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LOGIE W. L.

MEDICAL INAUGURAL DISSERTATION

ON

CYNANCHE TRACHEALIS.

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MEDICAL

INAUGURAL DISSERTATION,

ON

CYNANCHE TRACHEALIS,

WHICH

IN ACCORDANCE WITH THE STATUTES, RULES AND ORDINANCES

OF THE

UNIVERSITY OF M'GILL COLLEGE,

FOR THE ATTAINMENT OF THE

DEGREE OF DOCTOR IN MEDICINE AND SURGERY,

WAS DEFENDED IN PRESENCE OF THE PRINCIPAL

G. J. MOUNTAIN, SS. T. P.

THE GOVERNORS AND MEDICAL FACULTY OF THE SAID UNIVERSITY,

BY

WILLIAM L. LOGIE,

OF MONTREAL.

——Vitales vias et resperamina clausit.—Ovid.

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TO

WILLIAM ROBERTSON, M.D.

PROFESSOR

IN THE UNIVERSITY OF M'GILL COLLEGE,

THIS ESSAY

IS

DEDICATED,

WITH EVERY SENTIMENT

OF

RESPECT AND GRATITUDE,

BY

THE AUTHOR.

September 1833

Presented to the Medical Society of Edinburgh — By order of the Principal Governors & Medical Faculty — J. Stephenson

Sec: Med: Fac —

I grow dam resident member of the Medical Society —

MEDICAL INAUGURAL

DISSERTATION

ON

CYNANCHE TRACHEALIS.

Cynanche Trachealis, the subject of this discourse, is a disease of an inflammatory nature, seated in the mucous membrane lining the trachea, and frequently extends into the minute ramifications of the bronchiæ, and in the progress of the disease is accompanied with an exudation of coagulable lymph, which soon assumes a membranous form and lines the inflamed surface. Dr. Good names it Empresma Bronchitis, and defines it to be breathing permanently laborious and suffocative; short, dry cough; expectoration concrete and membranous; fever a cauma.

Dr. Home was the first person who gave an accurate account of this disease, he named it Suffocatio Stridula, in an essay published in 1765. Dr. Michaelis, of Gottingen, also wrote a full account of it in 1778, and named it the Angina Polyposa, sive membranacea. It has received a variety of names, but is now universally known by the name of Croup.

The effect of the inflammatory action on the mucous tissue in Croup, is different to what it in general is in inflammation of that tissue at any other time, as a membrane is always formed to a greater or less extent in Croup, whereas, in the other case, the mucous secretion takes in the appearance of pus; the inflammation in Croup must, therefore, be one *sui generis*, arising from a particular cause, for why should not a membrane be formed at all times in inflammation of that mucous lining.

Some authors say that this membrane is secreted on no other occasion and in no other part of the system; but a membrane similar to this is discharged at times from the intestines; and Dr. Good, in that species of Diarrhœa called by him Diarrhœa Tubularis, says that it occurs very frequently, and appears to depend upon a peculiar irritability of the villous coat of the large intestines, which, in consequence, secrete an effusion of coagulating fibrin instead of secreting mucus: he also says, that it has a striking resemblance to the fibrous exudation thrown forth from the trachea in Croup, but the intestinal secretion is usually discharged in larger, firmer and more compact tubes—this has generally been mistaken for a separation of the mucous membrane of the intes-

tines, but the exudation has no vascular structure. Morgagni also gives examples of the formation of a similar membrane in the uterus, caused by the irritation that takes place in painful menstruation, and this membrane is at times so perfectly formed as to render it difficult to be distinguished from that belonging to an ovum.

Many disputes have arisen respecting the nature of the membrane in Croup. Dr. Holme thought that it was of the nature of thickened mucus; and he remarked that when complete it is tough and thick, and that it might be soaked in water for days without dissolving it—that it does not adhere to the windpipe, as there is always fluid matter beneath it, and that beyond it the windpipe bronchial tubes and pulmonic vesicles are covered with pus or purulent mucus. Cheyne compares it to the exudation of the inflamed pleura or peritoneum, and considers it thickened puriform fluid; others have likened it to the buffy coat; while, by Pinel, it is regarded as albuminous exudation. According to the investigation of its chemical properties, by Maunoir, it appears to contain albumen in various proportions and to owe its tenacity and firmness to this principle. It has, therefore, been inferred that this substance, without being solely coagulable lymph, or thickened mucus, or dried purulent matter, is a morbid product secreted from the trachio-bronchial mucous surface in a semi-fluid form, and undergoing, in consequence of the presence of albuminous matter, coagulation as it is more freely exposed to air.

Croup is one of the most alarming, and if not early attended to, the most fatal disease to which children

are liable; it has of late years been of more frequent occurrence than formerly—the cause of this is not known. It is a disease peculiar to infants only, it attacks them commonly from the first to the third year; and it has been remarked by Dr. Horne, that the younger children are when weaned, the more liable are they to the disease. Though Croup is sometimes met with as late as the tenth or twelfth year, it is yet evident that the tendency to it diminishes surprisingly as life advances. The reason that adults are so exempt from this disease, is supposed to depend upon some change which the mucous membrane undergoes about the age of puberty. It is remarkable that Croup sometimes attaches itself to particular families, and several of the same family are generally seized with it at the same time: this has lead some to consider it contagious; but there it must be remembered it occurs as an epidemic, and that the children of the same family are of the same habit of body and brought up in the same manner, and, consequently, all of them are liable to be attacked by it during that epidemic. It generally attacks the most robust and healthy children; sickly children and those worn down by some other disease are very rarely attacked by it. Those who have once had it are more susceptible of it than before, though the susceptibility gradually wears off as they grow older. Second attacks of Croup are seldom so violent as the first. It is more frequently met with in cold than in temperate climates, and appears chiefly in the fall and spring and in low marshy situations, and it is said to be most prevalent near the sea coast. It very frequently appears

in cold changeable weather, after a cloudy hazy day. It occurs as an epidemic, but is not contagious. Croup has been divided by authors into two species, the true inflammatory and the spasmodic or spurious. These, in a pathological point of view, differ materially from one another. The inflammatory kind is seated in a mucous tissue—it has no interval, but continues its course till it destroys the patient or yields to the remedies employed. The spasmodic kind comes on suddenly, most frequently at night, and returns in paroxysms with short intervals of ease: this species depends upon spasmodic action of the muscles about the glottis. There is reason to believe that from repeated attacks, or some unknown cause, the latter may terminate in the former. In Croup there is a disposition to occasional exacerbations of all the symptoms. This tendency to spasm is attendant on all diseases which affect the air passages, whether arising from inflammation or not. It is perceived in Laryngitis, Bronchitis, Hooping-cough and Asthma, and also in Croup. Some authors maintain that these exacerbations point out the true nature of the disease; hence, they conclude that it is rather of a spasmodic than an inflammatory nature. A proof, I should think, of one species of Croup depending altogether on spasm for its existence, and the other being purely inflammatory, is, that the spasmodic, although it may appear in an aggravated form, will yield to antispasmodics or a mild treatment; while the inflammatory, unless early and actively treated, will very shortly run its course and terminate fatally. Yet, the spasmodic may at times very much resemble the inflammatory form, as

there is more or less of muscular action concerned in both; fortunately the same treatment answers for either, with some modifications; for if in a case of the spasmodic form, the symptoms did not give way to an emetic or the warm bath, it would be judicious to employ the same means as recommended in the inflammatory form.

Croup may be divided into three stages; the first named the forming stage, the second the inflammatory, and the third the membranous or purulent.

FIRST STAGE.

In this stage the child is lively, laughs and plays, and shows an unusual and morbid degree of exhilaration. The circulation is not yet affected, and the respiration not confined or even hurried; the skin is natural and of an ordinary temperature; but there is the hard harsh sounding cough, which is unattended with expectoration, or if any thing be expectorated, it is thin, whitish, and in very small quantities. The peculiar sonorous hoarseness perceived when the patient coughs, and which is one of the first and most certain signs of this complaint being about to take place, is not at this period observed when he speaks. The cries which he utters after each fit of coughing denote, to a person familiar with this disease, the existence of danger. During this period, the mucous membrane of the nose is observed to be affected, as the secretion of

the nostrils is either altogether arrested or very much diminished, and continues to be so during the whole course of the disease. When the fauces are examined, they are sometimes without any appearance of inflammation; frequently a redness and swelling greater than natural appears.

SECOND STAGE.

The second stage is ushered in with symptoms denoting general increased action; the circulation is quickened, there is heat and dryness of the skin, thirst, hurried respiration, white furred tongue, flushed countenance, frequency of pulse, a restlessness and an uneasy sense of heat. The hoarseness increases, and now not only attends the cough, but is perceived whenever the patient speaks or when he inspires. It resembles a noise similar to that of air passing through a metallic tube, or the crowing of a cock. The cough is more frequent, the face becomes flushed during the coughing but subsides as the circulation becomes more equal after the exertion, yet leaving the cheeks redder than natural; the eyes are blood-shot, watery and swollen; the patient is drowsy, and falls into frequent but disturbed slumbers, from which he generally is roused by a return of the cough and other symptoms; he elevates his head in order more freely to obtain air. These symptoms continuing for a longer or

shorter period, according to the violence of the disease, are followed by the last stage.

THIRD STAGE.

In this stage the cough is attended with some expectoration of a thin frothy mucus, but no relief is obtained by it; now the symptoms run so high as to threaten immediate suffocation. The patient becomes much exhausted by the efforts he makes to relieve himself, he experiences a severe constriction about the throat and frequently raises his hands towards his neck; he throws his head backwards endeavouring to breathe easier, not succeeding in this, he tries every position, but in vain, he obtains no relief, and throws himself back in despair; his face now is of a livid hue, except round the mouth, which is much whiter than the rest of the face, the lips are also livid, the forehead is pale and covered with perspiration, and there is a look of great anxiety and dread. The hands and feet are cold; the pulse is small, frequent and contracted; the hoarseness is now not so great; the patient seldom or ever speaks, even the cough is less harsh than it was in the other stages; the apparent diminution of the hoarseness and cough is very deceitful and must be guarded against. A short time previous to death all the symptoms are generally alleviated. This disease runs its course variously; sometimes it continues for

several days, or may end in a few hours. The difference in termination is said to depend upon the constitution, upon the period at which the remedies were employed, upon the nature of the remedies, and their power or influence upon the system.

CAUSES.

The predisposing causes are supposed, by Dr. Underwood, to be the lax fibres of children, the abundance of moist humours natural to them, and the plentiful secretion from the bronchial vessels; and perhaps the change of food from milk.

The exciting cause is cold, and particularly exposure to a damp atmosphere.

The proximate cause is a peculiar inflammation of the mucous membrane lining the trachea.

PROGNOSIS.

The prognosis will be favourable, when the cough is attended with expectoration; when there are intermissions and the breathing not so laborious, also a disposition to perspiration.

The prognosis will be unfavourable, if there should be no abatement of the symptoms; if the lips be of a livid hue, surrounded by a white ring, and the rest of the face flushed; the breathing very laborious.

ANATOMICAL CHARACTERS.

On examining the trachea after death, the following appearances have been observed: the mucous membrane lining the larynx upper part of the trachea and the larger divisions of the bronchiæ is found of a greater or less degree of redness, it is covered by an adventitious membrane of a pale yellow or greyish colour, this membrane arises a little below the larynx and extends in some cases down into the bronchiæ; its thickness will depend upon the degree and extent of the inflammatory action. It is either of a tubular compact form, or appears in detached portions, mixed with mucous or flocculi of albuminous matter. It adheres more or less firmly to the mucous membrane, generally its attachment is very slight, and when this is the case there is a quantity of viscid or puriform fluid between it and the mucous membrane. When the disease has been of short duration, the false membrane is of less extent. There is also serous effusion in the bronchial cells, this effusion is found in a greater or less quantity in all subjects that have died by obstructed

or imperfect respiration, and has by some been considered as the ordinary product of mucous inflammation, though this fluid has not been observed to be poured out in other parts. Its presence in the air cells is accounted for in the following manner; whenever, either by reason of an insufficient supply of air or of the presence of inflammation in the membrane, the blood is but partially or imperfectly arterialized, congestion is the consequence, and the vessels, to relieve themselves, begin to pour out their serous contents. If the original cause be longer maintained, the heart is obliged to supply the brain with a fluid inadequate to support its healthy tone and actions, and the nervous influence imparted to the whole body, and of course to those parts concerned in the important process of respiration, being impaired, the lungs become still more loaded, the effusion is continued and increased, at length the energy of the brain fails, the muscles of respiration cease to act, and death ensues,—hence, in those cases where the false membrane is so thin or its extent so small as to be incapable of impeding respiration, yet death is caused by the inflammation preventing the arterialization of the blood, and thus the brain is deprived of that stimulus which is necessary for the maintenance of its healthy action.

TREATMENT.

In former years the treatment of croup was not arranged with any pathological precision, in consequence of which each author recommended a particular remedy, without paying any attention to the symptoms present or the duration of the disease, whereby a great deal of mischief might be done; to avoid this, it will be better not to confine oneself to any particular or favorite remedy and to that alone, but to employ the remedies according as the symptoms may indicate, and the more easily to perform this, it will be necessary to attend to each stage of the disease.

In the first stage the indications are to restore the suppressed secretion of the trachea and surface of the lungs, and to prevent the development of the second stage. There is no doubt that if attention were paid to the timely application of appropriate remedies in the first stage, the disease might be cut short at once; but so little attention is paid to that certain symptom, hoarseness, when it shows itself, that very frequently the physician does not see the patient till he is far advanced in the second stage, and hence the reason why croup so often terminates fatally. The means employed in the first stage are an emetic of tartarized antimony and ipecacuanha, and after the vomiting has ceased, thet artarized antimony is to be continued to keep up a gentle nausea,

so as to excite the return of the healthy secretions. At the same time the external surface of the throat may be inflamed by the application of the spirits of turpentine and tincture of lytta, or by mustard and vinegar. By continuing the use of these remedies it is very seldom that the disease will not be subdued in a very short time.

In the second stage the indications are to subdue the increased action and prevent the formation of an artificial membrane. The first thing to be done is to place the child in a warm bath and keep him in it for five or ten minutes, after this he is to be wiped dry and placed in bed, this frequently affords relief to the breathing, and often allays the spasm which exists, then if the child is plethoric and the pulse is hard, a vein is to be opened and blood drawn according to the age and strength of the child and the violence of the disease. The relief obtained from the bleeding is in general very great. It may be necessary to repeat the bleeding, this will be required if the first bleeding has not had the power of reducing the violence of the symptoms, or that the pulse continues firm, the skin warm, the face flushed, and the oppression considerable. Some prefer leeches to repeating the general bleeding. After the bleeding a brisk emetic is to be given, the tartarized antimony is preferred from the power which it has at the same time of allaying the action of the heart and arteries. After the vomiting has ceased the calomel is to be administered in large doses, and repeated every two or three hours, till greenish coloured stools

are produced; when this takes place it is a favourable sign and there is often an immediate alleviation of all the symptoms, as soon as this occurs the dose must be diminished, and also the frequency of its exhibition. Calomel is now more relied upon for the cure of the Croup than any other remedy, it is a most valuable medicine in conjunction with others, and in many instances, appears to have acted as a specific. Dr. Rush was the first person who recommended it. Dr. Hamilton, of Edinburgh, strongly advocates the use of it, he says that in every case where he administered it previous to the occurrence of lividness of the lips, &c. he has completely succeeded in curing the disease. In the interval of each dose of calomel, the tartarized antimony is to be given to keep up a gentle nausea, and the tincture of digitalis joined with it has been found of great service. Blisters are not employed from the length of time they require to produce their effect. Rubefacients are used instead of them; such as the spirits of turpentine and tincture of lytta, this will act very rapidly, also the volatile linament. The low regimen is to be strictly observed, this constitutes the treatment of the second stage.

In the third stage the indications are to remove the effects of the previous inflammatory action, which consist in the formation of the false membrane, and to prevent the recurrence of the same by altering the condition of the inflamed surface. It is found that cases of recovery in Croup have been more frequent in proportion to the early adoption of remedial measures, this will show the necessity of the most active means in the second

stage, for there is a great difference between checking inflammatory action, so as to prevent its effects from taking place; and removing those effects, when they have taken place; hence the reason why the last stage of Croup is one of great hopelessness, for here we have to remove the effects of the previous inflammatory action. Emetics are the remedies principally depended upon to produce any effect in this stage; if the adhesion of the membrane be slight, they will act with more certainty. In a few instances emetics have accomplished both indications, but this is of very rare occurrence, and in some cases though the membrane has been removed, yet its removal was not followed by any success, as the difficulty exists in the removal of the disposition to subsequent effusion. The antimonial emetics are preferred, the American physicians employ the *polygala senaka* in the form of a decoction, if this fails to produce the desired effect, the sulphate of copper is recommended to be used, this is said to have been serviceable in some very severe cases. These are the only remedies that have any effect in this stage though many others have been tried. Dr. Cheyne was induced to apply leeches to the neck in this stage from having observed in dissections that the thyroid veins were very turgid, he also recommends the bowels to be kept open by glysters, and the strength of the patient supported.

BRONCHOTOMY.

When all means have failed, bronchotomy has been recommended as a dernier resource, but this operation has been attended with so little success, that it is now seldom or ever performed; for the operation to be followed by any success, it would be necessary to ascertain at what period it should be performed, and what are the symptoms that would indicate its necessity. The want of success has been said to be owing to its being performed too late and it has been proposed to be performed earlier in the disease, but in the earlier stages no object can be gained by the operation; when the membrane is red and swollen, and no fluid effused, it would be more likely to aggravate the disease than relieve it. When the adventitious membrane is formed, there is reason to believe that the extent of the disease has been such as to render a recovery very doubtful, as effusion into the air cells may have taken place, or the mucous membrane of the bronchial cells may have taken on a disposition to inflammation from the irritation it has undergone, or the inflammatory action may already have set in, here then the effects produced by the disease are such as to render the operation unavailing, and at no period of the disease do I see the propriety of the operation.

SPASMODIC OR SPURIOUS CROUP.

This is not so dangerous as the inflammatory croup, it is the result of spasm of the muscles of the glottis, it comes on generally at night, has the Croupy inspirations, it returns in paroxysms, and in the intervals there are no unpleasant effects. It attacks delicate more frequently than healthy children. It may occur at any season of the year; it lasts but a few hours; during the fit the pulse is quick, but there is no puffing of the face; it is frequently excited by painful dentition or a deranged state of the stomach and bowels. There is at times great difficulty in distinguishing the spasmodic from the inflammatory Croup. The spasmodic attacks suddenly, there are intervals of ease which is not the case in the inflammatory, there is no phlegm about the mouth and the fit goes off suddenly.

TREATMENT.

This form will readily give way to the warm bath, followed by an emetic, after the operation of the emetic

brisk purgatives are to be given, antispasmodics are also of great service, if it occurs during the period of dentition the gums that require it are to be freely scarified.

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