterson. page 765.
more upon one side than the other,
this leads to foot drop and to inco-ordination of the foot: the disease may next attack the arms and produce wrist drop.

Dr. Bizzard says that dropped feet are a characteristic of alcoholic paralysis, as wrist drop is of lead paralysis.

In Paroxysmal cases, a cataleptic condition was present, the limbs would remain in whatever position they were placed and the carted for some days. Increasingly difficulty in walking with a tendency to Ataxia may now come on, but I never saw any approach to the exaggerated movements that were common in Locomotor Ataxia, and Coordination and muscular sense do not seem to be very much interfered with: greater and greater weakness may now come on particularly in the lower extremities and eventually the patient may become completely paraplegic.

Elective Involution: The fasciculi stream gradually fails in well marked
Parotid Neuritis. Buzzed. page 85

Unde care of Paterson. page 789.
Cares to produce any contraction and the reaction of degeneration becomes gradually established; this is a sign which helps to distinguish a case with ataxia manifest from true locomotor ataxy.

Drs. Buzzard says that he does not know how to explain the occasional exaggeration of the tendon reflex, unless it be due to interference with the inhibitory influence of the cortex cerebi caused by the action of alcohol. It would appear to me that in Peripatetic Recruits, just as in Central nervous disease, we get at first a period of irritation and later on a period of depression and loss of function; that the sensory fibres particularly those distributed to the skin are the first to be seriously affected and afterwards the sensory motor fibres to the muscles and vegetative nerves. Thus the following order seems to me to be commonly observed and we may in the person of one patient have the various stages as we proceed from the periphery to the centre.
1. Cutaneous Irritation phenomena, causing
    Tingling, Parasthesia, Neuralgia, etc. Hypoesthesia

2. Cutaneous Depression phenomena, leading to
    complete Cutaneous Anesthesia and
    trophic disturbances.

3. Muscular Irritation phenomena, causing
    Cramps, Catatonic condition,
    Muscular Hypoesthesia,
    Exaggerated Tendon Reflexes.

4. Muscular Depression phenomena, leading to
    loss of the Tendon Reflexes, loss of power and wasting.

We should therefore expect in well advanced cases, to find Muscular Hypoesthesia replaced by Muscular Anesthesia. I do not know whether this has been noticed. Atrophy has sometimes been observed.

Vasomotor & Pubococcis functions.
The muscles waste as already mentioned, occasionally the muscles of Respiration.
may be attacked, and death may follow.
Sudden flushing or Pallor sometimes
at other times, great quivering of the
pulse perhaps to 150, may occur.
Besides these symptoms there may
be a roddens and adenomatous condition
of the limbs, patches of glossy skin
and other tropic disturbances.

Cerebral & Mental functions.
The memory is usually impaired,
in half an hour they will have forgotten
their dinner. Irritability and restlessness
are common. Defective judgment and
self control & moral degradation.
Delusions are frequent, there are
often of a painful nature; sometime
they will tell you they have just
been down Leith Walk or been to
Queensferry although they may not
have been out of their beds for a week.
A sort of Imbecility may follow,他们
become listless and lie in bed content.
with anything. They usually sleep badly at night.

Epileptic attacks may occur though these are commoner in the acute condition. Phthisis does not seem to be at all uncommon; see Dyce Dutt's work, mention this, and there were three or four such cases in the ward during my appointment.

Necrose - Necrosis or softening of the brain or general paralysis may terminate the condition. The patient Christiana Cameron had just an attack of Dr. Beerman and afterwards a tremendous apoplexy.

The special characters of the disease are:

1. That it is progressive and from below upwards.
2. That it affects both sensation and motion.
3. That there are no visceral or organic changes.
4. That women appear to suffer at an early age.
ape from it and in larger proportion than men.

Diagnosis:
It may resemble locomotor ataxy, but in this there are, except in the con genital form, no tremors, no wasting or paresis, unless the ant. convexity of the cord become involved; the Arequipa Proterton symptom is present & there are visceral disturbances, it is also uncommon in women.

A Transverse Myelitis would be distinguished by Bladder and Bowel Trouble, Bedsores and the History.

In Poliomyelitis Anterior Acuta or Subacuta there are no sensory or mental change.

In General Paralyz, there are ideas of grandeur.

In Paralyz Aiptes, the tremor differs
and Tension is present and there must be no sensory changes.

To distinguish Simple Softening, the history and absence of tremor should be noted.

Proposed:
The authorities differ very much about this, but it would seem to be good if stimulants be given up & proper treatment be adopted.

Ann Henderson, who was under Dr. Affleck’s care and in a most advanced stage of the disease, made an excellent recovery.

Treatment:
The withdrawal of stimulants is the most important element in the treatment. A nutritious diet is necessary. Internally it is best to give von, arsenic, quinine, strychnine and
Cod liver oil.

Massage occupies the first rank as a remedial measure. Electricity is useful; the application of the current may be attended with much pain & it should therefore be employed with caution and of only moderate strength.

The main points to which I would direct attention in this Theses are:

1. The division of Del. teburns into stages according to the Skampyrf nervous conditions & to the activity of the Metabolic & Eliminative processes.

2. The condition of the Urine in Del. teburns in regard to its general characters, to the presence of certain abnormal ingredients and particularly to the preliminary elimination and then very great increase in the excretion of the uric & Phosphates.

3. The Reaction of the Blood in Del. teburns.

4. The Pathology of Del. teburns - the regarding it as somewhat analogous to Acute Gout.

5. Diagnosis of Alcoholic conditions by the examination of the Urine.
6. Prognosis and determination whether the patient will have Del. tremens or not by the examination of the urine; the significance of the Chlorides.

7. The principal complications of Del. tremens and their characteristics.

8. These diagnosis by the examination of the urine.

9. Treatment by encouraging metabolism and elimination and by avoiding Hypnotics.