AN INAUGURAL DISSERTATION,
on
Pneumonia

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BY
By R. W. Shimer

OF
Tennessee.
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CHARLES W. SMITH,
BOOKSELLER AND STATIONER,
NASHVILLE, TENN.
To

W. H. Bowling M. D.,
Professor of the institutes of medicine, and the practice of medicine, in the university of Nashville, &c. &c. Equally esteemed as a philanthropist, profound scholar, and destitute, teacher, of the different branches of medicine, assigned to his chair, the following treatise on pneumonia, is respectfully inscribed, as an evidence, of the highest regard for his untiring, and skillful, teaching in the teachings of medical science.

By his friend, and disciple,

The Author.
writing upon a subject which has engaged
the minds of the most wise of ancients as well
as modern writers, it will not be expected that
one who is as limited, as the author of the present
Treatise, is, both in a theoretical and clinical
point of view, will be able to elucidate with
the same force, and elegance, the phenomena of
pneumonia, or inflammation, of the lungs The
subject of the present consideration. Notwithstanding

The humbleness of the author, he prides in knowing
that it is his privilege, as well as others to give
his views upon the important subject however
full those views may be. Before entering
upon a discussion of the pathology of the lungs,
their Anatomical, and Physiological Structure
should first be briefly considered. The lungs are
two in number, and are divided or separated from
each other by the mediastinum, and heart. They
fill up the remaining portion of the cavity of
the thorax, not occupied by the heart mediastinum.
Oesophagus, Bloodvessels, and Trachea. The lungs are of a soft sponge-like texture; each lung is divided into lobes, the right into three, the third being intermediate in size and situation. The left is divided into but two lobes. The lungs are united by means of the bronchial tubes, pulmonary vessels, and trachea, to each other and as it were suspended by these organs; they have also an attachment to the diaphragm, by means of a fold of the pleura, by these attachments the lungs are kept in their proper position.

When the lungs are in their natural situation, they present somewhat a conical appearance, the apex above, and the base which is cut off from before backwards and from above downwards and resting on the diaphragm. The lungs are always in apposition with the cavity of the thorax, consequently they are more conical or less conical in proportion to the
Form of the Cavity of the Thorax. The volume of the lungs is likewise various, being always in accordance with that of thorax, and heart.

The office of the lungs is that of arterializing the blood, by bringing in contact with the venous blood of the capillaries of the lungs, air by means of which the venous blood is rendered fit for the sustenance of life, as the lungs vary in size, so will the quantity of air received into them in a given time vary in the same proportion, it follows therefore that different individuals will inhale different quantities of air—Those having well-formed lungs will inhale more in a given time, than those whose lungs are comparatively smaller in volume. The lungs are different in size and form — the left is narrower and longer than the right lung; the cause of this difference is owing to the liver (which is situated in the right hypochondriac region).
prevent the descent of the diaphragm, as low in this as in the left—pericardial region. The internal surface of the lung is convex especially the posterior part, and is covered with a serous membrane (the pleura) which lines the inner cavity of the thorax. The proper function of which is to secrete serum by means of which the parietes of the thorax and surface of the lungs are lubricated, thus the organs are enabled to move upon the surrounding parts with ease. The inner surface of the lung is slightly concave particularly that of the left lung. This is caused in part by the pericardium and mediastinum, against which the inner surface of the organs rest. The anterior and inferior portions of the lungs are thin and sharp; the inferior part of the left organ is excavated for the reception of the heart which is always
Exposed at this part even at the fullest distension of the air-cells. The base of the lungs rests upon the diaphragm, and is somewhat concave; the concavity corresponds with the convexity of the diaphragm. The affer ascend between the scaleni muscles, trachea, and last cervical vertebra; this portion of the organ is narrower and somewhat rounder. If the patient be in the recumbent position at the time of the examination, it will be found on drawing a line vertical to the clavicle, there will be a portion of the affer of the lungs varying from a half inch to two inches in length, exterior to the clavicle. This is rather a deviation from the natural extent of the organ, but is of sufficient occurrence to render its knowledge of importance to the practitioner of medicine.
The portion of the lungs, called by anatomists, the root, is composed of the bronchiae, pulmonary artery, and veins. Their vessels are enclosed in a membrane which is continued over them from the mediastinum, and extended from them to the lungs. There are four veins and one artery, and these are so arranged that the artery is above, the veins below, and the bronchiae between and behind them. This should be born in mind, as acknowledgment of this fact is of great utility in forming a diagnosis, as will be seen when we come to this part of our subject. The division of the trachea into the two branches called the bronchiae takes place behind the aorta opposite the third dorsal vertebra. The branches are separated from each other at nearly right angles, their inclination is toward the inner surface of the lungs.
The right tube is longer but shorter than the left; its direction is nearly horizontally outwards, and enters the corresponding organ on a line with the fourth dorsal vertebra. The left branch is about an inch longer than the right and extends more obliquely outwards consequently extends somewhat lower than the former before it reaches the lung of the same side. When these tubes have arrived at their place of destination they divide into other smaller branches. The right into three the left into two. These again divide into other branches. The division is thus continued until the tubes are so small as not to be perceptible to the naked eye. The blood vessels are terminated in the capillaries of the lungs. It is of this minute ramification of the bronchial tubes and pulmonary vessels that the parenchymatous substance of the lungs
is composed. The color of the lungs is various, different in the same individual at different periods of life, also in disease. The lungs of the foetus are of a uniform tawnyish red, after the organs have performed the function of respiration they acquire a slight florid completion which continues through the period of childhood, at the age of puberty they are of a greyish red, and so on in proportion of time they appear streaked with red and in some instances quite black in their aspect. This last appearance should not be lost sight of as a want of such intelligence might lead to error—in a postmortem examination clasping a healthy lung of such an appearance with one which had been in a state of inflammation. The consistence of the lungs like the color is various in different individuals—
And at different sounds of life and according to the death the individual had died, give the foetus the lungs are firm dense and hard resembling somewhat liver but after they have performed the function of respiration they become soft flexible and elastic air bubbles may be infused out of them. When cut will exfunicate distinctly on being thrown into water they will float on its surface. The texture of the lungs is such that it is not easy to tear them asunder. There is a difference in the natural sound in respiration between the two lungs which difference is in consequence of the inequality in the size of the caliber of the bronchial tubes the right being nearly double that of the left side and where there is no such sound to be heard. The lungs are suffused with lymphatic nerves and blood vessels. But as our intention is only to give an outline of the anatomy of
The lungs as a guide in forming a correct diagnosis by means of auscultation and percussion. Two of the best modes of detecting the extent and situation of the disease. We shall not give a minute description of the organs under consideration; let what has been said suffice, as a general description of the lungs and their offices in a healthy state. But before we leave this part of our subject it will be well enough to give the sounds of the lungs in respiration in health. The air as it enters into the pulmonary passages produces a peculiar sound which is called the respiratory or vesicular murmur. When heard in the minute vessels of the organs. This sound is somewhat soft and crisper, not unlike salt when thrown upon hot coals of fire. In other situations the sound is more dry and unattended with crepitation which occurs in the expansion of the air vessels.
This is the bronchial respiration. This sound is very different in different individuals and at various periods of life, yet it is remarkably strong in children so much so that it has received the name of pediatric respiration. This gradually diminishes towards puberty and is comparatively falls in old age. All of the sounds are influenced by the chest consequently due allowance should be made for this while engaged in examining a patient laboring under pneumonia. With this imperfect description of the structure and functions of the lungs in healthy condition we come next to speak of their pathological appearance in acute inflammation. Pneumonia or inflammation of the lungs is a disease of no recent date as it is spoken of by the oldest authors of nosology, neither is it a disease of any particular country or vicinity its range being as extensive as the globe itself or at least as far...
as the population of man extends nor is it confined to a particular season of the year as it may occur at any period, but the time it makes its greatest inroads is during the months of January, February, March, and April, in the two latter of which there is generally the greatest mortality. Though not confined to any particular section of country, pneumonia more frequently occurs in low, damp situations or where the temperature of the atmosphere is frequently changing from one grade to another than in parts which are dry and the atmosphere temperate and regular. Pneumonia may be regarded as a dangerous disease rarely failing to cut short the lives of many of them who are so unfortunate as to be attacked by it, yet many recover or are said to recover from pneumonia inflammation but the fact is perhaps will authenticated that no one
is so fully exempt from a subsequent attack as before. Persons who have once been affected with pneumonia may therefore be considered as being more liable to its attacks than if they had never suffered from such disease. Questions have been raised with regard to the precise part of the lungs that is first affected by inflammation, but there can be no doubt that all the tissues composing the substance of the lungs in the part affected are involved in inflammation. It is therefore important that we should find the precise part of the organ which is affected by inflammation and its extent. The inflammation may be very slight, extending over a small surface or it may involve only one lobe when the inflammation is thus limited it is called lobular inflammation. The whole lung and even both lungs may be involved in the progress of
The disease but this is seldom the case for
the life of the patient would be destroyed
before the inflammation could have
advanced this far. There are three conditions
of the lungs corresponding to different stages
and degrees which are very constant and
well-marked attendances. The first condition
is that of engorgement. The portion of lung
inflamed is engorged with blood and bloody
serum, it is of a dark red color especially
and the respiration is less than that of
the sound lung. When pressed there is a
presence of more fluid than air in the
Capillaries. It is indurated and heavier
than usual indentations made upon
its substance remain in some degree
and when divided by an incision the
edges of the engorged part are red in appearance
and a large quantity of bloody serum will-
generally a little from the edges of the divided portion. This is a brief description of the first stage of pneumonia which appearance has by some authors been called "fibrinization from the analogy of the lung at this period of inflammation to the spleen. When the disease has advanced as far as this, the organ becomes more altered in structure. The red appearance as in the first form is still present but the crepitation on speaking the substance of the lung is no longer to be heard. This doubtless is owing to the exclusion of air from the capillaries which is evident from the readiness with which a segment of the organ will sink if dropped in water. This would not be the case if the segment contained air. The divided surface is sometimes variegated in appearance being red mottled or variegated owing to the interlobular tissue and the black matter of the lungs being interrupted.
The organ has lost its springy texture. It has become more solid and weighty. If the organ be cut, the cut surface will be of a liver-like appearance, and from this circumstance this form of the disease has been by most authors termed hepatisation. If the substance of the lung be now divided and subjected to pressure, there will flow out a fluid containing streaks of purulent matter, showing the approach of suppuration. The hepatised lung is more elastic. Its texture is more friable than before, and is more easily crushed upon pressure. This results from the softening of the tissue which holds the substance of the lungs together. As no air is contained in the part of the lung which is hepatised, it follows therefore that if the whole organ were thus affected, that it would not collapse if the thorax were opened but would appear to be-
enlarged in bulk in consequence of the engorged state of the vessels with blood, serum, and lymph which is in the interstices as well as the vessels of the lungs and being retained in them and enlarged on sudden appearance of the lungs is thereby produced as in case of inflammation of other parts of the body sometimes the lungs become so enlarged as to press with such force against the parietes of the thorax as to leave in them the indentations of the ribs. When the lungs are enlarged as just stated they are frequently very soft and jellyy having changed from the liver-like consistence to this jellyy mass on the further advancement of the disease the dull and engorged state of the lungs will remain as in the second stage but the color has changed to a reddish gray or straw color there are small granulations which-
are white or grayish. The organs are still more brittle and rotten than before. At this period of the disease the lungs are full of purulent matter which if the substance of the lung be cut will ooze out plentifully. The more the lungs are engorged with this fluid the more soft they become and if crushed between the thumb and fingers they become as soft pulp resembling very nearly the fluid just described being a little more consistent of a cavity be formed by gently pressing the finger into the spongy pulmonary structure it will soon fill up with pus thus giving the appearance of a recently formed abscess for which it might be mistaken. (Though perhaps abscesses are not of as frequent occurrence in pneumonia as was formerly supposed) The occurrence of gangrene is perhaps equally as frequent.
high authority among modern pathologists. To the contrary notwithstanding, it is
of gangrene of being of frequent occurrence in the termination of pneumonia. When
gangrene does result from pneumonia the part affected is of a dark olive or greenish-
brown color; the part is moist and wet—its consistency is generally soft and
attended with a very offensive odor. So far we have been considering more
particularly pneumonia in a general sense. But both organs are perhaps
seldom affected at the same time and the entire organs never the inflammation
as already mentioned may be in a particular
part, like one lung, and has through all the degrees above mentioned without
spreading, but this is not generally the case.

For the inflammation continues to extend over a greater surface if not arrested—
until the whole lung is involved in inflammation if the life of the patient is not destroyed before the inflammation shall have advanced so far from Andrews's account pneumonia is rarely in both sides at once, and the lung most dangerous to the disease is the right. Other authors say the left lung. Whether one lung is more disposed to suffer from such inflammation than the other and which of either we are not able to say but are disposed to believe that both lungs are equally prone to such inflammation but are seldom affected at the same time. According to Laennec's statement there is considerable difference in the portion of the lungs as regards their liability to inflammation. The lower lobes being more liable than the upper lobes, the inflammation beginning in the lower lobes and extending upwards.
of this fact is of great importance in making a diagnosis as well as in the treatment of the case. Pneumonia is invariably accompanied with bronchitis the mucous membrane of the bronchial tubes is inflamed throughout all its branches that are in the inflamed lobe of the lung. This is sympathetic bronchitis dependant upon inflammation of the parenchymatous structure of the lungs. Bronchitis may exist without pneumonia but the latter never does exist without more or less affection of the bronchial tubes. The same is true in regard to the pleura the investing membrane of the lungs. There may be inflammation of the pleura without the substance of the lung being involved in it. But if the substance of the lung be the seat of inflammation there will also be inflammation of the pleura attending it. This is the fact in a majority of cases but—
There may be some cases of pneumonia without apparent inflammation of the pleura but it is highly probable that such cases are of rare occurrence. We come in the next place to speak of some of the means by which we are able to learn the degree and extent of the inflammation. Of all the means afforded us percussion and auscultation are the best together with the appearance of the patient if the can be applied to the chest over the inflamed part of the lungs and the digits in the incipient stage there will be a peculiar crackling sound heard which has been compared (by Watson) to the crackling of salt when thrown on hot coals of fire (by Andrade) to the rumbling of friction. This sound is known by different names as crepitation pneumonia minute crepitation the crackling of pneumonia etc. This crackling sound may be heard in a very limited spot in the
Beginning of inflammation. This is a sign of vast importance as by it we are able to know that inflammation is set up and are therefore able in the outset to use the proper precautions to prevent the advancement of the inflammation but if inflammation continues to advance the healthy murmur is destroyed or the sound is not heard. But if the forerun of the disease is arrested the healthy murmur again resumes its normal sound when this is the case it indicates the resolution of the inflammation. But the crackling may cease and no sound be heard at all. This indicates to us that the disease is still advancing or already arrived at the period of itsSatiation. When the lung is saturated it prevents the air from passing into the smaller tubes but permits it to pass into the bronchies and larger tubes of the bronchies in consequence of which there is a
different sound produced which may be detected by the application of the ear over the part affected. This is called the bronchial respiration and is compared to the sound produced by moving through a pipe. If the patient be made to speak at this time and the ear of the auscultator is applied at the same time to the chest there will be quite a difference in the sound of the voice compared with the healthy sound. This sound is compared to the voice of one speaking through a tube. The sound is more apparent when the inflammation is in a portion of the lung in which the bronchial tubes are large or entirely disengaged. When the lung is so specialized as to obstruct the caliber of the bronchial tubes and thereby destroy the sound, when bronchial respiration is present there is also dullness on percussion.

The part over the seat of disease—
This dullness will of course vary in proportion to the part and extent of the affected lung of the inferior part of the organ or the seat of disease. There will be but little if any dullness of sound, but if the seat be in the superior part of the organ or where the bronchial tubes are large the dullness will be considerable. The sound will also vary in accordance with the surface of the lung that is affected of the surface in a position with the parietes of the thorax. In the seat of disease, the dull sound will be audible but if the part be more remote the dullness of sound will be less audible. The period when no sound is heard but the bronchial respiration, is termed the critical one. That is whether the organ will gradually return to the healthy state or whether it is passing into the third stage or that of fumidant infiltration. If the termination be a favorable one there—
stage is doubtful. The general symptoms
of pneumonia are febrile excitement suls
frequent and vibrating, respiration
hurried, thin hot and dry secretions are
diminished tongue dry and generally
furred sometimes dark, great thirst.
The local symptoms are pain in the chest
more especially in the seat of inflammation
general shivering followed by increase of
heat and frequent fits of difficult respiration
ough which is augmented on a deep
inspiration. The expectoration tinged with
blood of tough phlegm like consistency
adhering to the sides and bottom of the
vessel in which it is expectorated. These
may be regarded as signs indicating
pneumonia, but they are not without exciting
for many be absent or there may be more
present and yet the inflammation may
be greater in every case one of the most—
Important practical signs is the presence of dyspnoea. If this be considerable the patient appears to take no notice of what is going on about him but occupies his whole time in respiring his articulations are difficult, countenance pale, or livid, nostrils dilated, delirium is also frequently present. When all these symptoms are present, that we have mentioned, the patient seldom recovers. The symptoms vary and some are frequently wanting entirely. The cough in sepsis affords but little information. The spueta attendant on the cough constitutes one of the most certain indications of the presence of sepsis. When this spueta is well marked it is of a must color. The appearance of liquorice spots or aviscid consistency so much so as to be separated with ease from the vessel in which it was spueta. When spueta is of the nature just described it
Shews that the inflammation has reached its second stage and therefore at its acme of the inflammation subsides at this period the sputa will gradually become less tenacious, the dark appearance will also disappear and the sputa expectorated will be like that of common cold. But if the disease continues to go on the consistence of the sputa will continue to the end of the disease which terminates with the life of the patient. The patient may from debility desist filling up this viscid matter but it will continue to be expectorated by mucous membranes of the bronchial tubes while the sufferer lasts. Though we have laid down these three stages of pneumonia they are not to be considered as all nor as always uniformly occurring as has been stated as regards the first second or third stage for all the symptoms which
are said to occur in the third stage may be present in the first, so various indeed are the symptoms that hardly any two cases are precisely alike, and as the termination are many and the symptoms defendant on them, we are prepared to account for the variety of the latter. Pneumonies may pass so quickly through its course or it may be taking not coming to an issue for several weeks but its usual termination is from five to ten days. The causes of pneumonia are many, but a rheumatic habit vigorous constitution and previous attack renders the individual more liable to its attacks. The season of the year, a wet cool atmosphere, low damp situations, those of a scorbutous habit of body or predisposed to phthisis are predisposing causes of pneumonia. The exciting causes are those applications which are calculated to check—
or diminish the excitements, as cold, exposure to cool air when coming out of a heated room. Not changing the dress to suit the vicissitudes of the weather. 3d. Acrid substances coming in contact with the lungs, act as a cause of pneumonia. Besides these many other causes might be enumerated. But as we have already bear in mind we will omit them, in the next and last we come to speak of the treatment of pneumonia if the symptoms are mild and the inflammation is in the inferior part of the organ and has not extended over much extent of surface the disease will generally yield readily by evacuations of the blood vessels and by such means at the same time as will relax the system and at the same time restore the excreting in general. But if the symptoms are severe and the inflammation more
Envisage our Treatment must be more
from it. The lancet (as justly remarked
by a physician of great skill) is the
right arm of the physician in the
subdual of inflammation. But it
might as correctly be said, That while the
lancet has been the right arm of the
experienced physician restoring the
Suffering to health and vigor by
Cutting short the inflammation, That it
has been the weapon in the hand of the
impersonal body with which they have cut
asunder the remaining cords of life by its
fuel and untimely use. When it has
that Hinnuli and Tonics were indicated
To support the already exhausted patient.
The symptoms which requires bloodletting
are dyspnoea hot and dry skin with
a full quick and wiry pulse. The patient
should be bled from the arm from a large-
orifice in a full stream until syncope. There is a decided impression made upon the system. The object being to relieve congestion of the lungs by reducing the quantity of blood in the system which serves as a general stimulant to keep up the inflammation. The patient should have some mild purgative, such as the sulphate of magnesia, to stimulate the mucous membranes of the bowels and carry off the feces which may be indurated and serve to keep up the excitement of the system. Though much purging is objectionable, the mercurials are the best supporters of the secretions and excretion. Colonel or muc. Masa in 3 or 3 gr. doses or smaller if the strength of the patient will not admit so much. Nauseants are better than full vomiting, ipecaco or Tartar Emetic or both combined and given in-
Small and repeated doses, if given separately from 1/2 to 2 grs of gelsea or if hawser from a 1/2 to 1 grs. will maintain a small dose. The syrup of squills is also a good promoter of perspiration. Some of the preparations of Potassa should be given to promote the secretion of the kidneys and skin, such as nitre and dowsors powders. Be mucilaginous drinks such as hawser, elm flats, and tea. If the inflammation continues and the patient's system will not allow further deflection by the general abstraction of blood and there is local pain, cuffs may be used with advantage over the rest of the skin of the application of an blister at this time to the part would perhaps be attended with good The tonics that are the most suitable are the Peruvian barks or the low forms of the disease Quinine and—
Brandy should be used to sustain the system. The extremities should be bathed in hot mustard water and cloths saturated with the same should be applied to the chest. The diet should be mild and generous such as butter, chicken broth, rice, soft boiled egg, side of the liver are likely to become constive. Gentle laxatives or enemas should be given.