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AN ESSAY

ON

CYNANCHE TRACHEALIS,

OR

CROUP.



BY JOHN CHEYNE, M. D.

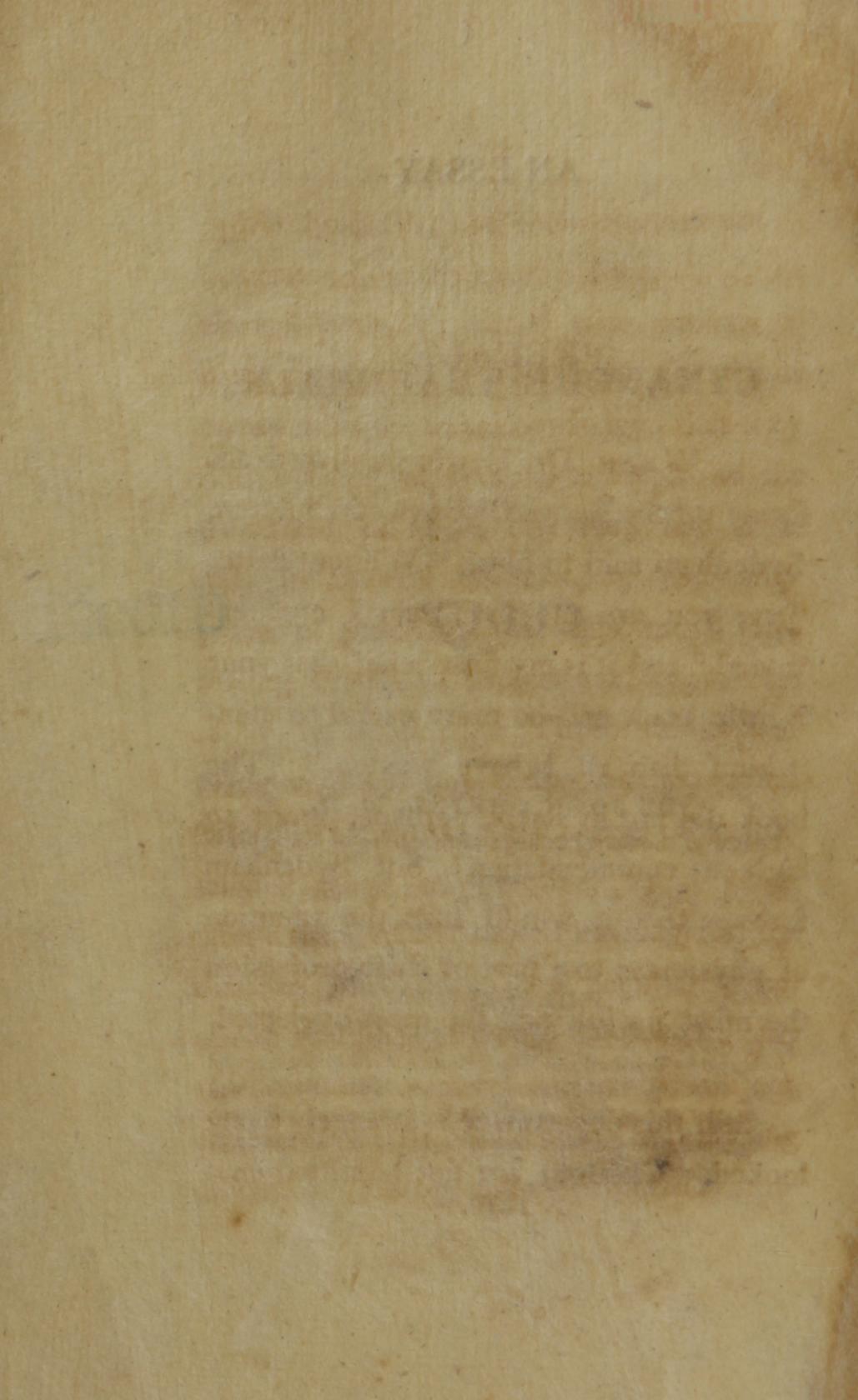
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PREFACE.

WHEN Dr. Harris published his Essay on the Acute Diseases of Children, Sydenham said to him, "Without flattery, you are the first man I ever envied; and it is my firm belief that your little book will be more useful to mankind than all I have written." The book did not in itself, perhaps, merit so high a commendation; but Sydenham foresaw that it would turn the attention of physicians to a part of their profession the most useful, and the most neglected.

Still this department is strangely overlooked. Children are not admitted into

public hospitals, and their diseases are ill understood, and superficially treated, or slurred over, by those who profess to teach medicine. The best physicians do not scruple to acknowledge, that they find nothing at first so difficult as the treatment of these diseases; and it is only by careful observation, and after years of practice, that this most interesting branch of professional knowledge is to be attained. These things had made a deep impression on my mind when I entered on the charge of an extensive range of practice, in a place where some of the most formidable of the diseases of children are peculiarly frequent and dangerous. I devoted my chief attention, therefore, to this subject, and resolved to seek, with unremitting diligence, all occasions of observation

and of study in a department so intimately connected with the duties which I had undertaken. I soon found my cases and observations multiply. I have been careful to compare them with the observations and cases of others; and I have arranged them systematically, with the intention of submitting them to the public, not without hopes of being useful to my profession.

My design is to discuss, in separate Essays, the most important of the Diseases of Children, beginning with those, as less intricate, to which children, after being weaned, are exposed, and proceeding afterwards to those which attack infants at the breast. My hopes of being useful rest upon the fidelity of my observations, and the minuteness and accura-

ey of detail, where I may have been enabled by dissection to elucidate any important points in the nature and history of the diseases of which I treat.

In this Essay, which I now venture to publish, I have attempted the discussion of one of the most interesting diseases, the most alarming in appearance, and in reality one of the most dangerous to which a child can be exposed. These motives might alone have been sufficient to lead me first to the discussion of the subject I have chosen; but in my situation I found an additional motive, of great influence. To this disease children are peculiarly exposed in the town where I practise; and the opportunities which this frequency has afforded me of observing it in all its stages,

and also of tracing, after death, the appearances and nature of the disease, have given me a confidence in what I have to lay before the public, which I could not otherwise have attained.

ESSAY I.

ON

CYNANCHE TRACHEALIS.

THE CASE

OF

MR. J. W. WEAVER

VS.

A TESTIMONY OF REFERENCE
BY THE COURT

JOHN WEAVER, M. D.

OF THE COUNTY OF ... STATE OF ...

BY HIS ATTORNEY AT LAW

JOHN WEAVER

THIS ESSAY

IS INSCRIBED

AS

A TESTIMONY OF RESPECT,

TO

JOHN ROLLO, M. D.

SURGEON GENERAL TO THE ROYAL ARTILLERY, &c. &c.

BY HIS MOST OBEDIENT SERVANT,

JOHN CHEYNE.

ESSAY I.

ON

CYNANCHE TRACHEALIS.

THE disease which in this country is called Croup, may be defined an inflammatory affection of the Trachea, which in the progress of the disease is accompanied with an effusion which becomes a tubular membrane, lining the inflamed surface.

It might seem strange that a disease so striking in the symptoms, and so speedy and fatal in the event, should not have been clearly described⁽¹⁾ earlier than the

(1) The following passage (transcribed from Ballonius into the *Sepulchretum of Bonetus*, Vol. I. p. 484.) may refer to this disease: "Ægri quatuor mihi noti, qui eodem fere tempore interi-

middle of the last century, were it not remembered, that formerly all the ailments of children were much neglected, and that even the most eminent physicians, when called to children, went with re-

“ ere pene morbo consimili : Omnibus medicis
 “ negotium dedit : Imo ausim asserrere morbum
 “ non intellexisse : Difficultas erat spirandi sum-
 “ ma, spiritus frequens et parvus ad mortem us-
 “ que : In sicco velut spirare videbantur : Nec
 “ tussis nec sputum, spiritum ne ad momentum
 “ cohibere poterant : Erecto paulum corpore ita
 “ parvum et frequens spirabant : Febris non erat
 “ magna, nec quæ istam respirationem require-
 “ ret,” &c.

“ Chirurgus affirmavit se secuisse cadaver pue-
 “ ri ista difficili spiratione et morbo, ut dixi incog-
 “ nito sublato : Inventa est pituita lenta contumax,
 “ quæ instar membranæ cujusdam arteriæ asperæ
 “ erat obtenta, ut non esset liber exitus et introi-
 “ tus spiritui externo, sic suffocatio repentina.”
 “ *Ballonius, Epid. et Ephemer. Lib. II. p. 197.*
 “ and 201. See also *Hildanus, Cent. III. Obs.*
 “ 10. Exemp. 1.

luctance, judging their diseases to form a labyrinth for which they had no clew (2).

Yet the descriptions to be met with in every systematic writer of that dangerous angina, in which no tumour is to be found in the fauces (3), however vague

(2) “ Quapropter medici non pauci, nominis
 “ amplissimi, palam sunt nobis aliquando professi,
 “ se pueris ægrotis, ac præsertim recens natis vi-
 “ sendis advocatos, invita quidem Minerva, tan-
 “ quam ad mysterium nescio quod evolvendum,
 “ aut insanabilem affectum sanandum, plumbeis
 “ pedibus accedere solitos.” *Harris de Morbis*
 “ *Acutis Infantum*, p. 2.

(3) “ Etenim angina alia vera, alia notha est :
 “ Veræ et legitimæ quatuor sunt differentiæ.
 “ Una quam omnium periculosissimam censuit
 “ Hippocrates, ubi neque in faucibus, neque in
 “ cervice quicquam apparet.” *Fernelii, Universa*
Medicina de Partium Morbis et Symptomat. Lib.
V. cap. 9.

“ Inter anginæ species gravissima est et celer.
 “ rima, quæ nec in cervice, nec in faucibus con-
 “ spicuum, aliquid efficit.”—“ Porro mortifera at-
 “ que omnium horrendissima angina citissime occi-

they may be, afford sufficient evidence that the disease (4) was not altogether overlooked.

“ dit, quæ neque in cervice, neque in faucibus quic-
 “ quam conspicui vel tumoris vel ruboris exhibet,
 “ simulque summi doloris tormentum, et vehe-
 “ mentem febrem, atque tantum non præsentem
 “ suffocationem infert. Tum profecti oculi ver-
 “ tuntur et rubent et veluti his qui strangulantur
 “ prominent. Vox impedita nihil significat, et
 “ qualis catulorum est,” &c. *Nicol. Piso de Cog-
 noscend. et Curand, Morbis, Lib. II. cap. 3.*

“ Si inflammatio interiores laryngis musculos
 “ occupet synanche appellatur. In synanche ma-
 “ xima est respirationis læsio, ita ut ægri strangu-
 “ lari videantur. Fauces vehementer dolent, nul-
 “ lus tamen rubor aut tumor, neque in faucibus
 “ intus neque extra in cervice apparet. Hæc
 “ species anginæ omnium periculosissima est.”
Lazari, Reverii Op. Universa Prax. Med. Lib. VII. cap. 7.

See also the 801. and 802. aphorism of Boerhaave, with Van Swieten's commentary.

(4) Perhaps it may be added, that there is ground for supposing the disease more frequent

Martin Ghisi ⁽⁵⁾, an Italian physician, published the first regular history of Croup;

now than it was formerly. In an inaugural dissertation, defended at Edinburgh in 1780, by Dr. Ambrose Cookson, there is the following communication from his friend Mr. Fell, of the county of Lancaster: "After diligent search, I have found some remarks made on Croup at its first appearance in this place in 1760. I say its first appearance, because my father, who was an accurate observer of diseases, and practised physic here for upwards of forty years, could not recollect that the disease once occurred to him; and none of my medical acquaintances had at that time the least knowledge of it."

"In that spring, six children labouring under the disease were committed to my care, to all of whom it proved fatal. Catarrhal complaints were then very frequent; indeed in most of them the disease commenced with symptoms of catarrh," &c. p. 8.

(5) Martino Ghisi *Lettere Mediche in Cremona*, 1749. This performance I have not been able to procure; I therefore must rely on the accuracy of Michaelis.

but the best and fullest is that of Chris. Frider. Michaelis, *De Angina Polyposa sive Membranacea*, published at Gottingen in 1778. The frequency of Croup in Leith and the neighbourhood, furnished Dr. Home of Edinburgh with materials for an essay on the subject in 1765. From possessing the same, or perhaps better opportunities, I have been enabled to compose the following history, which I trust is a faithful picture of this striking disease (6).

(6) I do not allow that the dissertations of Wilcke, *De Angina Infantum*, (*Sandifort, Thesaurus*, Vol. II.) or those of Millar and of Rush, relate to this disease. The dissection by Dr. Martin in Wilcke's essay appears to have induced Michaelis to say, in p. 6., that it contains one or two examples of the disease; but I think even that is far from being a clear case of Croup. The acute asthma of Dr. Millar is evidently a different disease, and in the Nosology ought to occupy a place in a different class.

The Croup (7) is less known in the temperate than in the northern regions of Europe. Peculiar to no season, it however chiefly appears in the winter and spring, in low situations (8) exposed to air passing over large bodies of water; and it is most especially the disease of sea-port towns. It is very prevalent in cold changeable weather, often appearing after a cloudy and hazy day; insomuch

(7) Concerning the etymology of this word, Rosenstein says, "He has not been able to learn any vulgar name for this disease, except that the Scots call it Croup." I rather think *roup* is the word; it is called Roup in this town; and, like many of our words, it is I imagine, of French origin, *roupie*.

(8) This disease, we are informed by Dr. Crawford, prevailed in the Carse of Gowrie, a plain in Perthshire, bounded by the river Tay; but he adds, "Hæc planities vero nuper desiccata fuit, et rarius occurritur morbus." *Disquisitio Med. Inauguralis de Cynanche Stridula*, p. 13.

that I have seen a mother, in whose family the disorder had been a frequent intruder, kept in constant anxiety by this condition of the atmosphere.

The Croup chiefly prevails in children from a short time after birth⁽⁹⁾ until puberty; attaching itself to particular families; and generally attacking the most robust and ruddy children. It does occur, but more rarely, in children exhausted by some other disease.

The disease⁽¹⁾ generally comes on in

(9) I have known this disease in a child three months old, but it does not frequently occur before weaning. It has been observed (I believe by Dr. Home), very justly, that the younger children are when weaned, they are the more liable to the disease.

(1) This description is in the main taken from a very perfect case which I attended the winter before last, and which exhibited the disease as it will often be seen in violent attacks.

the evening, after the little patient has been much exposed to the weather during the day, and often after a slight catarrh of some days standing. At first his voice is observed to be hoarse and puling; he shuns his play-fellows, and sits apart from them, dull, and, as it were, foreseeing his danger. His illness, indeed, does not prevent him from going to sleep, but soon he awakes with a most unusual cough, rough and stridulous. And now his breathing is laborious, each inspiration being accompanied by a harsh shrill noise, most distressing to the attendants: His face is swelled and flushed, and his eye bloodshot; and he seems in constant danger of suffocation: His skin burns, and he has much thirst; he labours more and more in breathing; still the ringing noise is heard, and the unusual cough: He tries to relieve himself by sitting erect; no change of posture, no effort gives him relief. Generally his sufferings are thus protracted until morning, when per-

haps there is a slight remission; his breathing is a little easier, but the anxiety, the fever, and the cough remain; he is soon as ill again as ever; and these symptoms continuing, weakened by the violence of his illness, with purpled lips and leaden countenance, he dies in two or three days⁽²⁾. In other cases, the disease, after continuing some time, appears suddenly alleviated: The breathing is free, the child soon becomes cheerful, his appetite for food returns, he amuses himself, and seems perfectly recovered, and the hope of every one is raised, only to make the disappointment more keen; for the child suddenly gets worse, and

(2) There are very distinct histories of the disease ending fatally in 24 hours: Of this Mr. Alexander saw four instances. Generally, however, the child does not die before the third or fourth day. Sometimes the disease continues much longer, for several weeks.

dies, his livid and swoln face and convulsive struggles giving him the appearance of one that is strangled.

When Croup is favourable, it terminates in various ways. Most commonly, after the disease has arrived at its height, the sequel is as it were a retrogression of the attack; there is poured out a moisture on the skin, the fever declines, and the croupiness, and, lastly, the cough, gradually wear away.

When bleeding is used upon the commencement of the violent symptoms, the relief is often immediate; and I have scarcely believed that I saw the same child breathing softly, who ten minutes before lay gasping and convulsed.

Sometimes, after the disease has continued a few days, a viscid and white substance is expectorated, and the child

is relieved⁽³⁾: Sometimes the Croup is chronic, and does not subside for weeks, when the resolution is very gradual, the child now and then coughing up portions of this white membrane.

When, in the urgency of the attack, the fauces and neck are examined, with a view to investigate the cause of these symptoms, even when a sense of heat is complained of in the throat, the tonsils are not swelled, and but little inflamed. In some instances there is a fullness to be discerned in the swell of the neck; but the disease is generally unaccompanied with this sign.

It may be said of this complaint, in common with Cynanche Tonsillaris, that the first attack establishes a predisposi-

(3) This does not always happen. See case 10, where the membrane was twice rejected, completely formed, and yet the child died.

tion to the disease. I have observed, that after the first attack, a slighter cause will produce Croup a second time than is required originally; nay, I believe that external cold and wet, without any specific state of the atmosphere, will bring on a recurrence of the disorder⁽⁴⁾. It is a confirmation of this, that children who have had croup, when they are affected with catarrhal complaints, have more or less of the croupy cough until they arrive at their 14th or 15th year.

Upon dissecting the body, the cause of these alarming symptoms becomes sufficiently obvious. When the child dies after an illness of three, four, or five

(4) Subsequent attacks are supposed to be less violent than the first; but I should, from my own experience, be led to believe that there is some error in this. Perhaps the immediate steps taken in consequence of the alarm excited by a knowledge of this dangerous complaint, may prevent it from forming. I have seen the third attack more violent than any former one.

days, there is found lining the windpipe a white membrane, of considerable tenacity. It arises a little under the larynx, and is sometimes prolonged into the division of the trachea; and generally a quantity of white fluid, like matter with which the lungs are filled, is seen gurgling up. The attachment of the membrane is slight, but the inner coat of the windpipe is inflamed. The inflammation, which is still perceptible, and which of course must have been more violent before this fluid exuded, I hold to be the immediate cause of the bad symptoms in the first stage of the disease; as the adventitious membrane and puriform fluid⁽⁵⁾, the consequence of that inflammation, is in the conclusion of it.

(5) I have added a case, where the membrane, observed on dissection, was not such as to impede the respiration; it was not more than a few detached crusts: But it would seem that the inflammation, the effusion in the lungs, and the general affection, had produced the same fatal effect.

The pathology of Croup is very simple. When the child dies, the inflammation has terminated by effusion. This effusion is of a lymph, strongly resembling purulent matter; which exuding on the inflamed surface of the windpipe, thickens there, forming the membrane. That this is the natural explanation, is proved to my conviction by analogies from other diseases; for a similar membrane is thrown out on other secreting surfaces, as in diseases of the intestines; and it is one of the most common appearances ⁽⁶⁾ we find in dissections, being the effect of pneumonia, and the cause of adhesions between the lungs and and pleura. As an argument, I may state, that I have discovered in a dissection of Croup an effusion ⁽⁷⁾ surround-

(6) *Morgagni de Sed. et Caus. Epist. 21*

(7) See case 7. In the Pædanehone of Severinus there is a similar appearance observed in the

ing the outside of the trachea, resembling, in quantity and quality, the white of an egg, and which, if it had been exposed to the drying influence of the air in respiration, would probably have assumed the very appearance of the membrane. I have seen this exudation, in all its different degrees of consistence, gurgling up at the epiglottis, puriform, and quite fluid; then at the larynx, possessing more tenacity; and, lastly, lining the lower part of the trachea, firm, and completely membranous. But in all these circumstances the colour was precisely the same. That this membrane is not merely inspissated mucus, I likewise conclude from the dissimilarity of appearance from the fluid of which it is

dissection of a boy who died of the epidemical angina, of which he treats: "Pervestigata larynx, "crustacea quadam pituita, facie exteriori connecta, citra ulceris speciem." *De Abscess. Nat.* p. 528.

composed wanting that resiliency which characterises mucus; from the membrane bearing maceration, without having its structure destroyed; and from their chemical properties being widely different (8). But indeed it is not natural to explain the appearance in this manner; and certainly it is not necessary to resort to this solution of the difficulty, for similar concretions are found in situations where there are no mucous glands; and I do not think that mucus will in any circumstances assume this structure; if it did, we should see the membrane in those diseases of children where the secretion of mucus is profuse, but where from weakness the power of expectoration is lost.

It is no hard matter to explain the difficulty of breathing in the latter part of this complaint, when the membrane

(8) *Vide* Michaelis, p. 60. et seq.

is compleatly formed; but in the beginning, the tumor and inflammation (although I suspect they are then much more considerable than they are afterwards) will hardly be thought to afford a sufficient explanation of the orthopnœa. I must suppose, therefore, that along with this fullness, and perhaps in some measure occasioned by its stimulus, there is a spasmodic constriction of the larynx. This I am the more inclined to believe, because, although in the first stage I have never seen an intermission in the disease, unless in consequence of bleeding (9), I have observed the breathing, which is always laborious, performed at particular times, and for several minutes together, with incomparably more distress. The inflammatory affection of the larynx is doubtless sufficient to account for the alteration which takes place in the sound of the voice and cough.

(9) Or some other antiphlogistic remedy.

There is a circumstance mentioned in the history of the disease, which I have not seen satisfactorily resolved: I allude to the sudden extinction of our hopes when they are at the highest, consisting first in a wonderful remission of the disorder, and soon after in a fatal exacerbation. Perhaps this ought to be attributed rather to a mechanical than to a spasmodic affection of the parts. It sometimes takes place after the expectoration of part of the membrane; and I suppose that the connection of the remainder with the trachea may be loosened; so that in taking a full inspiration, this detached portion acts as a valve, completely shutting up the tube, and thus suddenly suffocating the child.

Michaelis (1) supposes this disease to occur as frequently in adults as in chil-

(1) "Suspicio nempe, morbum in adultioribus non rarius quam in infantibus occurrere; cum

dren, with this difference, that adults have the power of expectorating the lymphatic exudation before it becomes a solid membrance. But if this were the case, we should at least hear the croupy cough, and peculiar voice and breathing, for these precede the formation of the

“ autem adultiores, materiem lymphaticam, primo statim tempore, quo in asperam arteriam effunditur, antequam in solidum coagulari concrementum possit, ore rejiciant, morbum in eis, primis jam plerumque in incunabilis, suffocari, et sub communis affectionis catarrhalis specie, observatorum oculis se subtrahere.

“ Infantum autem plane alia est ratio; isti enim initio materiem in asperam arteriam effusam, mollem adhuc paucamque, rejicere negligunt; mox autem illa ita inscrescit, ut vires jam infantis ad eam rejiciendam non sufficiant. Credo itaque rudimenta, initiumque morbi nostri, in adultis non minis frequenter, ac in infantibus occurrere; perfectum autem, atque completum morbum, cujus naturam membrana polyposa declarat, ob mox expositas rationes, in adultiore ætate rariorem esse.” P, 177.

membrane. Children of all ages up to puberty have died of Croup ; and yet a boy of ten, twelve, or fourteen years of age, has, as perfectly as ever he can have it, the power of expectoration. I have heard of no example of this disease after the fifteenth year ; and I have imagined this to depend on that change which happens in the constitution at puberty, and perhaps, in a more peculiar manner, on the change which the upper part of the windpipe undergoes. That a very material alteration does take place, is evident from the change in the voice, which now becomes firm and manly. I therefore suppose, that the greater degree of tone with which the trachea is endowed, enables it to resist those excitements which would have operated on the same organ in a lax and less perfect state. Hence it may be seen. that I consider the debility of the trachea as the predisposing cause to Croup.

The obvious exciting cause of this disorder, the inflamed trachea, the throbbing and accelerated pulse, the great thirst, burning skin, and high-coloured urine, together with the pain in the diseased organ, point out that it legitimately belongs to the order of inflammations; an order of diseases of which the general treatment is peculiarly applicable to the disease under review.

With a view to the formation of a plan of cure, it is proper to consider the disease as consisting of two stages—the incomplete, or inflammatory; and the complete, or purulent. In the former the membrane is not yet formed; in the latter it is fully formed. It is in the first stage that every effort for the cure of the disorder is to be made. In the first stage, our practice is bold, as it is simple; and unless the summary measures taken in the beginning succeed, all success, let

the management afterwards be ever so skilful is very problematical.

In the first and second days of illness, when the signs above enumerated ⁽²⁾ are distinctly before us, when we find the croupiness attended with much pyrexia, it is our duty to let blood freely; and to do it effectually, it must be done with the lancet. Venæsection is easily performed, as, from the nature of the disease, the jugular veins are always tumid; and in a child is easier to let blood from these than even from the veins of the arm. If, indeed, the child is very young, and worn out by a former illness, or of a tender constitution, it may be proper to apply leeches; but it will very rarely hap-

(2) To these might be added the buffy coat on the coagulum of the blood; but this is not always found. The parched tongue, likewise, although very common, and often a most excellent index to the inflammatory nature of a disease, is not pathognomic.

pen that we cannot use the lancet; and it is of much consequence to take away a large quantity of blood ⁽³⁾ without delay, it being well known, that to do this suddenly, is of the utmost importance in inflammatory diseases.

After bloodletting, I have been accustomed to order an emetic. I have observed the best effects from emetics, whether used before or after the bloodletting.

The warm bath is another very unequivocal remedy; but as it is a popular and simple application, it is generally used, along with an emetic, before the physician is called; and together or separately, by their antiphlogistic powers, they in

(3) It is not easy to establish a rule, but I should account from three to five ounces a full bleeding in a child under five years of age. I never at one bleeding took more than eight ounces of blood in this disease, and in every instance it will be found a free bleeding.

very many instances prevent the formation of the disease.

Brisk purges, when the bowels are inactive, and indeed in most attacks, are so obviously proper, that it is sufficient merely to mention them.

The solution of tartarised antimony, given every three or four hours, in nauseating doses, I have used with so much advantage, that I have no hesitation in recommending it. The vinegar of squills may be used for the same purpose.

The antimonial solution may, in combination with laudanum, be administered as a diaphoretic; but when the febrile symptoms run high, I should prefer giving the solution by itself, so as to occasion a continued nausea.

I have seldom omitted the application of a blister to the neck, and I believe it

is a valuable addition to the plan of cure, although I cannot affirm this upon my own experience. Blistering has proved, however, so useful in similar diseases, and is so strongly recommended in this, that it is well entitled to every attention.

That part of the plan of cure upon which I would chiefly dwell, is bloodletting. If in the inflammatory stage it is not in the first instance, attended with an abatement of the bad symptoms, it must be repeated according to the strength of the patient. Should the physician dislike the use of the lancet a second time (and indeed in this repetition he will not at all times have the concurrence of the parents), I recommend the application of a number of leeches to the neck. The many opportunities which I have had of observing the advantage decidedly gained by such treatment, have overcome the repugnance I had to the employment of this remedy in the beginning of my prac-

tice : and had I no other reason for affirming that the acute asthma of Millar is not synonymous with Croup, this alone were sufficient, that he dissuades us from bloodletting, and recommends assafœtida, musk, and Mindererus's spirit⁽⁴⁾.

The second stage of the disease is known by some remission in the phlogistic appearances, such as a change in the countenance from a florid to a leaden colour ; by the pulse getting smaller ; and by the difficulty of breathing continuing or increasing, the child frequently breathing easiest in postures which might be thought most unfavourable⁽⁵⁾ to respira-

(4) These medicines, says the Doctor, though children loath at first, they afterwards, when forced to take, even acquire a relish for !

(5) This, as a symptom peculiar to the second stage, I have frequently observed. I find it taken notice of in two instances, but without any conclusion having been deduced from it.

tion; and by a sediment in the urine. From having observed in dissections that the thyroid veins are very turgid, I have

“Malgré son oppression il avoit toujours mieux aimé avoir la tete basse qu’ élèvee.” *Observation sur une Maladie analogue a l’ Angine Polypeuse ou Croup des Enfans, par M. Mahon Associe Regnicole à Chartres. Histoire de la Société Royale de Médecine, p. 207.*

“Mitior respirationis difficultas, si capite paululum reclinato lecto incumberet, quam si sedentis potius sedem imitaretur.” *Observat. a Cl. Baeck ac Salomon. Michaelis, p. 285.*

I apprehend the explanation of this to be, that the trachea, stuffed with the membrane, has its capacity increased, by being stretched out to the full extent, which happens when the head is leaned backwards; whereas when the patient sits erect, which generally is the easiest posture in difficult breathing, the head falls somewhat forward, and the membrane, being doubled together in the trachea, becomes impervious.

I am inclined to rank a preternatural drowsiness as a pathognomic of the second stage; it certainly is often to be observed.

been induced, in this stage of the disease, to apply leeches to the neck; I have also used emetics, to procure, by the agitation which they produce, the expectoration of the membrane, should it occupy, as sometimes happens, only a small space in the trachea. The bowels are to be kept open by glysters; and the low regimen observed in the first stage is to be laid aside; and the strength of the patient supported.

It has been proposed to give children calomel under this disease, throwing it in quickly, with a view of bringing on salivation. I have ordered it in the second stage, but I never found it to be of any service. In a chronic state of the disease (6), I think this medicine promises success. In the first stage, the remedies we already possess are so valuable, that

(6) A case of this kind will be found in the last vol. *Medical Annals*.

I should be unwilling to relinquish them, unless the superior powers of a substitute were demonstrated.

Some physicians have proposed a scheme, absurd, because impracticable, namely, to pull out the adventitious membrane, after having performed the operation of bronchotomy (7). This operation cannot be done in the usual way, by making an aperture between two of the rings of the trachea; a longitudinal slit must be made, cutting the cartilages directly across. In the first instance, the bleeding from the thyroid veins is to

(7) This operation was proposed by Dr. Home; has abettors in Drs. Crawford and Michaelis; and, we are informed by Dr. Rush, was actually performed in Philadelphia by a gentleman of well known skill in physic and surgery!—without success. Dr. Michaelis has many arguments to this point, which leave no impression with me, but that he was a novice in the disease when he wrote this part of his book.

be encountered, which to my thinking, would suffocate the child. But suppose this difficulty overcome, and the forceps introduced into a tube not half an inch in diameter, (for such is the trachea at two years of age) the membrane may not, after the incision is made, be found to possess that tenacity which will enable it to bear the pulling out. Such I have found it after death, at the very place where the operation must have been done⁽⁸⁾: And if we loosen the membrane from the trachea, without extracting it, it will meet the

(8) I have separated the membrane from the trachea down to its bifurcation, in a case where this substance extended into tubes whose diameter did not exceed the eighth part of an inch, and then I have endeavoured gently to pull it out, but it broke off short. In this instance, the connection of the membrane with the inner coat of the trachea, at the part where it yielded, was stronger than the cohesion of the membrane itself; and in this child the membrane was stronger than I had seen it in any other dissection.

first inspiration like a valve, and the child must immediately be suffocated. But farther, is the child to be cured by extracting the membrane from the trachea? Certainly not; for there are instances where the child has sunk, even after the membrane had, by the use of emetics, been expectorated (9). Not only the membrane but the frothy and puriform matter with which the lungs are stuffed, must be removed before he can be saved; for this must be instrumental in the death of the child: I do not indeed believe that any prudent surgeon will be found to perform this operation.

Previous to the detail of a series of cases, I have only to say, that the means of preventing croup are still more obvious than the plan of cure, and the object is in most instances attainable. I have observed, in the first place, that

(9) See case 10.

some families are much more liable to this complaint than others. It is difficult to say whether this arises from a particular mode of education, or is owing to a peculiarity of constitution, which children of the same family often have in common ; but I have had the clearest proofs of this fact, that very often where one child in a family takes the disorder, the the other children are sooner or later affected in a similar way. I have known more instances than one where three or four children of the same father and mother have been attacked by this disease ; and authors ⁽¹⁾ have mentioned the circumstance of two children of one family being ill about the same time. In the second place, I have observed, that in Leith the danger is greater or less, in exact proportion to the nearness or distance from the sea-shore ; and I conclude that the observation would hold good else-

(1) *Home and Rosenstein.*

where. Of all the instances I have seen of the disease this year, amounting to ten or eleven, not one of the children lived a stone-throw from the sea-shore or harbour. In Edinburgh, which is only a mile and a half distant from the sea, nay, in the skirts of Leith the farthest from the beach, although not a quarter of a mile removed, the disease is rare: I therefore warn parents to take the alarm as soon as the disorder appears; and, where practicable, I recommend a change of habitation. This will generally be precaution sufficient, unless where the children have already sustained an attack; in which case it will be necessary, in this uncertain climate, to guard against an indiscriminate exposure to the air, particularly in damp weather, from December to the middle of the summer; and to adopt all those precautions with respect to regimen, so well known, and so strongly recommended as preventives in catarrhal complaints.

CASES

OF

C R O U P .

THESE cases will show the nature of Croup better than any general history of the disease.

The four first will place in a favourable point of view the advantages of bloodletting, in producing a resolution of the inflammation. The fifth, from Michaelis, shows a termination of the disease by expectoration of the membrane, effected by the use of emetics.

I may observe, that all the children whose cases are given from my own practice, except the second, were of a sanguine temperament.

CASE I.

OCTOBER 15.

As I was walking along Bath-street, a woman called me to visit a child who was ill of a cold. I found a fair complexioned boy, sixteen months old, who appeared in perfect health, and I was about to pronounce him so, when I heard him cough very croupily. Being aware of the insidious way in which this disease sometimes steals on, I ordered an emetic and the warm bath, and that the utmost care should be taken of the child, not without hopes that the disease might thus be prevented from forming.

The next evening the same woman came, quite breathless, to inform me that the child was at the point of death; and

although she wished me to hasten to her house, she did not expect we should find him alive. On my way thither, she informed me that the emetic had so much relieved the boy, that, thinking him well, she had quite forgotten his danger, and exposed him to the weather in the morning, which was very raw.

When I arrived, I saw the boy so much oppressed, that truly I stood some time without the power of asking a question, or presence of mind to recollect what was to be done. He was struggling sadly from a difficulty of breathing; his inspiration was peculiarly difficult, and performed with a grating noise; his voice was hoarse; his face was florid, and much swelled; the carotid arteries were throbbing violently; and he seemed in danger of immediate suffocation.

Though doubtful whether it were possible to save this child, I opened the

external jugular vein, and took a small cup full of blood, and ordered the warm bath again to be got ready for him. In the mean time, I visited a patient in an adjoining street, and was absent about ten minutes.

When I returned, I found to my great joy, the boy breathing easily, his face less florid, and the fever already abating. The cough was, however, still ringing and frequent.

After the bloodletting every circumstance was favourable. Next morning the child was cheerful and easy; but such was the severity of the attack, and so great the accumulation of blood in his head, that a violent ophthalmia, which lasted many days, was the consequence.

The warm bath and a blister were both used, and during the night an antimonial

preparation; but the friends of the child were satisfied he was already recovering before these remedies were prepared; and I have no hesitation in saying his recovery is to be attributed to the blood-letting.

The croupy cough continued several days.

CASE II.

May 16.....One o'clock, P. M.

Mr. H——'s son, eight years old,—
dark eyes and complexion.

He has had several attacks of this disease; one very severe, exactly three years ago, when he was relieved by bleeding in the neck.

Last night at bed-time he was taken ill. His mother gave him an emetic, and, as usual in slight attacks, he was a good deal relieved by the sickness and vomiting. He continued free from all the symptoms of the disease, except the ringing cough, until about half an hour ago, when his breathing became so difficult as to excite great alarm.

His breathing is now laborious, and the sound resembles the hissing of confined air through a narrow opening; it is rather slower than natural; he has a voice rauca and the ringing cough in the greatest perfection; his skin is warmer than is natural; his countenance is flushed; and his eyes are very heavy; his pulse is 120; he has had no passage from his bowels for two days.

He had been a good deal exposed to damp hazy weather; and I remember to have remarked, the night before he was seized, that I was afraid the weather would produce some more instances of this disease, a child I then attended being about to die of it.

Four o'clock.

With this boy Croup always occasions much apprehension; and at my last visit he readily allowed me to bleed him from the arm, whence I took four ounces of blood, and ordered him imme-

diately a dose of infusion of senna with tincture of jalap. His breathing was not relieved; and about half an hour after the bleeding it was much oppressed, but he soon became easier. The purge has just operated, after sickening him very much.

Evening.

His pulse, which in the morning was 120, is now only 100; his breathing is free; he has had a profuse perspiration ever since the purge operated; and he is again cheerful.

He was ordered a spoonful of the following solution every four hours: ℞. Sol. Antim. Tart. ℥vi. Aq. Cass. ℥i. Aq. ℥iii. ℥.

May 18.

He has been quite well, since last report: His cough is still a little rough: Yesterday and to day he has been running about the room, and amusing himself as usual.

CASE III

April 19.

Mr. W——'s daughter, æt. 12.

This girl is exceedingly robust and big of her age, of a florid complexion. She has been threatened with this complaint two or three times, and was taken ill yesterday evening. She had the day before been much exposed to the weather, which was damp and chilly. Though her cough was very rough, she went out to day. I saw her at ten o'clock at night.

Her respiration was performed with the utmost difficulty; she breathed so high, that I heard her immediately on

entering the house, although she lay above stairs. Her friends, tremblingly alive to the danger of her situation, were supporting her in bed, for she could not lie down. Her cough resembled the barking of a lap-dog, very hoarse and sharp; she was much flushed, and complained of pain, or rather great heat in the windpipe; her tongue was white; the tonsils and uvula were not inflamed nor swelled in the slightest degree; she swallowed easily; there was perhaps a fullness in the throat; her pulse was about 130, and pretty strong: She had an evacuation from her bowels this afternoon.

I took from five to six ounces of blood from the arm, and should have taken more, but she nearly fainted under the operation: She got very sick in consequence of it, and vomited; but she could breath in the recumbent posture

immediately after the bleeding, though her cough was still very frequent.

Observing that while the sickness continued, she breathed, comparatively speaking, easily, I was willing to keep it up, and gave her an emetic, which emptied her stomach, about half an hour after the bleeding. When the sickness went off, I had her put into the warm bath, where she remained about a quarter of an hour. I then gave her, to be taken during the night, a nauseating solution, similar to that ordered in the last case. A large blister was applied to the sternum.

Soon after I left her last night, she fell asleep, and slept softly for two hours. The medicine made her very sick during the early part of the morning. Since she was in the bath she has constantly had a moisture on her skin, which is cooler. The blister rose very well. She had

during the night considerable thirst, which still continues. Her breathing is easier, but often is interrupted by the cough. Her pulse is 100, and somewhat irregular. The blood is rich and florid, but not sisy. She has had no passage from her bowels.

I was somewhat surprised to be again sent for in the evening to visit this girl. Her complaint had returned about four o'clock, and in expectation that it would soon abate, I was not sent for until eleven. Her cough was worse than ever; it was ringing and incessant; the effort it occasioned resembled the convulsions of the whooping cough. Her breathing was quicker than last night, although not so difficult; her pulse was 110, and pretty full; her tongue foul. I found her sitting in the warm bath, and there I bled her to eight ounces. Before I could get the arm bound up she fainted. When she recovered, her breathing was

manifestly easier. I continued sitting by her for half an hour, during which time she was not two minutes free from a convulsive shudder, which sometimes made her even start up in bed. Her pulse was now, however, under 100, and not very weak. As she was still faint and sick, I gave her a small tea cupful of weak port wine negus. I ordered the volatile liniment, to rub her neck.

April 21.

When I left her last night, her cough became much less frequent, and she has not coughed since one o'clock in the morning. Her pulse is 70; and she breathes like a person in perfect health. She had a very severe fit of convulsive shuddering about two hours after the bloodletting. I called in the evening, when she had rather more feverishness, and some cough, but it had quite lost the croupy sound. She has started much much during the day. Her bowels are

open, in consequence of using the laxative powder, which was not given before this morning.

April 24.

She is quite free from all her complaints.

CASE IV.

“ A girl 15 months old, living a mile
“ distant from the sea, appeared in the
“ evening to be somewhat indisposed, her
“ skin being a little more hot than usual.
“ Dr. Home, who went to see her in
“ the morning, found her breathing la-
“ borious, the pulse hard, and beating
“ one hundred and thirty-five times in a
“ minute. He ordered five ounces of
“ blood to be drawn off immediately: her
“ voice then grew sharp, and resembled
“ that of a cock; the breathing frequent
“ and deep; her forehead and inside of
“ her hands very hot; both hands and feet
“ swelled, but without any redness. The
“ pulse now being hard, she was bled
“ again, which gave her much ease. She
“ was made to drink and breathe the va-
“ pours of warm water mixed with a little

“ vinegar : this had a good effect, and pro-
“ moted expectoration. The body was
“ unbound with the magnesia alba ; in the
“ evening a blister was applied round the
“ neck : The third day she was somewhat
“ better; but the voice the same as before,
“ the pulse hard, and the breathing deep.
“ In the evening four leeches were applied
“ under the chin, just at the top of the
“ windpipe ; and they having left off
“ sucking, the place was fomented with
“ warm water, so that the blood continu-
“ ed to ooze out for some hours. The
“ child was well the next morning.”

CASE V.

“ Infantis unius et dimidii anni, qui
 “ nutricis adhuc lacte spissiore jam aleba-
 “ tur, lectulum cum mutato loco fenest-
 “ ræ apposuissent, aëri liberorem justo
 “ transitum concedenti, die 29 Novem-
 “ bris habitum alacrem cum tristi muta-
 “ vit, accedente noctis præcipue tempore,
 “ graviori tussi : Nec insequente die etsi
 “ obambulare melius valuit. Cum febris
 “ observaretur nulla, nil nisi laxans accep-
 “ it. Insequente media nocte cum aliqua
 “ tussi, spiritus ducendi apparuit difficul-
 “ tas, anxia erat et celer respiratio, quæ
 “ suffocationis metum induceret, præter-
 “ naturale clangori stridenti juncta. Forti-
 “ ter movebatur pectus, fortiterque pul-
 “ sabant arteriæ. Per bihorium hæc con-
 “ tinuavit ægrotæ ratio ; tunc autem tur-
 “ bas istas placida exceptit quies. Primi
 “ Decembris, tempore matutino, pulsus
 “ plenus erat ac celer, facies rubra, in-
 “ quietudo summa ; increverat interea et

“respirationis difficultas et raucedo.
 “Cum de morbo nostro jam cogitaretur,
 “vena in brachio secta quinque sanguinis
 “unciæ mittebantur; quo facto et pul-
 “sus minuebatur vehementia et respi-
 “rationis difficultas; vesicatorium nunc
 “colli anterioris lateri applicabatur, nec
 “enemata omittebantur. Attamen spei
 “eventus minus respondit; exacerbaban-
 “tur enim versus vesperam et pulsus ve-
 “hementia et spiritus ducendi difficultas,
 “facillimumque jam erat stridorem istum
 “peculiarem distinguere atque agnoscere.
 “Diversa nunc aceti vapores ratione, in
 “usum trahebantur; nam non solum
 “spongia aceto calido immersa, ori æ-
 “grotæ admovebatur, sed vas etiam ace-
 “to ebulliente repletum, tenuique solum-
 “modo linteamento tectum, lecto appone-
 “batur, et itaque aer quem æger duce-
 “bat aceto impregnebatur. Nec quid-
 “quam hoc remedio, ægrotæ majus afferre
 “videbatur levamen; respirationis enim
 “inde minuebatur difficultas, et placidus
 “plerumque mox insequabatur somnus.

“ Infusum nunc florum sambuci theifor-
 “ me, copiosumque oxymel simplex exhi-
 “ bebatur. Vespertino tempore collecta
 “ urina, a primo jam initio alba apparuit,
 “ frustulisque mucosis quam plurimis
 “ fundum neutiquam petentibus, sed ei
 “ innatantibus, commixta. Prima inse-
 “ quentis diei luce, aliquando melius va-
 “ luit, et sponte mucii aliquid rejecit.
 “ Quæ omnia cum antè meridiem bene
 “ se haberent, imminutaque deprehende-
 “ retur morbi vis, emeticum exhibere
 “ mucii spontanea ejectio jussit. Repeti-
 “ tis itaque vicibus oxymel propinabatur
 “ squilliticum, usque dum vomitus cie-
 “ retur. Accedente vomitu insignis nec
 “ mucosæ remixta membranæ albæ, diver-
 “ sæ magnitudinis, in frustula divisæ, a
 “ mucosæ ordinario ob majorem tenacita-
 “ tem facillime distinguendæ copia excer-
 “ nebatur. Felicissimus ille prioris eme-
 “ tici successus aliud exhibere suasit.
 “ Nec illud quoque levamine caruit; li-
 “ berabatur enim æger a membranacea
 “ materia æque ac mucosæ omnium tenacis-

“ simo. Gratissima nunc in infante ap-
 “ paruit mutatio; pulsus æque ac respi-
 “ ratio naturali similior evasit, et placido
 “ sopitus somno per totam jacebat vespe-
 “ ram, maximamque insequentis noctis
 “ partem, sine ulla pene febre vel aliis
 “ pathematibus transegit. Tertii Decem-
 “ bris diei initio bene valuit, nec de alia
 “ re nisi de vesicatorio questus est. Nunc
 “ laxans propinabatur, cujus ope larga
 “ educebatur mucii copia.

“ Abundans nunc quoque ex naribus
 “ stillare cœpit humor. Nec minus in-
 “ sequente nocte bene se habuit, etsi tus-
 “ sis, nec molesta tamen, per intervalla
 “ rediret. Clangor specificus post pri-
 “ mum jam evanuerat vomitum, et rau-
 “ cedo in dies minuebatur. Quarto De-
 “ cembris mane aliud exhibitum fuit eme-
 “ ticum, quod vero paullulum modo mucii
 “ eiciebat. Quinto jam cibum appetere, et
 “ pristinam recuperare alacritatem cœpit.
 “ Laxantia, quorum adhuc continuabatur

“usus, magnam semper mucii quantita-
tem evacuarunt.”

I SHALL now proceed to detail five Cases which terminated fatally. The four first occurred in my own practice, the fifth is taken from Michaelis.

In the first and fourth the membrane was most completely formed, but there was least inflammation. In the second, the membrane, of which perhaps part had been expectorated, was less complete, but the inflammation was greater. In the third the inflammation was very great, but the membrane was less perfect than in any of the other cases. In the fourth case a considerable quantity of calomel was given, without producing any good effect. The fifth case ended fatally after the expectoration of the membrane, the boy dying hectic.

CASE VI.

On the 22d of February, in the same house where I saw the first case, I found a second in a child of a similar temperament. The character of the disease, however, was quite different. The inspiration was very difficult, but not hoarse; the cough was stridulous; the child was pale rather than flushed. When his mother took him on her knee, he struggled for breath, and seemed to be easiest when lying on his back, with his head low. His eye was heavy; he was afraid to cry; But was extremely fretful and irritated when I laid hold of his arm, insomuch that it was long before I got his pulse numbered. In the five seconds it beat 14 strokes, and was weak. His hands were chilly; he had great thirst, and swallowed easily: He had eaten nothing for two days: He had no fullness in the upper part of his neck, and it was not in

my power to examine the fauces: He had three stools this morning; and his urine, which has much sediment, he voids frequently.

Ten days ago he took a diarrhœa, attended with griping, which his mother imagined proceeded from detention. This disorder continued till Wednesday the 17th, when it entirely left him, and the croupy cough came on that afternoon; but the mother was not at all alarmed before the 20th, when his breathing had become very high; still she thought his illness proceeded from his teeth. This morning he was cheerful and easy; but the respite was granted only for a short time; his disease became much more threatening, and her fears were seriously awakened.

Of her own accord she had applied a blister two days ago, and she gave the boy a vomit this morning, which brought away much viscid expectoration and bile.

I ordered an emetic and two leeches to be applied to the neck.

February 23.

I called early this morning, and found that the child had died an hour before. The leeches were not applied.

DISSECTION.

There did now appear a fullness in the neck; but this was not an occasional fullness, but rather a thickness and natural shortness of the neck. The face, and skin of the neck, were peculiarly pale, like marble; the cellular membrane and fat were white, and most delicately transparent, and free from a stain of blood; the thyroid veins on the anterior part of the trachea were turgid, as were the external and internal jugulars.

The incision was made from the chin to the sternum, and the tongue, trachea, and gullet, were cut out, and pulled from the cavity of the thorax. There

was no inflammation of the fauces, nor any apparent affection of the throat; but upon looking into the glottis, a fluid like pus was observed working up from the trachea. The œsophagus was cut away, and the trachea slit up upon the back part, where there is a deficiency of the cartilaginous rings, and then the membrane presented itself fully formed.

The trachea was cut away near its branching off; and here, upon careful examination, the membrane was found most complete, and very strong; but gradually, as it stretched upwards behind the thyroid cartilages, it degenerated into a puriform matter, which loosely adhered to the rima glottidis and sacculus laryngeus. This matter was not like the natural secretion of the mucus of these parts; it was not the mucus thickened and become tough; much of it was fluid as the natural mucus is, but it had no other resemblance to it; it was like that matter which at first flowed out of the

larynx; it was of the consistence of cream, or rather the fluid part of it was thin and watery like whey; and in this the firmer matter, curdy, and like the discharge from a scrophulous joint, floated.

Upon taking up the membrane from the lower part of the trachea, where it was firm, the inner coat was seen inflamed, the vessels red, enlarged, and distinct.

CASE VII.*March 20.*

G. D——'s daughter, two years and a half old.

She is extremely stifled in her breathing, which is rather frequent; the expiration is performed as if the tube were shut up by a valve, and this forced back with a flap when the air returns from the lungs. There is no tumor in the fauces, no redness; her cough is very croupy and frequent; her neck is not swelled; her countenance is of a death-like paleness, and her extremities chilly; her pulse is very quick, but still firm and regular. She had a stool this evening.

This child some days ago, her friends say four or five, took the croupy cough,

and for two days her breathing has been affected; but as she had some appetite for food, and drank easily, they apprehended nothing. The child was visited some hours ago for the first time. She seemed suffocating, and five ounces of blood were taken from her neck. Before the compress could be applied to the orifice, she nearly fainted; she then vomited very freely, and derived temporary ease in her breath from the bleeding; but soon after the dyspnœa returned. The warm bath was ordered, and a blister, which was immediately applied to the neck.

In addition to this, when I saw the child, I recommended an emetic, from a notion that the membrane of croup was formed.

March 21.

I saw the child at eight o'clock this morning; she was writhing and twisting about, of an ashy paleness, and was just

dying. The vomit brought away a quantity of mucus, but notwithstanding my injunctions, it was not kept. The first mouthful, which seemed like the white of an egg, she rejected with great violence. I think there is reason to suppose it might contain in it part of the membrane. The urine passed since last visit had a most copious sediment. The child died at nine o'clock.

DISSECTION.

Upon making the first incision in the neck, and fat and cellular substance resembled very much, in whiteness and transparency, that of the last patient. The thyroid veins were not peculiarly distended, but the internal jugulars were very turgid. The thyroid gland was large, and the lobes of the thymus gland extended upwards to the thyroid cartilage, in two distinct slips.

Although there appeared no active inflammation, yet the effect of an increas-

ed action was very manifest, from the quantity of a gelatinous effusion which surrounded the lobes of the thyroid gland, and passed behind them round the trachea.

Upon lifting the sternum, the thymus, of a monstrous size, lay extended over the pericardium. The lobes of the lungs, which projected, were of a pale greyish colour⁽³⁾. Upon raising them from the thorax, the posterior part was of as darker red, not, however, as if inflamed, but as if more gorged by the gravitation of the blood in the supine posture of the body after death⁽³⁾.

(3) I suspect this appearance had led to an error in the first case described by Michaelis; for he says, "Pulmonum dextro æque ac sinistro in latere, facies inferior ac posterior colore insignis erat livido, unde ad inflammationem harum partium concludere fas est. Facies autem pulmonum anterior ac superior, naturali gaudebat colore." P. 256.—And again in the *Observations par M. Mahon*, "La portion des lo-

Having taken out the trachea and part of the lungs, the trachea was opened upon the back part at the bifurcation; but here there was no membrane. The trachea was then slit upwards, and on approaching the back part of the great cartilages of the larynx, the membrane was found distinct, fully formed, but not so strong as in the last instance. It was of less extent, as well as possessing a less degree of firmness. A streak of the membrane passed down a considerable way, attached to the fore part of the trachea. In general, it has been observed, that the membrane extended farther down, and was firmer on the back and membranous part of the trachea.

The membrane, which extended

“bes du poumon qui, s'est présentée la première
 “à la vue, lorsqu'on a enlevé le sternum, étoit
 “dans son état naturel.—Il n'en a pas été de
 “meme du reste du poumon. Il étoit rouge et
 “engorgé,” &c.

about an inch and a half downwards from the glottis, was in a manner floating in a milky-like fluid, white and opaque.

Upon tracing the branches of the bronchiæ, there was no membrane; but in cutting into the substance of the lungs, a frothy mucus was observed in the minute branches of the bronchiæ.

CASE VIII.

May 14.

M. D——'s daughter, 18 months old, was the day before yesterday seized with a croupy cough. Yesterday, with the cough, she began to have much difficulty of breathing, which towards noon increased to a great height; and this symptom has not once intermitted since. Yesterday and this morning she had her usual appetite for food. At present she labours inexpressibly in her breathing; her nostrils are inflated; and every inspiration raises her chest from the bed. If she is at all fretted, in crying her voice is very stridulous, and then she takes the ringing cough. Her face is of a leaden paleness, her eyes are languid, and she is very lethargic. When she is lifted up,

she struggles and tosses about till she again gets to lie down on her back, and then when her head is low, she appears easier, and is inclined to dose. She has vomited several times this afternoon. Her pulse is rather full and quick, and her skin warm; her bowels have been loose; her fauces are without swelling or redness; and there is no swelling in the neck.

The treatment in this case was similar to that already mentioned, only that I used no internal medicines but an emetic and calomel. The child died in nine or ten hours after I first saw her.

DISSECTION.

During this dissection I was much annoyed by the jealous watchfulness of the attendants, so that the operation was hurried.

On the fore part of the neck there was nothing particular to be observed;

there was neither swelling nor any appearance of inflammation; but upon making an incision, separating the larynx from the pharynx and root of the tongue, and then folding down the trachea and œsophagus, a viscid tenuous froth was seen to fill the upper part of the pharynx and opening of the windpipe.

Upon cutting out and carefully examining the trachea in its whole length, the inner coat was observed to be considerably inflamed. The epiglottis was inflamed, and somewhat tumid. The swelling of the epiglottis was not considerable, but it was red, and its vessels were distinct and turgid; and upon its concave surface films of a membranous crust adhered: When these were removed, slight ulcerations were observed on each side of the little ligament which runs down the middle of it. The membrane covering the cornua of the os hyoides and the thyroid cartilage was swelled and red,

and had that purplish or bluish cast, with lake-coloured turgid vessels, which would incline me to say that the inflammation was of an erythematous kind.

Within the cartilages of the larynx the membrane was distinctly formed, but irregular, perhaps displaced in some measure in the hurry of dissection. There was little inflammation lower in the trachea; and there was none of the membranous pellicles or crusts to be observed lower down than the crecoid cartilage; but the internal membrane had the vessels distinct, and slightly turgid.

I was not allowed to open the breast.

CASE IX.

Sunday, June 7.

A. R——'s daughter.

She has had catarrhal complaints since Sunday last, with a rough cough. On Thursday her breathing became affected in the manner it is at present, namely, frequent and laborious. During the night there is an aggravation of the dyspnœa. Her cough and her voice are croupy; her eye is heavy; her pulse is moderate in strength, and not much quicker than usual; she has no thirst; her appetite for food is natural; she is generally reserved, but sometimes amuses herself as if nothing was the matter; and is at no time fretful. The tonsils and velum are slightly inflamed; the submaxillary glands are full, but not painful. He ex-

pectoration is copious ; her urine is high coloured, depositing much sediment. The disease is well marked, but it has been less active in the attack than usual.

Evening.

In the morning I ordered a vomit, which brought away a great deal of mucus; and she had afterwards leeches, and then a blister applied to her throat. After the vomit had operated, she had a grain of calomel, which has been repeated every two hours since. This medicine has procured her several stools. I think her breathing is more difficult now than it was in the morning, and indeed she has more pyrexia. I ordered the warm bath, and a continuation of the calomel every hour and a half during the night.

Monday Evening.

She has had 10 grains of calomel, but without any abatement of the disease. This morning she got another vomit,

which caused the expectoration of much mucus, mixed with puriform flakes, resembling portions of the membrane. I ordered another vomit for this evening, and a continuation of the calomel.

Tuesday.

The emetic had a powerful effect, bringing up a considerable quantity of pulmonary secretion. The child, however, died this morning.

She had taken 12 grains of calomel.

DISSECTION.

Instead of examining the trachea by dissecting it from the neck and cutting it up upon the back part, it was determined to open it on the forepart, and to trace the diseased appearance through its whole length, and to follow its branches in the lungs.

When the integuments of the neck were dissected back, though there did

not any where appear marks of inflammation, there was a turgidity of the great veins. This, however, was evidently occasioned by the difficult respiration affecting the circulation of the heart, the impeded action of the heart causing a remora in the cavas and right sinus.

Accordingly, upon opening the thorax, we found the right auricle and the superior cava turgid with blood, as if the irritability of the heart and general system had been gradually exhausted by the laborious forcing respiration through the tube of the windpipe, which was progressively diminishing in capacity.

When the trachea was slit up on the fore part, from the thyroid cartilage to the division in the lungs, the membrane appeared completely formed in all this length, and of a firmer body than in any of the cases which have been given. It was more delicate behind the great cartilages of the throat, was firmest about

the middle of the neck, and again became more soft and liquid after the division of the trachea in the lungs; and gradually as I traced the bronchiæ, it lost its consistency. Although I observed a slight affection of the membrane of the bronchiæ, the adventitious membrane could be traced but a very little way into the lungs.

The lungs were distended with air in such a manner as if the air had escaped from the cells into the cellular membrane of the lungs. This I conceive to be the effect of the violent play of the lungs, and which must have obstructed the natural functions.

CASE X.

“ Puer novem annorum, habitus cor-
 “ poris tenuis delicatuli, adfectionibus ca-
 “ tarrhalibus sæpe obnoxius, ceteroquin
 “ sanus, tempore vernali anni 1775 feбри-
 “ cula cum levi tussi et tonsillarum tu-
 “ more correptus est. Hunc morbum ab
 “ aere frigido vespertino, in quo obam-
 “ bulaverat puer, ortum duxisse ratus,
 “ potum theiformem calidum, pulveres-
 “ que camphoratos et linctum pectoralem
 “ præscripsi. Satis bene inde se habuit
 “ ægrotus, febris disparuit, tussis metuit,
 “ tumor faucium fere evanuit. Cum vero
 “ nulla adesset expectoratio, hanc ut pro-
 “ moverem, oxymel squilliticum addidi
 “ linctui pectorali. Verum in eodem sta-
 “ tu per benas septimanas remansit tussis,
 “ ita tamen ut ægrotus genio puerili late

“ indulgeret, cibos appeteret, nocturna
 “ quieta frueretur.

“ Neque febris sub eo tempore re-
 “ crudit, neque respirationis difficultas,
 “ aliudve incommodum supervenit. Quin-
 “ decimo autem die accersitus res inveni-
 “ quam maxime mutatas. Quippe puer
 “ moribundi instar facie pallida, oculis
 “ labiisque diductis immobilibus, cute
 “ frigido sudore perfusa, anhelitu difficil-
 “ limo, stridulo, lento, respirabat. Pul-
 “ sus parvus erat et cellerrimus. Ver-
 “ bo quovis momento misellum animam
 “ efflaturam esse putabant adstantes. Un-
 “ de vix obtinui a parentibus ut venam
 “ secari sinerent. Quatuor sanguinis un-
 “ ciis absque levamine eductis, periculo
 “ magis magisque increscente, emeticum
 “ præscripsi; tartari nempe stibiati ali-
 “ quot grana in aqua simplice soluta, re-
 “ fracta dosi porrigenda, donec invertere-
 “ tur stomachus. Secundus remedii haus-
 “ tus, vomitum excitavit tussimque. Quo-

“ rum unita vi, non sine summo suffoca-
 “ tionis periculo ex faucibus protrusum
 “ forasque demum rejectum est concre-
 “ mentum membranaceum, firmum, ra-
 “ mosum, totoque tractu cavum, arte-
 “ riæ asperæ bronchiorumque conforma-
 “ tionem satis apte referens. Post sin-
 “ gularem hanc excretionem, pauculas
 “ sanguinis guttas secum vehementem, ces-
 “ sarunt omnia, quæ infanti mortem mi-
 “ nata erant symptomata, spiritum liber-
 “ rime traxit puer, calorem naturalem
 “ ciborum adpetitum, mentis hilaritatem
 “ recuperavit, lætusque cum parentibus
 “ lætis, ceu a morte ad vitam revocatus
 “ prandium cepit. Neque tamen restitutum
 “ sibi relinquere linctus camphorace-
 “ orumque usum ; suasi etiam vaporis le-
 “ nientis inhalationem. At breves atque
 “ deceptrices fuerunt illæ induciæ. Quip-
 “ pe tertio a dicta mutatione die respiratio
 “ denuo fit anhelosa, stridula, gallinæ gra-
 “ cillantis sono similis; pulsu tamen non
 “ adeo depresso et languido, quam in pri-

“ ori mali accessu. Hinc venam iterum
 “ secui, sed absque sensibili levamine.
 “ Circa vesperam, aucto suffocationis pe-
 “ riculo, tincturam ipecacuanhæ aceto
 “ scillitico mistam ad excitandum vom-
 “ tum propinavi, et quidem cum succes-
 “ su. Alterum enim concrementum pri-
 “ ori plane simile ejecit æger moxque
 “ sublata est spirandi difficultas.

“ Remanebat autem febris lenta, ver-
 “ sus vesperam exacerbans, sputum hac-
 “ tenus mucosum mutatum est in puru-
 “ lentum, accesset dysphagia, nec obsti-
 “ tit corticis Peruviani et aquarum selte-
 “ ranarum lacti additarum usus, quo mi-
 “ nus sudores et diarrhœa supervenirent,
 “ viresque ægroti penitus exhaurirent.
 “ Sic decimo tertio post alteram rejectio-
 “ nem die animam efflavit. Valde desi-
 “ deranti non concessum est cadaver seca-
 “ re, tracheæ que cavum inspicere.”

*Extract from the note of the dissection of
a singular case, as occurring in an
adult* ⁽¹⁾.

The Thoracic and Abdominal Viscera, *in situ*, appeared natural; there was rather more fluid in the Cavity of the Chest than usual, and of a brownish colour; the posterior and inferior portions of both Lobes of the Lungs had evident marks of inflammation, but more particularly the latter; the fluid found in the Cavity of the Thorax coagulated when exposed to heat; the Tonsils were enlarged, more particularly the left; and both Tonsils were covered with a thick membrane of coagulable lymph. About three inches of the Trachea from the Larynx

(1) He was a gunner, and had, previous to the attack of Croup, of which he died, suffered severely from a catarrh.

was taken off; it was covered with the same kind of membrane, and had the same appearance as in cases of Croup. Upon a farther examination of the remaining portion of the Trachea, we found a continuation of this membrane, but of a firmer texture than that in the superior part, accompanied with an appearance of inflammation of the natural membrane of the Trachea and its divisions; and this membrane, as well as the inflammation, prevailed the smallest ramifications of the Bronchiæ, which upon pressure were found plugged up with a bloody frothy kind of matter. Upon opening the Heart, polypi and coagulable lymph were found in the right Auricle and Ventricle.

was taken off; it was covered with the
 same kind of membrane, and had the
 same appearance as in case of Cyon.
 Upon a further examination of the re-
 maining portion of the trachea, we found
 a continuation of this membrane, but of
 a distinct color than that in the upper
 part, accompanied with an appearance of
 induration of the internal membrane of
 the trachea and bronchi, and this
 continued down to the lungs, where
 the trachea is a great number of times
 divided, which divisions were
 found to be very small and
 round, and covered with a
 thin membrane, and
 in the middle of each
 division was a small
 opening, which was
 found to be very
 small, and
 round, and
 covered with
 a thin
 membrane,

APPENDIX.

IN Newhaven, on the 30th of May last, I saw a boy of twelve years of age, whose breathing was very difficult; it was attended with a sense of constriction at the larynx; the inspiration was frequent and croaking, and his voice was rough and harsh: His breathing was so alarmingly difficult, that, according to the custom of the common people, all the women living in the neighbourhood were assembled to witness his death, which was hourly expected. His pulse was quick, but not strong; and he was much flushed. Since the attack commenced, he once or twice, unexpectedly, became easy, and continued so for a quarter or half an hour, and then the symptoms again returned in all their violence. In

these paroxysms he had many belchings, but I could not learn whether they relieved him.

His illness came on early this morning; and it was imagined to have arisen from his having gone off in an open boat yesterday, which was a very cold day, to fish.

I ordered him an emetic immediately, which sensibly relieved him. He was blistered, and he continued getting better under the use of a strong solution of assafœtida.

This I conceived to be a case of the acute asthma of Millar, and under this impression I treated it successfully as a spasmodic disease. I have never seen another instance of the disorder; but from its supposed identity with croup, I shall shortly point out the distinctive symptoms.

In croup, the cough, which I have so often noticed, is constantly ringing in our ears; in acute asthma there is little or no cough. In croup there is very seldom any remission; the remission in acute asthma is one of the most striking phenomena of the disease; and it is attended with some evacuation, as belching, vomiting, or purging. In croup the pulse is strong, the urine is high coloured, the fever is much greater, the voice is sharp and small; in acute asthma, the pulse, though perhaps equally quick, is less full, the urine is limpid, and the voice is croaking and deep.

By attending to these symptoms, we shall be able to determine the question of bleeding, which is safety in the one instance, and supposed to be improper in the other. When there is sufficient time deliberately to consider the progress of croup, it is hardly possible that it should be mistaken for any other disease.

It may not be amiss to state the error in the genera morborum, which gave rise to this diagnostic.

As synonymous to CYNANCHE TRACHEALIS, Dr. Cullen (*Synop. Nos. Meth. G. X.*) mentions,

SUFFOCATIO STRIDULA, *Scotis* THE CROUP, *Cl. Home* on the Croup.

ASTHMA INFANTUM, *Millar* on the Asthma and Chincough.

ASTHMA INFANTUM SPASMODICUM, *Rush*, Dissertation, London, 1770.

CYNANCHE STRIDULA, *Crawford*, Dissert. Inaug. Edinb. 1771.

The first and last of these dissertations treat of Croup, the intermediate two of the Asthma Infantum, the disease which occurred to the fisherman's boy.

Dr. Cullen, by departing from his usual accuracy and discrimination, has obliged me, in the first paragraph of the Essay, to state precisely the nature of the disease of which I was about to treat, a thing in the present instance of the last importance in a practical point of view, and to define it from the morbid organic condition, rather than from the symptoms, which, in a regular book of nosology, is unquestionably the preferable mode. My definition, therefore, is to be considered rather as an enunciation of the subject; for had I not been compelled by this mistake, I should not have thought it necessary to give any definition of a disease, which is particularly described in the next page. The advocates for the operation of bronchotomy, which, I find, is still recommended, will do well to attend to the distinction between the two diseases. I imagine I need hardly say, that in the *asthma infantum* there is no inflammatory membrane.

In the present state of surgery, I scarcely thought it necessary to add much in support of my opinion as to the unfitness of the operation of bronchotomy: But as I have been blamed for rejecting this operation in the cure of croup, I shall consider it in another point of view. At the same time I should hope, that what I have already said will have influence with most physicians.

Although in some instances, where the membrane has been formed and expectorated, and the child in consequence has recovered, the affection appears not to have extended much beyond the larynx⁽⁴⁾, yet I am convinced, that in nine cases out of ten, the immediate cause of death is not so much the narrowing and obstruction of the stream of air occasion-

(4) This too must in a great measure be the case in the peculiarity explained in *n.* 30.

ed by the membrane⁽⁵⁾, as the puriform fluid with which the bronchiæ are filled; for in most of my dissections, the puriform fluid has been found so completely to gorge the lungs, that the air would have been met by this fluid, and prevented from finding its way into the air cells, even had it passed the larynx easily, or had the membranous effusion which lines the larynx been removed. This puriform fluid I conceive to be a mixture of the lymphatic effusion of the minute branches of the trachea, of the natural exhalation of the lungs, and of mucus. He who imagines that the disease is always confined to the larynx, takes a limited view of croup; for by continuous sympathy, or from the exciting cause acting as violently there as at the larynx,

(5) In Case VIII. there was no mechanical obstruction in the trachea. It was indeed inflamed; but the immediate cause of death might be sought in the effusion of the lungs, and the general affection.

the inflammation often, perhaps always in some degree, extends to the more minute branches of the windpipe; and I have actually seen the membrane regularly formed in branches, not a line in diameter, which proves that inflammation had subsisted as violently in these branches, as it usually does in the larynx.

Suppose, then, in performing this operation, that the thyroid veins, and all the neighbouring blood-vessels, could be so commanded, that not one drop of blood should be poured out to embarrass the operator; that the membrane, as it lines the larynx, were extracted; and, to avoid any difficulty from the spasm of the larynx, that a tube were introduced into the trachea, and that the child were breathing through his tube, By what means could we promote the expectoration of the puriform matter which so generally fills the lungs?

Is it a consideration entirely to be overlooked, that the operation is to be performed upon an organ in a state perhaps of high inflammation?

It is alleged, that one child did escape from this operation (6). When the

(6) *Burserius*, Vol. V. § ccccxxxvii. *Inst. Med. Pract.* Burserius, like every other system-maker, must depend upon the observations of other men for the greater part of the intelligence which he is to communicate; and accordingly he follows Michaelis (sequar Cl. Christ. Frider. Michaelium, qui hujusce morbi historiam præ aliis accuratissime conscripsit, § ccccxxiv.), who has in some measure made up for his want of experience in this disease by his industry. The imperfect case which Burserius gives from his correspondent Locatellius, cannot be admitted in evidence, until the history of the disease previously to the operation be known. That the impression made by this operation upon the mind of Burserius himself was very faint, may be inferred from the manner in which he proposes bronchotomy. "In extremo suffocationis periculo, sola tracheo-

surgeons of former times were performing operations for the iliac passion, there may perhaps be an instance on record, where the patient has survived. But surely this would not be reason enough, why such an attempt should again be

“tomia, reliquis irritis spem aliquam facit quamquam non ab omnibus probetur.” *L. c.*

Were it judged right to perform this operation, a more hopeless way of doing it (so far as I recollect, for I have not the book by me), could not have been thought on. There was a transverse incision made between the second and third ring, and another between the fourth and fifth. Then there were two longitudinal incisions made, one on each side of the trachea, which joining the transverse ones at right angles, freed a quadrangular piece of cartilage two rings in length, and in all probability at least a third of the circumference of the trachea in breadth, which was removed.

I have known this operation performed in two instances, both of which were fatal, one of them under the most favourable circumstances, for the patient was an adult.

made. I must still maintain, that it becomes the surgeon, for the credit of his profession, to decline an operation so improbable, and which proceeds from a mechanical and contracted view of the disease.

Dr. Rollo's case, although in an adult, does not invalidate my opinion, that debility of the trachea predisposes to croup; for in his patient, the upper part of the trachea was previously reduced to a state of debility, by a severe attack of catarrh, a precursor to croup, which is daily observable in children.

Before concluding, I may observe, that, in the second stage of croup, I have had no success in administering calomel, which I have done in many instances since the foregoing Essay was written; that my opinion of its virtues is diminished by an extended experience

of its effects (7). During the first stage, in violent attacks, I should think myself

(7) The praise given by some physicians to calomel I was at a loss to explain, when I found it accounted for in a paper on Croup, by Dr. Ferriar of Manchester (*Medical Histories and Reflections*, Vol. III.), which I lately read with more satisfaction than any thing that I have seen upon the subject. He observes, that “ children who are liable “ to attacks of the croup, are sometimes seized “ with the deep barking cough, which will in- “ creased to such a degree, as to excite much “ alarm, about the usual time of the dangerous “ exacerbation; yet it will decrease again, and at “ length go entirely off, without any remedies but “ common demulcents. Cases of this kind, I sus- “ pect, have been described as genuine paroxysms “ of croup, and very trifling methods of cure have “ been recommended, in consequence of their ap- “ parent efficacy in the spurious croup, which al- “ ways cures itself.” The spurious croup is that croupy cough which I have mentioned, *p.* 25.

The only expectation from calomel which occurs to me, is, that it will occasion a new action in the trachea, and thus prevent the disease from

criminal, were I to neglect blood-letting and the antiphlogistic regimen, in favour

running its fatal course to effusion. In this view, calomel can be of no use in the second stage, where the inflammatory action is completed, and where our sole hope is from expectorants. In the first stage, I have given it as my opinion, that the way to succeed, is to endeavour to obtain a resolution of the inflammation; and indeed where there is nothing peculiar in an inflammation, this is a preferable design to that of inducing a new action in a part. The physician whom I have already quoted in this note, says, that the disease will generally be fatal, if the alarming symptoms be not mitigated within the first six hours. To this I do not accede; for I have more than once relieved children, where croup had come on alarmingly, by bleeding, on the morning after. But I may venture to affirm, that the disease, if not within the twelve or sixteen hours from the invasion of the alarming symptoms, will not be cured at all; and this, doubtless, allows too limited a period for the influence of calomel, which, it is a common observation, is even more tardy in affecting the system of children, than that of grown people. However, should calomel be proposed on any other principle, I shall willingly

of any other measure; for I am more and more convinced, that previously to the formation of the membrane, the disease is certainly to be cured by the means⁽⁸⁾

give it every farther consideration. For the present, I must decline using it, unless in such a variety as is mentioned *p.* 41. *note* 6.

(8) It was stated to me as a serious objection to the foregoing Essay, that, in the cure of Croup, I had brought forward nothing new. This it was not my intention to do. I found the practice unfixed, when I first entered on the consideration of this disease; and my object, in the first place, was to determine, for my own satisfaction, what course I should follow, under circumstances which occurred so frequently. My opinion is established, that this is an inflammatory disease, which, in the first stage, is to be treated by a strict antiphlogistic regimen, by emetics, and the warm bath: when violent, by blisters, large bleedings, and other evacuations, *p.* 24. *et seq.* In the second stage, by emetics, expectorants, and blisters; and that, while we have agents so powerful, we should neither trust to calomel, asafœtida, nor

which I have recommended. But when, by the paleness of the visage, the lividity of the lips, and the ghastliness of the eyes; by the cough evidently becoming more stridulous, although less sonorous⁽⁹⁾; and by the changes which I have pointed out, we discover that the inflammatory stage is over; I have no objection to offer against calomel; so that it does not preclude the use of expectorants, among

any other drug which has been hitherto offered as a specific for croup. Should I have been successful in bringing other physicians to think that these are fair conclusions, my object is granted in its fullest extent, and my time has been as usefully employed, as if I had been experimenting in order to produce a new remedy, which, as is shown by daily experience, however excellent in the sense of the innovator, is generally found only to involve the physician in fresh doubts.

(9) A hoarse, deep, barking cough is not so alarming as a shrilly crowing and stridulous one. The latter always characterises the second stage.

which I may rank medicated vapours; but I particularly allude to emetics, which I prefer to all other remedies in the complete stage of croup.

