Spastics is a disease of the spinal system and signifies a state of powerful and painful spasm of the voluntary muscles, which is long-continued and uncontrolable. While the disease exists, the spasm never altogether relaxes, except just before death or under the influence of remedies, and is violently increased at varying intervals by sudden and severe paroxysms. The muscles are rigidly contracted, and from the continuous and non-interrupting character of the spasm, we say that it is tonic; in contradistinction to the tonic spasm of convulsions in which there is alternate contraction and relaxation.
There are several forms and varieties, named according to their mode of development and subsequent course.

It has been divided according to the predominance and extent of the muscles affected; hence we have tetanus, or as it is vulgarly termed, lock-jaw: 
- Brachioradialis or bending of the body forwards;
- Spierrotoxones or arching of the body backwards; and
- Neurotoxones or lateralis when curved sideways.

A more useful division was afterwards made into traumatic and idiopathic tetanus, taking into account the probable cause.

And again with regard to its intensity, rapidity and duration it is subdivided into Acute, Subacute and Chronic forms.

The attack of tetanus is generally sudden and without any premonitory symptoms.

There are a few certain signs which can lead us to anticipate its onset: but it may be preceded by an uneasy sensation or additional pain in the wound, which may become inflamed. Then
May be febrile symptoms and restlessness, lassitude and debility, loss of appetite, head ache, paroxysms of sickness of vision and in almost every instance there is obstinate constipation of the bowels. Stiffness of these are symptomatic of the disease. The period when the symptoms manifest themselves varies, it may be in a few hours after the infliction of the injury or a few days may elapse and the accession is while symptoms of acute inflammation are present in the wound. Sometimes the discharge from the wound has been observed to be remarkably diminished or suppressed previous to the appearance of the tetanic symptoms. Very frequently all pain measures have entirely left the part and cicatrization is nearly complete before anything occurs to warn us of coming danger - in these cases it has been supposed that the exciting cause is a granulation formation in the injured nerve, which has become entangled in the dense cicatrix, and is thereby irritated. "The nerves concerned in deglutition are generally
first involved by the mental irritation, and the
sedentary action of the muscles produces
distortion of the mouth, with pain and stiffness
in the neck and jaws—usually the first symptom.
If the obicularis oris predominate in the action,
the mouth assumes a puckered appearance; more
frequently the antagonistic muscles are in the
ascendant, causing a ghastly smile. Dryness
and soreness of the mouth are felt; swallowing
and mastication are difficult; the cheek becomes
more and more rigid; and attempts to swallow
are apt to induce convulsive efforts, perhaps
threatening suffocation. Ultimately the jaw
becomes firmly closed; the masseters and temporals
feeling hard and bulging. All the muscles of the
face are involved. The forehead is much wrinkled
both longitudinally and transversely; and the
eyebrows, by the action of each corrugator
superficialis, are closely approximated, forming
a sharp angular curve at their highest
points and highest part. The eyes usually are
not fully opened; the obicularis and levator
seeming almost to neutralize each other.
The eyeballs are dilated, and fixed. The nostrils are dilated. The angles of the mouth are drawn much backwards, and (the elevators predominating over the depressors) are somewhat elevated. The ocularis oris binds the lips firmly on the teeth; which, however, are now always more or less seen, and sometimes wholly disclosed. This expression is indicative of much suffering, and is quite peculiar to the disease. It has been called the countenance of pain.

The tongue remains long free, when it becomes affected it is frequently protruded between the teeth and bitten.

Soon after the change of countenance has been assumed, a most distressing pain of a piercing character is felt shooting from about the ensiform cartilage back toward the spine in. Upward, inspiration, Alcmaeon considered this pain pathognomonic of the disease. It depends on spasm of the dia-

phragm, which is the first of the involuntary muscles affected. If the hand is laid upon the abdomen, the muscles will be found
to be tense and hard, conveying to the hand the idea of a board under the skin. Respiration is painful and difficult, the abdominal varieties seeming not to yield to the descent of the diaphragm in inspiration. A sense of weight is felt about the loins and small of the back. The pulse is at first rather quicker than usual, but falls, becoming weak and indistinct. The heat of the body is rather above the natural standard, though the extremities are colder than usual. The sphincters are usually contracted, constipation proceeds partly from this cause, and there is difficulty in passing urine, on account of spasm of the muscular fibres at the neck of the bladder.

By degrees all the symptoms set worse and the spasm is subject to aggravation; each paroxysm causing increased contraction of the muscles implicated. Exacerbations of the spasm occur every ten or fifteen minutes, and last two or three minutes at a time; followed again by the
Minor degree of contraction. The intervals between the exacerbations diminish as the case advances to a fatal termination. The spasms extend to the muscles of the trunk; to the large muscles of the extremities; to the legs before the arms; to the muscles of the face and lastly to the tongue. The last voluntary muscles affected, are those of the hands and fingers, and they frequently escape altogether. All the muscles that are involved, continue in a state of contraction, until the disease is relieved or the patient dies, and are hard and wrinkled in their centres. The exacerbations may be produced by the most trifling causes, such as slight movements on the part of the patient to effect a change of posture; by sneezing; by the opening of a door; shaking of the floor or bed; bowing of the bed curtains; by a current of air; by presenting anything to be swallowed, or it may be, without any obvious exciting cause. They generally begin by
an increase of the pain felt at the sternum and as the intervals shorten, and they increase in severity and frequency the stage becomes greater.
Complete relaxation of the haemorrhage has seldom been observed, but it is remarkable that it sometimes gives way during sleep—
That is, in the milder cases where the patient is able to sleep, when he is awakened the full tension of the muscles instantly returns.

Varieties of the haemorrhage,
when its effects are confined to the muscle of the face and cheek, the masseter and temporal being chiefly affected, fixation of the lower jaw is the most prominent symptom and is called trismus.

When the muscles of the front of the body are chiefly affected, bending the body forwards, so that the head and knees tend to come in contact and the patient is called together like a ball, it is called emprosthenos.

Generally the strong muscles of the back are the most affected, overcome...
On the anterior aspect of the body, and bending it back like a bow, until in extreme cases, the resting points are the occiput and heels. This condition is termed tetanus, and is of much more frequent occurrence than erythrotoxins. The nearest form is pleurotoxins or bending of the body to one side. The term tetanus is by some writers employed to denote involvement of all classes of muscles, without preponderance of action in any of the antagonistic muscles, contracting each other exactly, rendering the body rigid and straight. The ordinary use of the word, however, denotes the disease in general, and includes all its varieties.

Tetanus erascentium, tetanus infantum. This form of the complaint occurs as its name implies in newly born children. It usually appears about the seventh or ninth day, but may occur up to the end of the second week after birth. It is very common and very fatal in the West Indies.
Eighty years ago it occurred in about 17 per cent of the children born in the Dublin Lying-in Hospital, but after the ventilation was improved the mortality was reduced to 5 p.c. There are constipation and hardness of the abdomen. At first the jaw fails and the infant is incapable of tak[ing the breast]. Some have supposed it to be produced by the retention of the meconium in the intestines; others, by the irritation of the wound made by dividing the umbilical cord, but this cannot be proving that there are no nerves in the cord to irritate. It has been traced to currents of cold air or to bad ventilation. In some the disease is acute and very rapid, death taking place in 10 to 30 hours; it is sometimes subacute life being protracted eight or nine days. Treatment should be purgatives.

There are other cases varieties of the symptoms which should be noticed. Sir Gilbert Blane has described a case of
tetanus in which the patient suffered no pain, though the disease ran its usual course and terminated fatally. The muscular contraction...cular perceptions were attended by a sort of tingling sensation, of a rather pleasant kind, with a strong tendency to fits of laughter in the accesses.

On some occasions the contractions have been so violent that the teeth have been broken by them. There is one case related in which the femurs were fractured by the powerful contraction of the femoral muscles. The broad muscles have been found after death to have been torn across. The recti muscles are frequently ruptured.

The muscles of the injured part may be first attacked by chiasm, instead of those of the face and neck. Two cases of this kind occurred in Guy's Hospital, and are related by Sir J. Barham. One of them, a sailor, received a lacerated wound of the ball of the thumb, by a splinter
of wood which was extracted. The wound healed.

Two months after the accident there was a

painful spasmodic affection of the muscles

of the part; tetanus supervened and the pulse

died; on dissection two pieces of the spleen

were found resting on a branch of the radial.

The muscles of the eye are sometimes, but not

often, affected. When they are the eyeball is

fixed and drawn slightly inward, and the

patient is unable to direct it to particular

objects. Cerebral complications are very

rare in tetanus; when there is delirium it is late,

at the last or has existed previous to the

tetanus. It has attacked those suffering

from bronchitis, and laryngitis, and has also

been complicated with erysipelas; in such

cases of course terminating fatally.

Remission of the symptoms has been observed

to occur in several instances. The remission

may be for a few days or for a considerable

time; and the disease has subsided for even

20 days. M. Duval has mentioned some

curious cases in which it assumed the form
Anomalous ague, in one of which it was noted that "both sides of the body were never affected by the paroxysms, but alternated in successive fits."

The mode of death in this disease seems to be of a mixed nature. Partly it appears to result from asphyxia, caused by the contracted muscles preventing expansion of the thorax, thereby suspending or embarrassing the breathing; but it occurs chiefly from asthenia: the power of the heart flags and is exhausted by the continuance of the suffering by the fatigue and expiratory consequences upon the muscular action, and by the patient's inability in many cases to take sufficient nourishment. Death sometimes takes place suddenly, during a paroxysm, and in such cases is probably due to failure of the respiratory muscles.

**Exciting Causes.**

Traumatic tetanus supervenes on some wound or other bodily injury, and is usually of the acute variety. The history of this
Species of tetanus presents nothing constant or uniform. The existence of a wound is not essential. It is liable to follow hurts of any part of the body, and of every kind, degree, and extent from a mere bruise or scratch, to a fracture or an amputation. Sir James B. Grigor tells us that in the Peninsular War the complaint supervened in every description and in every stage of wounds, from the slightest to the most formidable; the healthy and the flowering; the incised and the lacerated; the simple and the compound. The following is a statement of the injuries and wounds that may give rise to it. 1. Contusions and strains without any wound. 2. Wounds of the soft parts, embracing simple abrasion of the surface, incised, lacerated, punctured and punctured wounds. 3. Burns and frost bite. 4. Dislocations and fractures, simple and compound. 5. Minor operations as, extraction of teeth, ligature of piles etc. 6. Major operations, amputation, castration, excision of the mamma &c. 7. Gangrene,
place of the leg, fistula in ano, persistence of
former worm under the integument.
8. Obstetric causes, abortion, retained
placenta.

Some have considered the situation of the
wound as a source of frequency, while others
declare it to be a matter of indifference. The
disorder often follows injuries of the
extremities rather than of the trunk, head, or back.
It is particularly apt to supervene or contam-
inate, lacerated or punctured wounds of the
dense textures well supplied with nerves,
especially wounds of the hands and feet upon
gunshot wounds in the course of nerves and upon
injuries of the joints. Hermes states that he
found it oftenest after wounds of the elbow
and knee, others again say they have seen
it more frequently after injuries of the
thum or great toe. It is popularly
supposed that an injury of the thumb
is apt to be followed by lock-jaw.
When tetanus arises from any of the causes
enumerated there is good reason to believe
that injury has been done to some nerve, that it has been fractured or torn, or partially divided or included in a ligature applied to a bleeding artery; or that it is continually excited and injured, by some rough or sharp foreign matter lodged in the wound. (Mill.)

Tetanic symptoms occur at a fixed period after the reception of the injury. A case is on record of a man being seized with convulsions, almost instantaneously after the infliction of the injury, and dying with symptoms of tetanus in a quarter of an hour. This however is out of the usual course of the disease and it is probable that fright had something to do with it. In general tetanus commences between the fourth and fourteenth day after the infliction of the injury; sometime in the second week in the most common period of all. In the Peninsular war it did not commence later than the twenty-second day. The period of accession is sometimes longer
delayed than this, however. The longer
the disease delays its attack in their
traumatic cases after the occurrence of an
injury, the milder in general does it prove.
We know nothing of the changes that take
place in the interval.

Malignant tetanus is extremely rare in
this country, being more common in warm
than in temperate climates. It is often
of a chronic character than the traumatic
species, and arises from cold suddenly
and newly applied or long continued;
exposure to the night air during sleep;
shaken transitions from heat to cold;
intense anxiety of mind; sudden suppression
of the secretions or excretions; going into
a bath while heated or all paid to cause
it. The invasion of the disease after the
exhibition of the cause is more rapid in
this than in the symptomatic variety.
The instance of the exposure takes place
during the night the complaint may be
manifested the next morning.
Dr. Morrison, speaking of this kind of tetanus in the West Indies, gives it as his opinion that the "cause does not preceed some of the symptoms (constiveness for instance) longer than twenty-four hours."

**Predisposing Causes.** Tetanus occurs at almost every period of life. The youngest case of regular tetanus on record is 22 months and the oldest 75 years. A greater number of males than females are attacked in the proportion of 5 to 1 in this country, but this is small probability owing to their being more exposed to the causes of the disease. Heat appears to act as a predisposing cause only; the exciting cause in addition to the wound in the traumatic species, being the application of cold, after the heat or during the prevalence of hot weather. A warm and moist atmosphere is supposed to predispose to it in all climates; depression of mind and debility of body however induced may probably be considered as predisposing causes. It will
attack the healthy as well as the unhealthy, the emaciated as well as the robust; the spare as well as the muscular. Habits of temperance or intemperance are supposed not to have much influence, either as regards recovery from the complaint or as predisposing to it. There are several hygienic causes such as ill ventilated apartments, draughts of cold air when the body is overheated.

Europeans are particularly exempt from attacks of tetanus, in all climates. The degenerate and native of warm climates, generally, are more liable than natives of temperate climates. John Hunter thinks climate the first of the predisposing causes and it can probably produce it without any other. Fever is believed by Jenner to be a common cause. In post mortem examinations, of the bodies of many who have died of tetanus, balls of worms have been found in the intestines and some authorities have held them to be the chief cause of the complaint.
Diagnosis. There are one or two diseases which closely simulate the symptoms of tetanus, but from which it may be easily distinguished. There is a peculiar affection of the muscles elevating the lower jaw, causing a kind of tremor, in which the spasm though constant is not increased by paroxysms as in tetanus. It has been observed in disease of the alveoli from carious teeth, in ulceration of the gums and mucous membrane of the mouth to be, in children, at the period of dentition.

Hysteria sometimes achieves a remarkably close simulation of the phenomena of tetanus; and yet it, also, is capable of being readily distinguished: spasm and rigidity being more decidedly paroxysmal, with intervals of complete innervation, and to a certain degree within the control of the patient's will. The ordinary signs of hysteria also are present, usually in a distinct and prominent form.
The differences between tetanus and hydrophobia are equally well marked. In the one the spasm of the muscles is tonic while in the other it is tonic. The two diseases differ in their mode of induction. Tetanus is caused by irritation of a nerve or by exposure to cold. Hydrophobia is the result of a specific poison introduced into the circulation, and they affect the nervous system. Also, tetanus makes its assault at a much earlier period after the infliction of the injury. In hydrophobia the eyes are usually bright and glittering or protruded. There is thirst and aversion to fluids, in tetanus there is great thirst. The face is usually much in motion in hydrophobia, and the patient is constantly shaking off a peculiar tenacious secretion, in tetanus the jaws is fixed. In tetanus the mind is generally clear to the last, whilst in hydrophobia it is subject to rapid impulses and other deviations passing into delirium.
Physiologically, while, in tetanus, the stimulus which excites the spasms, spreads on through the true spinal cord; in hydrophobia it is often conducted from the ganglia of special sense, or even from the brain; so that the sight or sound of fluids, or even the idea of them, occasions, equally with their contact, a with that of a current of air, the most distressing convulsions" (Carusus.) Poisoning by strychnia, or its salts, or the vegetables from which it is procured, is far more likely to be mistaken for natural tetanus. When a poisonous dose is administered to an animal, Dr. Hunter tells us that it "becomes agitated, and trembles, and is then seized with stiffness and starting of the limbs; then fits of general spasm succeed each other as in natural tetanus, until one more violent than the rest takes place, and the animal is dispossessed. There is no other test by which we can distinguish these symptoms from those.
of tetanus than by observing the time which they occupy. Dr. Christian states that "the disease never proceeds quickly fatal as the rapid cases of poisoning with oxovomica. "Besides the fits of natural tetanus are almost always slow in being formed, while oxovomica brings on perfect fits in an hour or less." "It is right to remember, however," he adds, that oxovomica (or its poisonous element strychnine) may be given in small doses frequently repeated, and gradually increased, so as to imitate exactly the phrenomena of tetanus from natural causes."

Persons who have taken an overdose of phrychnia, sometimes survive the tetanic symptoms but die afterwards of the irritant effect of the poison on the alimentary canal. In suspicious cases we must inquire into the history of the patient: whether he was likely to destroy himself, or have poison administered to him by others; what he last swallowed and when
it was taken; whether he has lately been exposed to cold whilst preening; and whether he recently received any injury. By a careful examination of all the circumstances, we shall generally be led to form a correct diagnosis.

The prognosis is generally bad, but more favorable in the idiopathic than in the traumatic species. It has been attempted to establish a prognosis on the state of the pulse, but as might have been expected it has failed, for it is only during a paroxysm or toward the termination of the disease that the pulse is much affected. The symptoms to be considered favorable are a slow progress and long intervals between the paroxysmic attacks: when for the first time or from days the muscles of the jaws are solely affected and that not to an alarming degree; when the bowels are not obstinately costive; when the skin is moist and moderately warm, and especially when
the patient gets relief, we may entertain hopes of an eventual recovery. On the other hand, when the attack is violent, double, when the muscles of the neck, back, and abdomen are rigidiy contracted, when the patient complains of shooting pain from the sternum toward the spine; when the abdomen feels hard, and the least pressure upon it produces spasm of the affected muscles, we fear a fatal termination. The patient in these cases, sometimes dies on the second and generally before the fifth day. If he live to the twentieth day of the disease his prospect is somewhat better, and the spasmodic symptoms may abate. Some, however, have died as late as the sixteenth, the twentieth, and even the thirty-fifth day, but this last is very rare indeed. Spasmodic startings of the muscles set in early in the disease and when they recur every night or ten minutes, are to be regarded as very unfavorable. The longer the disease delays its assault in traumatic cases, after the
reception of the injury, the child in general does not prove, and the brain room is then for hoping that it will end favorably.

The pathology of tetanus is like that of several other nervous diseases, exhibiting the most severe and violent symptoms, while involved in great obscurity. It is not so obscure, however, as some others. It is undoubtedly an affection of the nervous system, and it is admitted by all authorities that that part of the nervous system affected is the spinal cord and its nerves, that there is an irritation of its substance or of its different nerves. "We may conclude," says Dr. Marshall Hall, "that there is an augmented excitability of the spinal centres, constituting a constant predisposition to the attacks of spasm or paroxysm." It is evident that the brain is not involved in the disease, as the mental faculties remain clear and distinct acute.

The post-mortem examination, the body is
usually rigid, the muscles form and contract,
ed, occasionally ruptured, and sometimes
there is no rigidity. There may be
congestion of the various organs, which
is probably often owing to accidental
circumstances. The nerves at the seat of
wound may be inflamed, lacerated or hurt
used, or perfectly healthy and uninjured.
In one case the nerve had reunited. The
brain may be healthy, firm, congested,
lighter than natural, pinkish to the
medulla Oblongata may be healthy or congested.
The spinal cord and its membranes are often
congested, more especially at the origins of
the nerves, and the amount of serum protein
naturally increased. The specific gravity
of the spinal cord is said to be different
in different positions, being greatest at the
front connected with the nerves of the wounded
part. Most modern pathologists refer
it to an inflammatory condition of the
spinal marrow and in support of this
opinion Barthe Lamy asserts that it occurs,
Distractions of soldiers, who died of tetanus, particularly in some of those wounded at the battle of Waterloo, he has constantly observed an inflamed state of the spinal cord. Of course when such a doctrine as this has been started, you may expect blood letting will follow. So it has and to a most extravagant and absurd extent, fourteen to fifteen pounds of blood have been taken in the course of a few days by one practitioner; another bleeding his patient eight times and applying 942 leeches along the course of the spine and to the occipito-parietal. Innumerable instances, however, occur of inflammation of the spinal cord and its membranes without any tetanus, and equally innumerable examples of tetanus have been met where no unnatural appearance at all could be discovered within the vertebral canal. Dr. Todd and Mr. Bouman hold that in tetanic form the natural solar force of the spinal cord is greatly excited, and kept up by the constant
irritation applied directly to the cord itself or propagated to it by the nerves of the injured part.

If you irritate the exposed spinal cord of a recently decapitated animal, passive tonic contractions of the limbs is induced and from this it has very reasonably been argued that the after altered state of the blood vessels of the cord, under inflammation, in the living man, may cause such irritation as to produce tetanic spasms. And tetanic rigidity certainly is caused sometimes by spinal arachnitis.

Dr. H. Hall has applied distinguishing epithets to the disease: where the irritant his agent acts directly on the spinal cord, he calls it centric tetanus, where it is in some distant part of the body he calls it eccentric tetanus.

The disease attacks the lower animals, frequently the horse and the dog—brought on usually by injuries of the extremities, but also idiopathic. It is not uncommon in the horse after castration
Prof. Barton advances the following proposition with regard to the pathology of this disease, 'that it is essentially a disorder of the excito-motor apparatus, that it results from irritation of a peculiar kind, affecting that part of the nervous system, that the irritating cause may be central within the spinal canal itself: that, again, it may be, and often is, eccentric, situated at the extremity, or somewhere in the course of one or more of different spinal nerves, and that a certain predisposition is for the most part necessary, to render the body susceptible of the disease under the operation of exciting irritation.'

The treatment of tetanus is a most vexatious subject and is in general as unsuccessful as the pathology is imperfect. Almost all the acute traumatic cases are fatal. Humeen says he never saw a case of acute symptomatic tetanus set well.
Dr. Dickson found all creative measure followed by 'qualified disappointment'; and it has been so with most who have had to deal with it. Hippocrates declared that tetanus supervening on a wound is mortal. Different authors have extolled different remedies, and there is perhaps no other disease which is said to have been cured by such opposite modes of treatment. Cures have been ascribed to the cold bath or cold application, to the warm bath, to opium, to mercury to wine and salt and many others. One of the strongest characteristics of completely formed tetanus, is an insusceptibility or resistance to the most powerful medicines that are employed. Whatever remedies therefore are administered should be given in the form most easily absorbed. The disease being of a spasmodic character we naturally look to antispasmodics and sedatives for relief. Opium, therefore, has been much used and
highly praised, but like other remedies, it has been chiefly successful in the idiopathic form of the disease. It is well known that pain fortifies the system against the influence of narcotics. enormous doses of opium have, therefore, been given in tetanus with but little effect. A case is noticed in the nineteenth volume of the "London Medical Gazette" where upwards of four pounds of Laudanum and upwards of six ounces of solid opium, were given in ten days. When administered in the solid form it is found undissolved in the stomach after death. It should therefore be given in a liquid form: as Laudanum or as solution of the acetate or amniate of morphia. The propriety of giving opium in tetanus at all is questionable as its physiological effect is to excite rest to quiet; the motor function of the spinal cord. This, with the failure of opium in the severe forms, and its equivocal utility in any, should, I think,
prevent its use altogether.
Then the jaws are firmly closed, and the 
mouth cannot be opened, food and physic 
should be carried into the fauces and 
into the stomach by means of a flexible 
tube; passed through the nostril, or 
through the mouth by passing it behind 
the back teeth. The patient may also 
be put under the influence of chloroform 
twice a day and fed. The warm 
bath has a relaxing effect on the 
venous circulation, its power is greater 
when the water is medicated with from 
two to six drachms of tartarate of antimony. 
It is not of much use however, and some 
have condemned it as actually harmful. 
The cold bath has long been employed 
and has had a somewhat fluctuating re-
futation. The great mass of evidence in this 
country is against it; in fact it has been con-
considered injurious rather than beneficial. 
Sir James McElyot says that during the 
Campaign in Spain the warm bath gave
only momentary relief: and the cold bath was worse than useless." It has however been used with benefit in the East Indies, when
the cold affusion is still the favourite expedient. After it the patient is rubbed dry and to bed and has laudanum administered.

The application of ice to the spine has been recommended: to be of much service the cold should be continuous and severe.
Irrigation over the upper part of the spine with the subsequent application of Endermic
use of pedicutes may do good. Paralysis.
A conitra or belladonna may be sprinkled on the raw surface: if these are don't is
probably the best
Dr. Rush and others regarding tetanus as
depending on previous relaxation recommend alcoholics and bark: and in some
cases where this plan of treatment has been carried to an almost unlimited extent it has proved successful. In one instance
related by Dr. Carrie the disease lasted
six weeks and during that time the patient drank 110 bottles of port wine without its ever producing a symptom of intoxication. In addition to this he took from one to two dracontias of laudanum every night, and Dr. Currie remarks that with the wine this small dose seemed to have a more composing effect than threis the quantity taken before he began it. Whereas this plan of treatment has been successful it has always been in the more chronic variety of the complaint.

Mercury of course has not been left out. It is applied at the very commencement of the disease in the form of ointment. It is evident that here is no time for its effectual exhibition in acute cases, but the more chronic form of the complaint has sometimes yielded on the month becoming affected. Its use, however, has usually resulted in disappointment. Digitalis has been employed, as a muscular
relaxant, but as large doses are required its use is attended with considerable danger. Tobacco is a most powerful relaxant and is administered in the form of enemas. Some authorities have strongly recommended it, but like digitalis it must be used with great caution, or instead of being a remedy it will become a poison. Fatal syncope has followed its injection in other emergencies.

The very marked torpidity of the bowels which accompanies tetanus naturally led to the use of purgatives, and I think their value cannot be overestimated. Very large doses are commonly required to procure evacuations from the bowels. As only the most active purgatives can be of use I would recommend croton oil as the most eligible.

Oil of turpentine is also well adapted for use in tetanus, both on account of its purgative and anthelmintic properties. For worms are very frequently found in this
intestines after death by tetanus. It may be given either by the mouth or as an enem.
Externally belladonna may be applied to the spine or to the affected parts, and has thus afforded relief: it is also administered in large doses internally.
Cannabis indica was very successful in the practice of the late Prof. John Miller, he records three fortunate cases, under its use; all traumatic.

The calabar bean, from its sedative action on the spinal cord, will I think prove a very useful adjunct to the Indian hemp and is at least worthy of trial.

The inhalation of chloroform relaxed the chills and curtailed suffering: and it has certainly contributed, if not to the cure of tetanus, at least greatly to alleviate its symptoms.

Considering that the action of paraldehyde poison is antagonistic to the effects of artificial tetanus by strychnine, it was hoped that this might prove useful.
in tetanus. It has now been used by inoculation in several cases, but the result on the whole, has been unfavourable. Amputation of the injured limb has been proposed and practised in traumatic tetanus. It can be of use only at an early period of the case. The diminished number of tetanic cases which have occurred amongst the wounded, since the practice of immediate amputation became generally established throughout the army and navy is, says Sir George Ballingall, "a strong argument in favour of a further trial of this remedy, in the early and acute form of the disease. A far safer and far more promising expedient is division of the principal nerve supplying the wounded part. This supposing the nerve to be known and accessible, is less formidable, less severe, less hazardous, less maiming, and judging from past experience more effectual, than amputation of the wounded part."
Bloodletting has frequently been practiced, but I believe with no marked success. When resorted to it must be early, and in such a degree as sensibly to affect the system, but rather as an adjuvant to other remedies than as a means of cure. As the disease however tends to exhaust the power of the heart, bleeding is a remedy that should be used with great caution.

Having thus briefly noticed the principal remedies recommended by different practitioners in tetanus, I shall now attempt an arrangement of the treatment.

The type of the disease is augmented excitability, therefore the first principle is to avoid all excitation, imposing absolute quietness and seclusion, for, once the slightest movement or inspection, made upon the surface or upon the senses, will cause exacerbation of the symptom, it is of the highest importance to protect the patient from such sources of trouble. The bowels should be well cleansed by purgatives at the
Rest and then let alone. Poultice may be given by the mouth while the patient is under the influence of Chloroform; or it may be given in the form of rectal or suppository emetics. Whatever else is employed wine may be given in large doses. Cold may be kept constantly applied to the spine, ice in bladder, to produce a sedative effect, but must be watched in case it prove excessive. Indian hemp pushed so as to maintain moderate narcosis will be found most beneficial. Chloroform will be employed cautiously and occasionally to relieve the paroxysms. Prompt division of the injured nerve in traumatic cases has often been followed by the most remarkable beneficial results and is worthy of trial. The patient should be placed in a darkened room and left alone as much as possible, and should be enjoined to speak, move, or swallow as seldom as he can. Such I think are the chief points to be attended to in the treatment of tetanus.