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A N
INAUGURAL DISSERTATION
ON THE
CYNANCHE TRACHEALIS.

SUBMITTED TO THE PUBLIC EXAMINATION

OF THE

FACULTY OF PHYSIC,

UNDER THE AUTHORITY OF THE

TRUSTEES OF COLUMBIA COLLEGE

IN THE

STATE OF NEW-YORK:

WILLIAM SAMUEL JOHNSON, LL. D. President;

FOR THE DEGREE OF

DOCTOR OF PHYSIC;

ON THE THIRTIETH DAY OF APRIL, 1793.

BY SAMUEL BORROWE,

Citizen of the State of New-York.

Whence in bright floods the VITAL AIR expands,
And with concentric spheres involves the lands;
Pervades the swarming seas, and heaving earths,
Where teeming Nature broods her myriad births;
Fills the fine lungs of all that BREATHE or BUD;
Warms the new heart, and dyes the gushing blood;
With life's first spark inspires th' organic frame,
And, as it wafts, renews the subtile flame.

DARWIN.

NEW-YORK:

Printed by T. and J. SWORDS, Printers to the Faculty of Physic of
Columbia College, No. 27, William-Street.

—1793.—

INAUGURAL DISSERTATION

CYANIC ACID

FACULTY OF PHYSIC

JOHN C. BONGAN
TRUSTEES OF COLUMBIA COLLEGE

Imprimatur.

STATE OF NEW-YORK:
WILLIAM SAMUEL JOHNSON, L.D. Registrar

Samuel L. Mitchill.

DOCTOR OF PHYSIC

ON THE THIRTEENTH DAY OF APRIL, 1792.

BY SAMUEL BORROWE,

Citizen of the State of New-York.

Whence in bright floods the vital life expands,
And with concentric spheres involves the lands;
Irradiates the twinkling sea, and beaving earth,
Where towering Nature boasts her myriad birth;
Pills the one range of all that breathe or move,
Warms the new heart, and dyes the glowing blood,
With life's first spirit inspires the organic frame,
And, as it warms, renoues the subtle flame.

NEW-YORK:

Printed by T. and J. Swaine, Printers to the Faculty of Physic of
Columbia College, No. 47, William-Street.

1792

TO
GOZEN RYERSS,
AND
JOHN C. DONGAN,
OF
STATEN-ISLAND;

THIS
DISSERTATION

Is most respectfully inscribed,

By their much obliged Friend,

The AUTHOR.

Doctor Buxton

from his Friend

the Author

INARTICULAR DYSARTICULATION
GOZEN EYERS

CYANOSIS TRACHEALIS
JOHN C. DONGAN

THESE are perhaps the most delicate of which children are subject, they prove more certainly destructive, it is left to nature, than the Cyanosis Trachealis. Such was its typical fatal nature, that not long since many have been suffered to expire without calling in any medical assistance, as it was conceived to be immediately owing to the then successful method of treating it.

With respect to the nature and cause of this disease, there has lately been a variety of opinions entertained, which have given rise to as great a variety of remedies, and of very opposite kinds.

Almost every Physician has had a different method of cure. As they could not all be right, there

 INAUGURAL DISSERTATION

 CYNANCHE TRACHEALIS.

THERE is perhaps no disease to which children are subject, that proves more certainly destructive, if left to nature, than the *Cynanche Trachealis*. Such was its supposed fatal nature, that not long since many have been suffered to expire without calling in any medical assistance, as it was conceived to be irremediable; owing to the then unsuccessful method of treating it.

With respect to the nature and cause of *Chynanche Trachealis*, there has lately been a variety of opinions entertained, which have given rise to as great a variety of remedies, and of very opposite kinds.

Almost every Physician has had a different method of cure. As they could not all be right, thousands

fands of the sick, no doubt, must have fallen a sacrifice to the disease, for want of medical discernment, or by reason of a blind attachment to an improper plan.

We have accordingly seen one set of men warmly recommending the *sthenic* mode of cure, prescribing contrayerva, Peruvian bark, &c. with a view, as they express it, of counteracting the virus, or correcting the tendency of the fluids to putrefaction.

How much to be feared are such Practitioners, who, in spite of modern experience to the contrary, still adhere to that delusive, and I may say, dangerous system, the *humoral pathology*! And how much to be pitied are those unfortunate patients who come under their immediate care!

On the other hand, we observe another set of men, who, with great propriety, advise the *asthenic* method of cure.*

Others have said that there are two species of this disease, *spasmodica* and *humida*.† That there may be a *Cynanche Trachealis Spasmodica* I will not attempt to deny; but in all those cases which I have had

* Cullen's First Lines, and a Letter from Richard Bayley, Surgeon, to William Hunter, M. D.

† Rush's Inquiries and Observations, page 120.

had an opportunity of observing, there did not appear to be any thing like spasm.

In this Dissertation, I shall, therefore, confine myself to that species which Doctor Rush calls *Cynanche Trachealis Humida*. I shall first attempt a review of some of the opinions that have been advanced with respect to its nature and causes, and then endeavour to point out what appears to me to be the most proper method of cure.

HISTORY of the DISEASE.

THE celebrated Doctor Francis Home has observed, that the *Cynanche Trachealis* is confined to the sea coast, and mentions as a proof of this opinion, that it seldom occurs in Edinburgh, while, in Leith and Musselburgh it is very common. He likewise observes, that it frequently appears along the coast of Fife, the maritime parts of Airshire and Galloway.*

From

* A Treatise on the Diseases of Children, London printed, 1772, in which there is an extract from Home's Book on the Croup.

When I shall have occasion to speak of Home's opinion in future, I beg leave to refer the reader to the above mentioned Treatise, as I have not been able to procure Home's original observations on this disease.

From these facts, Home draws a general conclusion, that this disease is peculiar to the sea shore. This I am disposed to doubt, for, upon inquiry, it is found, that the *Cynanche Trachealis* frequently prevails in the most inland situations.*

I was lately informed by Zina Hitchcock, a reputable Physician in Washington county, that the *Cynanche Trachealis* frequently occurred in the neighbourhood of *Fort Edward*, which is two hundred and twenty-one miles from the sea shore.

Many more facts on this head might be mentioned; but I conceive those already stated sufficient to do away the opinion of Home, with respect to this disease having a *necessary* connection with maritime regions.

In another place Home has asserted, that the *Cynanche Trachealis* only occurs in the colder seasons. This is erroneous, for it is known to prevail in the heat of summer.† There is no situation, no climate, nor season exempt from it. But I have observed, that it more frequently prevails during those seasons in which there are the greatest vicissitudes.

There

* Cullen's First Lines of the Practice of Physic.

† This fact was communicated to me by Dr. Samuel L. Mitchill, one of whose brothers died of this disease in the month of August.

There has been much dispute about the seat of this disease. Some have supposed its situation to be in the *glottis*; others, that it was seated in the *trachea* only.* Dissections, however, prove that it is not confined to the *glottis* and *trachea* alone, but that it extends into the extreme branches of the *bronchia*.†

The *Cynanche Trachealis* may be said to be peculiar to children, as it is never known to attack persons after the age of twelve or fourteen years.

This disease has been considered as contagious;‡ but from the observations which I have been able to make, it does not appear to depend in any degree on contagion. I have never seen an instance in which it appeared to be communicated from one person to another, although they were placed in a situation favourable to receive it, had there been any contagion.

From these circumstances I am induced to conclude, that this disease is not to be considered as contagious; and therefore, does not require all that

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* Treatise on the Diseases of Children, page 154.

† Dr. Bard's Inquiry into the Nature, Cause, and Cure of Angina Suffocativa, page 22.

‡ Bard's Inquiry, &c,

caution that was formerly taken of keeping healthy children apart from those labouring under *Cynanche Trachealis*.

It is not uncommon for this disease to attack the same child repeatedly. Whether this proceeds from the force of habit, or from the peculiar irritability of the child, I shall not attempt to determine. The latter however appears to be the most reasonable conjecture.

D I A G N O S I S.

CULLEN, in his *Synopsis Nosologiæ Methodicæ*, has placed this disease in the class of *Pyrexia*, and order of *Pblegmasiæ*. As the pathognomonick symptoms are collectively viewed in the definition, I here give it in the words of that learned Nosologist.

“*Respiratione difficili, inspiratione strepente, voce raucâ, tussi clangosa, tumore fere nullo in faucibus apparente, deglutitione parum difficili et febre synocha.*”*

The

* Culleni *Synopsis Nosologiæ Methodicæ*.

The most distinguishing characteristics of *Cynanche Trachealis*, are the hoarse dry cough, and shrill sound in inspiration, which is compared to air passing through a *brazen tube*,* to the crowing of a young *cock*;† and it is likewise said to be similar to the barking of a young *dog*.‡ Together with these symptoms there is a pain about the *larynx*, great difficulty of respiration, and a sense of suffocation; the cough is remarkably dry, the pulse is for the most part frequent, and the patient is extremely uneasy, continually throwing the arms and legs about, frequently turning from side to side, often placing the hands to the throat, as if he was choaking. In the earlier stages of this complaint, the face is considerably flushed; but in the latter stages, it becomes pale and frequently of a livid appearance. As the disease advances, there comes on a disposition to sleep, which appears to be produced in part, by the strength being exhausted, in consequence of the great anxiety and struggling of the patient, whereby the circulation ultimately becomes languid. If roused from this apparent sleep, the uneasiness is considerably increased in consequence of the circulation being quickened; whereby a greater quantity of blood is sent to the

* Cullen's First Lines of the Practice of Physic.

† Bard's Inquiry, &c.

‡ Rush's Observations, &c.

the lungs in a given time. Together with these symptoms, the difficult respiration continues to increase, which, in a very short time, terminates the existence of the unfortunate patient.

This is the common course of *Cynanche Trachealis* if left to nature, and, I fear, too frequently when a cure is attempted.

Rush mentions that there are small red blotches sometimes observed on the skin. This I consider as an accidental occurrence, and therefore not requiring any particular attention.

It is said that the fauces are swelled and somewhat inflamed.* That this may sometimes take place, I shall not attempt to deny; but I have never been able to discover the least appearance of inflammation or swelling in the fauces, though I have been particularly careful in examining a number of patients with the *Cynanche Trachealis*, while I was under the tuition of the late celebrated Physician and extensive Practitioner, Charles M'Knight; and likewise those patients that have since come under my care.

It is mentioned that the *Cynanche Trachealis* comes on with the usual symptoms of a common catarrh.†

I rather

* Cullen's First Lines.

† Cullen's First Lines, vol. i. page 352.

I rather suppose this to be a mistake, for I have seen many children in the earliest stages of this disease, and the peculiar symptoms that are above enumerated were the first appearance of indisposition.

REMOTE CAUSE.

THE remote causes may, perhaps, with some degree of propriety, be divided into the predisponent and occasional.

The predisponent cause appears to me to be a certain irritability peculiar to children, as the *Cynanche Trachealis* is never known to attack a person after the age above mentioned, viz. twelve or fourteen years.

With respect to the occasional or exciting cause, there are many opinions. Home supposes that the peculiar stimulus of the air near the sea, may be considered as the occasional cause. The marine air (says he) supplies a stimulus calculated to increase the secretion of mucus from the *glands* of the *trachea* and *lungs*. He supposes that a great quantity of sea salt is carried into the atmosphere, which being inspired into the *lungs*, stimulates the orifices of the *glands*

glands dispersed on the internal surface of the *trachea* and *bronchia*, and thereby increases the secretion of mucus, which forms the preternatural membrane.

This is ingenious theory ; but I believe it will be found contrary to fact. The only case in which marine salt is suspended in the atmosphere, is when the surf is very great, and the spray is forced by the wind to a considerable distance from the shore, as happens on the south side of *Long-Island*, where the spray is carried to the distance of several miles on the land ; so that a briny fluid in some cases *trickles* in drops from the leaves of the trees. Notwithstanding that the air is so greatly impregnated with saline particles, this disease is not found to be more rife there than in the most inland situations.

This holds good with respect to many parts of the *West-Indies*, as in *Turk's-Island*, &c. where the shore is continually washed by the sea. But I cannot learn that the *Cynanche Trachealis* is more frequent there than in the places more remote from the sea coast.

From the foregoing considerations I am induced to conclude, that the sea air is not the occasional cause of this disease ; that is, from the salt it contains.

After a fair and candid examination of the occasional causes of *Cynanche Trachealis*, I am inclined to think,

think, with Cullen, that the principal are cold and moisture applied to the body which was previously much heated. This accounts for this disease occurring most frequently when the greatest vicissitudes of weather take place.

PROXIMATE CAUSE.

THE proximate cause of diseases has hitherto escaped, and probably will for a long time continue to elude the most accurate researches of man. It is therefore with the greatest diffidence that I shall offer an opinion on this subject.

The proximate cause of *Cynanche Trachealis* has been supposed to be an inflammatory action of the vessels on the internal surface of the *trachea*. This supposition does not by any means account for all the phænomena, and is indeed contrary to fact; for dissections prove that there is no primary inflammation in the *Cynanche Trachealis*.

Ronaldus Martin, Professor of Anatomy at Stockholm, discovered by dissection that this preternatural membrane extended even into the most minute ramifications of the *bronchia*; where it resembled

bled the membrane that lines an egg-shell. In this case there was not the least vestige of inflammation in the *trachea* or *lungs*.* Bard likewise mentions several dissections which he made of patients who died of *Cynanche Trachealis*, in which the preternatural membrane was completely formed; and, in most of those cases, there was not the least appearance of inflammation. He mentions also the case of a patient who died in consequence of an inflammation of the *trachea*, and on dissection there was not any of this membrane formed. Here then there is both a positive and a negative proof, that inflammation is not the cause of the before mentioned membrane. Rush makes the following observation: “ I acknowledge that I have generally seen both species that have been mentioned, without inflammatory symptoms, and sometimes without fever, especially in the first stage of the disease.”† In those cases which are said to be attended with inflammation, I consider it as an effect of the mechanical action of the preternatural membrane on the tender and delicate surface of the *trachea*.

It has been asserted that the *Cynanche Trachealis* depended on a disposition to putridity; in consequence of

* Bard's Inquiry into the Nature, Cause, and Cure of Angina Suffocativa, page 22.

† Rush's Observations and Inquiries.

of which, there was such a state of the vessels on the internal surface of the *trachea* induced, as caused them to effuse a fluid which is disposed to inspissate.

If I should for a moment admit the improbable idea that there is a putrid state of the body, I should then ask those who contend for this opinion, how they can account for the formation of the morbid membrane that is constantly found in the *trachea* and *bronchia* of patients who have died of this disease. If there is a putrid state induced, there is of course a diminished cohesion of the particles of matter. If there is a want of cohesion in the component parts of the body; or, in other words, if the solids and fluids are in a dissolved state, as was formerly said, how is it possible for them to secrete a substance which is possessed of so great a degree of tenacity as the membrane before mentioned?*

If we carefully attend to the history of this disease, we shall find that there is no symptom of putridity attending it, except the debility that accompanies the last stage should be considered as such, which can be accounted for more rationally than on the supposition of the body's being in a putrid state. Independent

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of

* Bard, in his Inquiry into the Nature, Cause, and Cure of Angina Suffocativa, observes, that this membrane is somewhat similar to Sham-moy leather.

of any reasoning on this subject, the remedies to which the *Cynanche Trachealis* is found to yield, afford sufficient proof that it is not a putrid disease.

From what I have been able to observe, I am of opinion that the proximate cause of *Cynanche Trachealis* is a peculiar morbid action of the vessels on the internal surface of the *trachea* and *bronchia*, whereby a fluid is secreted which forms the tough membrane.

The next object is to ascertain what the real nature of this membrane is. It is supposed by some, to be inspissated mucus,* and by others, coagulable lymph.†

I am not willing to admit the supposition of its being mucus; for I know of no fact or experiment by which it is evinced that mucus can acquire such a degree of cohesion as this membrane is found to possess, in so short a time, viz. a few hours. If it is mucus, why does not every child that labours under a common catarrh get the *Cynanche Trachealis*? And why does it not attack adults?

These are objections to its being mucus, which I conceive it is not easy to remove. It may not be
improper

* Bard's Inquiry, &c. Rush's Observations; and Home on the Croup.

† Bayley's Letter to Dr. Hunter.

improper to observe, that the gastric juice is not capable of acting on this membrane, or of producing any change in it, while mucus is perfectly dissolved in the stomach.

It is found that children who have recovered from the *Cynanche Trachealis*, have, for several days, passed in their stools large portions of this membranous substance, which retained a great share of its former tenacity.

This fact was some time since communicated to me by Doctor Samuel L. Mitchill; since which, I have had an opportunity of observing it in several cases which came under my care.

In this way we may account for the recovery of children who have not thrown up the membrane in the act of vomiting; for, as they coughed it from their lungs, it was immediately taken into the stomach.

This membrane not appearing on giving an emetic, has given rise to an opinion that it is not formed in every case of *Cynanche Trachealis*; and, in all probability, has induced many to suppose that this disease was spasmodic.

That this morbid membrane is composed of coagulable lymph, I am disposed to deny; for the coagulable

agulable lymph is never separated from the blood in a state disposed to assume a membranous form in the body, except in cases of great inflammation, which is proved does not take place in this disease. As a further evidence that no primary inflammation takes place in this disease, it may not be improper to observe, that the blood, when drawn from a vein, under the most favourable circumstances, to produce a separation of gluten, does not shew any tendency of that kind, at any stage of the disease; and it is allowed, that in every case of considerable inflammation or predisposition to it, that the blood, when taken from a large orifice, in a full stream, shews, when cold, a portion of its gluten separated.

I shall here take the liberty of inquiring into the propriety of Cullen's placing this disease in the order of Phlegmasiæ: his definition of which is,

“ Febris synocha, phlogosis; vel dolor topicus, simul læsa partis internæ functione; ^a sanguis missus, et jam concretus superficiem coriaceam [^] albam ostendens.”

Here, then, is certainly a mistake; for the *Cyanthe Trachealis* is deficient in two of the principal characteristics of the order in which it is placed, viz. inflammation, and the buffy appearance of the blood.

From

From taking this view of the subject, I am inclined to think that this membranous lining which is so constantly found within the *trachea* and *bronchia* of those who have died of *Cynanche Tracheatis*, is neither inspissated mucus nor coagulable lymph, but a substance *sui generis*, produced by the peculiar morbid action of the vessels on the internal surface of the *trachea* and *bronchia*.

PROGNOSIS,

THE prognosis of this disease is principally to be drawn from the difficulty of breathing, and the peculiar shrill sound in the act of inspiration, together with the dry cough.

When the respiration becomes very laborious, cough dry, and the diseased peculiarity of the voice is considerable, we may conclude the patient to be in an extremely dangerous condition. If these symptoms continue to increase, and the face becomes pale, or puts on a livid appearance, the pulses sink, and there should be other marks of great debility, we may venture to prognosticate certain death.

On the contrary, if the cough is moist, or attended with expectoration, the respiration free and easy, we may with some degree of certainty predict a favourable termination.

EXPLANATION

EXPLANATION of the SYMPTOMS.

HOME divides this disease into two stages, the first inflammatory, the second putrid. What could have induced him to make this groundless and needless division, I can scarcely imagine, since it is found on dissection, that neither inflammation nor putridity are attendant on the *Cynanche Trachealis*.

That there is a stage of excitement and a stage of debility, I am willing to admit. But they can be accounted for on the true laws of the *Animal Economy*, better than on the supposition of inflammation and its consequence, putridity.

I shall attempt to account for the first stage of *Cynanche Trachealis*, or what Home calls the inflammatory stage, in the following manner: When a child is attacked with this disease, he is extremely uneasy, and continually turning from side to side. This restlessness causes some considerable increase of the circulation, and the face becomes flushed. These symptoms have given rise to the opinion that there was really inflammation present. But it is well known that all these symptoms may, and do frequently occur, without inflammation, as in the hot stage of an intermittent fever.

The

The stage of debility, or that which Home calls putrid, may be accounted for in this way: The morbid membrane that is found lining the *trachea* in this disease, extends into the most minute ramifications of the *bronchia*. The *bronchia* being thus coated with a dense expansion, the air cannot perform its proper operation upon the blood in the lungs. Hence no decomposition of the respirable part of this fluid takes place; and of course the circulating mass does not become *oxygenated*. The want of *oxygen* in the blood may be the cause of the livid appearance of the face in the latter stages of this disease.

As the membrane extends into the minute branches of the *bronchia*, the difficulty of breathing increases, which cannot be explained on the supposition of putridity; but can very clearly be accounted for, by supposing that the blood is deprived of its natural stimulus, the *oxygen*, or base of vital air. This likewise accounts for the feeble state of the pulse in the advanced stage of the *Cynanche Trachealis*; for it is a well established fact, that the circulation and energy of the system depends on the respiration. Consequently, if the respiration is in any considerable degree affected, debility must ensue, and all the vital functions suffer an interruption in proportion to the degree of obstructed respiration. I therefore

therefore suppose, that most patients who die of *Cynanche Trachealis*, expire in consequence of a subduction of that stimulus which is necessary for the support of animal life, and not by spasm* or putridity.†

METHOD of CURE.

THE first indication of cure in *Cynanche Trachealis*, is to deplete the system, which is most effectually done by letting blood, in considerable quantity, from the jugular vein, arm, or any part most convenient; but the jugular is to be preferred. The venæ section should be repeated, if there are marks of a full habit, or if the difficulty of breathing should not be relieved by the first operation.

When I recommend blood-letting, it is on a different principle from that on which it is commonly advised in this disease, viz. that of abating inflammation; which, I have endeavoured to prove, does not originally accompany this disease, nor essentially appertain to it.

It must be allowed that respiration becomes necessary in proportion to the quantity of blood contained
in

* Bayley's Letter to Dr. Wm. Hunter.

† Home on the Croup.

in the system. If we diminish the quantity of blood, of course respiration becomes less necessary. Hence a person breathes more freely, in consequence of a smaller quantity of blood passing through the lungs in a given time. In proportion to the greater or smaller quantity of blood which passes through the lungs, the presence of vital air becomes more or less necessary to *oxygenate* it; for without *oxygene* life cannot exist.

In this disease, the *oxygene* is with extreme difficulty, and in small quantity communicated to the blood, in consequence of the interposition of the filmy concretion which invests the *bronchia*. If this is admitted, we can account for the great relief which blood-letting affords patients affected with *Cynanche Trachealis*, which is almost instantaneous, and therefore cannot be accounted for upon the supposition of this disease being inflammatory. Blood-letting may be of service in another way. We know, that when blood is drawn from the human body in considerable quantity, and that in a short space of time, its effects are very great. The change thus brought about in the system, by the rapid evacuation of blood, may operate on the vessels of the *trachea* and *bronchia* in such a manner as to induce an action in them, contrary to that which exists in the

morbid state, and in this way cure, or at least prevent the increase of this disease. Emetics are then to be given, to throw off the tough matter from the lungs and *trachea*. The propriety of giving emetics, in *Cynanche Trachealis*, has been doubted by Home. He supposes that emetics promote the secretion of mucus in the lungs, without causing it to be evacuated, and in this way increases the complaint. This reasoning will not do, for I think there is the highest improbability that mucus does produce the peculiar membrane.

Throwing aside all theory, the great success that constantly attends the use of emetics in *Cynanche Trachealis*, is sufficient to recommend them as powerful remedies. There are many instances in which the early administration of an emetic has totally removed the complaint in the space of a few hours, by causing the patient to discharge the membrane from the *trachea*; and in other cases has caused a loosening or separation of it; and afterwards, by the effort of coughing, it has been entirely brought off. In children who are so young that they have not the power or understanding to expectorate, it has been taken into the stomach, and after some time makes its appearance in their stools, as has been before observed. Besides the effect of throwing off this membrane,

emetics

emetics produce a great revolution in the system, by the concussion they give the whole body; they must of course have a great tendency to interrupt or alter that peculiar morbid action of the vessels on the internal surface of the *trachea*. Emetics likewise determine to the surface of the body, and keep the bowels regular; two circumstances of very great consequence in the cure of this disease.

The steam of warm water has been highly recommended to be taken into the *trachea*, with a view to dissolve this membrane. This I consider as an insignificant remedy, for it has been found that even the maceration of this membrane in warm water for several days, has had little or no effect in destroying its tenacity. Besides, it is a remedy that cannot be used but with extreme difficulty, particularly with young children. I therefore think it may with propriety be neglected.

A blistering plaister is next to be applied to the throat, which, by determining to the surface, affords great relief in *Cynanche Trachealis*, and appears to be well calculated to produce the change so desirable in this disease. There is, however, one very great disadvantage sometimes resulting from the application of blisters to the throat: They are apt to produce

produce disagreeable ulcers, which often end in mortification and consequent death. The occurrence of these ulcers may be accounted for from the parts being kept in continual motion, by the uneasiness of the child, which exposes the blistered surface to the continual action of the air. This, joined to the friction, produces irritation and inflammation, which sometimes terminate in mortification. I therefore think that blisters should be applied with the greatest caution, and not suffered to remain on longer than merely to act as rubefacients.

Calomel has been much recommended, particularly by Rush.* In what manner calomel acts, is not easily explained. I suppose, however, it is not by correcting acrimony, as has been imagined; † for calomel occasions a happy change in so short a time, that it appears impossible for it to be absorbed, and in that way produce its effects. I rather suppose, that it acts in the manner which Rush observes, ‡ or, that it acts by stimulating the stomach and bowels, which causes a derivation to them, whereby the morbid action of the vessels on the internal surface of the *trachea* is interrupted.

The

* Rush's Inquiries, &c.

† Bard's Inquiry, &c.

‡ " In what manner does calomel act in this disorder? Is it by increasing the secretion of mucus in the numerous glands of the fauces, œsophagus, stomach, and bowels; and thereby lessening the excretion of it in the TRACHEA?"

The warm bath is a remedy on which great dependence is to be placed; for, by its great power of determining to the surface of the body, it is found to relieve the difficulty of breathing which constantly accompanies this disease,

The cure of *Cynanche Trachealis* is, therefore, to be effected by the remedies already mentioned, viz. blood-letting, blisters, emetics, warm bath, and calomel.

As a proof of the propriety of the plan I have recommended, I will subjoin five cases of *Cynanche Trachealis* which were successfully treated by it.

C A S E I.

ON the 20th December, 1792, a son of Mr. Farrier, aged two years, was attacked with a hoarse, dry cough, and great difficulty of breathing. The mother put the child into a warm bath; but finding the symptoms increased, at two o'clock, P. M. sent for Doctor Hamersley, who directed a gentle emetic, which

which operated very well. At three o'clock the Doctor requested me to visit the child with him: as we found him labouring under all the symptoms of a distinctly marked *Cynanche Trachealis*, we judged it advisable to let blood; four ounces were taken from the jugular vein. The warm bath was repeated; after which the symptoms were somewhat relieved: we then ordered four grains of *emetic tartar* to be dissolved in four ounces of water, and directed two drachms of the solution to be taken every fifteen minutes till it operated as an emetic. This caused the child to throw up a great quantity of viscid matter; produced a moisture on the skin, and opened his bowels. At nine o'clock we visited him again, and directed the emetic solution to be repeated; half an hour afterwards the child was seized with a fit of coughing and vomiting, which caused the vein to be forced open, and he lost (agreeable to the mother's information) near five ounces of blood; after which he rested very well all night. At eight o'clock on the morning of the 21st, the child was much better in every respect; there remained, however, some degree of the peculiar sound of the voice; to remove which we directed *oxymel scill.* one tea-spoonful to be taken every hour. This had the happy effect of keeping up a moisture on his skin, and caused him to cough up a considerable quantity of ropy matter.

matter. The following day the child appeared to be perfectly well, and continued so without the aid of any other remedies.

C A S E II.

ON the 18th December, 1791, I was sent for to see a daughter of Mr. James M'Kay's, who was the day before attacked with *Cynanche Trachealis*. From the extreme difficulty of breathing that she laboured under, I thought it advisable to let blood; I therefore opened a vein, and suffered her to bleed *ad deliquium*. After she recovered from the fainting she was put into a warm bath, and puked freely with a solution of emetic tartar, which had likewise the beneficial effect of producing an evacuation from her bowels. Two hours after I visited her again, and finding the difficulty of breathing not altogether removed, I directed the emetic solution and warm bath to be repeated; at the same time a blistering plaister was applied to her throat. The following day her bowels were opened with calomel, and on the fourth day she was perfectly well, except the soreness of the blister.

C A S E III.

A child of Mr. Walter Reed's was, on the 26th November, 1792, seized with a hoarse, dry cough, and laborious respiration. The following day I was desired to visit him, at which time he was apparently in the greatest distress, and, in short, had a most complete *Cynanche Trachealis*. I immediately opened a vein in the arm, and took from it six ounces of blood; on which he shewed symptoms of *deliquium*. He then took small portions of emetic tartar, which caused him to throw up a considerable quantity of viscid matter. The warm bath was then used, when his skin became moist, and he passed several large portions of a membranous substance by stool. The next day he took a small dose of calomel, which brought away, by stool, a great quantity of the preternatural membrane; the child was thereby greatly relieved; and by keeping his bowels open with calomel, in a few days he was perfectly restored to health.

C A S E IV.

A CHILD of Mr. Jacob Brown's, one year and seven months old, was attacked with *Cynanche Trachealis*. On the 31st December, 1792, at eleven o'clock P. M. I was requested to visit him. The violence of the symptoms called loudly for immediate assistance: I therefore opened the jugular vein, and took away near eight ounces of blood; ordered a warm bath, and an emetic solution, which relieved the difficulty of breathing, caused him to heave up some viscid matter, and likewise to pass considerable in his stools. The skin appearing to be dry, I directed the bath to be repeated, and small portions of the emetic to be taken in such a manner as to keep up a constant nausea. The third day the child was perfectly relieved of the difficulty of breathing, and in a few days more appeared to be in perfect health. About six weeks after, he had a return of the complaint, and notwithstanding every thing was done for his relief, he died on the fifth day of the disease.

C A S E V.

MR. John Hillyer called on me the 26th January, 1793, to visit a child of his which had been complaining for several days: When I first saw the child, he appeared to be gasping for breath; his face was pale, or rather inclining to a livid appearance; his pulse extremely weak and frequent; in short, all those symptoms appeared which accompany what Home calls the putrid stage of *Cynanche Trachealis*. From the disease having been of several days standing, and from the violence of the symptoms, I almost despaired of saving the child. Willing, however, to give him every possible chance of recovery, and being fully satisfied that putridity was not the cause of the debility, I immediately opened one of the jugular veins, from which near seven ounces of blood were drawn. The child appeared to faint; I then stopped the blood, and on recovering, he breathed much more easy. I now pursued the same method as in the former cases, with respect to the bath and emetics. In addition to which, a blistering plaister was applied to the throat, and, to my great satisfaction, after seven days the child was perfectly relieved of the complaint.

In

In this last mentioned case, agreeable to the opinion that was formerly entertained of this disease, antiseptics should have been freely administered. What would have been the consequence of such a plan? The answer is plain—certain death.

After having given the plan of cure, above recommended, so satisfactory a trial, there does no longer remain a doubt with me, that the supposition of this disease being attended with putridity is erroneous; and has of course been productive of much mischief.

F I N I S.

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