AN INaugural dissertation
on Dilatium Tremens

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by

J. Maclin Driver

of Kentucky

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To

W. H. Bowling, M.D.
Professor of the Theory, and Practice of Medicine, in the Nashville University.
This thesis is respectfully dedicated, by

The Author
I have chosen this disease as the subject of my thesis, not with the expectation of advancing anything new concerning its pathology or treatment, for I think this impossible in the present state of our science, but from the fact that my facilities have enabled me to investigate more cases of this frightful malady than of any other disease. The designation of Delirium Tremens originated with Dr. Sutton in 1818 previous to which time nothing positive was known concerning this affection, except a few ideas advanced by Dr. Pearson, Carter and others near the close of the 17th century. Dr. Worr of Philadelphia
s "The stimulating mode of treatment was practiced in that city for upwards of 50 years prior to the publication of Dr. Suttles' tracts." He however fails to inform us as to their knowledge of the disease, only saying the stimulating treatment was pursued.

The causes of this disease are both predisposing and exciting. Under the first class are may place as the most common and efficient, the long and excessive use of alcoholic liquors; whether to indulge in the habit formed tippling, whereas the individual is never absolutely sober; or to remain for a long time in an absolute state of intoxication. We have also as predisposing to an attack, the excessive use of
any narcotic drug; great mental operation, low state of the system, loss of blood or any circumstance producing excessive drains upon the animal economy, such as severe disease, hunger, masturbation, etc. As regards the predisposition of sex and season; we find the odds largely in favor of the male, notwithstanding a smaller relative quantity of alcohol will produce the disease in woman than in man. We see more cases in summer than in winter, as the quantity consumed is then smaller. We meet with the largest number of cases between the ages of thirty and sixty, no case being recorded under twenty two. As regards causes we find to be the most common and efficient to be the deprivation of a stimulus
to which the brain has accustomed itself. We however may have the disease to occur during the progress of a drunkard's disease; for it is not dependent upon nervous depression or exhaustion following long continued excitement, than upon disordered nutrition. As exciting causes we may have a severe disease, a violent injury, severe loss of blood, mental anxiety, bodily fatigue, etc.

Delirium—a picture of the result of the immediate effect of alcohol upon the brain is characterized by much violence; the patient is regardless of personal danger and will madly rush upon what may prove his ruin; is very talkative; requires much restraint to prevent him injuring himself or others; the head is
hot, countenance flushed; eyes suffused; pulse rapid, strong and full. Convulsions may occur, and stupor coma and death result. At this stage we often have tremors which most usually mark its transition into Delirium Tremens, or some settled form of insanity.

Delirium Tremens proper as supervening upon the abstraction or diminution of an accustomed stimulus, most generally makes its appearance from the first to the third day succeeding the over-indulgence or cessation. Its approach is generally indicated by certain premonitory symptoms. The patient will complain of great debility, of feeling unwell without being able to explain his ailments.
his spirits are depressed; his temper irritable and obstinate; he manifests great
distaste for his ordinary avocations, sleep, unsoundly, and is often aroused by
frightful dreams, the absurdity of
which it is difficult for him to realize.
We now often witness a loathing of food,
nausea and occasional vomiting. The
bowels are irregular, with loose
bilious discharges. Slight tremors
often occur at this stage, and the
anxiety, loss of sleep, restlessness increase.
Up to this time the tongue remains moist,
the pulse soft and comparable, sometimes
quick and irregular. The disease with
proper treatment may now subside,
but most generally the watchfulness
and delirium become complete. The
shatters incessantly, will suddenly arise
and seek for something in the room; will give orders to persons not present; the same difficulties which beset him in his dreams now torment his waking hours. His attention is readily fixed but soon returns to delirium, his pulse is quickened from exertion but still soft and compressible, tongue moist and creamy, pupils contracted, but no intolerance of light, a marked difference in the temperature of the body and extremities, the former about the usual standard, the latter cold and covered with a clammy perspiration, sometimes emitting and unpleasant odors; the bowels are evacuating with occasional discharges of a dark, and offensive material; the urine is generally scanty and high colored. There is now no end to the hallucinations, terrors, and fancies.
which fill the patient's mind. Accompanying this train of symptoms, there is one very prominent and rarely absent—the fear of some impending evil. The mind, that unthinking essence, the harmonious workings of which, has stamped upon man the image of his God, becomes filled with terror and despair; the poor wretch fancies every man's hand against him, and from this state of gloom and despondency he occasionally sinks into absolute inactivity mingled with a peculiar shade of melancholy. These symptoms may continue from three to four days, alternating from better to worse. It may however last from two days to two weeks. At the close of these periods yawning and drowsiness
come on followed by sleep, indicating a favorable result. The patient at first may arouse from his sleep and resume his delirium, but soon sleeps again, which may continue from six to forty-eight hours, and the patient awake rational. But on the other hand the symptoms may continue to grow worse until death closes the scene. This may occur suddenly even whilst the patient is considered convalescing, or during sleep when there is no grounds for apprehension of such an event; or the patient may continue violently delirious and suddenly cease to live. Most generally however the fatal end approaches more gradually. The hallucinations cease or are unconnected; the patient is greatly agitated and with difficulty
restrained to the bed; if "effusive haemorrhagie place
the pupils will be dilated and tongue brownish
towards the centre". In addition to these
symptoms we have preceding the fatal
event low muttering delirium, subsultus-
tentendum, convulsions etc.

This disease
like all others presents various complications.
The most ordinary are: the vascular con-
gestions and inflammations peculiar to the
season and climate. Thus we have during
summer, diarrhea and dysentery, in winter
Pneumonia, cerebral inflammations, the
various acute and chronic affections of
the alimentary canal, liver and kidney.
The various forms of mild fevers, the acute
forms being said to prevent its development.
We may also have as a complication the occur-
rence of any accidental injury. All these
Complications demand of us a careful and thorough investigation, for by their own treatment must be guided.

The diagnosis is generally attended with but little difficulty. The diseases for which it may be mistaken are encephalettis, the delirium of fever and the various forms of insanity. The mode of invasion of encephalettis is sufficiently distinct to distinguish it from the diseases under consideration. Encephalettis is very abrupt in its approach. The patient after a few hours becomes furious and delirious. In Delirium Brownsee the patient complains of general indisposition, disturbed slumber, loss of appetite for a day or so preceding the attack. In Delirium Brownsee there is little violence of delirium, the patient is mild and tractable. His pulse soft and compressible, tongue moist and creamy, skin moist
and relaxed, intolerance of light or sound. Whilst in encephalitis, there is violent delirium, pulse hard and resisting, tongue parched and red, skin hot and dry, great intolerance of light and sound, and an absence of the fantastic hallucinations, and muscular tremors as prominent in delirium tremens. Dr. B. Jones has found the quantity of the phosphates secreted by the kidney to be below the usual standard in delirium tremens, the reverse being the case in encephalitis. In delirium of fever, there is an absence of the fantastic hallucinations, muscular tremors and so on, so characteristic of delirium tremens. The approach of insanity is more gradual in its approach, and more persistent than delirium tremens. There is also no disturbance of the general motor functions in insanity, whilst the reverse occurs in delirium tremens.
The prognosis of an uncomplicated case of Delirium Tremens is generally favorable. It however must be guided by the number of attacks, various complications, habits, age and strength of the patient. There are present in the course of bad cases certain signs of unfavorable import by which our prognosis must be guided such as obstinate hemigliss, cold surface with clammy sweats, brown dry tongue, exsanguine tremors, small pulse, incoherency, low muttering delirium, convulsions etc. Absence or declension of these symptoms are indications of a favorable result. It is very rare that a case of pure Delirium Tremens leaves any morbid appearance. Even those cases wherein we see morbid changes should be best to regard them as contingent upon the habit of the patient. There is however sometimes seen a general atrophy of the brain; the convulsions
much shrunken, subei large, the subarachnoid space filled with a fluid of a jelly-like consistency, the substance of brain stiff and watery, the convecticies much distended with a serous fluid. The arachnoid is found thickened and sprinkled with white spots. The saccharionian glands are sometimes enlarged. In those cases occurring as the immediate effect of asphyxiation the appearances are more manifestly inflammatory; the vessels of the brain, more particularly those of the pia-mater and granum-interpositum are slightly injected. If a case of this latter kind proves fatal before the poison is fully eliminated from the system, the heart and large arteries, the liver, spleen and kidneys are filled with dark ironous blood, in which alcohol has been detected. In these cases the stomach is often much inflamed, presenting its inner coat much injected. Another case we see drooping of.
the pericardium, softness of the muscular tissue of the heart, the various chronic affections of the thoracic and abdominal viscera. None of these appearances are constant, the disease being met with where they are absent and vice versa.

Even in the present advanced state of medical science nothing has yet been offered sufficiently explanatory of the pathological condition upon which delirium tremens depends. From a careful review of the symptoms and a knowledge of the ordinary effects attending the ingestion of alcohol, I shall conclude that these forms of delirium are due to some morbid impression made upon that part of the nervous system, which physiological experiment and clinical observation have determined to be the centre of intellectual actions—namely the superficials of the brain. A preliminary solution to bring about this change must be the presence of some poison circulating.
in the blood. That this poison is alcohol, the experiments of Dr. Perry leave us no room to doubt, “alcohol having always been detected in the blood of these animals poisoned by it, provided they did not survive its introduction in the stomach sufficiently long for it to be eliminated from the system.” Breckat and Grandois have detected alcohol in the portal circulation of mice, dying from immediate drinking. That this poison in blood will more materially affect the vascular matter of the convolutions of the brain than any other part of the economy is very obvious, it being in such close proximity to the pia-mater “a network of blood vessels from which innumerable blood vessels dip down and penetrate its substance.” Again as producing this convulsed impression upon the brain, we have the alcohol displaying
a selective affinity for the gray vesicular matter of the brain, just as atrophia seeks the centre of implantation of the optic nerve or straining the spinal cord. As proof of the existence of this selective affinity, we have soon after the injection of alcohol, talkativeness, rapidity and variety of thought, exhilaration of spirits, animation of the features etc. Again DePuy found in the brain of those animals to which alcohol had been administered "a considerable greater quantity of alcohol than in a relative amount of blood," proving clearly its affinity. The results attending this continued application of a stimulating admixture to the brain is found great excitement inducing at times as we will see, the disease the denominated delirium a partie. The second effect, depression from over-stimulation this Humboldt proved by the immersion in alcohol of the cranial nerve of a frog.
He found the irritability to be soon lost, if the stimulus was steadily applied. Hence we account for delirium tremens occurring without an intermission of the usual climacteric. Another mode of producing these forms of delirium is by means of defective nutrition. Since we have the chemical, vital, and physical properties of the blood changed, producing the coagulation of its albumen and impairment of the solidifiability of its fibrin—A state of the blood in the highest degree capable of preventing healthy nutrition. The theory that of mere incidence is that the forms of delirium mentioned are due principally to an alcoholic poison circulating in the blood, having an affinity for the gray vesicular matter of the brain, thereby causing depression by overstimulation, and the same effect by reverting the general nutritive operations of the brain, by deterioration of the blood through the channels mentioned.
In the treatment of Delirium e-poteu, we must endeavor to eliminate the alcohol from the system, without too much depriving the vital powers. The milder cases outside most generally themselves, but if we are called in, we may if there is reason for believing the stomach contains indigestible substances, administer an emetic—the best being one of the vegetable kingdom. Of course this procedure would be contraindicated if there was irritability of the stomach. In such an instance, we would administer ice and drinks, small doses of maphaque, the offbearing draught, with small doses of potash, soda, ammonia etc. Where there is much determination of blood to the head, we may cautiously apply cold or leeches to the temples. The bowels should be kept open by small doses of oil and magnesia.
Pelusium Tremens being dependent upon cerebral exhaustion and perverted nutrition, the indications to be fulfilled in the treatment are: first to support the brain and quiet nervous disturbance by procuring sleep; second to restore the balance of nutrition. For the fulfillment of the first indication no remedy has been found equal to alcohol in drink. But here a moral principle interferes; it seems as if nature has brought about this change for the purpose of checking the poor imbriate in his mad career. Besides we have a remedy nearly as good, in some of the opium preparations called opium during the premonitory symptoms, we should endeavor to cut short the disease. We may administer small doses of opium and repeat
them often. Probably the best preparation is
ten drops of the tincture with an equivalent
of the elution of Morphine, or Hooffman's
anodyne with camphor mixture every
hour or two. If there is nausea or
vomiting as it often the case we may
administer the above prescription in a
small quantity of sulphuric ether or
aromatic spirits of ammonia with
water; or we may administer a larger
quantity by the rectum. If the nausea
and vomiting continues, we may alloy it
by anodyne fissions over the epigastrium, by
counter irritations or the means of some
of the delirium statu. Moderate purgation
is useful, best obtained by a turpentine
enema, magnesia etc. these means with
a nutritive diet will often succeed in
checking the delirium. Should these means
fail, and the disease increase, we must proceed to more energetic measures. We may give the tincture of opium in from one to two draughts doses every two or three hours, steadily pursuing this plan until sleep ensues. Upon the occurrence of this everything should be excluded from the room calculated to disturb the patient, unless it assume the appearance of coma. If the patient is aroused, we may promote sleep by small quantities of warm negus or yolk of egg beat up in warm water, ginger and brandy.

If the opium fails to have the desired effect and the pupils become much contracted, we must suspend its administration for awhile, or combine it with camphor or substitute another remedy; for instance a dose of acetate of ammonia, alternating.
with opium. We may sometimes obtain happy results from combining with opium small quantities of alcohol, quinine, coffee, spirits, sulphuric ether etc. The beats should be kept open by magnesia, castor oil, rhubarb or aloe, and when the hepatic secretion is deficient by colostrum. In the last stage we must sustain our patient by ammonia, carb, brandy today, milk punch, essence of beef and wine. Where there is coma all sedatives should be stopped and a blister applied to the scalp. We may have to bleed in very robust persons, to obtain respite from convulsions, but we must proceed very cautiously. The patient may be allowed as much liberty as may be consistent with his sense of the safety of others. During convalescence, give the most nutritious diet, administer tonics 9c.
In the treatment of this affection, there has been, beside those mentioned, great many remedies recommended, such as the inhalation of chloroform, the cold douche, digitalis, hyoscymamine, tincture of hops and numerous others all which may prove of much avail and should be used when circumstances demand them. Such is the general plan of treatment which must be modified by any existing complication. If the complication be a severe injury, the quantity of quinine must be increased until the head be injured. If encephalitis we must resort to both general and local blood-letting; being very cautious to only draw blood enough to prevent disorganization. In other complications the indications are so prominent, that I shall not speak of them.