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The Inaugural Dissertation

of

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The diseases of children are among the most important and interesting which engage the attention of the medical practitioner. Their diagnosis is difficult for the child is generally unable to describe its feelings, and we are obliged to judge of the symptoms merely from appearances; their course too is generally extremely rapid, and if remedies can be of any avail, they must be resorted to at the earliest stages.

In attempting shortly to describe the symptoms, progress, and treatment of each, I shall confine myself to giving a digest of the opinions of others rather than drawing on
on my own limited experience

NOSOLOGICAL DEFINITION

"Difficult respiration, noisy inspiration: the voice hoarse, cough ringing "pain of throat without any apparent "tumour, debility: not difficult and "the fever syncope" (delirium)

Symptoms

The premonitory stage of croup lasts generally only for a few days, the signs are, catarrh accompanied with febrile symptoms of greater or less violence, which consist of alternate chills and heats, increased vascular action, debility, loss of appetite, sickness: sometimes however these are extremely slight; restlessness, pre"-palpitation, disturbed sleep, uneasiness in the throat, indicated by the frequent application of the child's hand to the part, unusual heaving of the chest and frequent breathing being only observed. After these or sometimes
sometimes even when none of them have occurred, the child is attached during the night with a peculiar clanging cough, the sound of which is extremely easily recognised, though with difficulty described. The respiration is difficult, sonorous, the voice hoarse, "sharp and stridulous; pulse frequent, hard; skin hot and dry, or sometimes covered with perspiration, and the veins especially of the neck swollen and distended. These symptoms abate during the day, but only to return on the following night with greater severity. The restlessness is now much increased. The breathing becomes more oppressed and the cough more distressing, accompanied with the expectoration of scanty mucus, sometimes streaked with blood. Vomiting at times follows a severe paroxysm of coughing, and when sanguineous and membranous matters are thrown off.
off, slight relief is experienced. At this stage the throat is frequently painful to the touch, the chest generally is dull on percussion, and by means of the stethoscope we discover a mucous followed by a sibilant rale, and at times a voice like sound accompanying either inspiration or expiration.

The last stage is indicated by an increase in severity of all the symptoms, the voice is either entirely or almost inaudible, the motions of the alvei of the nose and chest are extremely violent. The head is thrown back, the forehead is covered with perspiration, the eyes are dull and sunken, the countenance becomes thin, the tongue is much loaded. The lips livid, the pulse is weak, irregular or intermittent, the extremities swell and become pale and cold and the sufferings of the patient are terminated, generally within twenty.
twenty four hours, either with evid-
etent signs of suppuration, or general
exhaustion of the vital powers.
This is the general course of
the more severe forms of croup—it
to often however occurs in a much
slighter degree, producing merely
at night the crowing respiration
without the system experiencing
much general disturbance. These
forms however ought to be watched
with the greatest care, as they are
extremely apt to run into the
more severe state, just described.

Croup most generally termi-
nates on the fourth or fifth
day, but some authors affirm
that at times it passes into a
chronic state, and is prolonged
for three or four weeks. This is
however denied I think justly by
others, and is ascribed merely to
the removal of the more severe
symptoms, while a slight inflam-
matory action.
action continues in the bronchi, rendering the patient extremely liable to relapses, and terminating either in recovery, or in ulceration with mucopurulent expectoration and other symptoms of tracheal consumption.

**Diagnosis**

leyanche maligne may be mistaken for croup when it extends to the larynx. The peculiar cough, absence of difficulty of deglutition and of aphthae in the mouth, the hurried and laboured respiration sufficiently distinguish it.

The tracheal affection which often accompanies the first stage of measles, may be so severe as to simulate croup, especially its less severe forms, but these symptoms usually subside on the appearance of the eruption, and careful attention to the previous symptoms are sufficient to point out the nature
nature of the disorder.

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change of the seat of the pain &

The escape of foreign bodies

the violence of the strangulation

Lastly, the different sound of the

cough.
cough, the clear expectoration often accompanied with vomiting, and the complete intermissions between the paroxysms, the voice respiration being unaffected, prevent its being confounded with hooping cough.

Grippe chiefly occurs in cold and moist climates, especially in towns on the seacoast, on the banks of rivers or in damp situations. It attacks children most commonly between the first and the eighth years, and seldom till they are weaned. Dr. Home states that early weaning renders them more liable to it.

It is stated to occur epidemically at times, and several authors have brought forward facts in order to prove its infectious nature also. Leases have no doubt occurred in which a child has been seized after sleeping with one labouring under
under group, but here both children were exposed to the same predisposing causes, and it becomes a difficult point to ascertain whether the disease was produced by infection or merely by similar causes acting on both children.

The exciting causes which produce catarrah and bronchitis appear also to produce croup. It often follows the different forms of cymanche, hooping cough, scarlet fever & cold acting suddenly on the body, violent exertions of the voice, crying, or swallowing acid or hot substances are among its most common causes.

**Prognosis**

The dangerous nature of the disease and its liability to pass into a more severe form, must make us always extremely guarded in our prognosis.

A return to health may be predicted.
predicted when the disease occurs in a mild form. When the breathing between the paroxysms of coughing is natural, when the cough becomes less violent and the voice resumes its natural tone, when the expectoration is mixed with mucous or membraneous sheets, when a copious and general perspiration comes on, the patient not becoming exhausted, and the pulse regular not intermittent.

On the other hand if the fever be severe at the commencement of the attack, if the respiration be audible, sonorous and laborious, if no expectoration of mucous or membraneous sheets take place, if the countenance become livid, the eyes sunken, pulse frequent, small, weak and irregular, and if general exhaustion and depression of the vital powers together with the symptoms I have already described
described as characterizing the latter stages of the disease make their appearance, a puffed termination is to be apprehended.

Group however instead of terminating as first described, may excite or pass into other diseases, which although not necessarily puffed, greatly increase the danger of the patient. The spasmotic action of the larynx and the membrane produced interrupt the process of respiration and may cause extension of the inflammation to the bronchi, and substance of the lungs, this is indicated by severe and supporting cough, frequency of pulse, lividity of color, and cold perspirations.

The disease also may extend to the parts immediately below the mucous membrane, when this occurs, a mucous exudate discharge follows that of the group, there is great
great pain and irritation of the trachea, and difficulty of breathing accompanied with the symptoms of hectic fever.

A slight inflammatory action is believed to continue in the bronchi even for some time after the disease appears cured, and to this cause is ascribed the tendency to relapse which is always observed. This disposition diminishes with the length of time which elapses from the separation of the first attack, but is not altogether removed even for weeks or months, especially if the child be delicate or the situation in which it lives one favorable to the production of croup. I have now stated the symptoms, diagnosis and terminations of the disease, before however considering the mode of treatment best calculated to remove it, I shall describe the appearances found.
found on dissection, and the pathological conclusions to be drawn from them.

In the milder forms we observe inflammation and softening of the mucous membrane of the larynx, sometimes extending down to the minute division of the bronchi. When it is more severe the surface is covered with an albuminous, sometimes serous, exudation, and in the later stages this exudation becomes concreted and forms a more or less complete membrane. This membrane is often confined to the larynx and the larger parts of the bronchi but in some complicated cases it has been observed entirely to line the tubes to their terminations. Its colour is greyish white and its thickness varies from one to two lines, when of this latter thickness.
it has a laminated structure, appear to consist of two or three layers, the interior of this membrane is covered with mucus and its exterior or part is in contact with the mucus membrane of the air passages is dotted with specks of blood at other times it is separated from it by a layer of pus.

When death occurs early in the disease, we find instead of the membrane only an albuminous coating, and in this case the obstruction caused by the coating the mucus has excited spasm of the air passages and proved fatal by producing asphyxia. The parts immediately below the mucus surface have not been observed to undergo any remarkable change, and none of the other morbid appearances which have been described, such as congestion
congestion of the brain, emphysema or heparization of the lungs, may
with much greater propriety be
referred to the imperfect circulation
and respiration, rather than to the
effects of the disease.

Many writers suppose
that croup is not merely an
inflammation of the air passages,
but a disease of a distinct nature.
For sometimes when there is a
large quantity of false membrane
formed, there is little or no ap-
ppearance of inflammation in
the mucous membrane or sub-
gequent tissues. At times we find
neither a false membrane nor
have we symptoms of inflam-
mation or general fever. Strong
plethoric children though little
liable to croup, when attached
have the most inflammatory
form, while in weakly children
it is generally less inflammatory
and
and the nervous and spasmodic symptoms are greater. A large de-
pletion often entirely alters the char-
acter of the disease changing it
from the inflammatory to the spas-
modic type.

In the more inflammatory
cases and those in which there
is the most abundant production
of false membrane, the purine and
crystalline in the blood and
the albumen in the urine are
increased in quantity, while in
the spasmodic variety little or
no increase is observed. It is of
great importance to bear these
facts in mind, as they will indi-
cate to us the mode of treatment
in the two varieties of the disease.
When the fever is high, the urine
albuminous, the false membrane
is produced much more early
than when the nervous symptoms
predominate, in the latter case,
there
There is often no membrane formed but merely a viscid fluid thrown out.

Sometimes, however, as I remarked previously, the pleural membrane may be produced, without its formation being preceded by any of the symptoms which usually characterize the premenantary period. Thus, when a previously healthy child has been suddenly seized with the peculiar cough and sonorous respiration, if an emetic be given, a large quantity of mucous and gelatinous matter is brought up, showing that the disease has been for sometime established. These are the facts brought forward in support of the position that the inflammation is of a peculiar character. Some writers bring forward the acute symptoms and respectably fatal termination as opposed to this.
this opinion - but in these cases the peculiar termination is produced not by the local effects of the in
flammation, but by the injected and obstructed respiration, the
consequences of which constitute the symptoms described as those
of the third stage. The imperfectly arterialized blood being circulated
through the brain produces the
lethargy, diminution of the vital
powers, and increased disposition
to spasmodic action observed in
this disease.

Attempts have been made by
Schmidt and other experimenta
lists to produce this disease artificially
for this purpose they injected sti
mulating and aerial substances
into the trachea of other animals
in some cases inflammation was
produced, without false membrane,
at other times with it, and this
chiefly in young animals, but
never
never in sufficient quantity to obstruct respiration, a fact which corroborates the opinion of Belden that the phenomena of this disease are chiefly to be ascribed to spasm of the trachea and larynx.

Treatment

In the treatment of larynx the principal objects are:

1. To subdue inflammation and prevent the formation of false membrane.

2. To procure the discharge of the membrane if already formed.

3. To subdue spasmodic symptoms and support the powers of life.

If the patient be seen at the commencement of the disease with the symptoms of the first stage an antimonial emetic ought to be given. This will frequently bring away a large quantity of mucus and
which glairy fluid from the trachea,
producing immediate relief. If
the child be plethoric bleeding either
general or local should be had
recourse to, before the nauseating
effects of the antimony perjures
off. This is to be followed by the
exhibition of balomel and James
powder, and the patient should
be placed in the warm bath. If the
balomel does not act on the bowels
a dose of castor oil ought to be
given. The use of balomel in this
disease was introduced by the
American Physicians who gave
it in large doses for the purpose
1 of arresting the albuminous
secretion and 2 for destroying what
had been already thrown out. But
Dr. Braugie states that it does not appear
to possess the efficacy in this disease
formerly ascribed to it, and besides
that it is extremely apt to produce
dangerous intestinal irritation.
when
when given it ought to be combined with James Powder as a diaphoretic or with rhubarb or Senna syrup as a purgative.

This treatment will in general cut short the disease, if it fail then the treatment necessary for the second stage must be had recourse to. This is a repetition of the enema which may either be prepared as previously or cepac-cean, followed by the administration of a larger quantity of blood than in the last stage. Local blood letting is now preferable to general as not so liable to produce syncope which would favor reaction or perhaps excite convulsions. The bowels ought to be kept freely open with purga-
tives, and solution of tartar bicarbon-ate given in nauseating doses both for the purpose of favoring expectoration and also to produce diaph-
orsis. This last is materially assisted
by the warm bath in which the patient should be immersed at least once or twice daily.

If relief be not speedily obtained by this treatment and the suppurating seizes still continue, counterirritants especially those which act rapidly must be had recourse to; a blister may be applied at the back of the neck, rather than at the front as in the latter position the irritation may extend to the implants membrane and aggra-

vate the symptoms of the disease. A liniment of turpentine camou-

has been recommended to be applied to the neck, chest and Dr. Lyce who thought in these cases that the common blister was too long in acting, proposed to produce vesication by steam and invented an instrument for this purpose which however does not appear to have come into general use.
If the third stage supervene our attention ought to be principally directed to detaching and removing the false membrane. This is best effected by expectorants such as squill, ammoniac, or by an emetic of squill in preference to carbolic or benzoic acid, as it does not lower so rapidly the vital powers, the only objection against the use of these medicines in expectorant doses is the long time occupied before they take full effect. The inhalation of the vapour of warm water either alone or with a small proportion of camphor are useful not only by assisting to detach the false membrane but also in subsiding spasmatic symptoms.

In many cases the use of the remedies mentioned will be effective in cutting short the disease and restoring to health, but in others they give...
give rise to great and dangerous depression of the vital powers, this must be obviated by the use of stimulants, but their effects require to be carefully watched, lest they bring on a return of the inflammation.

**Tracheotomy**

Formerly when the false membrane was supposed to be confined to the larynx, the operation of tracheotomy was performed for the purpose of extracting it, or in cases where suffocation threatened for allowing the air to reach the lungs. But in certain cases, this operation is wholly unavailing for either of these purposes, as the membrane and effusion extend not only to the larger but also to the minute ramifications of the bronchi from which it is impossible to extract them, and (even) they would completely prevent the access of air to the lungs.
The operation acts only on one of the effects of the disease, not on the disease itself. To treat it with success we must employ those remedies which will most powerfully counteract the morbid action in which it consists.

The diet during convalescence ought to be strictly antiphlogistic, and little food ought to be given unless exhaustion come on, when light nourishment should be allowed.

During convalescence, change of air is extremely useful, especially a removal from the croupy situation to a warmer and dryer place, the child should be warmly clad, and especially during the winter months be kept in rooms about the same temperature.

Charles Murray Henderson