On the Nature of Bronchial Asthma

&

The Principles of its Treatment.

In considering the nature of a disease we usually first think of its symptoms because we are first in practical medicine, brought face to face with these; after becoming acquainted with the symptoms and physical signs, we then begin to ask ourselves what are the changes going on which are producing these symptoms, and finally what is the result to the anatomy of the individual.
By the help of the symptoms, a knowledge of the morbid changes, and the application of our knowledge of physiology and the processes of pathology, we may hope to arrive at a decision as to the nature of the disease we have to deal with.

In the disease we have before us, we are led, from a consideration of the symptoms and physical signs, to infer that, during an attack, there is some considerable obstruction in the lungs, in respiration.

We will first then proceed to endeavour to discover the nature of this obstruction. Let us begin by a consideration of the morbid changes found in those who have died, having suffered during life from this affection.

Without taking up time by enumerating the various lesions found in different individuals,
we may sum up the morbid change found by saying that these are
those of bronchitis and emphysema, as these are the only constant
conditions found, hence, either
these constitute its morbid anatomy
or it has none at all.

Are these changes, then, suf-
icient to account for the symp-
toms of an attack of Asthma?
Clearly not, for then Asthma would
be identical with bronchitis and
emphysema, and the symptoms
would coincide, more or less, with
those of an attack of bronchitis.
If then these structural changes
are not sufficient to account for
the obstruction produced, we must
look around for some other
probable cause.

Now there are two other ways
by which this obstruction might be
produced—leaving out of account
any exceptional accidental cir-
-cstances - the first being a narrowing of the bronchial tubes produced by swelling of the mucous membrane, the second being a narrowing produced by a contraction of the muscular fibres in the walls of the bronchi.

Let us see what is to be said with regard to the swelling of the mucous membrane. Now the swelling of the mucous membrane is one of the first things that happen in bronchitis, and if, then, these asthmatic symptoms be produced by swelling of the mucous membrane, then one would naturally expect the symptoms to resemble in some degree those of bronchitis, but, we have a considerable difference, for, Asthma is to be distinguished from Bronchitis by 1. The fugitive physical signs
II by the spasmodic character of the dyspnée II by the scant
inspiration II by the difference in the breathing, in Bronchitis
it being hurried if affected at
all, whilst in Asthma it is
slow, wheezy, & prolonged.

Again, Professor 

*Andrew Haldane showed,

when investigating the causation
+ influence of Nitrates upon the
dyspnée of Asthma and Bronch-
itis *, that the Nitrates, which
are well-known to rapidly pro-
duce great dilatation of the
blood-vessels by their special in-
fluence over smooth muscular
fibre, caused the auscultatory
phenomena of Asthma to dis-
appear, whereas, if the nemosis

* "The dyspnée of Asthma and
Bronchitis; its causation + the
influence of Nitrates upon it."
By Sir A. Fraser M.D. F.R.S. Edin.

Oliver & Boyd 1888
had been due to swelling of
the mucous membrane from
hyperemia (as alleged by some). Then their administration ought
to be attended by an aggravation of the stenosis and an
intensification of the dyspnea as well as of the auscultatory
phenomena dependent on the stenosis, but this was not so.

Clearly then we cannot attribute the obstruction to simple
swelling of the membrane.

We will now see what is to be said with regard to the
contraction of the bronchial tubes:
1st, is it possible? 2nd, if possible, is it probable?

Let us apply our knowledge
of anatomy and physiology.
That the bronchi possess mus-
cular fibres in their coats was
shown by Dr. C. J. B. Williams
by his experiments on the lungs.
of men, dogs, rabbits, and other animals, when he caused contraction of the trachea and bronchial tubes by the application of electrical, chemical, and mechanical stimuli. The muscular coat was shown to be more abundant in the smaller tubes than in the larger. The former contracting sufficiently to entirely obliterate their passages.

These experiments were confirmed by Lunge who showed in addition, that irritation of the vagus caused them to contract, whereas section of it led to emphysema of the lungs. He saw, by means of a magnifying glass, the narrowing of even the smallest bronchial tubes.

In addition to this, we know that the bronchial tubes are surrounded by a network of
nerves, being branches of the anterior and posterior pulmonary pleuræ and contain minute ganglia: these pleuræ are made up of branches from the pneumo-gastrics, recurrent laryngeal, the spinal, nerves, and the ganglia of the sympathetic: thus, it will be observed, that the bronchial tubes have a very wide area of connections.

From the above facts, the possibility of contraction may be fairly assumed.

How comes the question, is it probable that such a contraction takes place during an attack of Asthma? Let us enquire into this probability.

How an attack of Asthma is brought on by various exciting causes, e.g. particular climates—bad ventilation—particles of dust—smoke—odour of hay, certain
flowers, or of speeacuanka - e.
- manarions from some aminals.
 Diet has an important influence.
 any overloaded of the stomach
  may set up an attack - con-
  stipation and urine trouble.
  emotion - anger and figh.

on examination of these
exciting causes, and bearing
in mind the facts of physiolo-
and anatomy mentioned above,
it will be observed that they
may be divided into two classes,
namely, those which may be said
to act directly and those which
may be said to act indirectly.
e.g. Amongst the direct causes
may be mentioned peculiar
climates, bad ventilation, particle
of dust, hay, smoke, and eman-
ations from certain animals.
These might produce an attack
by reflex action through the
small ganglia surrounding
The bronchial tubes of which mention has been made previ- 
ously, or through the pulmon-
ary pleuris. Amongst the in-
direct causes may be mention-
ed emotion, anger, and fright, the irritation being reflected 
through the pneumogastrics and 
producing a motor effect on the 
pulmonary pleuris; again, where 
indigestion excites an attack, 
the sensation might pass through 
the gastric branches of the pneumo-
 gastrics and be reflected by the 
motor filaments of the pulmon-
ary pleuris, and so on.

Again, Asthma has been 
seen to follow upon food in 
old age and alternate with at-
tacks of this malady, also to 
follow upon attacks of Syphilis, or upon the subsidence of skin 
eruptions such as eczema; here, 
the cause of the Asthma might
be said to be indirect, being
produced by means of the blood.

Again, Professor Fraser showed,
when experimenting as mention-
ed before, that the Vitrioles, which
are well-known to act upon
non-striped muscle, when ad-
ministered in Asthma, caused
the auscultatory phenomena to dis-
appear, and that when their
influence had passed off, the
auscultatory phenomena re-appear-
ed.

Taking into consideration
these facts, and in the absence
of any other seeming explanation,
we may assume that this is
probably what takes place, viz:—
that in an attack of Asthma
we have contraction of the bronchi
and that the symptoms are part-
ly accounted for by this contraction
and partly by the bronchitis
which is always present.
And now we must define the position of the bronchitis and emphysema which we have seen was always present after death. Emphysema is practically always associated with chronic bronchitis. The bronchitis I would be disposed to say practically always preceded the attack of Asthma, from considerations which will be mentioned later, and that it acted in some cases as the exciting cause.

Having now come to a conclusion as to the probable cause of the obstruction in the lungs, we ask ourselves does this then constitute the essence of Asthma? Before we can answer this question we must examine asthmatic cases more generally, and here let me insert an extract as to the origin of Asthma.
"Of the manner in which asthma originates nothing is positively known. The literature of the subject contains no reference to that particular point, and opportunities of observing it are, evidently, very rare. In the routine of practice the patients are seen only when they have already been asthmatic for a considerable time. From the reports which they or their friends furnish it is certain that no one in a state of perfect health becomes suddenly, and without some warning, subject to the peculiar attacks of dyspnœa. The sole exceptions to this rule are perhaps the isolated instances in which foreign bodies have imperceptibly entered into the air.

passages. In its typical form, however, the disease before it as-
sumes its distinctive characteristic is invariably, and for an indefi-
its period preceded by a series
of symptoms which constitute
one of its integral parts.

"In the vast majority of
cases all present troubles are as-
signed to what appears to be a
peculiar form of inflammation
which starts in the pharynx,
rapidly spreads upwards along the
 contiguous mucus membrane, but
is, at first, effectively arrested in
its downward course by the pro-
jecting tissues of the larynx.

The irritation which it produces
chiefly cause fits of sneezing and
cough - is supposed to be a mere
symptom of an "ordinary cold";
if it occurs in the height of
summer, when such causation
is obviously inadmissible, one of
"Hay fever". But because cold is presumably, still within the limits of health and because "hay fever" occurs, after all, only once a year, the discomfort which arises from them, receives but little attention; and when at last Asthma is fully developed, it appears to have come on quite insidiously.

Accordingly, many patients declare—and seemingly with good grounds—that before the onset of their dyspneal paroxysms they never had a day's illness. On enquiry however, it will be found that, not only were these symptoms present, but they were unusually severe and protracted; and though they escaped the notice of the sufferers, they did not escape the notice of his friends. Thus one asserted that he had always enjoyed good
health and did not know what illness was till he became asthmatic. But it was soon elicted from him that whilst attending his brother's funeral, his relatives were struck by his distressing coughs and entreated him to seek advice for it. Shortly afterwards the dyspnâea commenced. Another who was equally emphatic on the same point, was reminded by his wife that he had, for a long time been subject to a form of cough which sounded to his like whooping-cough and had greatly disturbed his nights' rest.

"In many instances, especially in children, the dyspnâeal paroxysms are traced to some inflammatory affection of the chest, which was either idiopathic or a part expression of measles and whooping-cough. The
stories run that recovery was greatly delayed; it was particularly noticed that the cough had changed its character; painful and severe at first, it succeeded in clearing the chest of a very viscid exudation; but subsequently, though its frequency had been reduced, its efficacy was perceptibly diminished. The expectoration, it is said, required an unusual effort during which the breathing became visibly embarrassed, such paroxysms occurred chiefly at night, and returned with great obstinacy, whereas the days were comparatively free from them. Gradually, however, the nocturnal attacks also subsided and there was some prospect of a favourable termination of the disease. Apparently, the general condition, which had been
greatly impaired showed no signs of improvement. The respiration also became readily op-
pressed on the slightest exertion or by excitement. Whatever hope there was of a recovery, was soon altogether destroyed. After an inv-
terval of days, or even of weeks, during which all symptoms had considerably abated, the
dyspnoea returned, with as great a violence as ever, from unknown or inappreciable causes. It now began to "dawn" upon the patient and his medical ad-
viser that whatever may have been the original disease, the disease which then presented itself was Asthma."

Again "The first thing that I learn about it is that

* "on common Neuroses" By James Frederic Goodhart. London. 11. 11. Lewis

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It largely occurs in those who have in one form or another a neuritic inheritance, or are themselves clearly of nervous temperament. I have gone over my own cases from this point of view, and this is the result of 35 cases (27 males and 24 females) nine only were not evidently neuritic. In eight the disease was hereditary. In ten there was rheumatism in the family; in five a pronounced history of Meqrim; for others I have noticed the existence of diabetes or some nambulism in the relatives. In the patients I note such things as Chorea, "a highly nervous and crotchety lady," "If anything goes wrong in business the man is sure to have an attack;" the attack comes on after any little excitement. A girl of 17 had convulsions
when an infant; another young lady had hysterical aphonia and urticaria and had rheumatism at other times: another patient has had urticaria, headache, &c. and so on.

Again, "always a nervous constitution with a history of Asthma or nervous disease in the family - produced owing to irritation of the circle of respiratory nervous system."

These quotations may be taken as expressing the general experience of those who have had numerous asthmatic individuals under their care: if one carefully enquires into the history of the individual suffering from Asthma, one can usually elicit some information concerning

* Extracted from notes of lecture given by Prof. Granger Steward
Winter Session 1893-94
some previous trouble, hence I think we may safely assume
that Asthma occurs not in
the previously healthy, but rather
in those who either themselves
are neurotic, or have come from
a neurotic stock, or who have
previously suffered from other
affections.

In conclusion I would sub-
mit that I. The obstruction in
the lungs during a paroxysm
of Asthma is partly produced
by contraction of the muscles in
the walls of the bronchi thus
causing narrowing of the tubes
and partly by the attendant
bronchitis; II that Asthma
itself may be regarded rather
as a secondary affection occurring
only in those whose constitution
has suffered from previous
affections, or whose constitution
is imperfect owing to tertiary
We now pass on to a consideration of the principles of treatment and in this we must be guided by two great considerations:—

I. Avoidance or removal of exciting cause

II. Relief of paroxysms

I. Avoidance or removal of exciting cause.

Upon this will depend in a very great measure our success in the treatment of this disease, for in a large number of cases if the exciting cause be avoided or removed, the patient may remain free from attacks for very long periods: e.g. where the attacks seem to be brought on by climatic influence, then an atmosphere diametrically opposite
should be selected; where the disease has originated in a damp climate the patient should be sent to a dry one, and if at the sea-shore, then inland, & so on. Again, where indigestion seems to have brought on an attack, then the patient should be recommended to live upon a light diet avoiding over-much animal food and late dinners & suppers. Constipation must also be avoided. In hereditary cases exercises likely to strengthen the constitution must be recommended & gymnastics.

In Bright's disease, foot, & these morbid conditions must be dealt with as far as possible and so with the remainder of the exciting causes.

II Relief of Paroxysms:
Paroxysms I would divide into two classes, namely severe, and
not sense, leaving it to the physician to determine which class to place his patient in.

for this reason, namely, that in the one case I would recommend a certain treatment until the severity of the attack had abated whilst in the other case I would leave out what might be termed the initial treatment.

I swear: the first thing essential is immediate relief, and for this purpose we endeavour to attack the seat of obstruction in the lungs by means of inhalations; this may be effected by burning various substances in the room until the atmosphere becomes unbearable to all except the Asthmatic; Nitre-paper, made by roasting thick blotting paper in a warm solution of 23 of Nitrate of Potash in a bunsen.
ful of water, is a favourite and good remedy.

Hugh's oregie Paper, stannumino
leaves, &c. The following, however,
being a good combination:

Oliaura Tabula

Stramonii

Iolea Inflat. 20 3ii

Pulv. Pet. Nitrolic 3ii

Vei Eucalypli 2f

34. Burn a tea-spoonful near
patients bed. repeat if neces-
sary. (Grainger Stewart)

The efficacy in relieving
spasm of the various fumigating
papers & powders sold for the
purpose probably depends greatly
upon the fact that fumes are
produced when these are burnt,
and the fumes have been shown
experimentally by Prof. Fraser.
to be of very great value in re-
lieving spasm.

Speaking generally with
regard to inhalations of the class
mentioned above, I would be
disposed to employ them as seldom
as possible, because, in the first
place, the effects are so transcendent,
and in the next place I have
frequently observed that asthmatic
people who always fly to
these when a paroxysm comes on,
become more frequently attack-
ed, and this, I think, has
been the experience of others,
whereas in the case of those
healed by medicine internally,
attacking more the disease as
a whole, but whose relief was
perhaps, not so rapid, the
attacks have been rather long.

In between, other circumstances
being equal, Professor Fraser
also showed that the Pulleys
when administered by the skin.
ach produced a more lasting effect than when inhaled. Morphia: "We know of no remedy so generally efficacious in cutting short a severe fit of Asthma as Morphine administered hypodermically, and we are accustomed to add a small dose of Atropine to the Morphine. We give from a $\frac{1}{2}$ to $\frac{3}{4}$ of a grain of the acetate or hydrochlorate of Morphine, with 20 to 30 of a grain of the Sulphate of Atropine. A hypodermic of this kind will often subdue the most severe paroxysms of Spasmodic Asthma in a few minutes."

* "A manual of Medical Treatment, or Clinical Therapeutics" By J. Burney MD F.R.C.P. Cassell & Co 1876."
"It is a remedy, however, which is to be used with great discretion and which should be strictly reserved for the very severe paroxysms."

"In very bad attacks, where the patient cannot swallow, and where he can only inhale with great difficulty, the best treatment is to give hypodermically ⅙ of a grain of morphia, with two minims of the B.P. hig. Atrop. This combination often acts very rapidly."

"In no way can the bronchial stricture be so rapidly and so safely subdued as by the subcutaneous injection of morphia."

Burney Yeo

"A Dictionary of Treatment." By William Whitta M.D. Henry Renshaw 1846

Berhart - as mentioned before.
Most authorities are agreed that a hypodermic injection of morphia quickly allays the spasm, but that there are a number of restrictions as to its use; e.g. it would not be wise to employ it in the bronchitis of old people, or where there is much bronchial catarrh, nor where uraemia is present; again, if this remedy be applied often then the dose must be increased, and as a consequence the morphia habit may be induced.

And now let us pass to the second class where the paroxysms are not so severe. In these cases I would recommend that inhalations and morphia be left alone, and that medicine ad-ministered internally be relied upon. In treating these cases
it is as well to remember the
bronchitis associated with the
Asthma, and to let the treat-
ment be directed conjointly a-
gainst both.

Now the drug which has
been found to produce the best
results is Iodide of Potassium;
this, to be the more efficacious,
should be combined with a
stimulating expectorant mixture,
The old-fashioned one of Ammoni-
Calcium, Quills, Speeae, and Sen.
ega being an excellent one; to
This may be added a little
Tinct. Chamomill. I have been
in the habit of using the fol-
dowing mixture frequently, and
always with very good results.
The patient gradually recovering
and remaining free from anoth-
er attacks for some considerable
time. This mixture should be
continued until all wheezing
and expectoration has ceased.

4 Am. Curt. 3½
Fr. Stille 3½
Vn. Vpec. 3½
Fr. Aruca 3½
Po. Tod. 2½
Fr. Sharonia 3½
Sy. Fruni Verg. 3½
Ag. ad. 3½
Am. Tod.

Sy. a tablespoonful every 3 hours
in water.

During the intervals a mixture containing As and Fe will be found to be an excellent tonic and may assist in warding off other attacks.

Millina Evans M.D. CM
Alyn Estyn
Mumbles
Swansea

April 1899