Thesis

A Contribution to the Clinical Study of Bronchial Asthma

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It is now more than twelve years ago when I was first brought in contact with a severe case of bronchial asthma. I was called out to a patient, about two o'clock in the morning, whom I found sitting up in bed, leaning forward, and gasping for breath. Her breathing was exceedingly laboured, so that every muscle of the bent shoulders had to be brought into play, and the beads of perspiration stood on her forehead. But alarming as these symptoms looked, the trouble gradually subsided with some suitable remedy. The patient had repeatedly such attacks at stated intervals, and always occurred during the night, from which
she always seemed to recover within a week or two, and then enjoy comparatively good health for a time. The case struck me as so remarkable, especially with regard to its periodicity, that my whole interest became enlisted in the study of these symptoms.

In many respects I regret that I had to confine my observations of these symptoms to their clinical aspect within the range of a private practice. But as this clinical enquiry into the phenomena of lethargy has been perfectly independent and uninfluenced by any theory either recent or remote, it may claim some attention however small, especially as I have succeeded in devising a treatment for my asthmatic patients, which has practically resulted for a cure for further attacks, and established a good state of health. Many of these cases will be given in the course of thi
Thesis with more or less fulness, as illustrated. My observations are based on hundreds and fifty cases, under my personal care, during a period of twelve years.

In reviewing the Pathology of Bronchial Asthma, it may be conceded, that this disease is coeval with the human race itself. Attention of it is made by Hippocrates, Archeaus and Celsius. - Willis, Van Helmont, and others, are said, to have correctly interpreted its nature. (Théry. De l. Asthme. 1859.) This was during a period, when physical diagnosis was as yet unknown. Seeing that its phenomenal characteristics are so startling, it must at all times have attracted the attention of observers. Yet without the aid of physical diagnosis it is easily conceivable, how under the term Asthme, the ancient writers meant to denote all forms of dyspnoea, however various and differing from one another, and therefore included under this term a promiscuous group of affections, with
nothing in common except the one symptom of laboured breathing.

With the advent of physical diagnosis at the beginning of this century, a differential diagnosis commenced to distinguish between the numerous current species and varieties of dyspnoea. The first step in this direction was taken by Corvisart. He had meanwhile rescued from oblivion Cerebronquer's invention of Percussion; and by the practice of it, he was enabled to recognize during life, certain forms of disease of the heart, which were as yet, either imperfectly, or not at all known. Rightly he inferred, therefore, that the dyspnoea in those cases was not due, as was generally supposed, to a disturbance of innervation, but that it was the necessary consequence of appreciable anatomical changes. Not unnaturally, he suspected that other species of nervous asthma might similarly betray themselves as symptoms; but his supposition, though well-founded, could not be confirmed by percussion alone.
Physical diagnosis was brought to a very high state of perfection, by the invention of Percussion. Laënnec unfolded a thoracic pathology, which enabled him to differentiate between most of the prevalent forms of asthma thus recognised by the Physicians. Most of the asthmatic affections which had been considered hitherto as idiopathic were either recognised as symptoms of well-defined diseases or were differentiated into forms of perennial dyspnoea, such as laboured breathing with puérile respiration, and spasmodeic asthma.

Laënnec observed that the Asthma with puérile Respiration generally occurred in individuals, who were subject to "nueuses catarrh" (Traité de l'Auscultation Paris 1849, p. 519). But he was doubtful whether such catarrh, satisfactorily accounted for the paroxysmal character of the dyspnoea. The Spitting was not particularly tenacious and expectoration was always easy. He felt therefore constrai
to admit that those attacks of breathlessness, probably arose from an unknown disturbance of innervation. But how to account for its spasmodic form, was a more difficult task. Most of the cases under his notice, were accompanied by laryngeal stridor, profuse tears, vomiting, or sometimes convulsions. In other cases again, no such effect could be detected. It was evident to him that permanent organic lesions could not be the immediate cause of it, but that the rapid onset and the sudden cessation of the attack presupposed a cause, that came and went in a similar manner. While he readily granted to the nervous system, the principal share in the production of the dyspnoea, he expressly and significantly added, that as a rule several causes contributed towards it. From the researches of [Reissiger], it was known that the bronchi were provided with muscular fibres. Their function however had not yet been ascertained. Laennec reasoned, that because they were muscles, they were necessarily contractile, and
therefore liable also to spasm. He concluded that the immediate cause of asthma was a spasm of the muscles of the bronchi and of those of the alveoli. Laennec's theory of asthma as a substantia eff ect of nervous origin is believed in to a great extent to this day, notwithstanding the rise of pathological anatomy which threatened its existence.

A medral assumed as the immediate cause of dyspnœus or paroxysms, a bronchial spasm, which in it, turn, was due to an abnormal irritability of the Vagus and of the Phrenic nerves (Austral. Clinique Médicale p. 250. 1829.) He based this theory upon the cases he has met with, in which orthopnoeic had resulted from the pressure upon those nerves, by enlarged bronchial glands, the lungs being otherwise intact.

Hitherto the inquiry into the cause and nature of spasmodic asthma, was carried on by means of clinical methods, with Williams the pathology of the disease passed to a great extent from the bedside to the laboratory. He proved conclusively
that the bronchi contracted on mechanical, chemical and electrical stimulation. But Williams did not succeed in demonstrating the innervation of the bronchi. (Williams, the Pathology and Diagnosis of the chest 1840)

Longet proved the innervation of the bronchi. He showed that irritation of the Vagus caused them to contract, whereas section of it led to emphysema of the lungs. (Longet “traité d'anatomie et de Physiol. du Systéme Nerv., 1842)

Many others, such as Volkmann, Knaus, Loewinson, Wintrich, Budde, Rosenthal, also Rügener, Bert, Gerlach, and other experimented on the innervation of the muscles of the lungs, with various and conflicting results. They thus supplied abundant evidence of the bronchial contractility, and thus the last link in the chain of reasoning was confirmed.

Some declared their objections to the foregoing process of reasoning, and looked upon Asthma as a symptom of pathologi-cal changes, such as bronchitis of a peculiar form, disease of the heart, or emphysema...
of the lungs. — The physiological researches as to the innervation of the bronchi, when completed gave rise to a theory of spasm and paralysis of the bronchi among some pathologicalists; but their position has been found untenable, and is now abandoned (Williams, Op. cit. p. 91).

More popular was the theory of bronchial spasm, in which the tightness, which the patient perceived across the chest, was supposed to point to a constriction of the air-tubes. (Hyde-Salter, on Asthma, 1862, p. 33.) Hyde-Salter started with the definition, that bronchial asthma was distinguished by an unusually prolonged expiration, and by the presence of sibilant sounds. He maintained that a combination of such signs invariably indicated the nervous origin of the dyspnoea, whatever else may be present at the time. (Op. cit. p. 256.) Along with this, he was anxious to prove the existence of bronchial spasm; the difficulties however with which he was confronted, were great. Bronchial asthma, is not as a rule, the subject...
of what may properly be called clinical observation. Asthmatics are not disposed to consider themselves as patients. Their sufferings are forgotten as soon as they are over; and they often entertain the erroneous notion, that nothing is very far wrong with them. They usually provide themselves with some remedy to which they can have recourse in their hour of need. This, then, only in the severe and protracted paroxysms, when their remedies fail them, that they apply for help. But then, in the presence of terrible suffering, the actual condition is such, as to render an exhaustive examination impracticable.

The great majority of asthmatics present themselves in the intervals between their attacks, when they are really seen at their best. The physical signs are then either negative or so insignificant as to be disregarded. As for the statements made by the patients, although made in good faith, they clearly cannot claim any reliance for pathological purposes. It is under such difficult
circumstances, that Hyde-Salzer sought to maintain his theory of bronchial spasm. His views were shared by Biermer (Volkmanne's Sammlung Klin. Vorträge 27). Biermer sees in the efficacy of a dose of chloral an unerring proof that the disease is of nervous origin. But in his time, it might not have been demonstrated that the therapeutic action of chloral is not only exerted on the nerves, in a similar manner as morphia or anti-pyrrin, but its sedative action, which is very great in cough and asthma, is fully equalled by its loosening and liquefying action on the fibrous and adherent coatings of the bronchi; and thus acts fully as much, as a powerful expectorant as a sedative remedy in cough or asthma. (American Therapeutic Journal 1890) When Biermer compares the spasm of the bronchi in its interference with respiration, such as colic of the intestine does with peristaltics, the case is not quite analogous. But viewing it from the point of innervation, in both...
There is great similarity. Mr. Kneaggs' teaching on insensibility (Lancet 1897 April 24) says: "when we from explanatory lesions is forthcoming, it is only natural that we should turn to the nervous system for inspiration, for the movements of the intestines are under the influence of a somewhat complicated piece of nerve mechanism, a description of which is given in Foster Physiology Part II p. 491."

Similarly there is a very complicated system of nerve supply to be found in the respiratory apparatus. The nerves to the lungs come chiefly from the Vagus. As on each side the Vagus nerve winds round the root of the lung, it gives off in front branches to form the anterior pulmonary pleurics, and then behind shorter branches to form the posterior pulmonary pleurics. Both these, but specially the last, are joined by filaments of the sympathetic system, more especially from the second, third and fourth thoracic ganglia; and it is maintained by some, that fibres pass direct from the spinal (intercostal) nerves into these pulmonary pleurics. Some of the
new fibres thus reaching the lungs along
the Vagus nerve are efferent fibres for the
muscular fibres of the bronchi, and these.
But the chief and most
important fibres are afferent fibres, con-
cerned in the regulation of the respiration.
The function of the fibres coming from the
sympathetic system have not yet been
clearly ascertained; but there is evidence
that some of the fibres coming from the
thoracic ganglia are vaso-motor (con-
strictor) fibres for the pulmonary vessels
(Foster Physiology Vol II)

In view of such an extensive and
complicated mechanism of the innervation
of the lungs, it is not easy to ignore the
important part that nerves must play
in bronchial asthma. And yet the act
of the nerves can neither be the primary
nor the only cause of this disease. A
similar case presents itself in the
female pelvis. The innervation of the
organs in that region from its many
and complicated filaments, give rise
to so many nerve arrangements, which
However, are not considered, the prime fac- tors of the suffering. They only indicate
some deeper lying lesion, which may
often be difficult to ascertain. Frequently
it happens however, that after the patholo-
gical lesion or cause of illness has been
successfully removed from the pelvis,
there yet remains, the pelvic nerve suf-
ferrings, which may continue, with more
or less persistency, and will only yield
to suitable treatment after a time.
Likewise asthmatic patients, who
may have suffered for years from their
troubles in the chest, may under suitable
treatment have lost practically, every
trace of catarrh in the bronchi, and yet
have periodic returns of laboured breath-
lessness, which can only be accounted
for, either because. There may still linger
some slight catarhal excitation in some
remote region of the bronchi (as or above
or because, the tone of the implicated new
pleuruses, has not yet recovered from its
irritated and cleared condition. The
latter view is the more probable in the cases
of women, who suffer at the same time from
...
hysteria, which may be more or less pronounced. The following case in my practice may illustrate this: Mrs. P. aged 45, was seen in April 1893, when she called, it was in the interval of attacks. She had suffered from bronchial asthma for about nine years. She was pale, and so highly nervous, that she began to cry, whilst being examined. There were tibilant thumps all over the lungs, but percussion note was resonant. With suitable treatment the cough and cnsult had disappeared, after a period of two months, and also the attack of dyspnoea became less frequent. Hysterical attacks however seemed to bring on spasmodic asthma, which only yielded after persistent tonic treatment, after a period of over one year, which she was entirely free from any asthmatic attacks, and has continued so until now. Another case was that of a girl M. C. aged 60, who was seen in June 1890. She was suffering from a severe attack of bronchial asthma, and great nervous excitement. Her nervous movement...
corded almost choroid, she twisted her
wrists and facial muscles, and was foremost
with effusion of tears. The bronchial
friction was severe and catarrh abun-
dant. Also the tongue was thickly coated
and bowels costive. Percussion note over
the lungs was resonant and auscultation
revealed sibilant rales and thrills.
Temp. 104.4 Fahr. The case in its severity
was only of a week's duration, whereas
in this case the bronchial asthma and
the nervous derangement, terminated
almost simultaneously, after three weeks
and the patient has remained well ever
since.

The sputum with which the paroxysms
invariably terminates, must as a patho-
gical product, be always considered of
great importance, as affording some clue
to the pathological process. Lefèvre
(Recherches sur l'asthme, 1836) describes
sputum as "of grey colour, tenacious or
in consistency, filamentous in shape, like
Macaroni (boiled) or twisted into spirals
and moulded upon the ultimate ramifications
of the bronchi, in which it had probably stagnated for a time." To him, the disease was a peculiar inflammatory process, which caused the increased irritability of the bronchial muscles.

Thomas Legden ("Zur Kenntniss des Bronchialasthmas: Virch. Arch., vol 72, 1872") who examined microscopically the epithelium of the bronchi and found "tubular contracted bodies with obliquely spiral lines and a narrow homogeneous looking thread, which ran along their axis, and terminated with a spiral twist." He also observed peculiar octahedral crystals, which had been seen before by Charcot and Robin. He attached less importance to the presence of the spiral structures, than to that of the crystals, the points of which he supposed to imitate the Femoral filaments of the Vagus in the bronchial mucous membrane, and thus produce a bronchial spasm. But Charcot's crystal occurred also in other diseases with mucous catarrh, in which at the time no peribronchial dyspnoea was present. Vagus on the other hand maintained that the dyspnoea was caused by those spiral.
formations causing obstruction of the bron-
chials. (Verhandl. d. Congr. f. inn. Medizin 1882)

Curschmann (Deutsch. Arch. f. klin. Med. Bd. 87. 1885) then saw Leyden's spirals
in a large number of cases of asthma.
He held with Léfèvre that they were the pro-
duct of a peculiar form of bronchitis,
causing dyspnoea by reflex irritation.
He thought asthma to be essentially a
neurasthenia of the Vagus. He looked upon
asthma, as a secondary affection, and
a bronchial spasm induced by the pre-
sence of these spirals. But Vierordt
(Berlin. klin. Wochenschr. 1883) pointed
out, that these spirals, are found in the
duodenum when no dyspnoea exists.

In connection with the consideration of
the pathological character of the duodenum,
it is very significant, that such illnesses
as measles, whooping cough, and infant-
nile bronchitis, when neglected or imperfectly treated, give rise to frequently to bron-
chial asthma in later years. This is
the frequent experience of so many phy-
sicians, because many of these infantile
illnesses, are treated without the help of a medical attendant. The cataract, in such cases left as a residuum in the alveoli or bronchioles forms a nidus for bacterial structures. These may either through their multiplication or chemical changes become a continued source of irritation influencing the mucous membrane and the nerve filaments of both vagus and sympathetic. The same danger is observed in long standing bronchitis, or when the disease is repeated in successive winters, if then the lungs are not carefully cleared of the cataractal exudation. The illness will be liable to become an asthmatic bronchitis. From this we can gather what an important rôle the sputum is playing in spasmodic asthma. M. A. Act. 52, was seen in Nov. 1889. She suffered from a severe attack of bronchitis, with copious, stringy sputum, congestion of the liver, headache, and furred tongue. There was no depression, and her health had always been good up to that time. Temp. 102.7 Fahr. Her recovery, which was effected in about three weeks, was considered very good. She was in good health, up till Dec. 1890, when another attack of bronchitis seized her. But as
yet without any dyspnoea. There was a complication of pleurisy on the left side in the axillary region and downwards, which made the cough very trying. Also emphysema became now apparent, and the stomach very troublesome. After a period of two months she made a fair recovery and remained so till in 91 in Jan. She had a severe attack of influenza, which led mostly to severe prostration and great cyanosis. Her lungs remained during this time quiescent, there was slight bronchitis, which could be kept in check. In the winter 1892, she had again very severe attack of bronchitis, which combined with the lesion left by the previous pleurisy, resulted in a fibrous form of Phthisis, aggravated with bronchial spasm and emphysema to still further weaken the action of the lung. The heart also became now feeble, and cyanosis became gradually more marked. During summer in 1892 she was able to rise every day for nearly 10 hours. By Nov. in 1892 she suddenly felt the old trouble of cough and asthma to return, which now lasted four months, before recovery set in, and that only partially. The history of the patient now resolved itself to a regular return of the Bronchial Asthma every winter during 1893, 1894, 1895, which usually lasted several months with varying severity.
The sputum was always copious, thin, clear, and inodorous, and never decomposed. The patient was always better during the warm months in summer. The last attack in 1895 was very severe, with great prostration and anaemic emaciation. The sputum was very tenacious and abundant. In March 1896 the abundant expectoration had resulted in severe haemorrhage from the lungs, which rapidly proved fatal.

Whatever part the diaphragm may play in the parotygal attacks, the observations made by many scientists with regard to this muscle do not seem very convincing.

Germain See (Diction de l'Étude de l'Homme, iii, 1865) maintained that the parotygan, consisted of three elements: bronchial circulation, stemness of the diaphragm, and emphysema. Considering the rare opportunities of witnessing a parotygal attack, it is difficult to ascertain what role the diaphragm plays. Some clinical cases may give colour to the theory of the diaphragm in spasm. A patient, C. G., aged 36, suffered from spastic colic attacks for many years. The parotygan usually occurred...
during the night. A principal feature of her ailment was persistent costiveness. When the patient felt that a paroxysm was about to come on, she was ordered to use a warm injection into the rectum, which invariably cut short, or prevented altogether, the attack; and the sense of fulness and tightness in the epigastric region and chest disappeared. Such an experience may lead one to suppose, that the diaphragm was implicated. In ascertaining the cause of bronchial asthma, it is natural that the nasal cavities should come in for a fair share of attention. It is well known, that polypi may cause the disease and upon the removal of such cause, the disease may be cured. (Valboli, Die Annwendung d. Salvantskautz, &c. 1871.)

But, as in other cases, polypi may exist without causing the existence of asthma. There must either be, a predisposition in the lungs to asthmatic affection, or else, the polypi acted as a foreign body, causing an inflammation in the mucous lining
which by continuation, may reach the bronchus and produce ultimately, catarhal exudation, leading to attacks of dyspnoea.


Weber observed, that attacks of dyspnoea were frequently ushered in by acute coryza, which was apparently not due to mechanical or chemical irritation. He therefore concluded, that the congestion arose from vasomotor disturbances, and that the process extended from the nose, to the ultimate ramifications of the bronchi.

Whatever may be the starting cause of such a coryza, it must evidently, rapidly spread into the bronchial mucous membrane, such as may occur, in a bacterial infection, similar to influenza, or the pollen infection, known as Hay fever, in its various forms. An exciting cause there must exist, for the production of the hyperaemic state of the mucous membrane. Cold air may be quite sufficient in certain states of health, to produce such an effect. — However, it would seem,
there are more cases of cough, some even with great swelling of the Schneiderian membrane, without any attacks of dyspnœa. Weber lays great stress on the supposition of a sudden frieufication of the bronchial mucous membrane. This frieufication is brought about by acute dilatation of its blood vessels, from nervous influences.

Sir Andrew Clark (International Journal of the Med. Sciences, Jan. 1881) says: "The paroxysms begin by a more or less diffused hyperaemic swelling of the bronchial mucous membrane, and are continued by the development at various parts thereof, of circumscribed congestive swellings, which come and go, with greater or less rapidity, resembling the skin in eczemia. The swellings, according to Clarke, become at first coated, with a viscid mucous, the vibrations of which give rise to the râbili and rhonchi at the end. They subside, and must take the place of dry râbles.

Professor Stith observed by means of the laryngoscope, an intensely congested
state of the trachea, and part of the right bronchus during the attack (Sithelmann, 1875.) Whatever important part the tympany, mentioned by Sir Andrew Clark, may have, in the causation of paroxysms, it is difficult to imagine that it should be the prime or even the sole cause of the attacks; for in conditions of oedema, and of acute inflammation of the bronchi, the embarrassment it causes is not very appreciable, as an attack of dyspnoea.

Professor Sardener, attributed to the normal functions of the bronchial muscles a decubestion action. By this he implies, that the bronchi, and especially the smaller bronchi, by slow vermicular or peristaltic contractions, impel back towards the pulmonary muscles. (Monthly Journal of Med. Science, 1850.) He further says, that in bronchial asthma, this function is deranged or suspended, and hence an accumulation of mucous results. "It is obvious," he observes, "that accumulation, must accompany the derangement of that action; just as constipation, is the invariable concomi
tant of the enolopurous derangement of colic
or ileus. In both cases, the peristalsis ceases
when normal action is restored, and in
general, there is in both, a copious discharge
of the previously retained evacuations.
whether the enology to given by Fairclough
receives some semblance of truth, in
clinical observation is not quite appar-
cent. Narcotics and Sedatives usually
alleviate these spasms, and are usually
most successful, when a free expectora-
tion is obtained, which thus would be
equivalent to the restored normal action
of the bronchial muscles, because the ex-
pectoration after that continues to be
comparatively normal and easy, for
a longer or shorter time.

The viscid and adhesive mucus, and
the underlying congestion, is supposed
by some, to be the cause of dry râles. But
some think, these râles, to be produced
by bronchial spasms.
Professor T. R. Fraser, found, that
after the administration of Nitrile of
Amyl or Nitro-Glycerine, the râles and
râles, were either lessened or re-
moved for a time (International Journal of Med. Sciences, Feb. 1868) From this he concluded "that the cause of these sounds cannot be interfered with by congestion of bloodvessels, or other results of inflammation, otherwise Vibriosis would increase rather than lessen, or suspend the sounds Adhesive mucus cannot frequently be expected, otherwise Vibriosis would not in so large a proportion of the observations have succeeded in producing complete silence." He further says, "the only explanation of the results of the observations that can reasonably be adopted, seems to be, that in bronchitis, though bronchial and sibilant are frequently produced, by contractions of the bronchial muscles, that dyspnea is produced, by the impeded movement of air, caused by these contractions, resulting from these contractions, and that both are removed by Vibriosis, because Vibriosis reduces the spasmodic contractions of the bronchial muscles." Now as it is a matter of clinical observation, that the rhonchi and sibilant rales, are louder and more
numeuros, when there is a larger amount of bronchial exudation, and that, in so-called dry or serous asthma, these sounds are more shifting and fainter, may therefore be due to deposits or adherent mucous over congested districts, as also, to contractions of the bronchial muscles.

Berhaut believes, that the dyspnoeal paroxysms are due to a transient stasis of the main bronchi, or even of the trachea, and that the function of breathing is undisturbed, so long, as only a limited number of tubes is obstructed. He says: "The distension is harmless, so to say, at its place of origin; and its presence, does not even betray itself by cough, which is not induced, by irritation of the surface of the bronchi. Gradually, however, the distension shrinks and undergoes other regressive changes, in consequence of which, it becomes detached from its matrix and is rendered movable. The plug now formed passes up to the main bronchi or else to the trachea. Having arrived here
the paroxysm begins, and ceases only when
the offending obstruction is got rid off. This
theory is not supported, by the facts ascertained
in ordinary clinical observations.
Often a severe attack of dyspnoea may
occur, and feel relieved, without any
appreciable amount of diminution
which would be the case, if the paroxysm
were due to the mechanical obstruction
of a larger or smaller plug of tenacious
mucus. Besides, the obstruction in the
trachea or bronchi would lead to inspiratory,
rather than expiratory difficulties,
as is the case in bronchial asthma.

In studying the observations on the
pathology of bronchial asthma, by so
many writers, one is struck with the
many divergent theories. It is difficult to formulate a definite concep-
tion of its pathology. So much how-
ever seems clear, that a spasmodic
constriction of the bronchial muscles
is an important factor in the production
of the paroxysm; yet not to the exclusion
of the fibrinous increases exudation, and
dalso to a general disturbance of the pulmo-
many nervous systems, which may act in a contrary direction, from the normal rhythm of respiration.

Anatomical facts are very scanty, on account of the protracted course, the illness usually assumes, and also, because of the rareness with which post mortem examinations occur in private practice. The few autopsies, that have been published, only show, that paracysternal alymphose may occur in connection with all conceivable diseases. In one case, of chronic bronchitis with asthma, an embolism of the pulmonary artery was found (Virchow: Gesam. Abhandl. 1 p. 356, 1856). In another case, a hypertrophied heart, covered with fat, and the venous membrane of the lungs was red and swollen (Phoebus, Der typische frühsommer Katarrh 1862 p. 69).

In most chronic cases, the heart seems to be hypertrophied and dilated. Other organs, as liver, kidneys, and spleen, may also be affected. There is usually more or less alveolar emphysema, sometimes induration in parts of the lungs, also products of exudation.
crowded with bacteria, which are usually Streptococci. — The essential feature of the pathological process on the respiratory surface, may be obtained, by the study of the pathological products. The epithelium would seem to be the starting point of the morbid action. The de-quarrated epithelium can be seen in the sputa, altered in shape; also stringy masses with the appearance of tubular casts.

Afterwards, there is a copious emigration of leucocytes present in the sputa, also fibrino-plastic masses accompanying the leucocytes. In this fibrino-plastic masses the leucocytes are disintegrated. Ultimately a hyaline fibrinous meshwork is formed, which is very adhesive at the base of the lung, but is rendered more soft, by glandular secretion in the larger bronchi, and so expectorated.

Whenever patients of this class, present all the characteristics of dyspnoea, such as; distention of the chest, diminished frequency of respiration, tympanitic resonance, prolonged expiration, sibilant ronchi; there is always the peculiar characteristic sputum present. But the sputum, being the product of
catarrhal or exudative inflammation requires several hours to form, so that the inflammatory state must be precedent to the paroxysmal dysphonia. The dyspnoea, paroxysms, and the exudative catarrh are both important factors of the disease. In the chronic form, they constitute the only manifestation of the trouble. But in the acute form which is the more typical, there is also visible, a constitutional disturbance and a severe irritation of the upper part of the respiratory tract, and often also there are cutaneous eruptions. These may be considered as prodromal symptoms, in the shape of colds, hay-fever, and vasomotor disturbances, which act as exciting causes. Their real meaning is the result of an inflammatory process, which most likely commences in the pharynx, travels upwards to the nose, and to the eyes; and downwards into the air-passage.

There is a tendency to a recurrence of the disease, which may be due to a peculiar predisposition in the nature of the patient. But also repeated attacks...
may increase the vulnerability of the tissues; the mucous membrane losing its power of reaction.

From what has proceeded, it becomes evident, that the formation of the exudative inflammation, is concerned in the production of the paroxysms, and that by way of a stenosis of the air-passages. The theory advanced by Curechmann (cf. cit.) that the Sputa cause irritation of the terminal fibres of the Vagus, and thus a bronchial contraction, is only partially true. The terminal fibres entering the muscles of the bronchioles are irritated, by the inflammatory process to cause contraction, and the Sputum, as accumulated product may embarrass the already narrowed lumen of the air-passages. To this must be added the transfiguration of the mucous membrane, caused by its hyperaemic condition. All these factors seem to prove a sufficient cause for the production of the paroxysmal dyspnoea.

The origin of Asthma is bathed in obscurity. The opportunities to observe
A case in its initial stage are very rare. When patients do come under observation, the malady is usually well established, that is to say, they have been asthmatic for a considerable time, and, as clinical history, must remain greatly in uncertainty as to the commencement of the illness. It has to content itself with the statement, that the patient had caught a cold, or that he may have been subject to hay-fever at one time; but in most cases, the onset can be assigned to an inflammation, that may be referred either to the pharynx, as sore throat, or to the nose, as an attack of conflux. In children, the pericarpion, may be traced to some inflammatory affection in the chest. Such is usually found, in a previous attack of measles, or whooping cough, or infantile convulsions. Their recovery in such cases was usually protracted, and the breathing may even then have been embarrassed; specially during the night. The general state of health may always have remained impaired, and may have shown signs of breathlessness, when unusually Auspicious.
themselves.

There is an acute form, which begins with great constitutional disturbance. There is a distinct rigor, with a temperature rising to 104° Fahr. There is headache, weariness, and aching limbs, with pain, between the shoulder blades. There is irritation in the throat, entering the ear, and the nose, followed by violent sneezing. Gradually the irritation is spreading downwards into the larynx and the bronchi. The face is puffy and the eyelids are baggy. Sometimes the lymphatic glands of the neck are enlarged. In many cases, there are various forms of cutaneous eruption. Occasionally there are herpes vesicles on the lips or on the whole face. Paraphymatous tonsillitis is frequently met; secured in children. On examination of the chest, there is hyperresonance, shallow breathing, and various kinds of rhonchi all over the thorax. Sometimes there is marked dullness of some parts of the back of the thorax. But by far the most
common cases, that come under notice are
of a chronic type.

Chronic Asthmas is distinguished by
a constant recurrence of dyspnoeal
paroxysms, which are generally of short
duration with intervals of more or less
complete freedom of respiration. The
respiration is restricted in its wants
and hence more shallow.—The
percuussion note remains unimpaired
or is but slightly tympanitic.

The attacks of dyspnnoea may be so
slight, as only to consist in a feeling
of constriction across the chest, or a heavy
load on it; threatening suffocation.
These sensations usually outside, by the
application of some remedy, inducing
cough and expectoration. The typical
paroxysms are a distressing and hard struggle
for breath. All the muscles of respiration
are engaged in obtaining an access of air.
The patient is bending forward, almost at
right angle, with the head supported and
the elbows resting on the knees. Often an
incessant cough, may torment the patient.
without making any impression upon
the obstacle, and copious frothy expecto-
tion, may bring us relief.

The nerves are in most cases affected
there is headache caused by disturbance
of the cerebral circulation, which is
greatly increased by cough. They are dis-
tressed at the thought of an impending
attack, and often fret.

The skin is flushed, and bathed in
perspiration, which often exposes them
to chills. In those, with a feeble heart,
the skin is cold and clammy, there is
profuse diaphoresis. The appetite com-
pletely fails, the patient is afraid, but
anything solid, might increase the
dyspnoea. The thirst is increased; the
mouth being dry and parched, owing
to the forced breathing, carried on through
it, and also because of the copious perspi-
ration. The tongue is usually furred.
The stomach becomes disfended, through
the sucking in of air, causing much dis-
comfort. Correction then greatly relieves.
There is constipation, nausea, and tendency
...vomiting.

the cardiac area, often cannot be made out, the impulse, may be distinct or imperceptible. The sounds of the heart, are generally feeble. Those on the right, rather louder, than those on the left, showing the tension in the pulmonary artery. There is often palpitation. The pulse often rises to a hundred and twenty per minute. The arterial tension is diminished, and the wave low.

Respiration is always noisy, with a wheezing at the largest. The chest is distended to its utmost limits in all directions. The diaphragm acts forcibly, descending with inspiration, and ascending with expiration. But the action of the diaphragm may be the exact opposite in violent cases. This condition lasts, until the obstruction is removed. The frequency of respiration is diminished, its average is between twelve and twenty in the minute.

Percussion reveals generally dullness of the upper, and always hyper-resonance of the lower lobes. This may vary on the few...
Sides. The dullness is mostly limited to the back, between the supraventricular fossae, and the angles of the scapulae. Auscultation sometimes, cannot discover any sound within the lungs, when nothing is heard, but largo nasal breathing. In other cases, the chest is full of resonous and sibilant sounds, the latter predominating. These signs rapidly change, their character and places. The whole may disappear and only vesicular breathing may be heard.

With regard to the Spurta, there is a great difference, varying with the attack. Short attacks, beside, on the expectation of a few greyish-white pellets which are usually transparent. Dyspnea, with catarhal affections in the larger tubes ends, with a large amount of thick, confluent, exceedingly tenacious sputum, of greyish-white colour. Again, in the acute form, there may be a copious, frothy and perfectly transparent fluid, containing yellowish white particles.
In long-standing cases, there are yellow, green, or greenish-yellow masses, with a tendency to confluence. The Sputum are odorous, and show no sign of decomposition.

During the interval of the attacks, respiration becomes freer, less noisy and quicker, and the distension of the chest gradually yields. The vesicular breathing is again audible, and the rhonchi diminish in number, and are mostly audible at the base. In the acute form, the improvement is not so marked, and intervals are much shorter. Within a few hours, a fresh attack may occur. The breathing remains shallow, and there is much exhaustion.

The attacks may come on by day or at night, at any hour; but there are no fixed intervals. There may be, however, premonitory signs, such as: Coryza, burning sensation in the soft palate, pain between the shoulder blades, profuse diuresis, or unusual diarrhoea.
In looking for a cause or causes that may predispose to this disease, one can easily detect certain constitutional defects, which are best studied, during the intervals. The patients are rarely well built, with well-developed muscles. They are often stunted, or very tall and slim, and all are in poor health. They are pale, of small stature and obese. The thorax is usually too small, and often deformed, and there are various deformities often in other parts of the body. The constitution of the asthmatic, in short, presents the result of bygone rickets. The state of their nutrition is likewise impaired. They have not sufficient power of resistance to injuries, and the process of repair is very imperfect. There is a want of vitality in their tissues, and hence, there is an increased liability to inflammatory changes, including the epithelial covering of the respiratory organs.

There is often an obturative form of an asthma, which is characteristic of asthma.
a large share of the disposition to the disease, may be assigned to this. While this anaemia lasts, it must favour the occurrence of fibrinous exudation.

There is always a certain amount of heredity in the predisposition to asthma, but the percentage is not very high, considering the great number of patients who suffer from this illness. Wanting illnesses on the part of a mother or father may be the cause of a debilitated constitution in the child, and so lay the foundation to an asthmatic disposition. If this happens, that asthma develops itself most frequently in childhood. It may occur in the earliest months of infancy. The infantile organism appears to be specially predisposed to fibrinous exudation. That is seen, when even in the purely catarrhal bronchitis of children, the sputa contain pseudo-membranes, which may account for the intensity of the attendant dyspnoea. Skin diseases are frequently associated with asthma. It is possible, that certain
Morbid principles in the blood, may affect the integuments of the lungs alternately, and produce a variety of symptoms. Clinical observation favours an alternation between them. It has been objected, that skin diseases occur in the cachectic by preference, and such patients are incidentally liable to asthma. It is possible, that bacteriological research may succeed in determining the fine relation between skin disease and asthma.

With regard to the exciting cause of asthma, it is possible, that bacteriology has given us, the most probable theory, that is to say, the progressive form of inflammation, starting in the pharynx, travellers upwards to the nose, and downward into the bronchi, as peculiar to bronchial asthma, is caused by a streptococcus. This microbe, has also been found in the eponymous exudations, in measles, whooping cough, and fibrinous bronchitis.

(The Rev. Roscoe, Med. 1885. and A. Frankel, Charité Annal. St. Jahrg.) There is a harmless form of the bacterium in the mouth in health. No distinction can be drawn between the saprophytic organism and the
Pathogenic one. But it is possible that the harmless variety may become toxic under certain circumstances. The same organism is seen in emphysema, which is a similar progressive form of inflammation as that seen in the mucous lining of the bronchi. From this it would seem that the harmless Streptococcus may become pathogenic in an injured lining and the more so in the constitution which is usually liable to asthma, because of its impaired tone and feeble power of resistance to any inflammatory lesion. In such patients, the fever is usually higher, the leucocytes usually abundant, which together form a favorable nidus for the culture and numerical increase of the Streptococcus.

Bronchial Cough is alleged to be caused by vegetable irritants, giving rise to hay-fever or hay asthmas. It is however observed, that the patients who are suffering from this affection, are usually anemic and liable to catch cold. If they have not actually a bronchial cough, they usually suffer from a hyperaemic and thickened Schneiderian
membrane, which may have been caused by repeated colds. As hay-fever usually occurs in summer, it may be that it is caused, by an excessive heat, dilating the vessels of the mucous membrane, and the streptococci, which may be present to a greater or less extent, cause an irritation in individuals, otherwise predisposed to asthmatic affection.

The same individuals, who profess to suffer from hay-fever during the summer, frequently suffer from conjuga during the winter. A patient, W. P., aged 56, complained of attacks of hay-fever every summer, when away where near fields of ripe corn. He suffered so severely then, that he went for every year, to escape the influence. He was ascetic, tall and with a narrow chest. For many years, he had been subject to attacks of conjuga during the winter, often accompanied by bronchitis. He also suffered from a very bleeding liver and habitual constipation. He presented in many respects a typical constitution, liable to asthmatic affection.
and the repeated chills or rigors, that he must have experienced, at the recurring attacks of coryza have produced in him a more or less permanent clearancement of the liver. His opinion as to the influence of the hay or cornfield producing attacks of coryza, seems fractionized and enigmatical.

Almost every asthmatic asserts that there are some places, where he is specially prone to suffer, and that there are others, where he is practically cured from his dyspnoea. They sometimes choose places, in which the air is decidedly unsuited for general health, but the asthmatic chooses such, as the most suitable for his wants. There are more ill-founded notions, which can usually be disregarded, when they come under treatment. It is no doubt that dry, balmy air is usually the best medium for these patients, as it is for all chest complaints.

Complications of one form or another are met with, in almost every case of asthma. There may be...
ideal lesions or functional derangements. There may be hyperplastic polyps and polyposis, or atrophic changes in the nasal mucous membrane. There may be diseases in the buccal or pharyngeal cavities; chronic oedema of the lungs.

Diseases of the lungs, such as bronchiectasis and emphysema. Compensatory pneumonitis; rapid phthisis.

Diseases of the heart, such as hypertrophy and dilatation of the right ventricle. Owing to an increase of pressure in the pulmonary artery from various causes, hypertrophy and dilatation is almost a constant cause of asthma. Ultimately there is cardiac weakness, as shown by the small pulse and cyanosis.

Disease of kidneys, gout and rheumatism. Various forms of skin disease, of which the most common complication is eczema, allied herpes vesicles and urticaria, and other itching forms accompanying asthma. Eczema and asthma are supposed to be alternate symptoms; if so, there must be a common cause, perhaps an imitation, set up by streptococcus.

The nervous system is in many cases found to be disturbed; there is often
in comme, and great frustration, or excitement; also frequent attacks of neuralgia, so much so, that neuralgia is considered to alternate with Asthma. There is often also palpitation.

The general nutrition is usually impaired. Owing to the obstructed character of the air passages, the breathing is shallow, and oxygenation is very imperfect, so that anaemia, and emaciation are the results.

With regard to the complication in the nervous system, and in the general nutrition, is there not an important connection between these and the chills or rigor which usually initiate the onset of the Asthma? — these chills are vaso-motor disturbances, clearing up both the nervous system and also acting on the circulatory system, causing a congestion of the liver among other adverse influences. It is this consideration, that causes me with a good deal of fear, to follow the labours of Acupuncture and also of Trouseau and somewhat more recently Sir Andrew Clark. This consideration has
led me, to adopt constitutional means of rectifying the disturbances in the system, as underlying the recurrent attacks, and which, on other grounds, seem hopelessly doomed, always to recur; so that the patient would seem to be a confirmed invalid; unless this constitutional disturbance is looked upon as a strong cause of predisposition in very many asthma, and at the same time is considered as requiring the removal as much as the bronchial spasm itself.

In diagnosis of bronchial asthma, the spueta must be considered very important. At intervals of attacks, there may be no spueta, and other signs may be imperfect; then the history of the case has to be relied on. The spasms in bronchial asthma are preceded by certain promonitory symptoms. There is an indication of inflammation in the respiratory mucous membrane for an indefinite period. There is a history of bronchitis, a liability to cold, or hay-fever. In children it may have been preceded by tonsilitis or any concomitant excitation.
Percussion and auscultation, in large number of cases, may give negative results. But then, there is the whole configuration: the anaemia and bimanual signs, that guide in some cases. In the great majority however, organic lesions are discernible, such as; catarrh, stenotic sounds in the eur-passages, and emphysema.

The physical signs, peculiar to bronchial asthama, may be observed or altered by various complications. — Insufficiency of cardiac muscles may be most common. — There may be moreover cyanosis, oedema of ankle, and adventitious heart sounds; and thus it may be referable to the circulatory system.

With regard to Prognosis, one has to distinguish, that there is an acute form, with hyperaemia, exudation and Transient stenosis; which may last only a few days. — When the illness lasts several weeks, then it assumes a paroxysmal character. Recovery from these is generally complete, and in the absence of complications respiration assumes a normal character.
In the chronic form, the disease may last for many years, and usually impairs the general health, more and more with the succession of every year, so that the patient is less able to resist the fresh attacks of colds, or other exciting causes. — But all this is in the main preventible, either by means of suitable remedies alone, or by combining them with proper change of air.

It is possible, that the predisposition, which in many is often hereditary and congenital, may not yield entirely. But the fact, that there is a constitution which predisposes to these attacks, must lead the physician, to examine the probable pathological aberration in that constitution, with a view of determining a possible cure, which might arrest the attacks altogether. This implies, that the tone of the system can be improved, either by the removal of such complication as might exist, or by the improvement of all these organic systems, as: nervous and circulatory systems, liver
haemopoetic and alimentary systems, to such an extent, as to restore them to their normal condition. — The very character of the fibrinous exudate in Asthma, indicates an impaired constitution, which underlies the trouble; and is the inherent seat of the disease. Hence the physician's task in grappling with the attacks of asthma, is only a small part of his efforts, in restoring his patient. His attention must be fixed on the constitutional liability, in order to carry victory over the disease. — This can be accomplished. It has been accomplished in very many cases; although the cases have been of many years standing. Some as long as twelve years and more, before they came under treatment. — In view of such experience in the result of constitutional treatment, the theories of such investigators as: Luschisso, Troussseau, Sir Andrew Clark, Professor Gardener, Professor Fraser.
are of great value. The physiological
epochs, which they enquire suggest,
are leading up to the pathological dis-
turbances, which confront the physi-
ocian, when dealing with the diagnostic
value of the remedies, which may
have proved successful.

From this, it must be gathered,
that bronchial asthma, is not merely
or essentially a spasm, the suppres-
sion of which, is so often held, to be
the main object of treatment. The
prevalent views of asthma and
its treatment, lead to serious
practical consequences. The life
of the patient is carried on, on a
lower scale; the tissue changes are
perverted, and instead of tending
to the preservation of the body, they
lead to degeneration of its compon-
ent elements. In later period of
life, when the tendency to regressive
metamorphosis is more or less normal
then the want of power to resist such
changes is marked, when brought on
by debilitating influences of a long-standing asthma.

Mr. M., aged 48, was suffering from chronic asthma for nine years. He was treated for the symptoms all the time, but he became so bad that he had to spend two or three months in his armchair, deerring the night. He was emaciated, very anaemic, also alimentary troubles set in. When seen in Nov. 1843, he was sitting up in his arm-chair propped up with pillows. Respiration was very laboured, and the cough troublesome. The attacks came on then every night. Within a fortnight the attacks were stopped entirely under suitable treatment — the cough also diminished and the exudation dried up. — The patient was then treated constitutionally, and recovered a fair amount of health. — The attacks remained in abeyance entirely. — But indigestion began to trouble him very much. In 1845, symptoms of cancer began to develop in the abdomen, which proved fatal in about two months' duration.
He had remained free from dyspneic attacks for over two years.

The prognosis as to life, chiefly depends upon the constitution of the patient, and upon the course of the disease. Complication of lesions in lung, heart, or kidneys render prospect of life critical.

A great deal can be done for asthmatic patients, if a rational treatment is adopted. Few are willing to submit to such a treatment, and often become impatient in carrying to an issue a constitutional restoration.

In course of private practice treatment affords the best and almost the only method, by means of which, the study of the disease can be carried out.

It is usually deemed protracted and intense for years; that advice is sought; and the suffering is usually so great, that relief must be adequate and speedy. Hence being confronted with the paroxysmal stage of the disease, and having arrived at the conclusion, by means of differential diag-
noses, that the spasm is that of bronchial
asthma. It is now important to employ
means, that shall be suitable to the
case in hand. The two factors, most con-
cerned in the production of the spasm
are, the contraction of the bronchial
muscles, and the fibrinuous, adherent
exudation. These have to be relieved
at once. Chloral hydrate is a power-
ful remedy; it acts as a sedative on
the nerves and general; and at the same
time is powerful in dissolving the
tenacity of the exudation \( \text{(vide supra}
American Therapeutics, 573) \). The doses
of chloral hydrate, have by preference
never been used in large doses. Ten
to fifteen grains at the utmost. It is
superior to any other sedative in these
cases, but has never been used by itself.
If the case is complicated with alimentary
troubles, so that neither food nor medicine
is easily borne on the stomach; then Peps-
ismuth, and ammon. chlorid are combined
with it. With impaired digestion, the
following mixture has been found useful
\begin{verbatim}
By ammon chlorid
Pepsismuth Subt. ä. à
Choral Hydrate
Semeigne Fréq.
Cyanum ad
\end{verbatim}
\qquad \frac{2}{3} à
\frac{2}{3} à
If the difficulty in breathing is very serious, subcutaneous injection of chloroform, or inhalation of Nitrite of Amyl, or Nitroglycerine can be resorted to, to allay the immediate distress of severe spasms.

In most cases the bowels require to be acted on, with a suitable purgative. When there is a great deal of bronchial obstruction from accumulated phlegm, and if digestion is fairly well, a stronger expectorant is recommended, especially to clear the lungs as speedily as possible, from the corrosive stimulation. Such remedy may include, besides Chloral Hydrate, also Tinct. Lob. Ether, and Carb. Amyl

A prescription of this nature has been exceedingly useful in long standing cases, with severe bronchitics.

\[ \text{Rx} \]

Cannnon Chlorid. \[ \frac{3}{8} \]
Cannnon Carb. \[ \frac{3}{8} \]
Chloral Hydrate \[ \frac{3}{8} \]
\[ \text{Tinct. Lobelina Ether} \]
\[ \text{Great Uceas} \]
\[ \text{Glycerin at } \frac{3}{14} \]
\[ \text{Eq. } \frac{3}{7} \text{ in water, when the cough, or breathing in Troubles.} \]

Tinct. of Lobelia, has been greatly objected to of late. (Dufreeder Beunnet, de L'Anse, chez les enfants et de son traitement par la Painture de Lobelia Inflata) and others
But two things have to be considered. It must only be used for adults, as all the above-mentioned remedies are only used for adults; it must be the ethereal tincture and it must be given with Carbonate of Ammonia. There may be however, even adult patients, whom it may not suit. In children, especially in infants, it is medicine is safer, nor more efficacious in its spasmodic attacks, as Theca, cocana. This may be made up as mixture, with little Potas Bromid and Tinct Camph. Co., along with glycerin.

And if the bronchi are much obstructed and cough rather feebles, a slight emetic in the form of Pulv Theca Ver in doses of grains 13 or 14, once or twice daily, till the breathing is normal. This has always proved very efficacious and prevented very severe feebles, if given early in the degeneration of the infant. — Celsus in children, the bronchi have to be kept open.

The smoking of Tobacco and Cigarettes is quite useless and really harmful as also are brought with great mischief the various inhalations of burning paper.
and powders. These fuming practices have been greatly condemned by eminent authorities. The opinion is that they do a great deal of harm to the nerve filaments in the mucous lining, by their irritating and debilitating influence on those nerves. — Besides the effect of these inhalations, in relieving is only transient, and in cases, where the bronchial obstruction is considerably they are powerless. It is the experience that no cure can be established, if the patient persists in using these powders or cigarettes, or even nitre paper for fumigation. — Partly, because the patient resort to these continually, and so keep up the irritation of the nerves to a stage of complete exhaustion and also, because the tone of the constitution, specially of the nerves, is lowered by these means.

If the heart is implicated in the dyspnoea, nitrates of Amyl or Nitro-glycerin, or Caffeine are of great service, as is shown in the following case. Klein, in T.B. act. 45, suffered in 1857, from very severe attacks of bronchial asthma, had also a very feeble heart.
There was consolidation at the base of the left lung, with severe and painful symptoms in that region, but the feeling of constriction spread upwards to the apex of the lungs. All remedies were useless in her case, with the exception of nitro-glycerine, which had a very remarkable effect on the dyspnoea and pain.

When the paroxysms are over, then an important stage has arrived, in the course of a rational treatment. It is important now to attend to a constitutional or tonic improvement, according to the variety of the predisposing causes. The main attention must be paid to the lungs, till they are quite free from the affection. For this attainment, suitable expectorants are required. Those given above, can be confirmed, either in the same form, or altered according to different requirements. — After the attacks the patient will require rest, and stimulants, these should be freely given in various forms. Careful dieting is also necessary. The anaemia, which usually exists in such patients, cannot be treated
successfully by the ordinary methods for anaemia. It has been found practicable and met with great success in large number of cases, who had no return of their attacks, by taking into consideration the nervous system, the haemopoetic system, and circulatory system. Hence a remedy, that will act on all these parts, has been found very suitable in most cases, where only tonic treatment was indicated:

\[\begin{align*}
&7\text{g} \text{ Ferri et Quiniae cit.} \\
&\text{Ammum Chlorid.} - 3\frac{1}{2} \\
&\text{Ext. Tarax. tig.} - 3\frac{1}{2} \\
&Tinct. Rhei Lom. - 3\frac{1}{2} \\
&Tinct. Chloroform. - 3\frac{1}{2} \\
&\text{Inf. Cinchonae ad } \frac{1}{3} \\
&\text{eq. } 3\frac{1}{2} \text{ t. i. d. l. i. e. et. aq.}
\end{align*}\]

This medicine can be either varied or another prescription made, according to lesion to be treated.

When possible and advisable a suitable climatic change is of great benefit in complete restoration. But this is purely on the grounds, that fresh
exhilarating and mild air, will always prove beneficial to the respiratory organs and the system in general.

The complications have to be treated, according to their indications, especially prominent will always be the heart, which will demand its own treatment, mostly stimulating and absorvent. From, Digital, Strophanthin, Bellad. Nat. Vom. Pot. Noce. and Cal. Carbon, may be required, at one time or another for its treatment.

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