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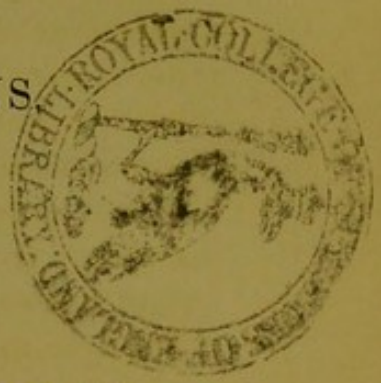
Marshall Hall from his
obliged friend The
Weiss?

ON

THE RELATION OF SLEEP

TO

CONVULSIVE AFFECTIONS.



BY

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The relation of Sleep to Diseases in general is a subject still needng full investigation; and that which it holds to Convulsive Affections would be found especially worthy of research. The *history* even of the spasmodic disorders which occur in sleep is so meager and unsatisfactory, that one more accurate and ample is required; but as the facts which illustrate it are for the most part common, I will confine my observations to some points respecting the *causes* of the convulsions which happen either in light or profound repose.

Sleep produces certain peculiar states, both of body and mind, which must have a most considerable connection with convulsive maladies; and I would beg the particular attention of the Society to—

i. The condition of the Circulation and Respiration.
ii. To that of the Motor Force and Muscular Irritability.
iii. To the Emotions of Dreaming.
iv. To the withdrawal of the Will.

i. *Of the state of the Circulation and Respiration.*—I will not here consider whether sleep itself may not be a consequence of cerebral congestion falling short of that which

would give rise to coma; but there is every reason to believe that the vessels of the brain are fuller at that period than in wakefulness. It may even be concluded that they are *necessarily* so from the position of the patient, and the state of the respiration. There is sometimes during sleep plain evidence of congestion; the face is flushed, the conjunctivæ are reddened, the veins of the neck and temple are turgid, the countenance looks occasionally swollen, the lip is somewhat livid, the pulse labours, the breathing is heavy, or even stertorous. We may be certain that the state of the vessels external to the brain is, more or less, a guide to that of those within. Through the cerebral circulation being impeded, the brain may so mechanically irritate the spinal cord as to lead directly to convulsive actions. That circulation is apt to be unusually disturbed, if sleep be preceded by unusual bodily or mental excitement, by a luxurious or immoderate meal, and by the emotions of dreaming, whencesoever arising; and whatever its difficulties, the helpless condition of volition is such that it cannot be assisted through the respiration, as in wakefulness.

11. *Of the Increase of the Motor Force and Muscular Irritability.*—It may be assumed that, in many who are predisposed to convulsions, spasmodic affections partly happen from the renewal and increase of the motor force which take place in sleep. Some phenomena of hybernation, and some, too, observable in paralytic limbs cut off from cerebral but not spinal influence, show well how irritability is fed by stillness; and it would be futile to deny, that liability to spasm, of every kind, is, *cæteris paribus*, in direct ratio of the measure of the motor force. During wakefulness this force must be continually lessened, and kept in check by expenditure carried on in some form or other; but in repose its augmentation may become dangerous in subjects liable to convulsion. Whatever be the cause which immediately excites it to unruly action, its own quantity or intensity must be well considered. We cannot too clearly regard this force as dependent on and modified by the

blood's condition, as all secretions are; and it is not more the office of the glands, each after its kind, to separate their fluids, than it is the vital function of the spinal cord, through the replenished vessels it abounds with, to supply unfailingly the motor power, whereof there is not only a different measure in sleep and wakefulness, but a superfluity in childhood, and a deficiency in age, whilst in some diseases it is as much below, as in others it is above, the demands of the system. I say nothing of idiosyncrasies, which would reward inquiry. Sleep may most manifestly be so indulged as to confirm or cause spasmodic affections. The vast amount of time consumed in it by infancy and childhood, wherein prevails frequently a most perilous excitability, calls for attention. Coma is fairly, in some of its consequences, comparable to an extraordinarily protracted repose, and may bring on, as I have frequently noticed in young children, so morbid a susceptibility of spasmodic action, that the slightest touch or a drop of water will reflexly excite general convulsions.

III. *The Emotions of Dreaming.*—These are, very probably, amongst the most common immediate causes of the convulsions of sleep; and this we should be justified in suspecting from the marked effect of emotion in epilepsy, laryngismus stridulus, and other forms of spasmodic malady during the waking state.

It is needless to enter at any length into the intense horror which dreams may occasion; all must have felt it; but in childhood they are singularly pertinacious and terrible, and may partly explain the frequency of convulsions at that time of life. Nor does the danger cease at the moment of awaking, for spectra are prone to linger and agitate.

I have frequently watched the quiverings of the muscles and the starting of the limbs in dreams, which I regard amongst the most frequent of all the causes of convulsive action. The dreams of epileptics have been pointedly referred to by Aretæus; and they have often a most unhappy influence on their dreadful disorder, breaking the sleep with

frightful paroxysms, and in some instances deferring by terror the time of its approach.

Emotion, speaking generally, has never so much dominion as in sleep, wherein the restraining power of volition is withdrawn, and there is a kind of general paralysis, attended commonly with high irritability, which extremely favours its inordinate play. Even the healthiest and strongest men are appalled by, and tremble from, the frightful and fantastic visions of their sleep; but to judge rightly of the effect of emotions in dreams, we must place fully before us the various conditions in which they have to act. The epileptic is oftentimes so excessively excitable that there is a risk of the slightest impressions. The young subject of laryngismus stridulus is as irritable occasionally as a sensitive plant; not a change of mind or body but acts with unusual and morbid violence. In tetanus or hydrophobia no impression is trifling. The limbs of the paralysed are now and then noted to be convulsed by a touch.

Dreams are, for the most part, referable to excitement of mind previous to sleep, to immediate impressions on the nervous system, to changes of the blood, and to various impeded or embarrassed conditions of the respiration and circulation. It would be well to subdivide this outline minutely, and to treat at length of their origin, which, well considered, would be found to illustrate much that is obscure in nervous pathology. The resemblance which exists between dreaming and delirium, extends somewhat to their causes. Both are oftentimes referable to impressions on the sentient nerves. A sensation too obscure to awaken is very likely to produce dreaming; violent or long-continued pain, especially if it happen in exhausted subjects who have been long sleepless, is very apt to be the origin of delirium. The state of volition is intimately connected with both instances, and throws equal light upon each; if it be suspended, or almost so, in the one, it may become so weakened and languid in the other, as to lose all effectual control over the operations of the mind. Delirium must be regarded as a source of convulsion; therein, as in dreaming, the emotions rise sometimes to their highest pitch.

It is occasionally not a little hard to say if a person be delirious or dreaming; the best test will be found in the endeavour to rouse him completely, and noting the effect of wakefulness on his delusion. During typhus there is often a prolonged dream, the will of the patient being as much withdrawn from directing his mind as from governing his muscles; and be it remarked that this condition may be commonly enough quite dispelled by fully rousing him. I watched but lately a young man dangerously stricken with typhus fever whilst he lay in unsound sleep. There was a lively quivering of the muscles of the face, particularly of the orbicularis oris. At one time it affected half, at another both sides of the countenance; the hands were in frequent tremor, and now and then the forearm was jerked abruptly. I imagine a dream was disturbing him. On my perfectly awaking him, and his will becoming active, all these movements ceased; but they returned the moment he relapsed into slumber.

In considering the relation of sleep to spasmodic movements, it must always be inquired, as a matter of course, whether it be sound or not. In truly sound sleep, chorea no longer waywardly agitates, and paralysis agitans ceases to shake, and many forms of local affections of the motor force find temporary quiet; but not so if the slumber be ruffled by emotions. I observed of a patient with mercurial erethism, that whatever agitated his mind disturbed also his body; the mere question of a stranger would make his muscles quiver. I watched his sleep; then he was often in perfect rest; but at other times he startled occasionally, and seemed to be dreaming when he did so.

The opposite influence of calm and disturbed sleep is clearly instanced by the following observation. A woman was affected with an almost perpetual tremor of the right arm and hand, which was extremely aggravated by emotion. I carefully noted that the arm and hand were completely still during perfectly sound sleep; but in imperfect or light repose there was a varying amount of tremor. The hand, no less in sleep than in wakefulness, became a delicate index of the condition of the mind. One night, when the patient

was resting profoundly, I examined the hand as it lay by her side; not a muscle quivered; but shortly afterwards the slumber became manifestly imperfect, and then the hand and arm, influenced as it seemed by the emotion of dreaming, shook very forcibly. On a subsequent night I watched more minutely, and for a longer time. In calm sleep the hand lay in perfect rest, but anything which disturbed the repose served also to renew the tremblings. When it became very violent, she occasionally seemed about to awake, and even performed a voluntary act or two, and made a kind of complaining noise, as though annoyed by something; but instead of arousing completely, she relapsed gradually into her former complete unconsciousness, the slow subsiding of the tremors well marking its return. And so she would lie, without any movement of the voluntary muscles, the arm participating in the perfect quiet, until a noise partly discomposed her and renewed the tremors, which it was interesting to note, were frequently the only sign whatever of some degree of mental activity.

There are some cases of hemiplegia wherein, though the will be powerless, intense passion violently convulses the affected parts; it may be well supposed that these are not a whit less amenable to the excitement of a dream than to the agitation of the waking state.

It is very probable that chorea, epilepsy, and other forms of convulsive action, are at times first excited by the emotion of dreaming; and that this is one reason why their immediate origin is not seldom involved in so much obscurity.

iv. *Of the withdrawal of Volition.*—There are a variety of considerations all tending to show that the withdrawal of the will in time of sleep must predispose greatly to convulsive actions.

Almost all the experiments which demonstrate and illustrate the reflex function are of necessity performed after the removal of the seat of volition; and it now seems strange that those movements should ever have been called voluntary which cannot be excited until volition is withdrawn.

The reflex movements of paralytic limbs are, *cæteris paribus*, always excited with a facility inverse to the power of the will; on the partial return of that power they become more difficult to occasion, and they fail to be provoked on its complete restoration.

But *all* states which abolish the command of, or enfeeble the will, predispose to involuntary action. Putting pathology out of question, we may note the fact commonly in the course of life. In infancy the emotions are written on the expression and gestures with a freedom denotive of an uneducated, and almost powerless will; in age the hand often trembles, partly because of the declining energy of the voluntary function.

Disease shows the same truth daily. In the coma both of adults and children, I have repeatedly excited reflex movements, and have observed the experiments foiled by the return of the mind's activity. Chorea is an affection wherein the balance between the voluntary or emotional powers is temporarily broken; the tongue cannot utter and the hand is made useless from the perpetual interference of restless emotion with the yielding will.

But experiments upon sleep itself are, after all, the best exemplifiers of the condition of the will in that wonderful state, and of the readiness wherewith reflex or convulsive movements may be excited in consequence.

I passed my finger gently over the palm of the hand of a child who lay fast asleep. The fingers closed and grasped so firmly that I could draw away the arm from the side, drag it in different directions, or lift it upwards. At length the child awoke; the same kind and degree of irritation was applied, but the fingers would not close thereupon, for the will obviously counteracted the impression produced by the recently effectual stimulus.

I have times and often occasioned other reflex movements in children during sleep. I have noted the arm to be suddenly withdrawn on tickling the hand,—the orbicularis palpebræ to contract and corrugate on the eyelash being touched, whilst a frown was produced simultaneously; yet

was the child not startled, no change affected the breathing, and sleep went soundly on.

Once upon my irritating the hand of an infant in fast repose, there was a general convulsive start, and a laryngeal noise at the same moment. This fact may be compared to another; in a nearly asphyxiated newborn infant I produced several times a most distinct inspiration by tickling the palm of the hand.

These, and other similar movements, were occasioned at different periods of sleep. Increase of irritability favours them undoubtedly, but it is far from being indispensable to their causation. All that is essential is a quiescent will. According to Dr. Baly, they may be excited in their full intensity immediately after the beginning of sleep.

There are states of extreme excitability of the nervous system, such as those instanced by tetanus and hydrophobia, in which they could, no doubt, be most readily produced; but sleep, so difficult to obtain in such cases, must be guarded from irritation with most scrupulous care.

We must be prepared for failure when attempting to cause motions of this kind. Sometimes the sleeper is half aroused by the touch, and a movement follows which is emotional or voluntary. As yet, I have experimented almost exclusively on young children, preferring them because their surface is so excitable, their irritability proverbial, their motor force excessive, their sleep profound.

But the most favorable condition, not even excepting early infancy, for the production of reflex movements during sleep, is that of cerebral paralysis, attended by *anæsthesia*. A young man, made paraplegic by this form of disorder, lay sleeping profoundly; I turned up the bedclothes gently, and, having exposed the legs, pricked the soles of the feet with a pin, and provoked the quickest and strongest contractions, and renewed them again and again at pleasure, the man still reposing as fastly as though nothing had touched him. The reason was clear; he was so truly anæsthetic, that neither the raising of the bedclothes, nor the exposure of the legs to the cold air, nor even the sharp and

rude punctures were at all felt by him, though the last were very effectual in exciting a reflex action of his muscles. Extreme insensibility and extreme *excitability* prevailed together.[1]

In two other cases of paraplegia attended also by loss of sensation, I excited similar movements during sleep, and with equal facility, without awaking the patient.

Experiments of this kind are a simple and admirable test of the real state of sensation in some cases of loss of voluntary power. A patient may assert that he does not feel at all, because his sensation is obscure or abnormal; a better proof of anæsthesia lies in the fact that keen impressions on the nerves of sense break not his rest.

In cases of anæsthesia from cerebral disease, in which there is no loss or impairment of voluntary power, it would be highly interesting to try the effect of stimulating the affected surface during deep repose, with the view of provoking the muscles to contraction.

In those instances of paralysis in which the will is but partially deprived of control, and somewhat resists the influence of the means whereby we endeavour to occasion reflex movements, sleep offers a propitious time for trial.

Hybernation is a more favorable state for the production of reflex movements than that of sleep, because it more fully suspends sensation, augments irritability, and withholds the will. Dr. Marshall Hall long ago observed how very readily the hybernant animal might be excited to motion, how the "slightest" touch of the hedgehog, and the merest shake of the bat, would produce acts of inspiration. I have since noted similar phenomena. A dormouse lay in the hybernant state, not a respiratory movement was perceptible; on my lightly touching the tips of the hair, there followed quick, deep inspirations, which became gradually slower and invisible. I also excited a distinct contraction of the sphincter of the eyelid by irritating its lash, and retraction of the extremities by stimulating the feet. These obser-

[1] "La sensibilité est donc distincte de l'excitabilité."—M. Flourens.

vations were repeated. No movements of this kind can be thus excited in the same creature when fairly awake.

In the deep, long, peculiar sleep of the unborn child, motions of its limbs may be readily occasioned by to and fro moving the hand, with a light pressure, on the abdomen of its mother. I believe them to be reflex, as Dr. Simpson insists, and they occur, according to him, in the anencephalous as well as the perfect infant. This fact is incompatible with the idea which some have entertained of their being voluntary.

Reflex actions would more frequently be observed as the effects of incision during the profound sleep or coma of chloroform, but for the extraordinary influence of that potent agent on the motor force and muscular irritability. But respiration continues as a reflex act during the extreme unconsciousness, and when it fails as such, may be excited, though not invariably, by the sudden impression of cold. I happened to see Mr. Paget, when observing the effects of inflammation in the wing of a bat, which he had placed under the power of chloroform, revive the respiratory movements from time to time by simply blowing upon the skin.

But let it be again remarked in connection with what occurs in sleep, hybernation and coma, that whatever withdraws the will in the *waking* state, predisposes most obviously to the effectual excitement of reflex actions. In this way attention may predispose to them. One day when travelling by railway with a strong, keen wind blowing in my face, I found myself breathing in a deep sighing manner. My attention happened to be fully fixed, and had withheld the will from its due action on the respiratory muscles. The moment I breathed voluntarily again the impression of the cold lost its effect. Reverie, in like manner, by abstracting volition, lends power to the influence of emotion, which will act upon the person absorbed in thought much as it does upon those who lie asleep.

I have performed a variety of experiments, which all tend to show the will as an antagonist of various causes of spasmodic action. I have acted with galvanism on the hybernant dormouse, and stirred its muscles with a force which would

not have operated, at least not visibly, in the waking state. In the same way I have affected the decapitated as I could not have influenced the perfect, frog. I have remarked the limb of the human subject to be so contracted by volition as to resist galvanism. In the headless dragon-fly I have produced respiratory movements with a galvanic force which the entire insect could have readily overcome. I have made similar observations with respect to temperature. The impression of cold on the conscious and unconscious is altogether different; I have seen the eft run rapidly along a surface so heated that it would have been convulsed instantly, but for its striving will.

Illustrations of this kind would have been classed, by Lord Bacon, under the expressive and convenient head of "*wrestling instances,*" which, in his own language, "we are also wont to call instances of predominance. They are such as point out the predominance of powers compared with each other, and which of them is the more energetic, and superior, or more weak and inferior."[1] Now, in sleep, the mind cannot wrestle with, and oppose any cause of convulsion, as it can in wakefulness; the body is left altogether unaided, and impressions play on it as though there were no will; and we cannot but conclude, that all kinds of physical irritation, and all forms of emotional disturbance, must have more power then. Our safety lies often in the facility with which we are awakened; by this, affrighting dreams are shortened; by this, the power is brought abruptly into play, whereby we can control or modify many forms of spasms. But here let me note a good effect of distressful dreaming in many sorts of difficult respiration. The patient complains of the repeated disturbance, and begs an anodyne, little thinking that he requires the influence of volition, from time to time, to aid his breathing, and that profound, uninterrupted sleep would soon merge into dissolution. The dreams which awaken, indirectly, preserve him.

I have already alluded to the reflex actions which may

[1] Novum Organum.

be occasioned during sleep in paralytic limbs. Paralysis should certainly be more studied both in light and deep sleep. Many instructive observations might, I suppose, be made in that extremely interesting class of cases wherein emotion acts freely on parts lost almost, or absolutely, to the influence of the will. What would be the effect of the agitation of a dream in that kind of facial paralysis in which the features are still subservient to expression, though volition cannot reach them? In such a case the symmetry of expression is destroyed in wakefulness; but in a dream it might, perchance, be restored from the will being withdrawn, by the influence of sleep, from controlling the unparalysed half of the countenance. Or, on the contrary, it might happen that the paralytic parts would be still the more influenced from being more irritable, and by consequence more easily acted on than the opposite.

But we must note the twofold influence of sleep in regard to the movement of paralysed parts. Whilst dreamful slumber may unusually disturb them, placid sleep may have such an effect in calming the emotions as to relax muscles, which seem to be invariably contracted in the waking state. A little girl, five years of age, had partial hemiplegia of the right side, the face being affected as well as the limbs. The fingers were invariably flexed in wakefulness, and very strongly under the influence of emotion, but in sleep they were perfectly relaxed, and I could straighten them with the greatest readiness. The face, too, looked quite unparalysed in sleep, though, on awaking, emotion so unequally influenced the two halves of the countenance, as to make obvious the paralysis of the right one.

In a hemiplegic woman whose arm had been long and severely contracted, the effect of sleep was remarkable. At a time when, in wakefulness, there was such obstinate contraction of the forearm and fingers, that the patient could not straighten them, nor could they be extended for her, sleep quite dispelled this involuntary motion. Wakefulness renewed it directly. Once, whilst examining the limb in

sleep, I partly disturbed the patient, and forthwith there was a convulsive starting of it.

Since making the former of these observations, I have learnt that Professor Romberg has remarked contraction of the flexor muscles of paralysed parts to cease during sleep.

Sometimes it is an object to straighten a rigid or contracted limb, and to keep it extended; sleep may offer an opportunity for doing so where we should be foiled in wakefulness.

There is nothing to wonder at in this occasional relaxing influence of sleep in instances of paralysis; the like effect of it has long since been noted by Sir Charles Bell, Sir Benjamin Brodie, and others in cases of local affections of the motor nerves.

In instances of a different description, and in which the mind takes no part in producing the rigidity or convulsive action, the muscles still act during perfect rest. Dr. Marshall Hall has mentioned a case in which the paralytic limb was contracted and drawn to the side in time of sleep. Sir Charles Bell has narrated an example of disease of the brain which occurred to a boy of eleven years of age. There was general paralysis, yet when he slept the left arm was always raised.

I observed a case of hemiplegia in a girl five years of age. She was convulsed in her sleep, but the *unparalysed* parts were *exclusively* affected. The disorder could not have sprung from emotion, for, in the waking state, the *paralytic* limbs were contracted with violence by the operation of the passions, whilst the *opposite* were under most absolute control. The effect of sleep, then, varies greatly in cases of paralysis, and this is one reason for new observation. Well investigated, it would throw considerable light not only on paralytic, but convulsive disorders; these, though seeming so opposite at first sight, are mutually illustrative to the highest degree.

A few remarks in reference to treatment arise most obviously from the preceding outline. Sleep should unquestionably be watched much oftener than it is, in order to detect, prevent, give aid in, and combat the effects of, convulsion. Symptoms which long baffle inquiry, and which

are really imputable to "hidden seizures," as Dr. Marshall Hall has termed them, can only be accounted for, in many instances, by watching sleep. It is an eventful period, speaking pathologically; apoplexy, epilepsy, paralysis, and attacks which lead either to mania or enfeeblement of mind, all, as we know, may happen then. I observed in one case that a peculiar, transient, recurrent kind of partial anæsthesia was produced by sleep.

The patient should always be awakened if convulsions threaten, or if the sleep be unusually heavy and profound, or disturbed by harassing and tumultuous dreams. A fit may be indicated by turgidity of the veins of the head and neck, by a quivering of the muscles of the face, startings of the limbs, contraction of the fingers, crowing inspiration, and a dilated pupil; but persistent expiratory efforts are especially alarming, and frequently begin the attack.

Sometimes it will be enough simply to partially arouse the patient; but frequently it will be necessary to completely awaken him, and keep him awake. Assuredly there are some cases in which sleep and epilepsy are not merely coincident, but absolutely related as cause and effect. Esquirol narrates an instance of the disorder in which the attack was uniformly preceded by sleep, to prevent which was to postpone it always. Heberden speaks of another, in which the patient entreated the bystanders to restrain him from sleeping. Dr. Hugh Ley mentions a case of laryngismus stridulus, in which the coming paroxysm was delayed most evidently by keeping the child awake and amused. Mr. Solly mentions an epileptic who believed that he could prevent his paroxysms by inspiring deeply. I well remember watching a patient in partial epilepsy; for awhile he strove successfully with the incipient attack, commanding his breathing, and opposing, by his volition, the contraction of his hands; but, at length, he fell into complete unconsciousness and pitiable contortions. I have seen many cases in which spasmodic action has been entirely mastered by efforts of the will.[1] In limbs partially

[1] I may refer to a communication made by me to the 'Lancet' for 1840,

paralysed, but prone to spasm, I have remarked emotion and volition to contend together, and now one prevail, and now the other. A good example of a wrestling instance is given by Cruveilhier, who speaks of a case of flexion and rigidity of the lower extremities, which was permanent unless a great effort at extension was made. But I doubt not that even epilepsy is far oftener prevented in wakefulness than we think, by those efforts of the mind which should, by all means, be encouraged. This is partly to be explained by our rule over emotion; partly, perhaps, by the effect of attention; but, most of all, by the command of volition over the respiratory movements. In sleep this is lost to us; and in that state we find the truth negatively exemplified, that volition is not only a directing, but very often a conservative, power. It is stated amongst the aphorisms of Hippocrates that the arrest of respiration indicates convulsions. And certainly the excitement of inspiration hinders them, as Dr. Denman showed when he suddenly applied cold to the face in cases of puerperal paroxysm.

In the deep sleep which not uncommonly succeeds to epilepsy, inspiration may, occasionally, be most advantageously produced by means of sudden and transient cold, the return of blood from the congested brain being, by this means, greatly promoted; and where there is dangerously

and to an essay on "Some of the Relations of Volition to the Physiology and Pathology of the Spinal Cord" in the 'Medical Gazette' for 1848, in which I have more fully entered into the question of the antagonism between the power of the will and various causes of spasmodic action. See Professor Volkmann's remarks in 'Müller's Archives' for 1838, and a note of Dr. Baly in his translation of Müller's 'Elements of Physiology,' 2d edition, p. 800; and Dr. Marshall Hall's second and third memoirs on the "Nervous System," in the Transactions of the Society. Dr. Holland's reflections on Sleep, Dreaming, and others, also, in which he refers directly to Volition, may be consulted with great advantage in respect to several points on which this paper touches. I would also make reference to some observations of Mr. Hunter, Mr. Grainger, Dr. William Budd, Dr. Watson, Dr. West, Dr. Carpenter, Dr. Kirkes, and Mr. Paget, and those which Dr. Sibson has published, since the reading of this paper, in the last volume of the 'Provincial Medical Transactions.'

profound coma, it may be necessary to irritate, and even to rapidly and severely inflame, the skin, so as to preserve consciousness by pain. The successful treatment of narcotic poisoning suggests much here.

There are some further points respecting the management of convulsive diseases in time of sleep, to which allusion will be excused on account of their importance. The sleep of the epileptic does harm often, both from deficiency and excess; and there are many cases in which it should, if possible, be as regularly recurrent as that of plants. The mind should be calm previous to repose, lest it be hard to obtain or dreamful; but its approach is often deferred by intense anxiety.

The head should be elevated,—but *after* sleep has come on, if the patient, from fear of obstinate wakefulness, object to raise it previous to repose; states of anæmia make exceptions to the rule. Indigestible or immoderate suppers and drastic purgatives, and anything whatever which may irritate the sleeper, or produce dreaming, or embarrass his respiration, should be shunned, of course. Opiates are generally to be avoided in epilepsy, for they make sleep too profound, or occasion excitement; but delirium tremens no more contra-indicates their use than the incessant motions of the obstinate chorea which endangers life by exhaustion; and chloroform may be found of essential value, when other narcotics have been tried and have failed.

More indications in reference to treatment might here be touched upon, but I fear to trespass longer on the indulgent attention of the Society; and would only add an expression of the hope that this small contribution, although very imperfect, may be of some service to future inquirers.