Theories & Treatment of Epilepsy.

Chas. M. Russell. 1862.
Chas. M. Russell -

In the wide field of medical research & observation - though many varieties are the diseases which call for our attention - perhaps none are more important, certainly none more interesting, than the disease which is commonly known among us as the Fitly Sick - or Epilepsy.

For to be a man, - it may be, to all appearance in perfect health, - suddenly thrown to the ground senseless & convulsed - his brows knit & features distorted - to watch him gasping & struggling for breath, even to such extent that every succeeding moment shall seem his last - may well excite the interest of the physiologist & student of medicine, - I lead them to put forth their best energies to unravel this subtle disease.
We say epilepsy. For though many of the highest eminence have devoted their time and talents to solve the mystery of an Epileptic seizure, still much is wrapped in darkness. Much yet remains to be known as to what may be the essence, as it were, of a malady which is fraught with such dire results to thousands.

For by many—by Epileptics now, as by the ancients of old—is regarded as one to be avoided. Many people, too often his near relations are afraid of him, as they know he is barred alike from the privileges of society, as from the benefits of most public institutions.

But though we might say much upon the social condition of the Epileptic—the limits of a thesis
will not admit of our doing so. We shall therefore plunge in medias res, I commence at once with the consideration of the theories of Epilepsy.

A. Joseph Wenzel

was of opinion that Epilepsy depended upon a disease of the Pituitary body of the nature of Calcareous deposits or granular degeneration.

But the time has passed away when any evidence can be given to this theory. Since it has been shown by Romberg, Rotkowsky, and others, that the pituitary body may be altered without the co-existence of Epilepsy. On the other hand that Epilepsy may exist without any appreciable alteration taking place in this little body.
Dr. John Simon endeavours to show that epilepsy by its symptoms tends to terminate in insanity. He believes that epilepsy is due to a diseased condition of the cortical substance of the brain.

In favor of this theory is the circumstance that we may cut healthy brain without giving rise to convulsions, but if the brain be cut while in a diseased condition, convulsions are produced.

There are other instances also in favor of elucidation of this theory. Thus, the sympathetic nerve is not sensitive till in a state of inflammation. The nerves of tendons seem to be without sensibility, but when inflammation supervenes...
they become exquisitely sensitive.

What objection then is there against Dr. Simeon's theory? This, we know that softenings may take place if tumours grow in the brain. Various kinds of brain diseases manifest themselves without the superintervention of epilepsy.

But supposing it be argued, that the nature of symptoms are strongly presumptive that an epileptic fit must be the result of some affection of the cerebrum. Thus, one or more of the special senses shall be deranged; patients may have illusions; phantoms shall suddenly rise up before them. Claps of thunder resound in their ears; an overpowering smell of breath irritate their olfactory nerves. Besides these, pain or
The answer to this is that the loss of consciousness may be explained other
wise than by admitting the brain to be the seat of this affection. It may be
due to an action beginning elsewhere than in the brain. And moreover
that the disturbed state of the mind
senses after an epileptic attack,
may result from various causes taking
place during the fit.

Dr. Radcliffe
refers epilepsy to the
restriction of the flow of the electric
current through muscle.
He thinks that the stillness of muscle
is due to the continuous flow of
nervous fluid. A contraction of muscle
due to the nervous power being
temporarily suspended. He explains
this by showing that in cases
of Delirium Tremens - Paralysis Agitans -
rigor, subsultus of fever, V slow mer-
curial poisoning. The circulation is
evidently depressed, as is evidenced by
the pale face, failing pulse, & the
benefit derived from stimulants; V the
nervous system below par.

The strong point in favor of
this theory is the occurrence of rigor
mortis after death, when one might
suppose all nervous influence to be in
abeyance. But how is it there
fore that a paralyzed limb is not
always rigid? Why do we not
witness convulsions after death, when
according to Radelph's theory, the
muscles would have full opportunity
to contract owing to the cessation
of the electric current?
And since Radelph's theory may be
expressed perhaps more clearly thus—The more lifeless the nerves connected to a muscle, the more contraction should there be in a limb—why do not paralyzed limbs always keep jutting about?

2. According to Heule

Epilepsy depends upon changes taking place in the circulation of the blood in the brain proper in various parts of the encephalon. He assigns Epilepsy to two causes

1. Plethora of brain

2. Acrania

He supposed that in the case of Plethora the congestion in the upper part of the brain causes unconsciousness and at the base, convulsions, tonic & clonic. And in the case of Acrania that there still is congestion at the base of.
the encephalon - because the blood vessels at the upper part of the encephalon contract and become empty in proportion as the empyema increases. As Abercrombie & Kellie have shown the impossibility of the cranial cavity containing life fluid that necessarily there is congestion at the base of the brain producing convulsions - that now the empyema at the upper part of the brain is the cause of the unconsciousness. In regard to this last point it seems singular that just the same effect shd. be brought about by an opposite condition - but yet it may be explained by supposing this symptom to be dependent simply on an alteration in the actual amount of the circulatory fluid.

Now assuming that plethora of the brain
causing congestion in the two distinct parts of the brain, the brain proper & base of that organ, was a sufficient cause of epilepsy; how is it that we so frequently find a hyperemic state of the encephalon which has not been accompanied by nor given rise to convulsive fits, but which nevertheless may have caused delirium, coma or even paralytic.

And secondly, in classic epilepsy, why should the blood vessels of the brain proper contract more than those at the base? Are their coats more contractile? or is it because they are further removed from the great propelling organ of the circulation — do they if there be a tendency to congestion the law of gravitation shall come into play?

and in dementia of brain of low fever,
it is frequently found by post mortem examination that there is marked congestion at the base of the brain—while during life this condition was not characterised by convulsive fits.

Dr. Todd

is a highly ingenious theory—V perhaps the one most generally received up to the present time. He held that Epilepsy was caused by a poison in the Blood, whether that poison be a product of the primary or secondary assimilation. V that when it had arrived at a certain point, its acme as it were, that it went off in an explosive manner, in the form of a fit.

Dr. Todd illustrated this by the action of Strychnine. For this drug may produce no effect in minute or gradually increasing doses up to a given point—beyond which the smallest increase of the dose will
...bring about the full toxic effect.

And Dr. Todd further pointed out that just as strychnine possesses a peculiar affinity for the spinal cord, so does this morbid matter which he believes to be generated in epilepsy have a special affinity for the brain. The nature and severity of the fits he explains to be due to the quantity of the morbid material, the part of the brain it chiefly affects.

Although Dr. Todd has left a name behind him which will never die, it must ever be honored and respected in the annals of medical history. Great was he as a scholar, physician, and physiologist, yet we must not accept his theory simply on these grounds; for when we come to analyze it, it may not bear the test.

It is quite clear that if there be a poison
in the blood, which is the cause of epilepsy. We must find out what this poison is - whether accumulated before a fit - whether diminished after one - but all attempts even to find out the poison have hitherto failed.

In favour however of the humoral theory are the cases of Epilepsy occurring in diseases in which the blood is evidently at fault - as in Rheumatism, Rheumatic Fever, Variola. Retained secretions - such as urea. But that retained secretions should have the power of inducing epilepsy seems to be negatived by the experiments of Moxon, etc.

These show that when the cutaneous perspiration is stopped by covering the skin with a layer of varnish, the animal dies without having epileptiform
convulsions.

If epilepsy be due to blood poison, we should not expect to find the application of a ligature around a limb successful in warding off a fit. And since epilepsy has ceased after the section of a nerve, the excision of a tumor, the drawing of a tooth, or the removal of a stone from the bladder - how can such facts harmonize with the theory that the fits are due to morbid materials in the blood.

Another very strong argument against the humoral theory of Dr. Todd is the fact of the cessation of epileptic fits after the expulsion of tapeworms.

In addition to this, it is not unfrequent to find in epileptics some particular spot of skin which forms the starting point of an Aura Epileptica.
Simply by pressure on this spot or by galvanising it, a fit may be produced. How can this be reconciled with the humoral theory?

J. Dr. Marshall Hall

proounded the doctrine that all convulsive diseases are dependent on disease of the spinal marrow. He considered epilepsy to be due primarily to an increase in the excitatory-motor power of the spinal cord. But that after many fits, the patient is in a state of exhaustion, caused by the loss of this excitatory-motor power, which loss is commensurate with the frequency, violence of the fits; but that the patient is still in a state of extreme susceptibility to a perpetuation of fresh fits. Now if this affection depend on an increase of reflex power, how can it persist when that reflex power is
diminished? We contend that in epilepsy, it is because the controlling influence of the cerebrum is held in abeyance that the special functions of the spinal marrow are brought into play in so prominent an energetic a manner. Thus we subvert Marshall Hall's theory. For in true epilepsy there is an entire loss of consciousness - showing that the cerebral functions are implicated. That in cases of epileptic vertigo or petit mal, there is a temporary suspension of consciousness. Marshall Hall also considered that in the first stage of epilepsy there is spasm of the glottis, causing apnea. That the other phenomena resulted from the circulation of impure blood. At variance however with this, is the fact that some of the worst cases of epilepsy do not present any
contraction of the laryngeal muscles - neither have laryngotomy or tracheotomy been followed by such favorable results as might be expected to accrue from these operations.

And in fits taking place after these operations, loss of consciousness has been the very first symptom; it certainly not due to the circulation of venous blood in the brain.

G. Dr. Ranschell advances the theory that epilepsy is due to an increased nutrition of brain leading to hyper trophy.

He thinks that if there be increased nutrition, there must be an increase of force - thus if the nutrition of the Medulla Oblongata or Pons Varthii is augmented, convulsions follow. If on the other hand, nutrition is slackened, loss of power or paralysis is the result. And as he thinks the reason...
why epileptic convulsions are so frequent in
children is because in them the nutritive
powers are in the highest state of perfection.
The processes of nutrition when diseased
give rise to cancer or tubercle, which
are tangible effects: in epilepsy they
give rise to symptoms. At the same
time Dr. Ranskill allows that there must
be a convulsive tendency in the patient
afflicted with epilepsy - for an irritation
which will produce violent convulsions in
one man will produce no effect in another.
In this way he explains epilepsy produced
by such causes as Pneumonia, Pericarditis,
retained secretions, Worms. Again he
considers that a convulsive tendency may be
developed without any provocating at all.
It proves this exclusively to his own
mind thus - Supposing the subject of
epileptic fits to have a worm - but by the
use of some antihelminthic that the worm is expelled. If the fits still continue - Dr. Ramelshill considers this to be positive proof that there is in such a case a convulsive tendency. Once more. Fts are apt to take place after indulgence in an indigestible supper, but many people eat indigestible suppers without the supervision of any fit. So Dr. Ramelshill considers this to be another proof that there is a convulsive tendency.

The second part of Dr. Ramelshill's theory seems very necessary to substantiate the first. For if we admit this much of his theory, viz: that epilepsy depends on hypertrophy of brain - then all the healthiest men whose nutritive powers are in a state of high perfection shd. be epileptics - all shd. be but natural shd. to suppose that their brains shd. be as well nourished as
all the other limbs of their body. And again, as increased use of an organ is allowed to imply increased nutrition, then we should especially expect to find epilepsy present in men engaged in deep thought in literary pursuits. But the second clause in Dr. Remak’s theory viz: that there must be a convulsive tendency comes very happily to his relief.

Dr. Brown-Séquard

is of opinion that epilepsy consists essentially in an increased reflex excitability of certain parts of the cerebrospinal axis, viz the control that in normal conditions the will possesses over the reflex faculty. He considers that the base of the encephalon, viz especially the Medulla Oblongata is the most frequent seat of the increase in the reflex excitability, therefore that part of the nervous
centre is the ordinary seat of epilepsy. Moreover, that the disturbance in the functions of the cerebral lobes during a fit immediately after a fit, that in the interparoxysmal periods is chiefly due to alterations taking place in the brain during a fit— that the same cause which produces the first muscular contraction produces a contraction in the blood vessels of the brain proper. The loss of consciousness Dr. Brown-Séquard shows by the following table how he considers the principal phenomena such as are met with in a complete epileptic seizure, generated each other.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Effects</th>
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<tbody>
<tr>
<td></td>
<td>2. Face. Spasms of muscles of eye.</td>
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<tr>
<td>Causes</td>
<td>Effects</td>
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<tr>
<td>2. Contraction of blood</td>
<td>2. Paleness of face - loss of</td>
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<td>vessels of face &amp; brain</td>
<td>consciousness &amp; accumulation</td>
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<td></td>
<td>of blood in base of encephalon</td>
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<td>3. Extension of the first</td>
<td>3. Tonic contraction of</td>
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<tr>
<td>excitation partly due to</td>
<td>laryngeal &amp; cervical &amp;</td>
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<tr>
<td>accumulation of blood in at</td>
<td>thoracic expiratory muscles.</td>
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<tr>
<td>base of brain.</td>
<td></td>
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<tr>
<td>4. Contraction of these</td>
<td>4. Cry &amp; stoppage of</td>
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<tr>
<td>thoracic muscles.</td>
<td>respiration.</td>
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<td>5. Further extension of the</td>
<td>5. Tonic contraction,</td>
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<td>first excitation of the</td>
<td>extending to most of the</td>
</tr>
<tr>
<td>nervous centre.</td>
<td>muscles of trunk &amp; limbs.</td>
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<tr>
<td>6. Loss of consciousness &amp;</td>
<td>6. Falling -</td>
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<tr>
<td>contraction of muscles of</td>
<td></td>
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<tr>
<td>limbs &amp; trunk.</td>
<td></td>
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<tr>
<td>Causes</td>
<td>Effects</td>
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<td>9. Exhaustion of nervous force generally ( \frac{1}{2} ) of reflex faculty especially after which extreme except for respiration, fatigue or headache which gradually becomes normal.</td>
<td>This table is self-explanatory.</td>
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I intended to give what Dr. Brown-Séguard
considered to be a type of an epileptic seizure. Therapy writers on epilepsy consider the fall to be due to convulsions, Dr. Brown-Séguard thinks it is the result of loss of consciousness. Since in epileptic vertigo it is not uncommon to see a patient fall senseless, but not convulsed.

Sometimes the cause of epilepsy is inscrutable, but the causes of epilepsy generally, are to be traced to hereditary predisposition - strumous diseases - malformation of head - organic lesions in the brain or spinal cord - debaucheries - prolonged constipation - habitual indigestion - intoxicating drinks - and too frequently the vice of masturbation. In addition to these it may be brought about by sudden fright, mental emotion - functional disturbances - nervous irritation. And so from the
nature of cause we may form a division of
epilepsies and classify them thus:

1. Idiopathic. In which there is no account
for the production of fits.

2. Sympathetic
Secondary
Worms (Tania - haeacides)
And some of the nervous centres.

3. Toxic in. Due to poisonous agencies
whether introduced into the blood
from without or generated within.

4. Symptomatic. As when there is softening
of nerve centres.

5. Bright's epileptic configuration of head.

A few words upon the treatment of Epilepsy.
During a fit it is of course essential
that the patient have a free access to air.
All violent muscular movements also, be
restrained - since it sometimes happens
that dislocation will occur. From the intensity of muscular action, I have had two cases of dislocation downwards into the axilla, both arising from violent muscular action during an epileptic seizure? By pressing the thumbs on both Carotids, the fit may be cut short. This plan also will serve to distinguish true from false Epilepsy; under ordinary circumstances, a person cannot bear to have the arterial supply to the brain be suddenly checked.

If fits are very irregular both in number and periodicity—taking place only one to day, two, or five a day or two hence. Then omitting several days; it is well to give a large dose of Quinine qst. xiv with go. ½ of the Extract of Beladonna. This will probably induce a periodicity of the attacks. We then know when to expect a fit. It may stave it off by quinine, or by placing a ligature round
or more limbs, so as to keep a large quantity of blood out of the circulation for a time.

If there be perverted action at the base of a nerve, it will be necessary to alter the action at the periphery. Epilepsy produced artificially in guinea pigs has been cured in this way, by applying a solution of nitrate of silver to the extremity of the nerve which produced the aura. And Brown, Séguard maintains, that if a change can be effected at one extremity of a nerve — as this procedure is calculated to do — there cannot fail to be a corresponding change produced in the other extremity of that nerve. It is in this principle that nitrate of silver is almost sure to do good, in cases of Epilepsy where the laryngeal nerves are obviously affected — in fact wherever there is anything betraying spasm about the larynx.
Sensibility of the nervous system.

Belladonna (a) excites the sympathetic system, thus causing dilatation of the pupil by depressing the power of the third nerve \( y \) allowing the sympathetic which supplies the radiating fibres of the iris to have free play.

(b) Causes mirthful delirium \( \text{but never coma, according to Dr. Ramskirt} \) (c) does not check secretion, as opium does

(d) Belladonna purges. In these particulars it is essentially of service in Epilepsy. It possesses great advantages over opium from its marked contrast in action. And as Epilepsy may be due to a state of congestion of the Cerebro-spinal vessels resulting from a relaxation of their coats which again is owing to a want of action in the nerves which supply those vessels. Belladonna acting as a stimulus to those vessels causes their contraction.
Vanderkoloth has found dilated vessels in the corpus olivaria in patients who have been epilepsy bite their tongues. In the respiratory tracts of those whose breathing is chiefly affected. And it is a well-known fact established by Claude Bernard, that division of the sympathetic produces redness of the part which that nerve supplies - showing that the normal condition of tissues must be in some way dependent on the influence supplied by the sympathetic nerve - especially as the part is restored to its normal condition by galvanizing the cut extremity of the sympathetic which supplies it. If nervous force be identical with electricity, the nerve is then restored to its original state. Thus it is that when the vessels are naturally congested, Belladonna acts by stimulating the sympathetic nerve - or in other words Belladonna
toned the involuntary muscles.

A sixth of a grain of the extract of Belladonna is a sufficient dose to commence with for an adult, but children bear Belladonna very well; require larger doses. Yet any time, too must be large a dose of Belladonna shall have been taken. Opium should be immediately given, since it is the true antidote to Belladonna. Yes, good a remedy for it, as chalk is for oxalic acid.

The so-called specifics in the treatment of epilepsy, such as Sulphate of Tin, Nitrate of Silver, and the juice of the Cochineal sanguineus, have been freely and fairly tested, with however such results as to expect but little benefit, if any, from their use. The tendency of Nitrate of Silver to cause permanent discoloration of the skin is sufficient of itself to
preclude its use, even though good effects might be obtained from its administration. Aside of Potassium, of course is an invaluable remedy when epilepsy can be traced to syphilitic taint, & most good seems to result from its action by giving it in large doses. Bromide of Potassium in some cases certainly seem to be of service.

The use of the tincture of the Muricate of Iron is attended with good results, especially when the history of the case points out that epilepsy has been brought about by masturbation.

Tartaric acid is of great efficacy in some cases—especially when the head suffers much. Also the combination of Iodide of Potassium, Ammonia & Belladonna, with tincture of Rhubarb & Bark. But a combination of a mineral tonic with an antispasmodic & sedative
appears to be of more service than anything else.

The cold shower bath cannot be too strictly enjoined.

If the patient be phthisic, he must abstain from stimulating food & drink. Take plenty of air & exercise. If asthenic, his diet and be nourishing, but not stimulating. A good may be derived from tonics & shower baths.

The great point is to prevent the recurrence of a fit. To this end, all causes of irritation such as constipation, intestinal worms, the irritation of teeth, etc. if possible be removed. Over-fatigue of mind & body must be avoided. Fits of passion, intemperance & dissipation not given way to.

But it does not do to continue any one mode of treatment for a long time—since
epileptics benefit most by a constant change of treatment. In females, epilepsy is certainly influenced by the menstrual period — for in them the fits almost invariably occur either just before, during, or a little while after this period. But it must be allowed that the treatment of epilepsy, on the whole, is unsatisfactory.

Charles M. Rushton.