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James Mackay
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Thesis
on
Pneumonia
by
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3rd April 1859
Pneumonia — гр. πνευμωνία — Peripneumonia περιπνευμωνία — Pneumonitis, Pulmonitis are names given to inflammation of the Parenchyma of the lungs. Two kinds of inflammation of the chest had been distinguished by the earlier Physicians; one Pneumonia or Peripneumonia affecting the lungs, the other Pleurisy affecting chiefly the lining membrane named the pleura.

This distinction has been more or less adopted by all systematic writers and nosologists.

In the nosology of Savages Pleurisy is referred to the head of Membranous inflammations (Phlegmasiae Membranacea) and Pneumonia to Parenchymatous inflammations (Phlegmasiae Parenchymatæ). The same distinctions are observed by Sagar and Vogel, namely of separating the two diseases into that of Pleuritis and Peripneumonia.

Cullen was the first nosologist who departed from this method of distinguishing the two diseases from each other, believing that had any difference existed.
existed that it was too refined for practical purposes, and he consequently fixed on the term Pneumonia, or Pneumonic inflammation to denote all inflammatory affections of the chest, whether of the lungs, or their lining membrane; and then distinguished the genus into two species, Pneumonia, Peripneumonia, or inflammation of the lungs, and Pneumonia-pleuritis or pleurisy.

Bulldo also deemed it probable that inflammation of the substance of the lung never existed alone, but that all acute inflammations began in membranous parts, and that inflammation of the lungs commenced in the pleura. He was led to this supposition by the result of post mortem examinations which always showed marks of the disease in that tissue. But it seems to be very doubtful if any acute inflammation of the lungs, or any disease which has been called Peripneumonia be of that kind. It seems probable that every acute inflammation
begins in membranous parts, and in every
dissection of persons dead of pleurisy
the external membrane of the lungs, or some
part of the pleura has appeared to have
been considerably affected" (Gullen Pract.
Med.)
so that the account of this disease as
given by Gullen is rather a description of
Purpura pneumonia, than pneumonia properly
so called).

The pathological views of Gullen
were long followed by almost all
British writers on the subject. Baillie
in his morbid Anatomy says that in
inflammation of the substance of the lungs,
the symptoms correspond a good deal with
those of pleurisy. Indeed inflammation
of the lungs is almost constantly attended
with inflammation of the pleura, so that
it is difficult to discriminate between them
in practice. But he says that "when
inflammation of the lungs is pure, the
pleura being not affected the pain in the
chest has been observed to be more obtuse
that in pleurisy, and the pulse to be less
Haller and Morgagni had also pointed out by their dissections that the substance of the lung may be inflamed without any affection of its investing membrane.

The precise seat of true pneumonia has been variously stated by different authors, some maintaining that the air vesicles and minute branches, others again consider it to be in the interstitial cellular texture between these, while a third opinion supposes it to occupy all these indiscriminately. Andral considers pneumonia as consisting essentially in inflammation of the air cells, the internal surface of which secretes at first a mucous, and then a purulent fluid. Dr. Williams states that the pleura of capillary vessels rather than any distinguishable texture is the essential seat of pulmonary inflammation and in support of this view he says: "In a case of this kind, which we have recently seen we cannot but recognize in this carmified state of the lung, the uniform non-granular hepatalization"
hepatisation, which we have described as that in which the interstitial pleura and tissues are the only seat of the inflammation and this variety of consolidation which is arrested or restrained by the pressure of pleuritic effusion appears to be another proof that the essential seat of pneumonia is not in the air cells." — Dr. Craigie supposes that pneumonia inflammation most frequently comes on as a bronchial affection, or follows the symptoms of neglected bronchial inflammation; hence he concludes that the disease has its seat in the minute extremities of the bronchial tubes. He gives as another proof of this view that in the congestive stage of this disease no crepitant rattle is heard; "and why the chief symptom indicating the presence of this stage is the short, checked inspiration, and the absence of vesicular or minute bronchial respiration." —

Most generally however it occupies the whole of the tissues which form the pulmonary parenchyma, including the smaller bronchial
bronchial tubes, the air cells, the intercellular tissue, and vascular ramifications. The pleura covering the diseased portion of lung is very frequently involved, and when it is thus limited it has not received any distinctive name.

When large portions of the pleura are involved the disease receives the name of pleuro-pneumonia.

The inflammation usually attacks the lower lobes of the lung whilst the upper part may be comparatively sound. The right side is much oftener affected than the left. Inflammation may take place in one or both lungs, hence the terms of single and double pneumonia. Of two hundred and ten cases of pneumonia, one hundred and twenty one were in the right lung, fifty eight in the left, twenty five double and six not ascertained.

Pneumonia when superimposing on other diseases has received the name of secondary, but when associated with a low or typhoid condition of the system - typhoid pneumonia;
Deaths occurring in England from Pneumonia during the years 1851 - 52 - 53 - 54
Deaths from Pneumonia 22001 21421 24078 23323
" all causes 395369 407135 421077 437905
The proportion of deaths from Pneumonia to every 1000 deaths from all causes for
1852 - 53 - 54
53.494 58.181 64.421
Proportion of deaths from Pneumonia to every 1000 persons living.
1852 - 53 - 54
1.196 1.331 1.280

From the Registrar General's Reports
And when with bilious disorders whether dependent on simple derangement of the liver, or upon a bilious fever - bilious pneumonia.

The disease may be of long or short duration, or acute or chronic.

Pneumonia, says Dr. Stokes, when it has a tendency to become epidemic very often attacks the upper lobes of the lung, "thus during the summer of 1833 a great number of cases of this description occurred in the Meath Hospital. The disease was in almost all cases of the typhoid character and in the adult male subject. I have seen it however in females, and not infrequently in children, in whom it is often mistaken for phthisis. In eighty cases of pneumonia, Andral found fifty-seven of the lower lobe, thirty of the upper, and eleven in which the whole lung was engaged. I think this proportion much greater than what occurs in this country."

Anatomical
1st. Anatomical characters—corresponding to the first stage of the disease.—Sanguineous congestion. When a portion of the lungs is inflamed its spongy structure appears to be redder than usual. This condition is due to enlargement of the capillary vessels which ramify on the cells of the lungs, and also to the stagnation of red corpuscles in them. The enlargement of capillary vessels is due both to the state of the blood and to the vessels themselves.

The lung excretes under pressure, though somewhat less than in the healthy state, and exudes a bloody turbid and frothy serum where pneumonia; it also retains the impression of the fingers, and is less tenacious, but more compact than in health. The cells are not as yet completely obliterated, but still retain a quantity of air which causes the lung to float in water.

This stage of the disease may be very much resembled by the mechanical congestion which takes place after death, but may be distinguished from it by being of a redder hue.
hence which is due to the fine capillary vessels being enlarged and filled with blood, and the softening greater. The position of the congestion may sometimes aid in the distinction, although not usually, as it is chiefly the lower lobes of the lungs that are affected by the disease.

If the disease is arrested in this stage, the lungs again resume their healthy functions and appearance, and if not, it passes into that of fully developed inflammation.

A stage of the disease preceding that of the congestive, has been described by Dr. Stokes as follows, "the pulmonary tissue is dull than usual, not at all engorged as in Laennec's first stage, and of a bright vermilion colour from minute arterial injection. I have found this condition in the upper portions of the lungs, in the middle and lower parts of which Laennec's first and second stages existed. It is obvious that this appearance will be but rarely met with, as a more advanced stage occurs before death; and it is often obscured".
obscured by cadaveric congestion."

Anatomical characters—corresponding to second stage of the disease—that of fully developed inflammation: the red hepatization of Lazzicée, and the red softening of sialial.

The lung in this stage of the disease is very characteristic, by being of a deep red—reddish brown, or grey colour. It is inelastic to the touch, and no longer crepitates under pressure. It has the density and consistence of liver, and will no longer float in water. Its friability is still greater than in the first stage, and if a portion be pressed between the fingers, it is reduced to a red homogeneous pulp.

When cut into, the lung bears a very striking resemblance to liver—it does not yield bubbles of air, but when pressed, a reddish fluid oozes from it in small quantity. When the cut surfaces are exposed to the light, it has a matted granular appearance, which is said to be due to the air cells being filled with fibrous concretions. Lazzicée considers...
this granular appearance as a distinguishing anatomical character of inflammations of the lungs, by which it may be distinguished from tubercular obstructions.

Andral was of opinion that incrumen consisted essentially of inflammation of the air cells which secretes a viscid mucous, and the exsudant fluid which accumulating so as to fill their cavities produces the granular appearance.

Andral's opinion is greatly corroborated by an experiment of Louis— he says "that if we throw an injection gently into the bronchi we find the lungs marked by an infinity of small masses which when divided afford precisely the granular aspect of this organ in a state of hepatisation". Dr. Williams ascribes this matted appearance to the deposition of lymph in the air vesicles, and he supposed that the absence of the granular appearance was owing to the inflammation occurring in the intervesicular tissue, which he named intervesicular pneumonia. This form of
the disease has also been named Inter-
lobular Pneumonia.

In hepatisation, the lungs have the appearance of being enlarged, which has been pointed out by Lassene to be due to the inability of the lung to contract on the admission of air when the chest is laid open, as in the sound state of that viscus.

As the disease advances to what has been termed the third stage, the lung becomes of a yellowish pale or straw colour and less firm. It is at this period that the hepatised lung attains its greatest degree of solidity.

Anatomical characters corresponding to the third stage of the disease, viz., that of suppuration, dry hepatisation of Lassene and grey softening of Andral-naw named Incipient Infiltration, which consists of diffuse suppuration of the pulmary tissue. In this stage of the disease the lung gradually changes the red hue for a yellowish or pale straw colour.
colour, but still retaining the red colour at some parts, and has not as yet lost its hardness or granular appearance, the suppuration being confined to a few points; these points gradually coalesce into one uniform appearance.

If the lung be cut into on this early stage of suppuration no matter how, because the strength of the tissue is still sufficient to retain it, but on the application of a moderate degree of pressure it is almost wholly reduced to a purulent fluid with only shreds of the solid tissue remaining. A very slight degree of force is sometimes sufficient, such as the handling of the tissue in its examination a cavity is produced which gradually fills with pus, which might be easily mistaken for abscesses, which is an exceedingly rare result of pulmonary inflammation.

Not infrequently however abscesses are met with in the lungs after death from injuries or severe surgical operations. Abscesses of the lung have sometimes been found untreated.
unattended by any marks of inflammation—
the matter being seceded in some other
part of the system, and deposited there.
It often follows serious inflammation—
The abscesses are small, circumscribed,
and full of pus, the tissue of the ad-
jacent lung being quite crepitant. They
are thus described by Baille in his
morbid Anatomy, "I have sometimes seen
a number of small abscesses interspersed
through the lungs, each of which was
not larger than a pea. The pus in these
is rather thicker than what arises from
common inflammation, and resembles
serofulose pus. It is probable that these
abscesses have been produced by a
number of small scattered tubercles
taking on the process of suppuration.
The lungs immediately surrounding these
abscesses are often of a perfectly healthy
structure; none of the cells being closed
up by adhesions"—

The purulent deposits that are
sometimes met with in the lungs of
patients
patients who have died after surgical operations, wounds are generally present the
circumscribed character.

Abscesses of the neighbouring parts, the
pleural cavity between the adhering lobes of
the lung in the mediastinum, Liver, &c., some-
times open into the lungs and form cavities
in its substance, enlarged bronchial tubes
filled with pus and tuberculous vomica
seem sometimes to have been mistaken for
abscesses.

Chomel states that during a period
of twenty five years he had only seen three,
and Laennec says "one of the best proofs
which I can give of rarity of abscess of
the lung is derived from this fact, that
notwithstanding the zeal with which morbid
anatomy has been cultivated in France during
the last twenty years, I know only of two
well authenticated instances of this affection,
besides those above mentioned." The testimony
of Braessais is also very strong on this point,
he says "If ulceration of the lungs without
tubercles were common, we should meet
with
with it in the military service more frequently than any where else, since during winter in climates moderately cold, there is not one patient out of fifty in the hospitals in whom the lungs are not more or less inflamed, and very few of these in whom on examination after death, the lungs are not found indurated. Now although I have never once omitted to examine, I never met with a case of ulceration without tubercles but once, and in this case the inflammation was produced by a musket ball lodged in the lungs for six years."

But though true pneumonic abscess is rarely observed after death, there is reason to believe that it is more common in cases which recover, Laennée says, "In the course of the year 1823, I met with more than twenty cases of partial suppuration which terminated in abscess, all these patients afforded distinct precordialism and an evident cavernous rattle in the place of the excavation; and
from these and other signs to be noticed shortly, although I had an opportunity of proving my diagnosis by dissection in two cases only, the rest being all cured, I can affirm the existence of abscess in the others with equal certainty.

When the greater part of the lungs are hepatized, the patient dies before the tissues break down, so as to form abscess, but when the lung is affected only in small portions there is generally time for this result. Hence abscesses are more apt to occur when the hepatization is moderate than when it is extensive, and hence too, recoveries not uncommonly take place.

Gangrene of the lung is a rare consequence of inflammation. According to Laennec it can scarcely be considered as a termination of pulmonary inflammation. He says, "It would seem in most cases, to approach the nature of the idiopathic gangrene, such as the anthrax, malignant purule
just like ye; diseases in which the inflammation surrounding the gangrenous spot seems to be rather the effect than the cause of the sputa cles. It has however been fully proved that gangrene of the lung does occasionally follow inflammation of the organ, although as in the case of abscess it sometimes occurs independently of it.

A gangrenous condition of the lung is described by Homel, of those who have been exposed to the effluvia of cesspools or sewers.

The appearances found after death are of two kinds - the one named diffuse gangrene of the lungs, the other cir-

Uncircumscribed gangrene - This form of gangrene occupies generally the greater part of one lobe, and occasionally the whole of one lung. It is irregular in its figure and outline. The substance of the lung is converted into a soft, pulpy, dark-coloured matter, and when handled falls into a pulvaceous mass, emitting a very
very offensive odour. This mass does not terminate abruptly in healthy lung, but is soft and infiltrated with a dark coloured serous liquid. The part of the lungs most usually affected are the middle lobes.

In the second form, or that which is circumscribed, is said to be a result only of the chronic form of inflammation, and caused by the obstruction to the circulation which chronic inflammation sometimes produces. The appearances are a dark coloured hard patch varying in size and shape, bounded by healthy lung, and not unusually by a distinct reddened circle of capillary vessels.

The three different stages of pneumonia inflammation are very often united in various ways. Mr. Bristole found in an examination of forty cases of pneumonia in the adult:

In 3 cases the first and third stages of pneumonia existed.

In 16 cases the second and third stages of pneumonia existed.

In 2 cases all three stages existed.

In 1 case lung was in the second stage only.

In 8 cases lung was in the third stage. Thus
Thus one lung may be in the third stage of inflammation throughout its whole extent, while in the other some parts are only affected in the first or second degree. Frequently the three conditions are found in the same lung, thus in the middle part of a congested lung, some spots of red hepatization may occur, and in the midst of the latter, some spots of grey hepatization being in the centre. In this way the transition from the first to the second stage is indicated by a red tissue around it and the congestion on the border of the latter. The bounding lines are not always accurately defined, but fall gradually into each other.

The pathology of these different stages consists first in the engorgement of the vessels with blood, and in the air cells being partially filled with a bloody seromucous effusion; in the second an effusion of plastic lymph filling up the air cells as well as the intercellular tissue; and in the third, a purulent fluid has taken the place of the plastic secretion.
The bronchial tubes, both the larger and smaller are almost always inflamed. It has been stated that pneumonia inflammation very generally comes up as a bronchial affection, or follows the symptoms of neglected bronchial inflammation.

The Pleuræ is very frequently, but not always inflamed on the diseased portion of the lung. Bulloz states that "the term pleurisy might with propriety be applied to every case of the disease, and has been very improperly limited to that of inflammation which begins in, and chiefly affects the pleurae eæstalis". So also Baéllie in his morbid anatomy says "Inflammation of the substance of the lung I believe seldom takes place without some similar affection of the pleura, at least in the instances which I have seen; this has been most frequently the case". That inflammation of the substance of the lungs takes place without affection of the pleura has been now aboudantly proved.

Coagulable lymph is often thrown out
on the surface of the pleura, forming a false membrane, causing adhesions between the two opposite surfaces. In the cases in which the inflammation of the pleura is extensive the disease is named pleurisy.

Pneumonia very generally attacks the right lung, more frequently than the left. Of fourteen hundred and thirty cases collected by M. Brissolle from different sources, double pneumonia occurred in about eighteen per cent of the whole—those of the left side about thirty per cent, and those of the right side about thirty-two per cent.

In secondary pneumonia the opposite sides appear to be about equally affected.

Lobular Pneumonia—This variety of pneumonia occurs almost exclusively in children below six years of age, and is comparatively rare in adults. The inflammation occupies distinct spots which are surrounded by healthy tissue. These
defined spots may occupy one or more lobules, abruptly surrounded by interlobular tissue, or they may be gradually diffused into the surrounding parenchyma, so that their exact boundaries cannot be precisely defined; or they may finally coalesce and thus form one continuous mass of inflammation as in the common lobary form of the disease.

Of these three forms of pneumonia, the last two are the most frequent, but the whole three forms may be combined in the same patient.

The patches of inflammation are found to be exceedingly diversified in size, shape, position and number. They may vary in size from a millet seed to that of an egg, and in number from one to forty or more in the same lung. They are rarely confined to one lung, generally extending to both occupying the posterior part of the lung. Occurring in red patches they form a contrast with the healthy tissue, giving the cut surface of the lung a mottled appearance. They do not
collapse when opposed to atmospheric pressure, and in consequence have a more prominent appearance than the neighbouring tissue. They also have a firm feel under the pressure of the hand. The same stages are present as in lobar pneumonia, namely that of congestion, parenchymation, and suppuration.

Abcesses are a frequent consequence of this variety of the disease. which has been supposed to be in consequence of the small extent of the inflamed patches; they occur singly, sometimes run together, and generally have a tendency to approach the surface; and are sometimes found communicating with the neighbouring cavities and bronchi. These abscesses are generally found, but to occupy one lung although they may be found in both.

It has been shown that this condition of the lung may exist without the superinfection of inflammation; and what has been taken in many instances for tubular...
lobular pneumonia is not a true hepatisation, but a consolidation of the lobule such as exists in the fatal state, and that this consolidation may be altogether independent of inflammation. These consolidated portions in the hepatised lung may be expanded by insufflation. This condition of the lung though not necessarily connected with inflammation is often developed under the influence of catarrh.

The same facts have been pointed out by Dr. Gardiner in relation to the lungs of adults, he says, "as regards the pathological nature of the pseudo-pneumonia condensation, it may be said that they all depend upon collapse of the pulmonary air cells in connection with some degree of obstruction of the bronchi. This obstruction may be arising to an increase of the secretion from the mucous membrane, or as is frequently the case in old and enfeebled persons to an imperfect eversion of the ordinary mucous which accumulates chiefly in the branches near
near the root and central parts of the lung. In the latter case the resulting disease is totally devoid of an inflammatory or febrile character, and is found to be developed with an intensity proportionate to the debility of the patient.

When on the contrary the bronchial secretion is increased and altered in character, a certain degree of febrile excitement may attend the disease, the amount of which is usually proportionate to the inflammatory character of the affection, and the amount of active treatment required. In some of the acute forms of pulmonary collapse acute oedema or even true pneumonic infiltration of the pulmonary tissue may supervene, giving rise to a complicated type of disease, which is of course attended by many of the symptoms of pneumonia. Such cases are according to my experience very common in connection with purulent infection after operations, and in the secondary inflammation after erysipelas or mumps fever." British and Foreign
Diphtheria Pneumonia - This term is used when pneumonia is associated with low adynamia fever, in consequence of the constitution having been depressed by some debilitating influence, and differs remarkably from the common type of pneumonia in many of its phenomena. The lungs in such cases are found to be engorged with dark blood, particularly their posterior portions. The texture is very soft and easily broken, and when pressed yields a dark and purulent blood, and yields none of the plastic secretion which gives firmness to the ordinary hepatisation.

This disease sometimes scarcely surpasses the stage of congestion. The blood always remaining liquid; in some parts of the texture occasionally an imperfect suppuration seems to exist, which is indicated by the softening appearing to be of a lighter colour.

Syptoms
Symptoms, Course and Terminations.

The disease very generally sets in with rigors, and is accompanied with the other symptoms of ptyalism, and is always attended with a cough which is more or less urgent, and as the commencement is generally dry, unless when the disease has-supervened on cataract or bronchitis. As the disease advances, the expectoration becomes more abundant which consists of a rusty colored viscid tenacious sputum that has been considered pathognomonic of the disease. There is high fever with flushed face. The cheeks are often covered with red or livid patches, and the whole countenance is oppressive of anxiety and distress. The eyes injected, the respirations hurried, the pulse frequent, full, and hard; thirst, furred tongue, anorexia, pain in the head and limbs.

Pain when present is dull and localized chiefly in the back part of the right lung, with a sense of weight and oppression rarely acute unless the disease...
disease involves the pleura, which has been shown by Portal to be a mistake. He cites cases in which, after severe and urgent pain of the side was felt, the substance of the lung was found to be affected only. The pain is evanescent, disappearing at the end of the first week usually, subsiding on the expiration of expectoration. In the secondary form of pneumonia the disease generally begins obscurely without any pain, or cough, the disease being distinguishable only by the physical signs, hurried respiration and great prostration of bodily strength. Pneumonia often assumes this obscure form when complicated with cerebral disease.

Cough—frequent and short, not spasmodic, but voluntarily suppressed from dread of pain.

Expectoration—at the beginning of the disease expectoratorv, is scanty, (distinguishing the disease from catarh) extremely, vivid, transparent; the first portions like gelatinous in consistence, rarely colourless.
generally lushed with blood, or pus, containing little, or no air, and sinking in water. In the later stages of the disease the sputum may become orange coloured. The colours seem to depend chiefly on the various proportions of blood, pus and carbonaceous particles, little fibrinous masses are seen, which appear under the microscope to be fibrinous casts of the air cells.

Respiration—shortness or quickness of breathing is also an early symptom of the disease. The number of the respirations may be increased, from sixteen, or twenty in a minute. The average standard of health is thirty, fifty, or even sixty. There is always a feeling of oppression, aggravated by muscular efforts, and particularly speaking. In some cases where the attack has been sudden, or has supervened on previous disease of the lungs, or heart the dyspnoea is more urgent, necessitating the patient to assume a particular attitude, which is commonly on the back, with the shoulders elevated.
Fever goes along with this disease to an intense degree, varies in type from the most obtuse to asthmatic. The fever is generally preceded by rigors, and is an essential character of the disease; it is a fever which admits secondary complications (cerebral, gastric, bilious &c.). The face is very often flushed, the eyes suffused; the flush is that of imperfectly articulated blood and consequently dark; the pulse is frequent, full and hard at the commencement and small and soft towards the termination. The termination when unfavorable is attended by colliquative sweats exhaustion and collapse.

Hemoptysis is rarely present in those of a previous sound constitution. The blood in pneumonia is buffy, the fibrine rising from three parts in the one thousand to as high as ten parts in the one thousand.

The tongue is rarely clean or natural, generally deeply coated, and after a few days dry and cracked.

The alvine evacuations are not necessarily much altered, unless by the medicine, which
which have been administered - sometimes there is a tendency to diarrhoea, and unless critical, is a grave complication.

The urine is scanty, particularly in the watery part, high coloured; the solids are also found to be deficient particularly the chlorides and urea. The solids are increased over 1000 of the watery part of the urine, but diminished from the normal amount in the twenty four hours.

Physical signs - corresponding to the first stage of the disease - congestion, expectorating rales are present, although not always in a pure form, often mixed up with the bubbling rale of bronchitis, in consequence of the inflammation having extended to the bronchiole or having superimposed bronchitis.

The expectorating rale is most distinct during inspiration, and they may be made very distinct when they otherwise appear to be absent by desiring the patient to take a full breath. In other parts of the chest the respiration is quickened - there is at first, ...
but very slightly marked dullness on percussion. As the disease advances to the second stage the expectorating rale disappears, the respiratory murmurs having previously disappeared; either no sound is heard, or only that of bronchial respiration, which is considered all of the characteristic signs of hepatization.

With regard to bronchial respiration, Dr. Stokes says "that it requires for its production not merely the solidity of the lung, but a certain expansion of the side during respiration. Thus we find that if the whole lung becomes solid, the bronchial respiration ceases, the side is fixed, an evident result of the new expansion of the lung."

In some cases during the transition of congestion into hepatization, before the latter condition is fully established, the expectorating rale and bronchial respiration are mingled together. Or, unusually however, while the bronchial sound is heard in one part, expectoration is audible in another, which is usually on the boundaries of the inflammation."
When the consolidation of the lung is complete the sound of the voice may be heard over a considerable extent, and so loudly, as to resemble pectoriloquy, for which it is sometimes mistaken. The bronchophony of a consolidated lung may, in most cases, be distinguished by its being extended over a considerable space, which is not the case with the pectoriloquy of a cavity. The vocal resonance is transmitted to the walls of the chest in vibrations which may be distinctly felt by placing the hand over the affected part.

Instead of the slight dulness on percussion observed in the first stage it is much augmented and sometimes even perfect flatness in the parts most hepatized.

In the third stage (that of suppuration) there are no physical signs by which this stage can be diagnosed, until part of the lung breaks down, and the pus is expelled, a humid crackle or gurgling expiration will then be heard.

When pneumonia terminates in abscess the signs are the same as those of tubercular excavations.
Termination of pneumonia. - Should the disease yield to treatment in the congestive stage, as it sometimes does, the convalescence may take place at very variable periods from the second to the fourth day. It has been stated that termination by resolution has taken place as late as the fourteenth day: the expectoration becomes more copious and assumes the character of ordinary mucus, the pain disappears - the other febrile symptoms gradually diminish, and convalescence may be established in a few days. A fatal result very rarely takes place in this stage of the disease.

But in the great majority of cases this stage is followed by that of consolidation which takes place generally the second or third day after the first attack. The accession of the second stage is indicated by the greater frequency of the respiration, the countenance becoming more livid, and the pain being often decreased.

If the disease goes on unchecked, suppuration
suppuration becomes established, constituting the third stage of the disease; when the dyspnoea is increased, so that the patient is compelled to assume an elevated posture; the pain disappears, the expectoration becomes purulent, the countenance pallid, and the lips cyanide, the skin is bathed with cold clammy sweat; there is an increase of mucus in the trachea, and the patient dies exhausted, asphyxiated, or comatose.

It has been questioned whether any recoveries take place from the stage of diffuse suppuration.

The termination of pneumonia or gangrene is very rare, Laennec says, "It can scarcely be assigned among the terminations of pulmonary inflammation, and still less can it be considered as the consequence of its intensity, since we find in cases of this kind the inflammatory characters very slightly marked, as well in regard to the symptoms as of the engorgement of the pulmonary substance."
Diagnosis - The general symptoms of pneumonia when all placed together are in general quite sufficient to distinguish this disease from all others. The diseases with which pneumonia are most liable to be confounded are bronchitis, pleurisy, certain stages of phthisis pulmonalis, and pulmonary oedema.

It is with the cases of bronchitis or rhinitis, to the minute ramifications of the bronchi that the greatest resemblance to pneumonia is presented; but may be distinguished by the expiration which is finer and more equal than that of bronchitis, and the pain being situated in the upper and anterior part of the chest toward the sternum in bronchitis. The spurt in pneumonia is tinged uniformly through and through with blood, whereas in bronchitis it is merely streaked with blood, and in the latter disease it is much more copious when once established. The skin is hotter and less livid than in severe bronchitis; the cough and dyspnoea being in general not so urgent.
There is no binaural inspiration or resonance, and the respiratory murmur is very seldom absent, dullness on percussion slight. The two diseases are not unfrequently embued, the pneumonia accompanying on the emphysema. From pleurisy pneumonia may be distinguished in the first stage by the crepitation and expectoration; and in the second, by the bronchophony and by the absence of any sign of displacement of the walls bounding the lungs, and by the percussion not being altered by any change of posture. From pulmonary oedema and phthisis, by their history and general symptoms which will in most cases be a sufficient guide to distinguish them.

Prognosis.

In cases of simple uncomplicated pneumonia occupying only a portion, or a single lung, occurring in a patient of a previously sound constitution, there is every chance of a favourable termination. The circumstances which chiefly affect
affect the prognosis are the stages of the inflammation; its complications with other diseases, and the antecedent history of the patient. An early and copious mucous expectoration, the sudden cessation changing for a mucous sputum; a free diaphoresis, diarrhöea when critical; the urine depositing a sediment; and the presence of the chlorides; the respiration being diminished in frequency, are all considered as favourable signs.

The age of the patient bears an important relation to the prognosis. The disease being very rarely fatal when occurring between the ages of 6 and 10 years. Of forty cases between these ages observed by Dr. Berhard and M. Ruff at the hospital for children at Paris one case only terminated fatally.

Unfavourable—the disease extending beyond the fourteenth day, occurring in old and debilitated persons, or very young children, and in those of a broken and laboured constitution—the breathing rapid and
laborious, violent symptoms of fever, and delirium; or those of typhus fever with low delirium, or coma; stupor; sudden cessation of the expectoration, with increased urgency of cough, or the expectorated matter tinged with blood of a dark, or black colour, coldness of the extremities, restlessness and facilitation, irregularity of pulse, the symptoms indicating suffocation, or suffocation.

The pneumonic inflammation extending to both lungs is frequently fatal in the first stage of the disease; inflammation attacking the upper lobes, and the roots of the lungs.

The complications of pneumonia with other diseases generally increases its danger, being very often fatal when supervening on the various forms of fever, or measles, scarlatina, smallpox, and in those of the gouty diathesis. Pneumonia taking place after severe burns, surgical operations, etc, is almost always fatal.
Pleurisy - Remote and predisposing.

The previous occurrence of the disease seems to be one of the most futile predisposing cause of pneumonia. A case is recorded by Dr. Rush, in which the disease occurred as often as twenty eight times. The sanguineous temperament; a vigorous and phlegmatic habit, winter and spring seasons, a peculiar state of atmosphere; great debility and privation, such as of the poor inhabitants of large towns. 

It has been said that the disease occurs chiefly in adult age, and in the male sex, which may be accounted for by their more frequent exposure to vicissitudes of temperature in our show employment. The following statement is made by Mr. Boulard on the liability of the different ages to this disease. He says, that out of fifty six individuals affected with pneumonia, twenty eight were from from thirty to thirty years of age, nine from thirty to forty; eleven from forty to fifty; and eight from fifty to sixty. While an
another occasion out of one hundred and thirty-four patients, thirty-eight were from fifteen to thirty years of age; thirty-four from thirty to forty; thirty-four from forty-five to sixty; and thirty-eight above sixty. Children are not admitted into the la Charite hospital. But respecting the great prevalence of this disease in infancy, the testimony of M. Guerison, Physician to the hospital de la Charite, he says that "three fifths of the children that die in the hospitals between birth and the conclusion of the first dentition, die of pneumonia chiefly in a latent state." In regard to the frequency of pneumonia in children, the above statement appears to be greatly exaggerated, as a sufficient distinction not having been drawn between the cases of true pneumonia and collapse of the lung, which was formerly so frequently mistaken for that disease.

The influence of cold in producing a liability to inflammation of the lungs is
is sufficiently proved by the greater number of cases occurring during the winter, and more especially the spring season. But of ninety cases occurring in the wards of M. Blondel in the la Charité during a period of five years, M. Louis states that eight of them occurred between February and August, and only sixteen in the remaining five months. The frequency of the disease in the spring months is also proved by the returns of the Registrar General's Reports.

The number of deaths occurring from pneumonia in London during the different seasons for the years 1850-51-52-53-54 were as follows:

<table>
<thead>
<tr>
<th>Quarter ending 31st March</th>
<th>1850</th>
<th>1851</th>
<th>1852</th>
<th>1853</th>
<th>1854</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of deaths</td>
<td>1011</td>
<td>1244</td>
<td>908</td>
<td>1083</td>
<td>1118</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quarter ending 30th June</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of deaths</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quarter ending 30th September</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of deaths</td>
</tr>
</tbody>
</table>

Coping
Exciting—all the common causes of inflammation; changes of temperature, more especially if they have been sudden and long continued. Lamee observes on this point that the cold long continued or applied when the body is only moderately heated, and covered with perspiration is a much more powerful cause of pneumonia than when cold succeeds to an excessive heat, and is not long continued. "The Russian who rolls himself in the snow, after coming out of the hot bath, or the bakers who go from their heated ovens almost naked, into an atmosphere of a temperature below zero, are not liable to attacks of this disease; while the porters whose occupation lead them to stand for a length of time at the corners of the streets are frequently affected by it."

Irritative affection of the voice—The inhalation of irritating vapours, asphyxiating gases, the action of some poisons to these may be added other affections of
of the lungs such as bronchitis, hooping cough, pulmonary apoplexy, and especially tubercular deposits, diseases of the heart, the exanthematous and continued fevers, and sometimes traumatic fever, particularly those supervening on severe injuries and surgical operations. As a proof that noxious exhalations gives rise to pneumonia, it is stated that the disease is very prevalent, as to be considered endemic in the neighbourhood of Mount Vesuvius.

Treatment.

The treatment to be adopted in pneumonia must vary with the different stages and types of the disease. We may thus consider first, the treatment belonging to the acute form of idiopathic pneumonia distinguishing it by the different stages, and next that of the various forms which the disease sometimes assumes. In the first stage of idiopathic pneumonia, the treatment must be directed to the subjugation, or arrest of the acute inflammatory symptoms.
and it is principally at this time that
our curative efforts are most effectual,
in changing the characters of the disease.
In the opinion of all ancient and most
modern writers blood letting is the first
and most efficient remedy. There are a few
Physicians of the present day who object
to its use under any circumstances, and so
far from admitting the efficacy of blood
letting as an antiphlogistic, believe that
it tends rather to retard recovery by
inducing debility, and lowering the conserva-
tive efforts of the system. Their argu-
ment for the entire exclusion of blood
letting rests principally on the fact that
the mortality is lessened with the diminished
frequency and the lessened amount of blood
taken. While the advocates for blood letting
admit that its employment in cases of
pneumonia cannot now be carried to such
an extent as formerly, they believe that
this difference depends in a great measure
on a change of type in the disease.
Mr. Alison from his own experience shows
that pneumonia is now of a less acute, and inflammatory character than it formerly was, and consequently is less tolerant of active depurating remedies. There is no reason for supposing a disease such as pneumonia must have been of the same essential nature in all ages. New diseases appear under different forms at different times, and such variations do not depend on any circumstances connected with the human body, but on modifications in the external causes of disease, and on conditions of the atmosphere, and other agents in nature, which exercise a powerful influence over the operations going on in the animal economy, whether normal, or abnormal. Although the external causes of inflammation may be the same under all circumstances, we must not conclude that the course and symptoms of that disease must also necessarily be invariable. For the modifying influences already mentioned are always at work; besides it is certain that pneumonia is something more than inflammation.
It prevails more extensively at one season than at another, without any appreciable increase in the force or efficiency of those agents which are recognised as exciting causes. It is attended by a fever variable in its character, under circumstances independent of the previous bodily condition of the patient. Different methods of treatment must therefore be necessary at different times; and it is reasonable to conclude that the practice of blood letting may have been tolerated to a much greater extent in the former types of this disease than it is at present. Without entering into this argument we may now consider the treatment generally adopted in this stage.

Blood letting is most beneficial in those cases which present acute inflammatory symptoms, and more especially when the constitution of the patient is robust and plethoric; if added to these conditions, there be considerable dyspnoea, and a general sense of oppression a fuel
and copious depletion may be expected to produce effectual relief.

No certain rule can be generally applicable to which blood letting may be carried. This is to be estimated more by the effect produced than by the actual quantity of blood withdrawn. The most marked relief will often follow the first bleeding, but if the inflammatory symptoms return sometime afterward it must be immediately repeated, and in some cases three or four successive bleedings are required to subdue the violence of the disease. Blood letting is most effectual at the commencement of the disease, and if resorted to at this time an amount of depletion often suffices to control the symptoms, which would scarcely affect them at a subsequent period. Tartarized antimony has long been recognised as a remedy of great efficiency in all pectoral complaints. Its use in acute pneumonia is generally regarded as subsidiary to blood letting.
but there are some cases in which it may be advantageously substituted for it, and in which our principal dependence is to be placed on its efficacy. When blood letting has been primarily resorted to, its application should be immediately followed by tincture emetic in nauseating doses, repeated every two or three hours, according to the severity of the case: it is used in the same way in cases where blood letting has not preceded it, and it is in such cases that its efficacy in subduing inflammation has been most clearly recognized. It may be given in doses of four half a grain to two grains alone, or combined with opium. It is better to give it alone however, as long as its operation is unattended with vomiting or purging; in the latter case much doses of opium tend to arrest these morbid and effects, and quick the irritation of the system. Nothing is known with certainty as to its mode of operation, but it has been
observed that its salutary effects are most apparent when unattended with much nausea, vomiting or diarrhoea. 

Although mercury is often given in this stage combined with opium, its beneficial effects are not so speedily produced, as those of tartar emetic; it acts more gradually, and does not affect the system like its use has been persisted in for some time. It is therefore more adapted to the less active forms of the disease and to the second stage. When given, it should be in all cases combined with opium, as the object of its administration is not to produce purging but exert its special antiphlogistic action upon the system by absorption into the blood. For this purpose from nine to twelve grains of calomel may be given after the first bleeding, and if it be desirable to clear the intestinal canal this first dose may be given alone, and if necessary increased. Subsequent doses of from nine to twelve grains, with a grain
or a grain and a half of opium, and the same of ipecacuanha given three or four times a day till the gums are affeeted, will generally be found sufficient in the mose acute cases. If there be a tendency to diarrhoea the Hydr. can extract may be substituted for opium. Local bleeding and blisters are not generally applicable in this stage.

In the second stage our chief efforts must be directed to the removal of the dyspepsia, and for this purpose the most efficient remedies are counter irritation, cupping over the chest, and the administration of mercuric, combined with opium. The mercurial injection is sometimes of great benefit, both from its counter irritant and special antiphlogistic effects. Expectorants are indicated if the products of inflammation are already beginning to soften and have a tendency to be eliminated in this way.

In the third or suppuration stage our main reliance is to be placed on
such remedies as stimulate the system, and support it under its present state of exhaustion. Of stimulant remedies we may use Carbamate of ammonia, tincture of lobelia, ether, and Camphor, in decoction of senega or wine, or hot spirits and water. The diet must be nourishing, and adapted to the feeble condition of the digestive organs. If from the putrid odour of the breath, and the appearance of the matter expectorated we have reason to suspect the presence of gangrene, our stimulant and nutritive treatment must be more energetically applied; but in cases where from the persistence, or recurrence of inflammatory symptoms, we have reason to believe that the gangrene is circumscript or mild, antiphlogistic measures may be cautiously combined.

Globular or Infantile Pneumonia.
There is nothing so peculiar in this form of pneumonia as to call for a different plan of treatment. The same principles must
must guide us as in the pneumonia in the adult, and our chief reliance must be placed in the same remedies, viz., depletion, calomel, and tartar emetic. — Continental Physicians are opposed to the abstraction of blood in cases of infantile pneumonia, they assert that it invariably debilitates the system and accelerates the patient's death. — This opinion is founded on observation of the secondary pneumonias which occur in the children's hospital at Paris. — In directing the treatment it is necessary to pay particular attention to the origin of the disease and the strength of the patient. — Pneumonia occurring in a healthy robust child of two years of age, from two to four ounces of blood may be abstracted with advantage, providing that faintness does not come on previously. — In very young children leeches may be substituted for general blood letting. — Tartar emetic may be employed with the same advantage as in the adult. —
in the atypical form of the disease, given in doses of one eighth of a grain every two hours, and continued for a period of twenty-four or thirty-six hours. Calomel is also an invaluable remedy.

The secondary forms of pneumonia occurring in children whose debility forms one of its most prominent characteristics, a stimulating plan of treatment is called for along with tonics—


Earb. Amm. assafoetida—along with nutritious diet, where hectic symptoms appear, the sulphate of quina may be advantageously given.

Typhoid Pneumonia—Blood letting in this form of the disease is usually inadmissible, and it appears to have little or no influence in controlling the disease; besides the depressing influence of the emulsion renders such a mode of treatment unarrangeable. If the dyspnoea be very urgent, considerable advantage may be derived from dry cupping, and counter irritation by means
of blisters and sinapisms, with a nourishing but non stimulating diet. The principal remedies in this form of the disease is tonics combined with cur- emulcent if the debility be very great. If tonics the chimee bark seems to be the most useful.