

On the
History of the Treatment of
Delirium Tremens.

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Summary, good. *



In using quotation marks (" ") in this paper, I do not mean that the words included are necessarily used by the author quoted, in the exact order I have given, but merely that ^{the} words are used by him. I have always adhered to the general meaning of the author, as I understood it.

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... Diminution of health, and the existence of
disease, are the direct results of the disturbance or re-
moval of one or more of the conditions of health, so
that the whole extended subject of the phenomena,
nature, and causes of special diseases and injuries
resolves itself into the investigation of the immedi-
ate or more or less remote disturbances of the con-
ditions of health. ... It appears that the removal of
disease consists essentially in the adjustment of
previously altered conditions of health, and that
the part ^{which} you have to take in the recovery of those
who may require your assistance is therefore al-
together indirect and secondary. Address to Edin-
burgh Medical Graduates, Aug. 1. 1859. By John
Goodsir, F.R.S., Professor of Anatomy. Ed. New Philo-
sophical Journal, New Series, Oct. 1859.

The distinguishing characteristic of modern improvements in the treatment of disease, is the evidence they give of fuller recognition of restorative power inherent in the system.

Medical men are at last perceiving, that rational treatment for the cure of disease must aim at, and only at, prevention or removal of hindrance to the operation of the natural tendency of the body to health: and that, therefore, a knowledge of the nature and power of this tendency is at least as important to them, as an acquaintance

(a) *Tracts on Delirium Tremens, &c.* By Tho^s. Sutton,
M.D., &c. London. 1813.

(b) p. 3.

acquaintance with the pathology of disease, or with the effects of direct medicinal treatment on the body. They have doubtless gained much directly, in modern times, by additions to their scientific knowledge, and to their means of cure; and by better understanding of what it is that they ought to do, in treating disease: but they have gained more indirectly, by fuller perception of their ignorance and powerlessness; and by clearer discernment of what it is that they ought not to do in the management of the sick.

It seems to me, that no better particular illustration, of the truth of the foregoing ^{remarks,} need be wished, than is to be found in the history of the treatment of delirium tremens. I shall endeavour to show this, by giving a sketch of that history, and then making a few observations thereon.

According to a tract on the disease, published in 1813, by Dr Sutton (a), who seems to have been the first to use the term delirium tremens (b), it appears: that, previous to the ^{above} date, delirium tremens had "generally gone under the name of phrenitis," and been treated like the disease of which it bore the name, by "the most powerful antiphlogistic remedies"; that its distinct nature and the special treatment recommended in his work, though then already "known to some professional men to a certain extent," were yet "wholly unknown" to many; and

(c) Besides ^{the} papers, to be noticed presently, of Dr Pearson (1801), Dr McWhirter (1807), Mr Wood (1808), and Dr Armstrong (1812), there is one by Monro primus, entitled "Historie of Successful Indulgence of bad Habits in Patients," published in 1752, or earlier, in which there is given a case of what seems to have been at least "delirium traumaticum," occurring in a drunkard after a fracture of the bone of the leg; and as Monro treated the case by stimulants, it may be taken for granted that he did not look on it as one of "phrenitis." See Med. Essays and Observations. Edin. 4th Edit. 1752. Vol. v. Part II p. 17, Case II.

(d) On the Brain Fever produced by intoxication. By John Armstrong, M.D. Ed. Med. & Surg. Jour. 1810. Vol. IX, p. 58.

(e) Reprinted in (f).

(f) Observations on Brain-Fever. By Samuel Burton Pearson, M.D. Ed. Med. & Surg. Jour. 1813. Vol. IX, p. 326.

(g) Practical Illustrations of Typhus Fever, &c. By John Armstrong, M.D. 2nd Edit. Lond. 1818. p. 310.

(h) Med. & Physical Journal. Lond. 1807. Vol. XVIII. p. 153.

(i) On the Treatment of Burns and Scalds. J. Wood. Med. & Physical Jour. 1808. Vol. XIX. p. 231.

and that it had not yet taken a station in medical writings (c). It also appears, however, that Dr William Saunders, Physician to "St. Guy's", had noticed it and distinguished it from "phrenitis" for 40 years, and, for many ^{years,} mentioned it in his lectures; that Dr Sutton himself had seen its distinction from phrenitis, at least as to fit treatment, early in the period between 1798 and 1807; and that he adopted that treatment from other practitioners.

In a paper "on the Brain Fever produced by Intoxication published by Dr Armstrong in 1812 (d), he expresses himself as first indebted, for anything like an accurate description of the disease, to a small tract, published in 1801, by Dr Burton Pearson of Newcastle upon Tyne, on what was commonly called the brain-fever, in that town and neighbourhood (e). Dr Pearson republished his tract, with additional observations, in 1813 (f). Dr Armstrong, however, in his "Practical Illustrations of Typhus Fever, &c," states it to be "well-known that Dr Young, of Newcastle-upon-Tyne, had treated the disease by opium long before Dr Samuel Burton Pearson resided there." (g)

Dr McWhirter published a "case of Brain Fever" in 1807. (h)

Dr, then Mr, Wood, of Newcastle, mentions "Brain-Fever and his treatment of it, incidentally, in a paper published by him in 1808 (i); and he wrote

Observations on Inflammation and Brain
Fever. By James Wood, M.D., Ed. Med. & Surg.
Journal, 1817. Vol. xiiij. p. 438.

wrote again of that treatment, especially, in 1817. (j)

The treatment adopted by Sutton, Pearson, McWhirter, and Armstrong, was essentially one, to-wit, the administration of frequently repeated doses of opium, with the view of procuring sleep; though the three last-named practitioners used stimulants in addition.

Dr Sutton generally ordered 2 grains of opium, to be given every 2 or 3 hours, till sleep ~~should~~ should take place. He gave purgatives along with the opium, if the bowels were con- fined; but he states that they are not a cure for the disease (Op. cit. p. 7).

"In a very early stage of the paroxysm, if the subject" was "plethoric", he allowed blood to be drawn" (p. 66).

He also gave 2 grains of opium, night and morning, for some days after the sleep was obtained.

He seems to have adopted the opium treatment on purely empirical grounds. He saw that, while one set of practitioners, including himself, considered the disorder as active in- flammation of the brain or its membranes, and, on that account, treated it by "copious de- pletion, vesicatories, purging, &c.": others, without pretending to precise notions of the cranial contents, ^{as to the confinement, of} used opium in large and repeated

repeated doses; and that the latter practice carried all the success (p. 5). He even speaks of the opium treatment as so different from that which the general appearance of the symptoms seemed to him to warrant, as to make him wonder how it came to be adopted. (p. 6)

In exemplification of the comparative success of the opium practice, he states that, during the three years previous to 1813, he had lost only 4, out of 22 cases of delirium tremens which he had treated; and that, of these 4, one was first seen by him only six hours before the patient's death (p. 71); while, on the other hand, he believed "the favourable average of recoveries", under the treatment usual at the time of his writing, "would not be more than 1 in 3". (p. 74)

He appears to have considered the opium to act beneficially chiefly by the induction of sleep. (p. 67)

He says "this disease will continue, with great violence, from three days to a week, and with moderate symptoms for a longer time, and is sometimes seen in the form of a chronic affection" (p. 13)

Dr Pearson was in the habit of giving 40 drops of laudanum in a glass of wine, immediately, and 15 or 20 drops every hour after, for 6 or 7 hours; and if sleep was not procured by these doses, he repeated them somewhat increased, after an interval of 4 or 5 hours. (Op. cit. p. p. 327 & 332)

He also gave sherry gruel, wine, porter, and soup, to resist "the debility of the system". (p. 327)

He does not mention what led him to his treatment: but he writes, in 1801, "of 93 cases that have been treated by the principles here adopted, not one has fallen a victim to the disorder; but, when a contrary mode has been attempted, few have recovered" (p. 326). In 1813, he says "if venesection, evacuations, rigid confinement, be employed by the practitioner, I can state, from much experience, that the odds against the patient's existence, let him be ever so robust, are at least 20 to 1." (p. 329)

Also in 1813, he says "the principal indications of cure the practitioner should have in view, are, to attain complete ascendancy over the patient's mind, and to procure sleep with the utmost attention". (p. 330)

In 1801, he states the cause of the disease to be "frequent and excessive intoxication". (p. 327)
 In 1813, he says "the brain-fever never originates from any other cause than exorbitant ebriety". (p. 329)

Dr. M^r. Whiter differs importantly from Dr. Pearson, in regard to the treatment of the affection, only in the greater importance he attaches to the use of stimulants, which seems to have been caused by his attributing the occurrence of the disorder, not to mere continued excessive use of stimulants, as Drs. Sutton & Pearson do, but to the sudden withdrawal of them, after such use.

He first gives a "Case similar to Brain Fever succeeding a Burn", and then a "Case of 'Brain Fever' itself", in each of which the patients recovered under treatment by laudanum, stimulants, and beef-tea; and he then adds, comparing the cases, "the pain of burning and turpentine having been applied to nearly the whole surface, must have been a high stimulus; its sudden subsidence, like the sudden abstaining from spirits, seems fairly attributable as the cause of the subsequent fever, in the former case as well as in the latter. Experience, independently of theory, has approved of the practice detailed. There are individuals, I am credibly informed, in this neighbourhood" (that of Newcastle upon Tyne), "who have survived seven attacks of Brain Fever. I have also been well assured, that where bloodletting, blistering and abstinence

(K) Ed. Med. + Surg. Jour. Vol. IX., p. 60.

abstinence have been prescribed, the patients have to a man, died."

He also gives a "Case of Paralysis, &c., from suddenly leaving off Drinking", in which he states, that the patient, having been, for the paralysis, bled (perhaps), purged freely, and recommended abstinence, had become much worse; but that on being then treated as the patients in the other two Cases were, he recovered, and he then remarks, "it would seem that the human system will bear no sudden reduction of high stimulant powers with impunity."

Dr Armstrong, ^{in 1812,} advises the administration of 40 or 50 drops of laudanum on the first attack of the disease, and 25 drops every 5 or 6 hours after, till rest is procured; ~~the~~ allowance of a pint to a bottle of Madeira in the 24 hours, with ale or porter in moderation, all according to the state of the patient's constitution, and to his previous habits; and support by beef-tea and soups. (k)

He states that his practice was founded on the same principles as Dr Pearson's ~~was~~; but that, notwithstanding, he had lost 3 cases out of 14. (Op. cit. p. 60)

In his "Practical Illustrations of Typhus Fever," he makes the leading objects of his administration of opium to be the removal of irritation, and

(l) Practical Illustrations of Typhus Fever, &c. 2nd Edit.
1818. p. 319.

(m) Case of Brain Fever following intoxication. Ed.
Med. & Surg. Jour. Vol. ix. p. 146.

(n) Ed. Med. & Surg. Jour. Vol. ix. p. 61.
He says, just before, "the exciting cause is invariably
intoxication".

(o) Practical Illustrations of Typhus Fever, &c. 2nd
Edition. 1818. p. 311.

and the induction of sleep. (l.)

In a case he published in 1813, he says that the pulse "was always diminished in its frequency, and increased in its force, by the exhibition of wine and opium". (m)

Writing in 1812, he says that he had seen some cases "in which the complaint did not occur till two or three days after the debauch; but that, "in by far the greater number of cases, this was not the case; the disease, in general, being the most immediate consequence of in-
 ebriety" (n). But, some years later, in the before-mentioned "Practical Illustrations," he writes "this disease most frequently occurs in habitual drunkards, and especially when, after repeated fits of intoxication, they suddenly lessen or leave off their ordinary stimulus for a time (o). And, again, "it appears that when, in a state of health, the energy of the constitution has been sus-
 tained by diffusible stimuli, their sudden abtraction or diminution so reduces the tone of the heart and arteries, that they cannot maintain the natural equilibrium of the circulation" (Op. cit. p. 322). Accordingly, he says that "on account of former habitudes patients must generally be allowed a limited quantity of diffusible stimulus, but particularly those who have long been hard drinkers; since it is to them what ordinary food is to temperate persons, —
 it

it cannot be abstracted for any length of time without exhaustion being induced: indeed, when judiciously administered in this disease, it is often highly serviceable in allaying irritation, and communicating an energy to the heart and arteries." (p. 315)

The change in his views in this ~~matter~~ matter does not seem, however to have greatly influenced his treatment, for he says ^{that} "where opium is freely exhibited, it will seldom be necessary to give much wine or spirits, even to the hardest drinkers." (p. 319)

Nevertheless, his treatment had undergone other considerable modifications. He now considered that the disease perhaps derived most of its peculiar characters from "partial congestions of the brain and liver, together with nervous irritation" (p. 311). He believed that the whole venous system was in a state of congestion dependent upon a diminution of the tone of the heart and arteries, in that state of collapse succeeding intoxication, during the existence of which he held the disease "invariably" to occur; and that the brain was the part which seemed more especially to participate in the congestion. And, apparently in consequence of such views of the pathology of the disorder, he now recommended free purgation, and in a few cases moderate blood-letting, as remedies in the early stage of the disorder affecting

(12) *Ed. Med. and Surg. Jour. Vol. ix. p. 61.*

(13) *Practical Illustrations of Typhus Fever, &c. 2nd Edit.*
1818. p. 317.

fecting a patient of a still unshaken constitution; and advised the early opening of the bowels, even in the debilitated (p.p. 315 & 320): although, in 1812, he had looked on blood-letting as "perhaps highly dangerous in every case"; on "even mild aperients" as, "in general," to be "avoided in the commencement of the attack"; and on drastic purgatives as never to be given (p.). He also now used calomel and tepid affusion in addition to his other treatment, in those cases in which he did not bleed (p.). Moreover, he recommended the use of cold affusion at an early period, in cases of vigorous patients; stating that whenever he had seen it used, the condition of the pulse and skin had "been improved, and the general irritation greatly diminished." (Op. cit. p.p. 324 & 327)

He says that the cold affusions were mentioned ^{to} him, about three years before, by Dr. Ramsay, of Newcastle-upon-Tyne; and also, that Mr. Gregson, of Sunderland, had "long been in the habit of occasionally using" them "in the earlier stages." (p.p. 324 & 326)

He gives the results of his practice up to that time, as follows: — "I have attended 40 cases, and out of the first 16, 4 proved fatal, but only 3 out of the remaining 24; the greater success in the latter having appeared to me chiefly to depend upon some differences made in the method of treatment." In another place, he says "it is truly remarkable, ^(p. 313) that

(x) *Med. & Physical Journal*. Vol. xviii. p. 231.

(a) There is a "but" here, in the original text; but the context, and Dr. Wood's own subsequent quotation of the passage without the word, show it to be here only by misprint.

that one of the patients whom I attended was a female, who had long been in the habit of taking opium to a great extent, and who was attacked with this disorder on suddenly lessening the dose." (p. 322)

After describing the disease, he writes, "most of the symptoms enumerated continue from 4 to 10 days, but cases less immediately urgent may be considerably more protracted." (p. 312)

Dr. then Mr. Wood, of Newcastle, as it appears in his paper published in 1808, was led to his treat^t of "Brain-Fever" — which as well as his treatment of burns, typhus, and some forms of ophthalmia, consisted in "the application of cold", and the use of "purgatives" —, from his having, as he thought, observed it to be a general principle "that inflammation from too high action might be cured by two, and opposite methods of treatment." (r)

He states that, in all the above diseases, he had "been invariably successful by" his treatment; but adds "yet I cannot (s) doubt that such states have been cured by the use of stimulants" (p. 231). He says, however, that "the cure, when it can be performed by the cooling plan, is always obtained by less expense to the constitution, than when it is performed by the opposite means

(t) Ed. Med. & Surg. Jour. Vol. xiii. p. 439.

(u) Practice of Physic. By David Craigie, M.D., &c. 1840.
Vol. ii. p. 65.

means". (p. 231)

He appears to have considered the refrigerating plan to act by "directly lessening diseased action". (p. 231)

In 1817, he gives the special details of his treatment of "brain fever". It consisted in the total withdrawal of wine, and fermented and spirituous liquors; keeping the patient "from light and noise"; feeding him with milk and cold fruits; purging by Epsom salts, &c.; and the application — on which he considered much to depend — of cold water to the head, by affusion, or, if that alone did not succeed, by means of large cloths. (t)

He had found the cold applications most successful in procuring sleep, when continued till the induction of "chivering", and until "the cold had almost become intolerable". (Opist. p. 439)

He states that "the pulse was always reduced 20 to 30 pulsations in the minute, by the application of the wetted cloths"; and that he had "not known one death under the cooling plan". (p. 439)

To quote Dr. Craigie, he "appears to have been inclined to ascribe the symptoms to a state of the brain, irritative and congestive, if not inflammatory". (u)

(v) Craigie. *op. cit.* p. 65

(w) D. Laycock, in *Ed. Med. Jour.* Oct. 1858. Vol. iv. p. 305.

(x) Craigie. *op. cit.* pp. 65, 68, & 91.

(y) Craigie. *op. cit.* p. 96.

Having now noticed the practice, and the opinions and observations bearing thereon, of those who were among the first to treat, and were the first to write of, delirium tremens as a peculiar disease; I shall next try to indicate, by examples, the principal changes which have ^{since} successively taken place in the opinions & practice of medical men.

Dr Klapp, of Philadelphia, in 1817, ascribed the symptoms of delirium tremens to an irritative and congestive, or inflammatory, state of the stomach induced by excessive stimulation with ardent spirits; and on this belief founded his treatment, which consisted chiefly in the induction of vomiting and catharsis, by large and repeated doses of tartar emetic. (v) He gave 2 grains every 15 minutes, till it operated as an emetic. More than 16 grains were sometimes required to produce this effect. (w)

The above view of the nature of the disease was also advocated, in 1821, by Dr J. M. Staughton (America), who, besides, adopted Dr Klapp's treatment; and, in 1835, by Dr Baron, of Charleston, who seems to have treated by cupping the epigastric and hypogastric regions, and giving stimulant enemas when the bowels were constipated. (x)

Dr Craigie says that Dr Klapp shewed that the administration of spirituous was totally unnecessary, and that a great majority of patients recovered without them. (y)

(3) A Paper on Delirium Ebriositatis. By Andrew
Blake, M. R. C. S. Lond., &c. Ed. Med. & Surg. Jour.
Vol. XIX. p. 497.

Mr Blake, in 1823, defined the disease as "indirect debility of the nervous energy, succeeded by a morbid increase of action in the brain and nerves, attended with delirium, and terminating either in profound sleep, or in effusion on the brain". (174)

He divides it into three stages:—one of nervous exhaustion, seldom lasting more than a few hours; one of "high nervous irritation", lasting from 1 to 3 days, "where a fatal termination is not about to take place"; and a third, or sleeping stage, preceded by a "gradual mitigation of the symptoms, with a strong tendency to sleep"; and he compares these to the cold, hot, and sweating stages of ague; representing the disease as "being to the brain and nerves, what intermittent fever is to the arterial system", (op. cit. pp. 498 to 501)

He considered the exciting cause of the affection to be "the sudden cessation of the application of diffusable stimuli" to the nervous system". (op. cit. p. 501)

He looked on fatal terminations as owing to intra-cranial effusion, and not "to venous congestion as Dr Armstrong asserts". (op. cit. p. 501)

He recommends trying to cut short the first stage, by preventing the occurrence of the second, and inducing sleep, through the administration of 10 drops of laudanum every second hour

— in effervescent draughts, and accompanied by the use of emollient or anodyne enemata, where there is slight gastric derangement; but with Camphor mixture and aether and accompanied with mild nourishment, where this is not the case —; the giving of stimulants in the intervals; the use of the warm bath, or tepid, or even in some cases cold, affusion; anodyne friction over the epigastrium; rubbing of the shaven head with "some strong volatile liniment"; and the administration of croton oil to remove constipation. (Op. cit. p. 503)

He says that, in this stage, he does not use "large doses of opium", but "quantities calculated to allay irritation, without increasing debility", because his object is "to raise the lowered scale of nervous power" (p. 503)

Should the second stage supervene, he advises full doses of opium; support by diffusible stimuli, and antispasmodics; calomel and Dover's powder; the warm bath; cold applications to the head, during the absence of perspiration; and croton oil, where indicated. (p. 504)

Notwithstanding all the above, he seems, to some extent, to ^{have} believed in a natural tendency of the body to right itself, for he cautions against interfering "too much," by overdoses

overdoses, "particularly of opium, with the intention, of nature", on the occurrence of the favourable change indicating the approach of the sleeping stage. Also he says "it does not appear to me to be of any service to attempt to break the chain of morbid concatenation too abruptly, as the stage of mental irritation seems to require a given time to subside, in proportion to the duration of the stage of exhaustion, to the mode of treatment adopted, and to its previous causes." (p. 504)

When effusion seems to have commenced, or to be about to take place, he would blister the head and feet; give musk and ammonia liberally; and use mercurial frictions, and the warm bath. (p. 506)

He allows blood-letting to a few ounces, for temporary relief, in the vigorous, during the second stage. (p. 506)

Mr Blake treated 10 cases. Of these, 1 died.

Dr Copland, in his Dictionary of Practical Medicine, in 1858, adopts Mr Blake's division of the course of the disease into three stages, although, without seeming aware of differing from the last named author, he assigns to the first stage a duration of at least one or two days. His treatment is also similar to

to Mr. Blake's, ^{that} except he restricts the use of
stimulants, more particularly to cases oc-
curring in exhausted and old drunkards.

(1501)

I may as well give here, some
additional details and ~~expressions~~
expressions of opinion from Dr. Copland's
book, which seem noteworthy in a paper of
this kind.

Dr. Copland insists strongly on the
distinction, which he thinks should be
made, between delirium tremens proper,
and that other form of delirium in which
he includes delirium ebriorum. He divides
"Delirium with Tremor" into "Delirium
with Tremor and excited Vascular Action
in the Membranes of the Brain" (in which
he includes d. ebriorum), and "Delirium
with Tremor from exhausted Nervous
Power," or true delirium tremens (in which
he includes delirium traumaticum, or the
delirium nervosum of Dupuytren); though
he admits that there are intermediate forms
or modifications, which cannot be referred
to one species more than to the other. He de-
fines

since the first form is "with great terror and irritability of temper, and violence upon being opposed; a frequent, full, or hard pulse; countenance often wild or flushed, and the head hot." (p. 497)

He considers the first form to be due to the use of alcohol, or of opium, or to certain other causes; and states it to ^{be} often directly occasioned by drunkenness; He also looks on delirium tremens as occasioned by the use of alcohol or opium; but he says that it commonly results from the abstraction of the accustomed stimulus. (p. 498)

For the first species, in which ^{he} believes ~~that~~ there is "increased vascular excitement," he recommends cupping, or leeching the head; cold washes or lotions to the head, when it is hot; the tepid bath, or sponging; purgatives, with stimulants, such as ammonia or camphor; aperient and antispasmodic enemata; and the anticipation and prevention of subsequent depression, by giving - besides the ammonia and camphor - opium, to quiet perturbation, and induce sleep. (p. 498)

Where the vascular excitement does not require bleeding, or has been reduced thereby, he allows ^{the}

the use of emetics. (p. 501)

In the course of his remarks on the nature of the disease, he gives it as his opinion, "that the pathological states in true delirium tremens, and in the delirium of typhus, are not widely different;" and that "it is probable that the state of the blood, the presence of congestion, and the greater affection of the substance of the brain, and of the organic functions, in the latter than in the former, may occasion all the differences of symptoms which exist between them." (p. 501)

After arguing against "the abuse of opium", as by some American practitioners, he says "I consider opium as necessary to the cure of this disease, as bark and analogous medicines are to the cure of ague." (p. 502)

He uses "Cholagogue" purgatives in delirium tremens, because he "concluded that collections of ^{vitiat} bile in the gall-bladder and hepatic ducts have favoured the supervention of this peculiar affection." (p. 502)

He says that when 'delirium tremens' approaches in character to the other form of delirium with tremor, its treatment must likewise be assimilated to that of the latter affection. He adds antimony to his remedies for such cases. (p. 503)

(b') Dr. Coates on Delirium Tremens, in the North
American Med. & Surg. Journal Vol. IV.
Quoted from the Medico-chirurgical Review,
London. Vol. viij. 1828. p. 457.

Dr. Coates of Philadelphia, in 1827, writes that the disease "consists in a heightened activity of the sensorium"; which "appears to arise from the generation, in that organ, of an unusual vital power, which is not, as in common, exhausted by the narcotic poisons habitually used."

That "it is doubtless necessarily accompanied, as all vital excitements are, with an unusual amount of the circulation of the blood in the organ affected"; and that it "is, from this cause, sensibly influenced by cups, blisters, and emetics." (Op. cit. p. 457)

That "it is not so far checked by the use of emetics as to render these advisable as a leading means of cure"; and "is not sufficiently under the control of the general circulation to be cured by venesection, or to be sensibly relieved by it, without such ~~an~~ exhaustion as is highly dangerous to life." (p. 457)

That "it is entirely and absolutely under the control of opium"; and "admits of

(c')

Craigie's Practice of Physic. 1840. Vol. ij. p. 86.

of very large doses of that drug - he gave, in severe cases, 5 or 6 grains every hour - "which are not productive of any injurious consequences, provided they are not repeated after a tendency to sleep is evinced." That "the patient must sleep or die?" (p. 45-7)

And that no "ardent spirits, unless indicated by peculiar circumstances, should be given during the paroxysm." (p. 45-7)

Notwithstanding the foregoing, Dr. Coates seems to have been, in some measure, aware that the disease was capable of spontaneous favourable termination: for he mentions, that it is common for sailors, on first leaving shore for a new voyage, to be affected with a degree of the disease known by the name of the horrors; and yet that they all recover, mostly under the use of strong drink, and occasionally, without any treatment; and that sleep invariably precedes the return of health. (c')

(d') Lectures delivered at the London University. By D^r Elliottson. — London Med. Gazette. Vol. X^v. 1833. p. 467.

(d'') Lectures on the Principles and Practice of Physic. By Thomas Watson, M.D., &c. 1857. Vol. II

Dr. Elliotson, in 1833, inculcates, as necessary, the administration of full doses of opium; but the amount he recommends to be given in 12 hours seems to differ little from that advised by Pearson and Sutton, though he prescribes larger doses at a time - 3 to 5 grains.

He holds that drams must, sometimes, be ^(d) allowed: also that, in certain cases, the use of opium must be preceded by antiphlogistic treatment. (op. cit. p. p. 467 + 468)

He considers the disease as having "nothing peculiar in it," but as "merely an instance of a general state of irritation." (p. 468)

He says "recovery from this disease under the opiate treatment is very frequent; whereas, under any other, patients continually die. However, the affection will cease spontaneously, like almost any other complaint." (p. 467)

Also, "it lasts, in general, from three days to a week, and patients may then sink gradually, or pretty suddenly; or, at the end of that time, they may, but it is rare, recover." (p. 467)

(a) Dr. Watson, also, in 1857, speaks strongly in favour of the use of opium, as follows:

"The great indication is to procure sleep; and the remedy which, in 9 instances out of 10, you will find successful, is opium. The beneficial effects of this drug, in tolerably favourable

favourable cases of delirium tremens, are really surprising. The opium must be given in full doses; and it must be ^{fearlessly} repeated if its desired effect do not ^{soon} follow. If the patients pass many nights without sleep, they will die. After clearing ^{out} the bowels by a moderate purgative, you may give 3 grains of solid opium; and, if the patient, after 2 or 3 hours, shew no inclination to sleep, you may begin to give one grain every hour till he does. His room, meanwhile, should be kept dark and quiet. Some patients resist very large doses of the drug; but presently sleep, or become composed, if you give some of their accustomed stimulus with it." (p. p.

Also, "if the powers and ^{404 & 410} natural sensations of the stomach have been injured and perverted, a temporary recurrence to the habitual stimulus will frequently be necessary." (p. 411)

He states that, "in a large majority of instances," the patient "has been a habitual drunkard; and very frequently from some cause or other this habitual stimulus has been diminished or taken away." (p. 408)

He also says that "the disease is not confined to drunkards." (p. 408) —

D^r Copland, in 1858, writes "D^r A. Jackson" (an American practitioner) "prescribes 10 to 15 or even 20 grains of opium every two hours." (c)

The extent to which the opium treatment has been carried, is shown in a paper published in the British Medical Journal, of April 19th, 1862.

The writer, James Weaver, L.R.C.P. Edin., Glandrinio, having, out of 12 cases of delirium tremens, which he attended during the six years immediately preceding the above date, treated six of the earlier by what he calls the "usual plan", to-wit, by giving 3 to 5 grain doses of opium every four hours, and a fair allowance of the habitual stimulant; and found that, of these, 2 died, and 2 became insane; seems, as a matter of course, to have assigned this bad result to want of sufficiently active treatment. Accordingly, he treated the next five, by 10 to 30 grain doses; and as these all recovered without a bad symptom, he was encouraged to go still farther in the 12th case. The result was the same as in the five; and he gives the details of the case — apparently, with great satisfaction.

satisfaction. I give an abstract of its treatment.

Feb. 26. 1862

5 A.M. 5 grains of opium,
Every 4 hours,
Saline aperient,
Fair allowance of
brandy & water.

6 P.M. 6 grains of opium.

Feb. 27; 1 A.M. 6 " " "

15 " " - Dov. powd.

6 " " 10 " " - Opium.

15 " " - Dov. powd.

1 P.M. 14 " " - Opium.

15 " " - Dov. powd.

10 " " 20 " " - Opium

15 " " - Dov. powd.

Feb. 28. 10 A.M. 20 grains of opium,
Every 4 hours, till
10 P.M., when he
dropped into a
doze, and slept for
4 hours.

Aperient

In consequence of a mistake,
the next dose of opium was
not given till March 1st at 2 P.M.

Mar. 1. 2 P.M. 20 grains of opium;

7 " " 30 " " " "

11 " " 35 " " " "

Mar. 2. 8 A.M. 40 " " " "

1 P.M. 42 " " " "

4 " " 40 " " " "

Mar. 3. 5 P.M. 40 grains of opium
1 ounce - Laud.

9 " " Do.

12 " " Do.

Mar. 4. 3 A.M. 60 grains of opium,

6 " " Do.

10 " " Do.

The patient then got half
an ounce of tincture of
digitalis, and, again in
four hours; but the only
result was, lowering the
pulse from 120 to 80 by
the second dose.

Mar. 5. 8 A.M. Cold shower bath

30 grains of opium.

1 grain of tartar
emetic.

12 A.M. 40 grains of opium.

1 grain of tartar emetic.

8 P.M. 60 grains of opium.

2 grains of tartar emetic.

Shower bath.

Dry cupping
of nape.

11 " " 120 grains of opium.

2 grains of tartar emetic.

He then slept 13 hours, and
the greater part of the next
24; after which he was
well. In less than a
week he was at his business.

24; after which he was
well. In less than a
week he was at his business.

well. In less than a
week he was at his business.

week he was at his business.

week he was at his business.

week he was at his business.

week he was at his business.

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week he was at his business.

week he was at his business.

week he was at his business.

week he was at his business.

(K) Ed. Med. & Surg. Jour. Vol. XXXI. 1829. p. 312.

(Q) Ed. Med. & Surg. Jour. Vol. XLIII. 1835. p. 354.

(h) Craigie's Practice of Physic. 1840. Vol. ij. p. 90

D^r Renton, of Funchal in 1828, published a case of recovery, from delirium tremens, under treatment by opium by the application of 20 leeches to the temples, a blister on the nape, and purgatives. (f')

D^r Stephen, of Portobello, in 1835, also gives a case, in which first 30, and then two hours and a half after, 15 or 20 ounces of blood were abstracted, the first bleeding preceding the exhibition of opium. (g')

According to D^r Craigie, D^r Potter states that in young subjects, and even in patients advanced in life, but recently attacked, he has bled, frequently to 70 or 80, and several times even to 100 ounces in three or four days. (h')

(i') Ed. Med. & Surg. Journal. 1831. Vol. XXXVj. p. 117

Mr. Spence, of Otley, Yorkshire, advocating, in 1831, the treatment of delirium tremens by large and repeated doses of tartar emetic, says, of that drug, that "from its great and well-known control over the nervous energy of the brain," it "lessens the vascular action through that cavity (!), and brings the patient into a calm state, which renders its administration safe as well as advisable, while at the same time it keeps up a proper action upon the bowels and kidneys." (i')

The disease is distinguished by him into 3 stages:—depression; excitement; and sleep. (op. cit. p. 116)

He considers treatment by opiates, in young subjects, rash and dangerous. (p. 116)

Four years before 1831, he attended a case of delirium tremens, in which, having first loosely tied the patient down in bed, and given him small quantities of brandy, wine, and opium, for 2 days, without perceptible benefit; and then given eight grains of opium every 6 or 8 hours, with constant increase of the excitement; he at last "administered 10 grain doses of tartar emetic with,"

"with the effect of removing the disease". (p. 107)

During the four years, the patient had not fewer than 20 attacks of the disease, and for all of these, except the first attack, he was treated by Mr. Spence in the following manner. "As soon as the delirium came on, he was put into a room well-aired, with little light, and secured in bed, with one person to attend him; he had wine occasionally, when he would take it; and whenever he became high and unmanageable, he had 8 or 10 grains of tartar emetic given, which in a short time produced considerable nausea. This was continued until he became quiet; and regularly repeated whenever the nervous excitement returned. Leeches were occasionally applied to the temples, the head shaved, and a cold lotion applied to it." — Mr. Spence says he has "frequently seen great advantage from the cold affusion". (p. 116)

The extent to which he was ready to carry the administration of tartar emetic in delirium tremens, may be inferred from what he tells of his treatment of a case of mania. In this case, he gave, at one stage of the treatment, 30 grains in a single dose, and followed it up, by administering, only 3 hours after, 5 grains every 5 minutes, till 75 more were given; thus giving 100 grains of tartar emetic in four hours & a quarter; and all, he says, "with the very happiest effects." (p. p. 114 & 115)

(j) Remarks on the History and Treatment of De-
lirium Tremens. By John Ware, M.D. Trans-
actions of Mass. Med. Soc. Boston 1831.
Quoted from Brit. & For. Med. Rev. Vol. XXII. 1847
p. 603.

Dr. Wall, of Boston, who wrote on delirium tremens in 1831, seems to have been the first to observe carefully, and point out, what was the natural course of the malady, and to advocate an expectant treatment.

The following extracts are slightly abridged from what he says at the above-mentioned date.

When "active treatment has been confined to the period of indisposition preceding the paroxysm; and, after its accession, articles of a purely negative character alone were administered, with the exception sometimes of purgatives, the result has uniformly been, that the disease has gone through a "regular course, and terminated" in "reeldom less than 60, or more than 72, hours from the commencement of the paroxysm. The termination in these cases - about 50 - has also been almost uniformly favourable, except in complicated cases. (j)

In the "majority of cases, if the disease is to have a favourable termination, the delirium of the third night is less violent than that of the

the preceding, and the paroxysm² ends "in sleep, most commonly not until the latter part of the night, or in the morning; but when the disease is about to terminate unfavourably, the delirium continues undiminished till death. The paroxysm is "especially apt to be prolonged, in those who have had repeated attacks; and in one such case, I have known it to extend to nearly 6 entire days." (Op. cit., p. 601)

For "the first part of his sleep, the patient is generally uneasy and restless," and "his breathing is irregular. During the first few hours, he often wakes once or twice, but goes soon to sleep again. Soon after getting into a sound sleep, the breathing becomes deep, slow, and sonorous," and "a profuse sweat breaks out. After 6 or 8 hours," he "awakes tolerably rational." He continues to sleep, during the greater part of the next 24, or even 48, hours; after which, "his restoration appears complete, so far as the peculiar symptoms of delirium tremens are concerned." (p. 605)

"The only cases I have seen or known, in which" the patient has died after falling asleep, "have been treated by large doses of opium. In such a case, no peculiar symptoms" occur, "till after sleep has taken place; but then, he becomes first more unquiet and restless, moans, breathes with difficulty, and falls at length into a state of complete coma, from which he never awakes." (p. 605)

"The disease terminates fatally in several other ways. Sometimes the patient is carried off by the sudden accession of convulsions: particularly in cases which have begun with them. They also occur very unexpectedly in cases which promise favourably." (p. 605)

"Even in the reports of cases submitted as evidence of the efficacy of various modes of practice, sleep has not taken place sooner than it would have done in the natural course of the disease. In the case I ~~formerly~~ formerly treated with opium, and which terminated well, a salutary sleep" did not take place "till towards the close of the third day; I have, indeed, seen sleep

(k) Article in Boston Med. & Surg. Journal, 1838.
Quoted from British & For. Med. Review, 1839
Vol. vij. p. 268.

sleep induced by opium at an earlier period; but it was premature, and the patient died. I do not undertake to say that it can never be right to administer opium for the removal of the paroxysm, but I have not yet seen a case in which I think it was necessary." (p. 606)

In 1838, Dr Ware gave the following table, showing the treatments and results of his private practice in the disease, during about 20 years. (K')

Treatment.	Number Cases.	Bled.	Died.	Recovd.	Complic ^d or acute disor ^s .
Opium, large doses.	8	0	4	4	1
" small "	7	1	2	5	1
Emetics.	12	1	1	11	2
Bleeding.	2	2	0	2	0
Eclectic.	9	5	3	6	7
Quinine.	1	0	0	1	1
Mercurials.	1	0	0	1	0
Expectant.	29	4	1	28	1
	69	13	11	58	13

(1) *Commentatio de Delirio Tremente. Auctore*
O. C. Höegh-Guldberg, M. D. et Hauniæ,
1836. Brit. & For. Med. Rev. Vol. VI. 1838. p. 320.

D^r Höegh-Guldberg, of Fredericksstadt, wrote a commentary on delirium tremens, in 1836.

Considering the sthenic form (delirium ebriorum?) a species of arachnitis, and that local congestions are especially to be guarded against in it, he advises bleeding to 12 ounces, in cases of its occurrence; with a repetition of the operation, if necessary, — but only if there should remain unaltered some marked sthenic character of the disease. He frequently observed the symptoms remit so quickly after treatment of this kind, that the critical sleep supervened within an hour. (!)

He looked on the employment of cold applications or affusions, as indicated, in young and strong persons, by the presence of urgent and continued congestions of the brain, with redness and heat — generally dry of the face; but as entirely precluded in the subsequent stage: and he says that when ^{they have been} used in these subsequent stages, he has seen universal tremors occur. As he had observed the mind to be somewhat steadied, or even recovered after every affusion, he recommends —
repetition

~~the~~ repetition every two hours, till the head becomes perfectly cooled. (Op. cit. pp. 328 & 329.)

Following Horn and Richter, he had tried cold effusion to the head, while the patient has been immersed in the tepid bath; and not without success. (p. 329)

He says that the efficacy of cold applications to the head may be increased by mixing them with slight derivations, such as mustard: the stronger rubefacients and vesicatories being most useful in the asthenic form of the disease, and not to be used in the sthenic, unless to overcome some dulness of the mental faculties, which might otherwise become permanent. (p. 329)

In the asthenic form of the disease, Opium is his main remedy. He states the fit time for its administration to be the beginning of the stage characterized by loss of former and present consciousness. If symptoms of apoplexy supervene on its use, it is to be discontinued.

No special reliance is placed in purgatives. Dr. H. G. had observed that the disease frequently

frequently occurred in persons labouring under diarrhoea), and that such a condition of the system did not alleviate the delirium.

D^r H.-G. thinks it sufficient, ^(p. 329) in fixing on the indications of treatment for delirium tremens, to bear in mind that the first object to be attained is the critical sleep. (p. 327)

Of 173 cases given by him, 149 recovered (22 of these under quiet alone); and 22 died. [There is no mention, in the article from which I quote, of what became of the other 2 cases.] Of those who took opium, 83 recovered, & 13 died, " " " were bled, " " " " 7 " " " [I suppose the remaining 59 cases were treated by cold water, ^{alone,} and that of these 2 or 4 died.] (p. 324)

The Reviewer, from whose articles the foregoing information relating to D^r H.-G. is obtained, makes the following singular observation:—"it sometimes happens that recovery from this disease takes place spontaneously; but the result of such rare cases is only to impress upon the mind the advantage of treatment." (p. 328)

(m') Brit. & For. Med. Rev. 1840. Vol. ix. p. 476.

Dr Stokes of Dublin, in 1838, lays great stress on the importance of distinguishing the 'delirium tremens' (delirium ebriorum?) occurring after a debauch, and that which occurs on the sudden suspension of alcoholic liquors after habitual use of them.

In the first kind, he believes the disease to consist in gastritis, accompanied with high excitement of the brain and nervous system, in consequence of the absorption of alcohol, or from sympathy with the stomach, and tending strongly towards inflammation of the brain; and the treatment to be that of gastritis. (p. cit. p. 476)

In the second species, he holds that the functions of the brain are disturbed by the abstraction of an accustomed stimulus; and that the indication is to restore that stimulus. (p. 477)

He lays it down as a general rule, that when delirium tremens arises from the want of the habitual stimulus, it is to be treated with stimulants and opiates; but that, when it supervenes on an excess, the proper treatment is that of gastritis, — leeches to the epigastrium and the adminⁿ of iced water. (p. 477)

(n) Observations on the Treatment of De-
lirium Tremens without opium. Prof.
J. Cahill, M. D. Dublin Jour. of Med. Science
Vol. XV. 1839.

Dr Cahill, writing on the affection in 1839, seems to have adopted a course of treatment much the same as that first advocated by Dr Wood of Newcastle, in 1808 and 1817; except that he gives habitual drunkards a moderate quantity of stimulants, "to prevent sinking"; and bleeds or leeches, and blisters for some complications, such as congestion of the brain or membranes, and gastritis; and that he does not seem to hold purgatives an important part of his cure. However, being better acquainted with the natural course of the disease, he ascribes less credit to his treatment in the recoveries accomplished under it. (n)

The following are extracts from the paper to which I refer.

"The douche or cold dash to the head" (a stream of water from a height of 4 or 5 feet - the patient kneeling over a tub) "and walking about a cold room, have the most beneficial effect in lowering violence and excitement, and restoring comparative calmness and reason. I have frequently seen the most violent excitement subdued, for a time, by" the douche, "and the individual return to bed quite cool and

and rational." (Op. cit. pp. 404 + 405)

"Opium is not beneficial, in many cases; in others, it is positively injurious; and, in all, a cure can be effected without its assistance" (p. 404)

"When the more violent symptoms have been abated, and the complications removed, the stimulus of nourishment alone is sufficient to allay nervous excitement." (p. 403)

"Perfect ~~recovery~~ recovery, and exemption from sequelae, are in an inverse ratio to the quantity of stimulants administered." (p. 405)

Dr. Cahill remarks upon the fact that in one case (of several which he relates) opium was given after a purgative, with most decided benefit; but he also says that "it was the most favourable case for that practice he ever saw." (p. 403)

Dr Craigie, in his *Practical* of
 Physic published in 1840, gives the following
 as his view of the pathology of the disease.

"In the early and incipient stage
 of mephitic brain fever, the symptoms de-
 pend on irritation of the brain. That is to say,
 the meningeal veins are loaded with an
 unusual quantity of venous blood, and the
 arteries with imperfectly aerated arterial
 blood, both charged with spirituous part-
 icles; and, as this circulates slowly, it ir-
 ritates the brain, and disorders the cerebral
 functions. The cerebral irritation thus in-
 duced is the great cause of the sleeplessness
 and restlessness, as well as of the fantastic
 delirium and hallucinations. In this stage
 of the disease, the symptoms may subside
 spontaneously, or under the use of appropriate
 remedies, by the poisonous blood being
 eliminated, in the manner of excretions,
 during sleep. If, however, the irritative
 action do not thus subside, it is liable
 to become fixed in the form of inflammatory
 congestion, and give rise to effusion of serum
 and other morbid products. Even without
 effusion of serum, the fatal termination
 may take place; but this result is much
 more frequent in consequence of effusion,
 subarachnoid

(0') Elements of the Practice of Physic. By
David Craigie, M. D. &c. 1840. Vol. ij. pp. 81,
82.

subarachnoid, cerebral, and intraventricular. Inflammation does not seem essential to the symptoms of the disorder. (O')

According to D^r Craigie, D^r Andreas, of Magdeburg, showed, in 1824, that neither in the preliminary symptoms, nor in those indicating the presence of the disease, did the diagnostic signs given by Sutton to distinguish delirium tremens from meningitis, differ in kind; and proved, from the symptoms and post mortem appearances, that the former was a form of cerebral irritation, peculiar, however, to drunkards, and modified by the remote causes and the persons in whom it occurred. And D^r Craigie himself says, in another place, that delirium tremens seems "to differ from meningeal inflammation, merely in stage and degree"; though "in meningitis, spectral illusions are less frequent and vivid. (Op. Cit. p. 67+84)

D^r Craigie supports his pathology by, among others, the following statements, which he considered warranted by what was known of the effects of alcohol on the blood; by the post-mortem appearances observed in the bodies of spirit-drinkers, both where death had not occurred in delirium tremens, and where it had; and by the symptoms

ptoms presented by habitual spirit-drinkers, and by those labouring under the disease. He states, then, that the presence of alcohol in the blood retards the motion of the latter; that this must produce pulmonary and bronchial (as well as other) congestion; that the morbid state of the pulmonary circulation must give rise to constant overloading of the meningeal and cerebral vessels with an excessive quantity of venous blood, and a load of imperfectly aerated arterial blood; ^{and} that the inflammatory state of the arterial tunics, the induction of which he considers to be the most certain effect of the habitual use of spirituous liquors, affecting the cerebral arteries, as well as those of the system at large, itself cannot fail to derange the circulation of the meningeal and cerebral arteries. (p. p. 74, 75, 76 & 78)

He also says that spirituous liquors probably also "act directly on the nervous system". (p. 77)

The effect of Dr. Craigie's pathological notions on his treatment is very evident. His practice is here indicated.

He says "the great object is the procuring of sleep." Also, "two grains of opium every second hour, till sleep ensue, are enough." (p. 87)

"In the most simple form of ^{pest} mthy^{ic} brain fever, in first attacks, and in young ^{sub-}jects," he applies, to the shaven scalp, cold wet cloths, cold affusion, or even ice in a bladder; if the patient is sick, gives tartar emetic, with or without ipecacuan, till he vomits, or the violence of the delirium is abated, following this emptying by an opiate with or without ipecacuan. (p. p. 88 & 93)

Then, if sleep is not produced, nor the delirium abated, and the face is flushed, the features distended, and the eye injected and restless, he bleeds to 15 or 20 ounces, and then after gives an opiate, with or without antimony. He states this to be very generally followed by some sleep, after which the delirium is abated or removed. (p. 88)

He states that "in some instances, the influence of the blood-letting is evinced only after from three to six hours." If it does not succeed, he repeats it, following it by the administration of opium, with or without ipecacuan; or cups; or give an opiate; according to circumstances.

He says that "in no case almost is it

it possible to dispense with the use of cathartics, that "the vomiting is often more readily allayed by freely opening the bowels than by the use of emetics"; and that he believes effectual prompt evacuation to be accompanied by "alleviation of restlessness; abatement of delirium, and diminution in frequency, with increase in firmness, of the pulse". He holds thorough evacuation before the use of opium, to be important. (p. 90-92)

He commends the use of Calomel or tartar emetic, with the opium, "to counteract" the "pure narcotic effects of the latter". In another place he says "camphor is a good sedative in affections of the brain, and, when united with opium, counteracts the pure narcotic effects of the latter drug, & renders smaller quantities requisite to induce quietude and sleep". (p. p. 92 & 94)

If emetics and cathartics fail in quieting, he uses the warm bath, where practicable; and, where it is not ^{practicable,} applies, as a hypnotic measure, hot salt water to the lower extremities, by cloths or by immersion. (p. 94)

He says that there are some cases of persons much advanced in life, or otherwise debilitated, where it may be expedient to allow small quantities of wine and water, ^{diluted with water,} or even spirits, in order to allow them the more easily to bear the requisite evacuation by antimonials & cathartics. (p. 95)

(K) Clin! Lectures on the Pract. of Med.. By Rob^t J. Graves,
M. D., &c. 2nd Edition. Edited by J. Moore Weligan,
M. D., &c. 1848. Vol. I. p. 540.

D^r Graves, in 1848, thinks "that opium, if given in the beginning, will increase the congestion, and bring on subarachnoid effusion; and therefore, begins his treatment by giving tartar emetic; afterwards adds opium, using at first a little, and increasing the quantity gradually; and at last uses opium alone. (p. 1)" [The exhibition of tartar emetic with narcotics was recommended by D^r Law, of Dublin, as early as 1835; and by D^r Graves, himself, as early as 1836. — Morehead's Clinical Research on Disease in India, 1856. Vol. 7. p. 538.]

When there is congestion with the delirium, he bleeds, or leeches; or, if blood-letting seems of doubtful propriety, or dangerous, gives tartar emetic, with or without opium, according to circumstances. (Op. cit. p. 540.)

He seems to have held the usual cause of delirium tremens to be the leaving off of some strong stimulant previously largely indulged. (p. 532.)

He appears to have had no particular theoretical foundation for his treatment, at least so far as the administration of opium was concerned, for he asks "why does opium act so much more beneficially in delirium tremens than in other species of delirium"? and confesses his inability to answer the question. (p. 524.)

(q¹) ~~The Pathology of Delirium Tremens, and its
Treatment without Stimulants or Opium.~~
~~By Alex^r Peddie, M.D., &c. 1854. p. 9.~~

(p¹¹) Clinical Researches on Diseases in India. By
Charles Morehead, M.D. &c. 1856. Vol. ii. p. 536.

Dr Morehead, of Bombay, states (in 1856) that from considering the cases that had passed under his own observation, he concluded that the disease ran a definite course, before he knew that previous observers had held this opinion. (p¹¹)

He resembles Dr Copland in the distinction he makes between two species of delirium tremens, and in adopting Dr Blake's division of the second form into three stages. His notions on the subject of the causation of the two species are also of the same nature as Dr Copland's, for he says "the first species in general immediately succeeds the excitement of hard drinking without an intermediate period of abstinence from the accustomed stimulus", and "in the second species, the symptoms come on in the habitually dissipated, after the accustomed stimulus has, from some cause or other, been for a time withheld."

He recommends, for the first form, cold affusions, rest and quiet, effervescent draughts with a few minims
of

of laudanum, sinapism ~~to~~ or a blister to the epigastrium; ~~and~~ calomel, morphia, and ipecacuan, at bed time, preceded by Cold affusion to the head and a hot foot-bath; and, occasionally, cupping the nape, or leeching the temples. (p. 533)

What follows relates to the other form.

He says that, if the circumstances of the second stage running a certain course be acknowledged "the indication of cure is not by full doses of narcotics to force sleep, but to conduct the patient through the period of delirium, by withdrawing all sources of irritation by moderating or sustaining the circulation, and by calming the nervous excitement." He thinks that "these indications of cure are best effected by cold affusion, and the use of tartar emetic combined with opium or some other narcotic, and the exhibition ~~use~~ of stimulants". (p. 537)

He believes that "the cold affusion may be used in all cases in which the circulation

~~is at~~ circulation is steady, the skin not covered with perspiration, or its temperature not below the natural standard; or in which there are not present any of the local complications which contraindicate its use "under ordinary circumstances".

Dr. Ke states that, in cases where its propriety is rendered doubtful by the state of the pulse, "it frequently becomes quite admissible" by its use being preceded by the exhibition of brandy; and even in ~~the same~~ cases where its use is contraindicated, cold affusion to the head, with a hot foot bath, may be used. (p.p. 537 & 538)

He states that "the exhibition of tartar emetic with opium or other narcotic (first introduced by Dr. Han, of Dublin) constitutes the most successful means of controlling the symptoms of this stage of the disease". He gives, every hour, or second or third hour, $\frac{1}{2}$ grain to 1 grain of tartar emetic, in $1\frac{1}{2}$ oz. of camphor mixture, with 20 to 30 minims of tincture of

of opium or hyoscyamus. (p. p. 538-539)

He says "6 or 8 ounces of port wine in the 24 hours will generally be sufficient, though the necessity of adding brandy to the extent of from 4 to 6 ounces not unfrequently occurs." (p. 541)

He states that on the approach of the unfavourable third stage, "all narcotic remedies should be completely intermitted, the head shaved - if this has not already been done, - a blister placed on the nape, the hot foot-bath used, cold cloths applied to the head, if it is hot, camphor mixture exhibited every hour with a little tartar emetic or spiritus aetheris nitrici, according to the state of the pulse and skin, and wine and mild nourishment, as beef tea and chicken soup, be given." (p. 546)

On the advent of the third stage, he blisters the scalp, and gives every second hour, $1\frac{1}{2}$ oz of camphor mixture, with $\frac{1}{2}$ dr of spiritus aetheris nitrici. (p. 547)

He considers it "very likely that the symptoms peculiar to delirium tremens, the busy, agitated, apprehensive delirium, the sleeplessness, and the muscular tremors - are due to a derangement of the functions of the brain by toxicæmia. He seems to have published some such belief in a cumulative toxicæmia, in 1848. (p. 550)

(91) The Pathology of Delirium Tremens, and
its treatment without Stimulants or
Opiates. By Alex^r Piddie, M.D., &c. 1854. p. 9.

Dr Peddie, writing in 1854, looks on the affection as "quite specific and peculiar": as "essentially a form of nervous poisoning, distinguished by a very remarkable uniformity of phenomena". (p. 1)

He says "the stimulus acts slowly on the nervous pulp through the medium of the circulation, poisons its substance, and sets up at last what may be termed an alcoholic erythema". Also, "this, in turn, no doubt, produces a certain amount and kind of debility in the cerebral functions, but combined with overaction of the circulation through the membranes of the brain, constituting a decided form of irritation". (p. 9).
 And in another place, he observes "the tendency of the "specific form of irritation of the brain and membranes, of delirium tremens, is to arachnoid inflammation". (p. 35)

He also states that "when alcoholic liquors have been long abused, the active principle appears to affect the system, by accumulation"; and that "the effect is brought about after the manner of a cumulative poison, the action of which is on the nervous centres".

Centus. (p. 12)

"The functions of the brain, in delirium tremens, are, he conceives, 'interfered with in consequence of the vitiated nutrition of its substance, and the irritation of the membranes' (p. 26)

The treatment he recommends is, the use "to reduce cerebral excitement" of "a moderate, but decided and steady, course of antimony, or some other agent capable of exerting a somewhat similar influence; judicious superintendence; permission of light and liberty; and moderate allowances of animal nourishment." (p. 30) He gave $\frac{1}{4}$ to $\frac{1}{2}$ of a grain of tartar emet. \dot{c} every two hours, or at shorter intervals, "according to the degree of excitement and irritability." (p. 32)

He says "it may possibly happen, that, in the advanced stage of the affection, the pulse may begin to falter, the heart to 'lose its natural rhythm, the surface of the body to become of a leaden hue, the tremors to disappear, and subsultus tendinum occur, and delirium of a muttering character only continue; then, certainly, the flagging powers of life would require to be sustained by some diffusible stimulus." (p. 27)

He states that "the action of the antimony appears to be chiefly sedative"; that "its direct

direct influence is in reducing the vascular excitement of the brain, soothing the nervous system, and diminishing muscular power; and that "its more indirect action is exerted on the functions of the skin, kidneys, and intestinal canal: and that ⁱⁿ the only "two or three instances", in which he had "found it necessary to suspend its employment, in consequence of diarrhoea and haemorrhagic discharge from the bowels, digitalis and ipecacuan were substituted with marked benefit." And he continues, "an antimonial course of treatment, in moderation, greatly diminishes excited action, induces weariness of muscles, general nervous exhaustion, and mental languor", and "thus removes all hindrances to the occurrence of the salutary sleep." (p. 32)

This treatment, so far as the negative part of it is concerned, appears to have been based by him, on his opinions as to the nature of the disorder, — opinions which of themselves caused him to regard the administration of alcohol or opium as necessarily tending to aggravate the malady; on observation of the effects of different kinds of

of treatment of the disease; and on, at least considerable, knowledge of the natural course of the disease.

In illustration, I quote the following.

"The physiological action of 'opium' is to occasion engorgement of the vessels of the brain—vessels already too highly charged with blood containing a poisonous ingredient. The most unmanageable cases of delirium tremens are those affecting opium ~~users~~ or morphine eaters, who appear to be extremely liable to this disease, if they indulge in spirituous liquors." (p. 13)

"Sleep occurs as the natural, the favourable, crisis, or rather termination of the disease. It is the result, ^{and the proof} of an improved condition of the brain and nervous system, a salutary relaxation succeeding a state of dangerous tension" (p. 30). "The paroxysm usually runs its course, if uncomplicated and properly treated, on the second or third day, or even, sometimes, earlier; and it seldom extends beyond the fifth day. It then terminates in a profound natural sleep." (p. 6).

D^r Peddie states that, during the ten years immediately preceding the time at which he wrote, he had treated, in the manner just described, upwards of 80 cases of the genuine disease—

disease—many of them very severe ones—; and that he had done so with uniform success, not only in regard to the speediness of the immediate recovery, but also to the comparatively thorough restoration to a healthy condition of body and mind. (p. 32)

He distinguishes both *delirium ebriosum*, and *delirium traumaticum*, from what he considers true *delirium tremens*, as follows.

"There is a form of mania which is sometimes mistaken for *delirium tremens*, but which must not be confounded with it, although characterized by very considerable muscular tremor. It is nothing more or less than a severe and protracted form of intoxication, — an affection of the brain and membranes, in which there is great vascular excitement, resulting from the direct or immediate action of alcoholic liquors. It has been styled by Darwin the Delirium Ebriosum. It originates from a single fit of intoxication, or at least from a short course of intemperance. It is ~~marked~~ marked by an uncontrollable desire for more drink, which, when gratified, excites to farther imperious demands, begetting indecorous conduct.

Other

Other symptoms and circumstances characterizing the paroxysm, are dry heat of skin, particularly of the scalp; flushed countenance; a sullen, determined, or fierce aspect; red, ferret eyes; dry tongue; strong quick pulse. The attack is in general easily overcome by the immediate withdrawal of all stimulants; confinement under the care of one or two firm minded and strong attendants, and the administration of emetics and purgatives. (p. 76)

Alcohol, in the habitual drunkard (though he may not be on the verge of delirium tremens) may, "by presence in the blood, and interference with the nutrition of the brain and nervous system, superinduce, on receipt of an injury, a febrile attack, attended by delirium presenting somewhat of the appearance of that disease, but which in reality has more of a typhoid character". It is the Delirium nervosum & traumaticum of Dupuytren. (p. 18)

(12) *Clinical Illustrations of the Pathology and Treatment of Delirium Tremens.* By Thomas Laycock, M. D. &c. *Ed. Med. Jour.* Vol. IV. 1859. p. 289.

D^r Laycock, in a paper on the disease, published in 1858, supports the expectant plan of treatment. (p. 1)

He gives the following, advised, among others

"No alcoholic stimuli" should be "admitted as diet, unless specially indicated." (p. 300)

(D^r Laycock, however, allowed "2 or 3 table-spoonfuls of wine", at night; believing, that a slight stimulant at bed time is often the best hypnotic. p. 291)

"When there is a tendency to diaphoresis, it should be encouraged as eliminatory." (p. 300)

"If the head be hot, the hair may be cut short, and a gentle douche applied every 3 or 4 hours; but this is rarely necessary." (p. 300)

"If the patient be alcoholized, and no important complication be discovered, the practitioner may consider the stupor and delirium as of no great pathological importance, and confidently wait the result of a few days' judicious watching and general management." (p. 300)

"A simple emetic will be useful, if there be bile or acrid stuff in the stomach." (p. 305)

He says "the etiology of delirium tremens comes under the general etiology of forms of delirium not due to structural or inflammatory disease within the cranium, and is a question

question of medical psychology". (p.302)

Relating to the question of the natural course of the disease, we have the following. "The average duration of treatment, of 22 cases "of all forms of delirium tremens", during the summer ~~trimester~~ of 1858 "was not quite 7 days". (p. 299) "Continued sleeplessness, although highly predisponent to morbid action, does not necessarily destroy. It is the casual and concomitant conditions of it which are to be dreaded. Hence, when sleep is induced by opium and these remain, the patient dies nevertheless. When sleep supervenes naturally, the causes of the delirium and sleeplessness are alike ceasing". (p.302)

He also states that he had "never witnessed a fatal case, in which narcotics had not been administered"; and, on the other hand, that, of 28 cases which he had had ~~had~~ under his care, and which with one exception (a case in private practice which was fatal under opium and alcoholic stimuli) were treated without opium or stimulants, and some without any drugs, all so treated ~~treated~~ recovered rapidly. (p.p. 289 + 304)

(x') Practical Notes on Diag^s, Prog^s, and Treat^t,
in cases of Delirium Tremens, By Thomas
Laycock, M. D. &c. Ed. Med. Journal, Nov.
1862. p. 393.

After the publication of his paper in 1858, Dr. Laycock continued to use the expectant treatment, and again wrote on the subject, in 1862. (21) I shall now give some quotations from the latter article.

"Since a case ~~cases~~ of delirium tremens tends, independently of active remedies, to a favourable termination in from 4 to 14 days (the cases I have treated have averaged 6 days' duration), the great indication of medicinal treatment is to favour this tendency, in expectation of early recovery." (op. cit. p. 411)

"It is certain, that drugs exercise an influence over the intensity of the symptoms, although they may not either cause sleep, or shorten the duration of the disease." (p. 411)

"Alcoholic stimulants are available in all asthenic forms of delirium. They have hitherto been administered in the methyotic form chiefly on the theory that the sudden withholding of the habitual stimulant is the exciting cause of the delirium. The depression of the nervous system may be partly due to the want of the accustomed stimulus, but it is still more commonly due to morbid causes of a more general character, such as indeed a feverish cold, or the like. Without such

Such concusses, abstinent from habitual stimulants will not excite delirium tremens. The indications for the administration of alcoholic stimulants must be drawn from the condition of the patient, just as in other diseases in which these are useful.

"The influence of opium and the salts of morphia is very various; in one class of cases having the most beneficial effect, in another increasing greatly the excitement and delirium" (p. 412). "It is never wholly safe to administer opium for the express purpose of procuring sleep, nor as a stimulant in more than the ordinary doses." (p. 414)

"It is not easy to determine beforehand when opium serves only to induce greater prostration and distress; most generally, however, the patient is of a nervous habit with a florid complexion - or at least he has had one - and is of a neuro-vascular diathesis. In cases of this kind where the exhaustion is great, an morphia inadmissible, camphor sometimes proves useful; or carbonate of ammonia with camphor and kubarana." (p. 415)

"Tartar emetic is chiefly indicated in those

those cases in which there is some inflammatory complication. It is advantageous, too, at an early period, in those in which the disease is more sthenic, and the mental disorder more nearly approaches insanity or mania. In these the patient is less apprehensive and timid: often loquacious, suspicious, and inclined to be aggressive upon slight provocation; he has notional delusions more predominantly than hallucinations of the senses; his nights are not wholly sleepless; nor has he tremors of importance. His appetite is comparatively little impaired; his tongue ~~coated~~ little coated, and, when projected, rather pointed and firm, than flat, flabby, and tremulous. The skin is hot, or natural, rather than cool and moist; and the pulse is less round, undulating, and quick.

Cases of this kind are intolerant of stimulants and opium even in small doses.

When, however, there are symptoms of depression, ~~and~~ especially in a young person, and the history is that of causes of exhaustion, laudanum, in 5 to 15 minimi doses, is a useful stimulant, in combination with 5 to 15 minims of "liquor tartarici emetici." (p. p. 415 & 416)

"Constipation and hepatic congestion"

gestion", as complications of gastritis, "indicate a suitable aperient" at the commencement of the treatment. (p.p. 416 & 417)

"Chloroform has been administered in very violent cases with advantage". (p. 417)

Dr. Laycock states that under "the expectant and rational method of treatment," during the four years previous to October 1858, of 28 cases, he only lost only one, and that "was one already treated by opium". Also, that, between that date and November 1862, he had 40 cases, the only fatal termination in which "occurred as a sequel to continuous epileptic fits in a young man exhausted by drinking and licentiousness".

Dr. Laycock does not appear to consider what have been called 'delirium ebriorum' and 'delirium traumaticum' other than mere varieties of delirium tremens. (p.p. 402 & 403)

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Dr W. J. Gardner, also, in his "Clinical Medicine", in 1862, testifies to the efficacy of expectant treatment.

He says the "patients required, as a rule, nothing but adequate protection, and good food, adapted to the state of the digestion." (p. 258)

Nevertheless he often gives opium "in protracted cases"; but always so, as never to exceed, in 24 hours, "the full dose safe for a healthy person". He gives two or three doses rapidly till a maximum total amount of ʒiʒ to ʒij is reached; then, or sooner if the pupils have become at all considerably dilated contracted, he stops, "for at least a good many hours". To prevent its accumulation in the bowels, he alternates its use with laxatives, or purgatives. "If the pupils are contracted from the first," he holds it "Contraindicated". He considers chloroform "a useful adjunct to opium". (p. 272 & 273)

When the disease is from "very long continued habits of drinking," and the patient is "much debilitated," he sometimes gives "a very moderate allowance

lowance of whisky; but he hardly ever gives it, at least in quantity, when the excesses are of recent origin." He sometimes bribes patients to eat, by a little of the habitual stimulant. (p. 258 & 270)

He says "purgatives" are "indicated from the first," where there is a "flushed, bloated appearance," a "very foul tongue," a "manlike peculiar odour of the breath, fetid" stools, and the history of a recent surfeit of eating as well as drinking." (p. 271)

He also says "since I adopted the plan" mentioned, I believe I have not lost a case, that was not complicated.

D^r. Gardner, too, seems to think it quite unnecessary to separate delirium ebriacum, &c., from delirium tremens; for he states, that there may be "all the essential phenomena of nervous disturbance consequent on the use of intoxicating drinks, without tremor, and without ~~the~~ well-marked delirium"; and that there may be "every degree and kind of nervous irritability, and almost every kind of cerebral disorder, in turn, due to this cause — from the fidgety, dyspeptic, and prostrate condition, called the horror of drink, to the most exaggerated mania, or the most ~~depa~~ desperate and repeated epileptic attacks." (p. 255)

Mr. Jones, of Jersey, seems to have treated delirium tremens by the administration of half ounce doses of tincture of digitalis, repeated at intervals of 2 or 3 hours; but as the following is the only notice I have seen of the results of that treatment, I cannot mention what success has been given as evidence of excellence in it.

Mr. Morell Mackenzie, Registrar to the London Hospital, writes, in the *Lancet* of March 8th, 1862 (p. 261), that, of three cases of the practice, that had come under his notice, death had occurred in two; and that, in the other, the digitalis had to be abandoned, and recourse had to stimulants and opium, under the use of which, the patient recovered.

C. R. Hinman, M. D., Chatham, on the same page of the *Lancet*, recommends half drachm doses of Cayenne pepper, in a little gin, every 4 hours, till sleep occurs. He says, ^{that} 3 doses were generally required, but that, in many, one had been sufficient; and that he had given 7, occasionally.

He also takes care that the bowels are freely open.

I have now, I hope, sufficiently indicated the nature of the successive changes and modifications, which have taken place in the opinions and practice of medical men, regarding delirium tremens; and therefore proceed to offer a few remarks.

The only means of ascertaining the absolute value of any method of treating a disease, being the comparison of the course of the disease under treatment with its natural course, we might expect to find that every final adoption of a method of treatment has been preceded by at least an attempt at such comparison; but on referring to the history of medicine, we discover, that, so far from this having been the case, the application of the test in question has been a rare exception rather than the rule.

By far the greater number of the methods of treatment which have at different times been more or less extensively adopted, have had nothing better to recommend them than accordance with particular pathological and therapeutical theories or the exhibition of statistics shewing fewer deaths to occur under them than under other methods.

What has just been said is true, in an especial manner, of delirium tremens.

Until the time of Dr Ware's investigation of the natural history of that disease, no writer on its treatment seems to have felt it even desirable, much less essential, to ascertain, from facts, what was the natural course of the disorder, and compare this with the course of the malady under any given treatment, before deciding on the absolute worth of that treatment. Even since Dr Ware wrote, but few practitioners, even to the present time, appear to have made any use of this all-important means of arriving at correct conclusions as to ^{the} propriety of their practice.

Some writers have evidently paid little heed to statistics of any kind, having been quite satisfied with their treatment if it only accorded with their pathological and therapeutical notions, and did not give startlingly bad results; and all who before, and most of those who since, Dr Ware wrote, have, to any extent, allowed themselves to be guided by statistics, have done so merely by comparing the statistics of one plan of treatment with those of another.

This latter use of statistics has doubtless been always of service; and has been purely so, where only estimated at its proper value; but, where this estimate has not been adhered to, it has been, also, indirectly, a grievous hindrance to progress, by distracting the attention of medical men from the more important comparison I have spoken of: for, relative value of treatment has, then, either come to be mistaken by them for absolute, or satisfied them so completely that they have never wished for more.

In this way, it has happened that practitioners have convinced themselves that their treatment saved lives from delirium tremens, merely by reference to statistics which might, at least as reasonably have been used to prove that the parties concerned were only allowed to recover, in place of being killed by a worse treatment. Their adoption of methods of treatment only on account of superiority, real or imaginary to other methods, might be excused, could it be supposed that it was fear of endangering life by experimentation that prevented them from

from practically ascertaining the natural course of the disease, and thereby judging of the positive excellence of any method; but the entireness of the satisfaction in their practice, which they manifest in their writings, precludes them from the benefit of so charitable a supposition.

Drs Sutton, Pearson, and Armstrong adopted their opium treatment solely because greatly fewer died under it than under a heroic antiphlogistic one. It is remarkable that, though they join in assigning an enormously high mortality to the antiphlogistic treatment, no one of them even hints that the mortality might have been smaller, had there been no treatment at all. Instead of saying that the antiphlogistic treatment was positively bad, and theirs positively relatively good, — which I think subsequent investigations have proved to have been the real state of matters, viewing their treatment in its most favourable aspect, they asserted that theirs was positively good, and the antiphlogistic relatively bad.

Dr Wood of Newcastle, would have

have deserved great credit for the adoption of so purely negative a treatment as his was, had he chosen it as negative and on rational grounds; but, on the contrary, it appears, that he held it an active and powerful means of cure, where it was really of little use, beyond ~~displacing~~ preventing, by displacing, the use of hurtful treatment, and perhaps alleviating some symptoms; and that his choice of it was founded on pathological notions for which he can have but little even apparent foundation.

Dr. McWhorter seems to have regulated his treatment almost entirely by a theory as to the cause of the disease. Even that theory has since been abundantly proved to be at least quite insufficient. Moreover, even his ideas as to the mode of action of the cause he assigns to the disease must have been of the very vaguest kind, or he would not have classed together, as analogous phenomena, the subsidence of pain after an injury, and the subsidence of stimulation

ation after its production by alcoholics.

Similar observations might be made on the practice of all who have treated the disease on other than expectant principles; for, the adoption of other principles have always been associated with, and dependent on, a corresponding omission of reference to the natural course of the disease, — no active treatment having ever been adopted in consequence of, or supported by, such a reference.

So that the mere adoption, of however extensive, of any of these non-expectant plans of treatment gives ~~no~~ no security for the possession by these methods of any positive excellence.

On comparing them with the simple expectant plan, it is found that the statistics show, under the expectant method, a mortality as small as that found under any other treatment, and greatly smaller than that observed under most. No doubt, those who still advocate active treatment, opiate or other, believe

(2) Ed. illud. Jour. Vol. IV. 1859. p. 304.

believe, either that these statistics are incorrect, or that those of the active treatment refer to instances where it has not had fair play; but it is remarkable that no one of such advocates seems to have published any comparative statistics to prove the superiority of ^{his} plan over the expectant one.

I have no time left to discuss the various pathological theories mentioned in this paper. I may however say that I believe that no theory has yet been advanced that affords a reasonable exposition of the essential nature of delirium tremens.

~~The~~ Statistics of the expectant method of treating the disease will be found in the notice I have given of what has been written on the subject by Drs Ware and Laycock.

I conclude, by giving, for comparison with those of the expectant method, the following statistics of the ordinary active treatment, taken from Dr Laycock's first paper. (C')

Dr Laycock states that, if he is "rightly informed, the stimulant plan, with alcoholic drinks and opium, has been usually followed at the Royal Infirmary, except from 1839 to 1842."

According to the table he gives, of 111 Cases between 1st July 1839 and 1st October, 1842, there died 13, or 11.7 per cent., and of 292 cases between 1st October 1842 and 30th September, 1850, there died 88 or 30.1 per cent. He does not state what treatment was employed from 1839 to 1842.

He says that "Dr Rogers reports, that of 75 cases admitted into St. George's Hospital, during five years ending 1856, 14.6 per cent. died."

That "the mortality in the General Hospital at Calcutta from 1848 to 1850, and in the Medical College Hospital, 1851-1853, was 15 per cent. in 321 Cases."

That "Colonel Tulloch, in his report on the health of the army (1853), gives the mortality of the cases of delirium tremens in Great Britain at 17.6 for the infantry,

infantry, and 13.8 for the cavalry".

And that, "from 1842 to 1848, there were 35 cases admitted to the Glasgow Infirmary, and 17 died, or nearly 50 per cent."

He considers that the statistics here given (after those of the Royal Infirmary) may be taken as indicating the results of treatment by opium and alcoholic stimuli.

Archibald Dickson.

April 9th.
1863.