aspirator, than the tubular needle; as thus the danger of wounding the re-expanding lung, or other important structures, is entirely avoided; while in puncturing diseased joints, or chronic abscesses, the hollow needle is equally efficacious and quite unobjectionable. In a case of total retention of urine, my colleague, Mr. Porter, lately tapped the bladder above the pubis most successfully with this instrument, the operation not being followed by a single bad symptom; and I have seen my friend, Mr. White, equally happy in the treatment of a large psoas abscess associated with Pott's caries, by the same means.

ART. XI.—*Laryngismus Stridulus.* By LAWSON TAIT, F.R.C.S.,
L.R.C.P., &c., Birmingham.

THE affection, or morbid conditions and their concomitant group of symptoms now known by the name of laryngismus stridulus, has more or less engaged the attention of all authors who have noticed such diseases; and although it is only in very recent times that any correct ideas of its pathology have been entertained, yet its semeiology and etiology have been tolerably well known, at best, however, only after a confused fashion, since the earliest times of medical literature. In the Hippocratic writings mention is made of an asthma as a disease of childhood; and as an evidence of how accurately the Father of medicine noted symptoms and how shrewdly he laid connexions (although in this case he was in error), he imagined the sudden attack of this asthma to be in some way connected with that great affection from the gods *την ἑρην νοῦσον*, and really the appearance of the paroxysms, their sudden appearance and disappearance would seem to justify his *à priori* views of its pathology.* Nearly all the subsequent writers on medicine notice such cases more or less minutely, giving more or less feasible explanations of their occurrence. In 1668 we find it pretty well described by a Spanish author, De Fonseca, in his treatise *De Angina et Garotillo Puerorum*, published at Madrid. Later in the same century we find Felix Plater describing a case most faithfully and minutely. It is also mentioned in Dr. Richard

* Trousseau (Clinique Medicale, Art. Epilepsie) says that he thinks these convulsions may be indicative of epilepsy, as, sooner or later, they are attended with more distinct and characteristic phenomena. As I have never seen epilepsy in infancy, I am inclined to believe that this great modern physician, who saw epilepsy where others have failed to find it, has pushed one of his favourite views a little too far.

Gower's *Treatise on Diseases of Children*, published at London in 1682, and by Dr. John Pechy in 1697. Our great English physician describes a disease which he, following Hippocrates, ascribes to epilepsy, and which is most probably laryngismus stridulus:—"Sometimes the fit comes suddenly, distorting the mouth and eyes, causing the face to turn black, and convulsing the limbs. Sometimes the fit is known to be coming by an involuntary contraction of the finger into the palm of the hand and an uncommon fixedness of the eyes." Hoffman well describes the disease in the sentence, "Tussis saepe firma et sicca infantes exercet, cum magna respirandi difficultate et suffocationis metû." In 1761, Dr. James Simpson published *De Asthmate Infantum Spasmodico*, with a most accurate description of the symptoms; mentioning the peculiar sound, "cum clangore surdo" (the best translation of *surdo* in this instance is *indescribable*, and so, truly, this peculiar sound is, but once heard it is never to be forgotten); that the disease continues its course without cough, and that it sometimes destroys the patient in a single attack. Dr. John Millar describes a disease and identifies it with the spasmodic asthma of Simpson, and remarks a tendency to glandular disease and general strumous condition. Rush, the great American physician, and the friend of Washington, wrote a paper confirming Simpson's views as to the condition being an acute asthma, but declaring that the pathological appearances were entirely negative, thus differing to a considerable extent from Millar; although, in fact, they are both to some extent right. Dr. Haygarth, of Chester, gives an instance of the amount of confusion existing in the minds of many writers on this disease, when he tells us that Dr. Richard Russell, in his book *The Economy of Nature in Acute and Chronical Diseases of the Glands*, Lond., 1755, was the first to mention the convulsive asthma of children. In addition, Dr. Haygarth does not seem to have learned to distinguish it from true croup.

Of the term laryngismus stridulus, I may say that it has little to recommend it, save its convenience and the general acceptance it has met with, for it makes no attempt whatever to classify the disease further than to indicate the larynx as a seat of a symptom; while no correct idea is conveyed as to what that symptom really is by the word *stridulus*. The sound emitted during an attack of the disease is not stridulant or creaking; it is much more accurately described by the English name for the affection, *the crowing*

inspiration, but I would much prefer to say that it was, to use Simpson's expression, a *clangor surdus*, an indescribable sound. Various names have been proposed for this affection, but all open to objection. Guersant, the writer of the article "Croup" in the French Dictionary of Medicine, has proposed the nomenclature of *laryngitis stridula*, as opposed to *laryngitis pseudo-membranacea*, or true croup, but I need not say that such a term is totally inapplicable, as the disease is not one of local inflammatory origin. The use of such a name has arisen from the mistake that many have fallen into of considering this affection as merely the first stage of true inflammatory, exudative croup—a mistake which, strange to say, Dr. West gives his adherence to. The term *thymic asthma* has been proposed by some because they had happened to find in one or two cases the thymus gland unusually large.* To this term I shall have further occasion to refer. *Cyanche stridula* and *suffocatio stridula* have also been proposed, the latter with more reason perhaps than any other. The disease has been also vaguely defined by Clarke, in his *Commentaries*, as "a peculiar species of convulsions in infant children;" and by John Cheyne as "spasmodic croup."

The last term is that adopted by William Henry Porter, the distinguished Irish surgeon, and in detailing to you the symptoms of this affection I cannot do better than read to you the description of the disease to be found in his admirable work on the *Larynx and Trachea*, written in 1826 :—

"It is in general a diseased action consequent on irritation, and should be considered rather as a symptom than as a disease itself. It occurs in very young children, and appears at the commencement of the period of dentition; sometimes earlier, but very rarely after the child has reached its third year. In some instances the constriction is both slight and momentary, and the spasm never produces either unpleasant or dangerous consequences; in others it is longer continued, and the infant struggles for breath, becomes purple in the face, and is apparently dying when the spasm begins to relax, and a long-drawn, crowing inspiration sets all things to

* Dr. Hirsch, of Königsberg (*Denkwürdigkeiten in der ärztlichen Praxis*, Frankfurt, 1830), describes many cases where the thymus was enlarged, and he gives the disease the name of the *asthma Kopp*, believing that the latter author had first attributed the disease to that cause, although Hood had done so long before (*Ed. Med. Journal*).

Dr. Kyll (*Rust Magazin für die Gesamte Heilkunde*, 1838), narrates cases of, and asserts his belief in, the thymic asthma.

rights again; and after a little time the patient revives and recovers well. These results are often mistaken for true (cerebral) convulsions, and form no inconsiderable proportion of the fits said to be occasioned by teething. In the fatal cases of spasmodic croup death is extremely sudden: the infant may be apparently in good health, and in a moment he makes a violent effort to inspire, which occasions something like a faint scream or cry, becomes black and swollen in the countenance, and dies before assistance can be procured." This is a description of that part of the train of symptoms to relieve which the surgeon's attention is directed; but of course there are others in which the physician is more particularly interested and which are part and parcel of the disease. Foremost and most constant in their attendance are those carpo-pedal contractions;—in the hand, a firm closure of the thumb upon the palm by the fingers, and extreme pronation of the entire limb; in the foot, bending of the toes, especially the great toe, downwards, and inversion of the foot. This is, as I have said, a very constant symptom. It has been present in all the cases I have seen, and I have as yet heard of no case where it was noticed to be absent. This symptom is, however, not peculiar to cases of laryngismus stridulus, but is a constant symptom of all head affections in children; to this point I shall have occasion again to refer when speaking of the pathology of this disease. After the fit is over the peculiar sound made and free respiration once more established, the child begins to cry, and generally falls asleep in a few minutes, exhausted. During this sleep the carpo-pedal contractions continue. There are other symptoms common to this and the other cerebral affections of infancy which frequently occur, such as vomiting, squinting, convulsions, &c. These are the positive symptoms. The negative indications are absence of fever and perfect freedom of respiration between the attacks, and that the progress of the disease is unattended by cough. Indeed, unless there be the more decisive evidences of brain disease little will be noticed, save that the child is fretful and evidently in imperfect health, though most of the victims present more or less distinct evidence of a strumous habit. When considering the etiology of the disease we find the first ruling condition is age. It is entirely a disease of infancy. Ley gives as reasons for this that the crusta lactea and excoriations behind the ears are prevalent during the time to which this disease seems limited; but these conditions are not confined to children under three years of age, while we find

that laryngismus stridulus practically is so. He barely hints at the true cause which is to be found in the relatively small size of the larynx. "When the inferior or recurrent laryngeals are cut, compressed, or irritated," writes John Reid, "all the movements of the muscles of the arytenoid cartilages are arrested, and the upper aperture of the larynx can no longer be dilated during respiration. If this happen in an adult animal, when the capacity of the larynx is comparatively large, respiration may be carried on with little difficulty; but if it should take place in a young animal, when the larynx is proportionally much smaller, difficulty of respiration is created, a struggle for breath takes place, and the very struggles increase the difficulty, as the increased force of current brings the arytenoid surfaces in apposition, thus mechanically decreasing the aperture while the inherent power for dilatation is gone." Thus we find that the prominent symptom of the affection is mechanically produced in a manner which we shall afterwards consider. This symptom may be imitated to a certain extent by any one during an inspiration, but not in expiration, and herein consists a most practical distinction between this disease and true inflammatory croup, that in the one the difficulty is during inspiration *alone*, while in the other expiration and inspiration is equally affected. Another predisposing cause for the occurrence of this is its hereditary tendency, or in other words, its strumous nature; as Dr. Ley has it:—"It may be doubted, however, whether this constitutional proneness does not resolve itself into a mere disposition to scrofula. My own experience would justify my deciding in the affirmative; and this opinion derives material support from the fact that the causes which thus aggravate or produce the disposition to the crowing inspiration of children are precisely those which call into action a strumous diathesis." Dr. Marsh has written that all the cases of this disease which he had witnessed had occurred in children either themselves exhibiting marks of the strumous diathesis or sprung from scrofulous parents. This is most certainly my own experience in the matter, and we find it supported by further majority of observers of the disease, especially in a most excellent essay by Dr. Wm. Griffin, in the *Dublin Medical Journal* for 1838, at the end of which he sums up his opinion by saying that authorities concur in asserting that for the most part, if not wholly, its occurrence is limited to those of strumous habits, and in families where there is a tendency to head affections and convulsions.

We find in addition that the exciting causes are moist climate and uncertain temperatures, irregular or bad food, and bad air; just the conditions, indeed, which influence, as exciting causes, the production of all strumous diseases, of which laryngismus stridulus is essentially one.

Regarding the pathology of this affection great confusion has existed, and indeed still exists, as may be seen from the various names applied to it, and from the fact that some authors, as Dr. West, deny it a separate nosological existence at all. To Dr. John Clarke is due the credit of first regarding it as a distinct disease, and claiming for it as such a place in our tables. Some of the old names for croup show that there has been great confusion between the exudature cynanche trachealis and laryngismus stridulus. Were *croup* used as a general name, as I think it ought to be, the term *spasmodic croup* would be the least objectionable of all the names which have been employed.

The word croup is derived from a Moeso-Gothic word *krop-jan*, degenerated in Icelandic to *krop-a*, signifying to make a noise with the throat. This, through Scandinavian handing down, rested in the eastern and northern parts of Scotland in the form of *croup* or *roup*, both of which were applied in the old Scotch language to the noise made by crows and frogs. In some old chronicle it is used in this way—"The ropeen of the rauyuis gart the cras crope," and in *Hudson's Judith* mention is made of the *crouping* of frogs. The adjective *roupy* is still in very common use among the Scotch peasantry, and is applied almost exclusively to the noise of croup or other form of impeded respiration, but I have heard it applied to the noise of owls. Knox, in his history, referring to some of his foes as limbs of Satan, says, they "*roupit* as they had been ravenis." Later we find that in such writers as Beattie and Fergusson the words are confined to the disease:—

"Oh! may the roupe ne'er roust thy weason (trachea),"

says Beattie; and Fergusson writes probably in allusion to some form of incantation for frightening away the disease—

"Baith cooks and scullions mony ane,
Wad gar the pots and kettles tingle,
To fleg (frighten) frae a' your craigs the roupe."

Thus there could be no objection to make croup the generic term, while the difference between the varieties would be sufficiently

defined by the words *inflammatory* and *spasmodic*. The term cerebral croup has been employed by several writers, and amongst others by Mr. Pretty, the only author, it seems to me, who has really conceived the true pathological condition of this disease, or at least of the great majority of the cases described under the name of spasmodic croup or laryngismus stridulus. Dr. Cox, in his work on *Convulsions Peculiar to Children*, Lond., 1825, records his opinion, after seeing many cases, that it ought to be named cerebral croup. Dr. D. Condie, of New York, in his *Practical Treatise on the Diseases of Children*, 1844, says that when it occurs in a child over two years of age, it is almost invariably symptomatic of cerebral or cerebro-spinal affection. Other writers have termed it chronic croup. It is very curious to observe what confusion and contradiction exists in the writings even of one and the same author regarding this disease. If we take Dr. John Cheyne, in the *Encyc. Prac. Med.*, as an example, we find that eminent physician, writing so recently as 1833, stating in one paragraph, that "the symptoms of croup which depend upon stricture of the glottis differ so in degree as to prove in many attacks the existence of spasm; this, however, is spasm caused by inflammation, for which no antispasmodic will be equal to venesection. That inflammation in this disease is often spontaneously resolved, the spasm depending upon it subsiding at the same time, is unquestionable; and has given rise to a belief, entertained by those chiefly who have overlooked the evidences of inflammation, that there is a purely spasmodic species of croup; we therefore take the opportunity which presents itself of stating that the hysterical affection just alluded to is the only species of spasmodic croup with which we are acquainted." The hysterical affection here referred to is the occasional laboured inspiration—half groan, half sigh, which we see young women indulge in during a fit of hysteria, and which has as much right to be classed with croup as has small-pox. It may excite surprise to read of Dr. Cheyne talking so gravely about the appearances of inflammation vanishing so instantaneously, but when another paragraph on the same subject is read, the surprise will, I am sure, not be decreased. After enumerating the symptoms of laryngismus and describing them accurately, he says:—"This affection, which ought never to be called croup, is not attended with cough; on dissection there is no trace of inflammation in the windpipe; the seat of disease, it can scarcely be doubted, is the brain"—and yet in spite of his

recognizing or rather guessing at the real pathological condition, naming the group of symptoms "a well-known disease of infancy," and taking notice of the characteristic sign, "the clubbing of the hands and feet," he quotes Dr. Kellies' well-known *Letter on the Pathology of the Larynx and Bronchial*, to the effect "that there is truly no essential difference between them (*i.e.*, the group of symptoms already described by himself, and now known as laryngismus stridulus, with true inflammatory croup), other than what arises from degrees of violence; and the obvious circumstance of intermission and continuance." But, alas! for Dr. Kellie's logic, his latter saving clause destroys all that he and Dr. Cheyne have already said on the matter. Even now the confusion has not yet ceased, but in the last volume of *Guy's Hospital Reports* has reached a new phase, under the name of "Tetany or Remittent Tetanus," in a paper by Dr. Moxon, where he narrates a well-marked case of laryngismus stridulus under that new fanciful name. Dr. Moxon tells us that the mother stated that all her children who survived at birth had "inward fits," and one, a boy, had outward fits and "spasmodic asthma." The little patient, three-and-a-half years old, had carpo-pedal contractions, difficulty of breathing, with croupy sounds, and at his first visit to Guy's, was seen by some one else, who, I think, properly named the case to be one of "spasmodic croup." Dr. Moxon does not agree with this propriety, but does not show good reason why.

There are three views of the pathology of this disease which I wish to bring under your notice: the first is that advanced by Dr. Ley, in his elaborate work on *Laryngismus Stridulus*, where he maintains that the spasmodic attacks are due to pressure on the vagus or its branch, the recurrent or inferior laryngeal by enlarged glands, creating an interference with the function of the nerves, and resulting in paralysis of the dilating muscles of the larynx, which he imagines are alone governed by that nerve. The second is that of Dr. Marshall Hall, who, in his struggles to account for every thing by what he called reflex motion or action, included, in his attempt, this disease, and stated that the attacks of spasm were caused by irritation causing reflex action. This, he said, originates in three nerves: 1st, the trifacial in teething; 2nd, the pneumogastric in overfed or improperly fed infants; and 3rd, the spinal nerves in constipation, vermes, catharsis, &c., these nerves acting through the spinal nerve and the recurrent laryngeal, and the motors of respiration. The third theory is one which is only

touched upon incidentally, or hinted at by most writers, and only thoroughly advanced by very few, including Mr. Pretty, although all, even Ley himself, advanced numerous facts in its support. It is that the disease is essentially one, in nearly every case, of cerebral origin, depending usually upon a tubercular inflammation of the meninges at the base of the brain. Dr. Ley's theory is based upon a very superficial and most essentially erroneous information regarding the physiology of respiration. The recurrent laryngeal supplies *all* the muscles of the larynx, both dilating and contracting, except the crico-thyroid; it is not, as he supposes, distributed only to the dilating muscles, so that paralysis of that nerve would leave the closing muscles in full power without any antagonism; such a state of matters would render expiration almost as inspiration, which we know in this disease is not the case. It was clearly shown by Le Gallois and confirmed by John Reid, that the distribution is as I have said, when the recurrent is divided the larynx is completely paralysed, and that the difficulty of inspiration in laryngismus is occasioned by the valvular wedge-shaped entrance to the larynx being readily closed by a forcible *down current* of air. Moreover, as the pressure which Dr. Ley presumes to be the cause of the mischief is necessarily permanent, the resultant paralysis or partial paralysis would necessarily be permanent also, and so, of course, would be the difficulty of breathing, and not as it really is, spasmodic with perfectly free breathing between the attacks. This is shown to be the case where there is no doubt about the pressure, as in cases of aneurism, or such cases as one narrated by Professor Henderson, where there was suppuration along the courses of both pneumogastric, and where the difficulty of breathing once established was constant, and the sound evincing that the functions of the nerves were exerted was heard during expiration as well as inspiration.

Besides all this, the facts of the morbid anatomy do not bear out Dr. Ley's theory: many, even some of his own cases, militate against it. It is not by any means the rule that we find enlarged glands in cases of laryngismus. I believe it to be the exception, because among the cases I have seen I have not been able to detect them, and in none of the then dissections I have made of children destroyed in an attack did I find a single enlarged gland of the slightest consequence. How many dozens of cases do we see where the glands in the neck and thorax are enlarged, and where there is no symptom of interference with the breathing? Last

winter I had charge of a poor child in whose body every gland that could contain tubercle was crammed with it, so much so that the right arm and the right side of his face were enormously œdematous on account of obstructed venous return, and yet he never had a laryngeal symptom.

When enlarged glands accompany laryngismus they are entirely a subsidiary phenomenon, depending on the same predisposing cause, struma; or they may be, as Cruickshank, in his observations on the *Glandulæ Concatenatæ*, says, they often are depending upon the disease of the brain. In many of the cases which Ley quotes, he confesses that others had differed with him in his opinion about the influence of the enlarged glands, and had expressed their convictions that the symptoms were due to meningeal affections. In one case the child had convulsions, and that down-cast of the eyes which compels the patient to raise his whole head to look at an object, and which is purely indicative of brain disease. At the examination he found the enlarged glands in the neck, and, of course, attributed everything to them. "There was, however," he says, "thickness and opacity of the arachnoid, with some degree of infiltration of the pia mater, especially in the situation of the optic nerves"—the usual situation of strumous meningitis; and yet this effusion he imagined to have been the result of the attacks of asphyxia and crowing—a strange example of the *ὑστέρων πρότερον*.

It would be tedious to enter into an analysis of all Dr. Ley's cases, but in the majority of them there are points which render them valueless in support of his views. In one, he says, that the recurrent on the right side was found embedded in the midst of the enlarged bronchial glands, an anatomical relationship, which would be so peculiar, that the correctness of the narration may be doubted.

Then, again, the almost constant presence of the carpo-pedal contractions detracts very much from the probability of Dr. Ley's theory, as it is not clear what influence glands in the neck or chest can have upon the extremities; while the presence of these symptoms, in nearly all undoubted cases of head affection, is a strong *à priori* argument for considering laryngismus stridulus one of that group.

Equally fallacious seems the theory that this disease is caused by pressure on the nerves by the thymus gland; but so prevalent has been this idea that, as I have already said, the name of thymic asthma was proposed for the affection, and under that name you

will find a case recorded in Dr. West's book on *Diseases of Children*, in which the weight of the gland is stated to have been $328\frac{1}{2}$ grains, and the pressure of the gland on the pneumogastric nerves was supposed to be the cause of the symptoms and their result. If we bear in mind the relations of the thymus gland, that it lies in front of the trachea, and that its lateral boundaries, according to Sir Astley Cooper, are the reflections of the pleura, and that it reaches from about the 4th bone of the sternum up to about half an inch below the lower margin of the thyroid body, it is difficult to see what it can have to do with the vagus or the recurrent. When we consider likewise that at birth the gland weighs normally about 250 grains, and that it increases in size up till the age at which Dr. West's patient died, and the fact mentioned by him that the brain in the case referred to presented appearances of disease, I think we are bound entirely to preclude the idea that the gland was either larger than it should have been, or that it had anything to do with the disease whatever. The conclusion at which I have arrived is that it was an ordinary case of strumous spasmodic croup. Did the thymus gland ever evince any tendency to mischievous pressure, the first evidence of it would certainly be that of obstructed venous return.

Dr. Marshall Hall's theory has little to recommend it, save that an occasional case may occur where there is no other explanation to be offered than that of reflex irritation. We all know from experience that there frequently is a connexion established of some sort or other, between the pain and irritation of the mouth, in teething, and gastro-intestinal disorder, and often between irritation or disorder of the bowels, and the apthous mouth, and even with some amount of cerebral disturbance; but, on the other hand, how many hundreds of cases do we see of very severe suffering in teething, and from intestinal disorder, without meeting with a case of laryngismus; and again, how frequently we meet with cases of laryngismus without any irritation of any kind being observable.*

* I am enabled here to add a very interesting note from Sir William Jenner's Lectures on Rickets, for which I am indebted to the courtesy of my friend Dr. Russell, Physician to the General Hospital:—

"The connexion between rickets and laryngismus stridulus is very close. I think it is about four years ago that I was struck by the connexion between them, and since that time I have seen a vast number of cases of laryngismus, and in every case, saving two, the child was the subject of rickets; and I believe the reason of laryngismus stridulus being so constantly referred to the irritation of teething, is that the ricketty

Dr. Cheyne, in his well-known essays on *Hydrocephalus*, mentions the crowing respiration, *not followed by cough*, with the clubbing spasm of the hands and feet, adverting to this peculiar affection as connected with the diagnosis of the disease of which he treats. Dr. Ley, in mentioning this passage of Dr. Cheyne's writings, says that that distinguished physician does not connect the two affections; but, to my mind, it is very clear that he does connect them very intimately in the relation of symptom and lesion.

Leopold Anthony Golis, in his work on *Acute Hydrocephalus*, suggests that laryngismus (acute asthma is the term he employs to designate it), is one of the predisposing causes of acute hydrocephalus. In this he shows an accurate observation of the connexion between them; his mistake is that what he imagines to be the cause, is merely a symptom.

John Burns, the celebrated obstetrician of Glasgow, gives the opinion "that cerebral disease is more intimately connected with the spasmodic form of croup than many imagine;" and seems to think that though this disease may sometimes have a reflex origin, yet, that it generally arises from a state of temporary paralysis of the recurrent from a cerebral affection at the base. "This sudden and, perhaps, transient attack of spasmodic croup, requires constant attention, as it is often the prelude of incurable disease in the head or spinal sheath, and is more immediately alarming if complicated with, or succeeded by general convulsions. It is too often connected with an inflammatory, or highly disordered state of the origin of the nerves coming off at the base of the brain, and this points out the demand for imperative treatment."

Pretty describes, as cases of cerebral croup, many cases of this disease, three of them occurring in his own family, and however much it is to be regretted that he was so unfortunate as to suffer to such an extent in his domestic circle, yet it has had the advantage of having given us a more faithful, trustworthy, and minute account of cases of the disease, than could have been procured by any other circumstances. The first of his children suffered for many weeks, at uncertain intervals, from laryngeal spasms, accompanied by and ending in croupy inspirations, but was apparently otherwise in the

condition retards the development of the teeth, and the practitioner refers the laryngismus to that which, like itself, is the consequence of the constitutional disease. Carpo-pedal contractions and even general convulsions are not, as is well-known, unfrequent in these cases; and are, like the laryngismus, to be referred primarily to the irritability of the nervous system and muscular debility."—*Medical Times and Gazette*, May, 1860.

enjoyment of perfect health. One of these attacks killed her instantaneously. Upon dissection the blood-vessels of the brain were found unusually loaded, and effusion had taken place into the ventricles, and between the arachnoid and pia mater. Four intussusceptions of the ilium, without any evidence of local inflammation, were also discovered, but no other appearance of disease. (These intussusceptions were merely instances of what we so frequently find in cases of sudden death, when one, two, or more invaginations of the small intestines occur either during the agony or immediately after death. This, I believe, to be peculiarly common in children). His second child was seized with convulsions a week after the death of her sister (they were twins, an important point in tracing the predisposing cause, struma), and had repeated paroxysms; the more advanced symptoms of meningitis came on, such as the peculiar motion of the arm about the head, frequent startings, with screaming, insensibility, squinting, and dilated pupil, &c. This child recovered after having had leeches applied to the temples, blisters to the head and neck, and the administration of the *mistura assafoetida*. The age of these twins was eight months. A third child of Mr. Pretty, a boy, was taken ill, when seven months old, in a precisely similar manner, but his case ended in recovery. As Mr. Pretty details them, no series of cases could be more instructive, as bearing on all the points connected with this disease, than those so carefully, and no doubt painfully, narrated by the father of the patients; bearing, as their histories do, upon its causes and symptoms, its pathology and treatment. "I asked," says Mr. Pretty, "a great many medical friends about the disease, but got little satisfaction. One said it was from cutting a tooth; he lanced the gums, but no tooth came till two months after recovery had taken place."

Besides those of his own family, he narrates about a dozen cases which had been under his own care, and, in all, he had strong reasons for believing that the encephalon was the seat of the disease.

The following facts, all of which have occurred in very strongly marked instances of laryngismus, under my own notice, also tend very much to strengthen the view of its pathology, which I have endeavoured to support in this paper. These spasmodic attacks are almost invariably the precursors of general convulsions and the other decided indications of cerebral disease, if they continue long enough, either from the fits of suffocation not proving fatal, or the means

adopted for their removal not proving effectual. It is very common for children to die of this affection in families in which other children have died of marked strumous brain disease, either complicated or not with the crowing inspiration, or where there is in the family a marked tendency to tubercular or strumous diseases. Pretty mentions the case of a man, father of two children, who died of this affection, who had always shown a weakness of intellect, and who ultimately became insane; when we recollect the intimate connexion between the strumous and tubercular diatheses and insanity the case becomes one of importance.

The three cases in which I had opportunities of examining the condition of matters after death, bear out what I believe to be the true view of the pathology of this disease. The first was the case of a male child, about seventeen months old, which I was asked to see by Dr. Gordon, of George's-square, Edinburgh. He had suffered from five severe attacks of spasm before I saw him, in each of which his mother said she expected to see him die in her arms. On my second visit I happened to see him in one, and certainly I have seldom seen anything nearer total suffocation than that poor child recovered from. I proposed that tracheotomy should be performed to prevent the attacks proving fatal. This was agreed to by Dr. Gordon, but declined by the parents. The child died two days after this, and permission was granted to examine the body. The dissection I performed in the most careful manner, laid bare *in situ* the entire length of both pneumogastrics in the neck and thorax, and ascertained that there was not a single enlarged gland to be found any where; neither were the pneumogastrics and their branches, the recurrent laryngeals, interfered with by any pressure, nor did they present any altered appearance. All the organs, both abdominal and thoracic, were healthy. The bronchial glands were so small as to be found with difficulty. In the brain was found ample evidence of strumous meningitis, and the ventricles contained above the average amount of fluid. This child had a strumous family history; in fact, there was no need to go further into this than to ask to see the father and mother. Convinced that had tracheotomy been performed, this child would have had the chances of his life very much increased in his favour, I have proposed it in two other fatal cases, with which I have met, but in both it was refused. In one of them, a female child, thirteen months old, similar negative appearances were met with as in the first, while the evidence of cerebral disease was much more distinct, as she had been labouring

under a chronic form of it for several months. In the third case, a female child, nine months old, the cerebral disease was well marked; while the only other morbid appearance was that of broncho-pneumonia, the symptoms of which had come on after the laryngismus had made its appearance, and were induced by the poor child having been carried by its drunken mother through a severe snow storm. This young sufferer had no very distinct history of struma; but the facts that its mother was a drunken collier woman, and its paternity doubtful, were quite sufficient to account for a strumous habit or, at least, a strumous disease.

I have used the word struma instead of tubercle throughout this paper when speaking of the meningeal lesion which is known as tubercular meningitis, strumous meningitis, or simply acute meningitis. The *post-mortem* appearances would entitle it to the first of these terms, but since it is a matter of every-day observation that this disease occurs in children in whose family history we have indications of the strumous diathesis, which in those spring from a purely tubercular stock, its frequency is far from being well marked, I prefer the second of the names. Between the strumous and tuberculous diathesis I do not know that I am in a position to give a satisfactory pathological distinction, but for clinical purposes they are sufficiently distinct.

There are other views of the pathology of laryngismus stridulus, most of them, however, too eccentric to demand serious attention. Such are Dr. Hood's view, that it depended on fatty degeneration of the liver, and that of Elsässer, that it was due to thinness of the calvarium. It was, I believe, Prof. Rolleston who showed that fatty liver in childhood is essentially a strumous disease, and if there be a connexion between this lesion and laryngismus stridulus I must claim for them community of sequence.

The treatment of cases of laryngismus stridulus has undergone as much variety as might be expected in a disease so mysterious, and the pathology of which has been so misunderstood. It must be perfectly evident from what I have said regarding its etiology that the heroic anti-phlogistics, bleeding and low diet, are inadmissible. Children's diseases, as a rule, do not stand bleeding, and they very rarely require it; and in the instance of laryngismus the patients certainly will not benefit by it. Good nourishing, though at the same time easily digested, food, with even slight stimulants, should be had recourse to. There is nothing that I have found to equal whipped white of egg with a little milk and

sugar, uncooked; and, if a stimulant should be required, the addition of a dessert-spoonful of champagne or a tea-spoonful of brandy. There is no stimulant that children more readily take than champagne, and none which seems to be of more service to them. I have very often, I believe, saved children by this wine when they have refused all other stimulants. Before administering it the effervescence should clear and an equal bulk of water be added; if the patient be feverish and it seem grateful, no fear need be entertained about the addition of a little ice. Milk and animal soups will also be of service. Counter-irritation on the head I have often seen of great use; and the forms which seem to me most convenient is the inunction with equal parts of croton oil and glycerine of the occiput, or an iodine blister. Of internal remedies that from the use of which I have seen most good accrue is, without doubt, iodine; or iodine in conjunction with bromine. In the form of iodide of potassium alone or combined with the bromide I am certain that I have seen it check most serious cases. The bromide of potassium especially seems to have a powerful sedative action on the nervous system, and in this way often checks or alleviates the spasms. To effect this, however, it requires to be given in large doses, and to a child of a year old I have given as much as two and a half grains of bromide of potassium and half a grain of the iodide with marked effect. Grain and two grain doses of the iodide at the same age are not excessive. Of course such causes of suffering as apthous mouth, irritable gums, and diarrhœa must be attended to.

The inhalation of chloroform, if the time of warning will admit of it, will be found of great benefit, as there is no more valuable aid in the treatment of infantile convulsions.

The question of the performance of tracheotomy is serious, but one which I think ought to be entertained; it is not likely to be one to which parents will consent until too late, nor is it likely often to be the fate of a competent surgeon to be on the spot when the operation is urgently needed. The risks of the operation in its after-consequences are great, and amongst English surgeons I fear it is not likely to find favour.