An Inaugural Dissertation, on
Pneumonia
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By

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In obedience to the requirements of the University of Nashville, Tennessee, J. Albert Smith of Clifton, Wilcox County, Alabama, offer to the Medical Professorship of the institution the following thesis.

Pneumonia.

In interest and importance, whether considered in a physiological or pathological point of view, the lungs (if we but except the heart) are second to no viscera of the whole cavity of the trunk. Viewed as a whole, they constitute the largest viscera of the body and fill the entire cavity of the thorax, except the small pericardium comprising the mediastinum with its contents.

By anatomists, they are described as two conical

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bodies, situated in each side of the chest, embracing the heart and separated from each other by that body and a membranous partition, the mediastinum. Externally, they are convex being moulded to the internal concavity of the thorax. Internally, they are concave receiving the concavity of the heart. They rise superiorly above a level with the first rib and are concave inferiorly, corresponding to the superior convexity of the diaphragm immediately below them. The right lung being the larger is divided into three lobes, by deep furrows extending from the upper and posterior part of the organ downwards and forwards to near the anterior angle of its base. The left lung from the greater intrusion of the heart on the left side of the thorax is the smaller of the two divisions of the organ and is divided
into two lobes. The left lung has the greater
length of the two, owing to the greater convexity
of the liver on the right side of the abdomen.
"Each lung is retained in its place by its root
which is formed by the pulmonary artery, pulmo-
mary veins and bronchial tubes together with
the bronchial vessels, and pulmonary pleurae
of meso." In structure the bronchial tubes are
similar to the trachea, being composed of cartilagi-
 nous and yellow elastic fibrous tissue. And
the whole parenchyma of the lung are composed
of the ramifications of the bronchial tubes, which
terminate into intercellular passages and air
cells, of the ramifications of the pulmonary artery
and veins, bronchial arteries and veins, lymphatics
and nerves. The whole of these structures, being
held together by an ela fibrous tissue, constitute
the parenchyma of the lung.
The bronchial tubes divide and subdivide until they ramify almost the entire lung becoming smaller and smaller in size with each division until they are lost in a change of structure, and this change of structure constitutes the air cell of the lung. It is, however, a matter of dispute among anatomists as to whether the air cells of the lungs are composed of the terminal extremities of the bronchi or the extension of the mucous lining of the bronchi or whether they are composed of a tissue independent of either.

The important functions performed by the lungs are matters of equal if not superior interest to that of their structure. A desire to learn the functions, have always been the great incentive to the study of structure. The anatomist only studies the structure of the human body in order that
its physiology may be the more easily understood, for without a knowledge of physiology anatomy would be of little use to any but the surgeon and but little to him. Then as the blood circulates through the various organs and tissues of the body, and fulfils its office by supplying them with nutritive material and the different secretory organs with the materials necessary for their different secretions, it loses part of its nutritive quality and becomes charged with impurities, consequent upon the deterioration of the tissues. Therefore as the nutrient of the blood is consumed in its passage through the system a fresh supply is constantly demanded. This supply is in a great measure received from the food taken in to the stomach, through the process of digestion and absorption.
But it is also necessary to get rid of the impurities with which the system becomes charged by deterioration. And as caustic acid is one of the most common and most abundant of these impurities, we readily perceive the great necessity of the free and unrestrained action of the lungs in respiration, in as much as it is through the process of respiration through the lungs, that the largest amount of this poisonous gas is exhaled. The aeration or oxygenation is the process through which the blood receives fresh supplies of oxygen from the atmosphere is also another important and interesting function of the lungs.

The right ventricle of the heart discharges dark venous blood through the pulmonary artery, which in its passage through the lungs takes into the capillaries that run in single
layers between the air vessels, affording to the blood the greatest facility of absorbing the oxygen of the air on both sides of the capillary vessels from the air vessels on either side of them.

The blood at this point of its circulation is rapidly changed from its dark colour to a bright scarlet red, and is returned back to the left side of the heart through the pulmonary veins to be circulated through the system. Now the oxygen of respired air is always less than in air before it is respired, and the decrease is generally in a ratio proportionate to the increase of carbonic acid.

The quantity of oxygen contained in arterial blood being generally twice the amount of that contained in venous blood. It is a fact known to all, how ignorantsoever they may be of physiology, that just as soon as the passage of air into the lungs is entirely obstructed, the functions of life are
suspended and death ensues as a necessary consequence of such suspension.

It is equally true that the functions of life are suspended when an atmosphere uncombined with oxygen is breathed; and again if an atmosphere charged with carbonic acid is breathed, the death of the animal follows speedily.

If, then, through the action of the lungs, the blood not only receives its oxygen, which is essential to the sustenance of life, but also throws off carbonic acid which is destructive to life, it is but reasonable to suppose that, like they who seek a knowledge of medicine, should study with interest the diseases to which this vital organ are subject.

When we consider the functions of the lungs as a respiratory organ merely, we are struck with astonishment that they are not more frequently the subject of disease than they are.
Their labors never cease, from birth until death by day and by night, but unceasingly they toil supplying to man and animals the materials of life. Coming in contact directly with every vicissitude of atmosphere, cold, hot, moist, dry, being exposed to every species of poison that enters the atmosphere, and often with foreign substances floating in it. And yet they often survive their three score and ten years in a totally normal state. It would appear that we might suppose, without being accused of superstitious or criminal ignorance, that they pass a vital power of resistance, not yet entirely understood, in contending with the subtilties that beset man's way through life. How as the human organism is subject to disease, it is no matter of astonishment that the lungs, seeing their junctions and their exposed condition should bear
this part. We propose, therefore, a consideration of that disease of the lungs known as Pneumonia in several of its forms.

Pneumonia, as defined by the brothers, is an inflammation of the parenchyma or spongy tissue of the lungs. As to the history of this disease we think it but reasonable to suppose that it is commensurate with the existence of man. We have at least no reasonable grounds to believe that it is a disease of modern origin. There are several varieties of this disease, dependent upon the different parts of the lung involved and the character of the fever attending it. The disease is more or less severe in proportion to the extent of the parts involved and the intensity of the inflammation. The disease sometimes involves a single lobe of the lung, and when this is the case it is called lobar pneumonia.
Sometimes a single lobule or a number of isolated lobules with intervening sound tissue are involved; and the disease is then called lobular pneumonia. But the most common form of the disease is that in which the whole of one lung is to a greater or less extent involved, which I suppose may be called single pneumonia as it is called double when both lungs are involved. Sometimes the fever in pneumonia assumes a low typhoid form, and we have then what is called typhoid pneumonia. Again the liver in pneumonia takes on disordered action, and under such circumstances we have bilious pneumonia, and it is the two last named forms of the disease that are, in latitude 32 of Ala. alike formidable to the physician and his patient. By those who have had extensive experience in this disease there are said to be three well marked stages, 1st that of congestion,
2nd that of well marked inflammation, and 3rd that of suppuration. As far as we have had opportunity to notice the disease, the patient generally labours under some indisposition, for a longer or shorter period, sometimes for several days, but it is by no means unrequent that the patient has no pulmonary symptoms, but is taken with a chill as in ordinary intermittent fever. In many cases it is difficult, if not impossible to discriminate between pneumonia and intermittent fever under twenty to thirty six hours. Generally, however, catarhal symptoms make their appearance in a few hours after the onset of the disease, and frequently before the chill, but it is after the fever makes its appearance that the patient experiences tightness or stricture about the chest. Head ache, dry cough, restlessness, urinary sensations and not
unfrequently pain in the region of the lungs. If the
time becomes acute we may infer that the pleura is
affected, for it is stated by some writers (Dundas)
that in pure uncomplicated pneumonia we have
no pain but a sense of oppression under the
sternum. We have never witnessed any case
of pneumonia in which there was not at some
stage of the disease more or less acute pain.
In many cases the pleuritic effusion is supposed to
displace the organs of the chest in pneumonia.
There is generally little or no pain except pressure
of the intercostal spaces. The pulse in the acute
form is generally frequent full and hard.
Percussion reveals little or nothing in the first
stage of the disease. "The vesicular murmur is said
by the writers to be feeble and a crepitant rale is
said to be heard like that of passing a lock
of hair between the fingers" (Dundas)
The fever returns more or less at some part of the day, generally in the later part of the night or early in the morning, and the cough during this remission is not so troublesome, but as the fever increases with the advance of the day, the cough also increases and becomes more harassing.

About the commencement of the second or third day at farthest, the patients begin to expectorate a pretty transparent expectorated streaked with red blood. Very soon after this as a general rule, percussion gives a dull sound over some part of the chest, and generally over that part where in the commencement of the disease the pain was most acute. As the inflammation advances the dulness extends until the resonance of one whole side is lost and the articular murmurs cease, showing that one whole lung is engaged or hepatised.
We should have stated that the breathing commences is always hurried and more or less difficult. Soon after the vesicular engorgement as a general rule the sputa assume a dark rusty colour and is exceedingly tenacious and sinks in water. At this stage of the disease the physician may well fear the prognosis of his case. Auscultation proving to the practiced ear that no air enters the vesicles of the diseased lung and percussion showing an entire want of resonance. If the opposite lung be entirely unaffected as it generally is in cases that recover it may yield more than a normal resonance owing to the fact that it has to perform the whole respiratory function. Recurring, then, to the position with which we set out that the lungs furnished to the blood the necessary oxygen for the healthy nutrition of the
Tissues of the body, and whether the carbonic acid consequent upon the deterioration of the tissues, we may I think very justly conclude, that in any form of lung diseases where a large portion is involved, that the whole economy must necessarily suffer. We need not wonder then when a whole lung is engorged that the same part, that the features assume a dusky or livid appearance, the countenance anxious and the whole frame enfeebled. If both lungs are involved to any considerable extent, the patient will in all probability die, but he may weather through the disease if but one side is diseased. Free expectoration of yellow juice is a favourable indication, but a dark thin fetid expecta is said to be unfavourable, as it is an evidence of a depraved condition of the system. It is said by some writers upon pneumonia, that the patient lie upon the sound side
in the commencement of the disease, to avoid the pain
consequent upon pressure and upon the affected
side in the more advanced stage of the disease in
order that the free dilatation of the sound lung
may not be infringed. Others state the position to
be constantly upon the back; but these are except-
tion to all general rules; as far as we have observed
the position in this disease, the patient in the
advanced stage takes a position between the side
and back, that is to say with the sound side elevated
above a level with affected side.
If the patient is to recover, there will be a decline
in the intensity of the symptoms. Free expectora-
tion, mixed at first and then entirely of yellowish
pus. The tongue cleans off, the pulse becomes
less frequent, the breathing less difficult, the
vascular murmur returns, the patient begins to
change his position and to rest comfortably on
either side, and we say he is convalescent. For bilious jaundice, the symptoms are much the same as in the form just described, with the additional signs of bilious derangement. The liver cannot certainly be in a state of inflammation, because there is no acute pain in the region of the liver. It is highly probable that its functions are suspended partially or entirely and the bile, which should be secreted from the blood in its passage through the liver, is thrown into the system through the general circulation and thus the skin is turned yellow. In short, the patient assumes a jaundiced appearance, showing its self not only upon the skin but upon the conjunctiva of the eye and in the secretions.

The perspiration, the urine, the expectoration from the lungs, the mucus from the bladder and surfaces all assume an intensely yellow color, turning in
Some instances the color of the patient as yellow as saffron. The tongue is generally coated with a dark brown covering, and the patient is apt to recover slowly. It is said by respectable practitioners of South Alabama, that most persons that have suffered an attack of yellow fever, will, if attacked with pneumonia, have bilious pneumonia, and in every attack of disease whether pneumonia or intermittent fever, the skin becomes yellow, showing that the liver is more liable to disordered action after an attack of yellow fever than before.

The few cases of bilious pneumonia that we have witnessed were in persons who had suffered from yellow fever during the fatal epidemic in Mobile and N. Orleans in the fall of 1853. In bilious pneumonia there is less blood and less of the rusty-coloured matter expectorated than in the common form of the disease. The blood in this
form of the disease may probably be masked or covered up in the bile thrown off with the
vomit.
In that form of the disease known by the physicians
of the south as Typhoico pneumonia, the symptoms
are frequently very obscure for a considerable time.
The pulmonary symptoms not showing themselves,
in many instances for many days after the
attack. Ordinarily the patient is attacked with
a chill, succeeded by fever which may continue
twelve or twenty four hours, but is usually
sweat off in twelve hours and is partially
restored to health, pursues his ordinary business
for a day probably, but does not acknowledge himself
good, takes quinine but has another chill
 notwithstanding. He suffers more with the next
chill, his physician repeats the quinine in larger
doses, but do not prevent the return of the chill
and thus the disease progresses day after day, the fever ceasing to intermit after a few days, but giving no perceptible evidence of a diseased condition of the lungs in many instances under eight or two days after first chill. The patient seldom complains of acute pain in any part of the chest, but has nausea and not unfrequently vomiting the cough and the whole train of physical symptoms common to pneumonia are set up, but it is very seldom that the expectoration is as great as in the acute form of the disease. The sputa is but slightly stained with blood and is not so generally characterized by the peculiar rusty colour common to the acute form of pneumonia.

Dr. Wood in his diagnosis of this disease, states that it does not materially differ from the ordinary forms of the disease. A very striking peculiarity
in this disease he says is in the character of the
expurgated matter. Even in the early stages of the
disease he says, it is generally bloody and
sometimes pure blood. Also that it is more copious.
This is high authority certainly, and is not to
be contradictory of course by one who is but
a tyro in medicine; but it is, notwithstanding
very wise of what is true in the disease
that the physicians of south Alabama call
typhoid pneumonia. In Alabama the disease
so called prevails epidemically and fatally.
The negro population, and particularly those of
them that live and labour on the large flat
land farms, die by scores during the epidemics
that sometimes prevail in that region, in the later
part of winter and early spring. And this form
of pneumonia is seldom characterized by profuse
vomition and the discharge of blood is but small
as a general rule. The pulse is almost always frequent, and sometimes full, striking a kind of double kick, as a current of water flowing against a wall and returning upon its self. The tongue assumes an appearance to that in typhoid fever, in dry, dried, and has a red tip and red edges. The teeth are sometimes curved and there is frequently delirium of a low muttering sleepy nature which may continue from day to day until the patient begins to improve or dies. But there is generally no turkey tambourine as in typhoid fever nor red patches on the skin of the whites that are attacked with it. The muscles round the nostrils in many cases are drawn in at each inspiration which is always regarded as an unfavourable indication. The duration of the disease is variable sometimes terminating fatally in a few days and at other times running on for fifteen or twenty days or
new longer. The other less forms of the disease do not continue so long running their course in ten or fifteen days.

Chances. As in many other diseases it is difficult to determine in many instances what the causes are. Doublet exposure to cold and moisture are among the most frequent. It is said that the disease is more common in cold than in warm climates, but there is reason to believe that a low temperature alone is not sufficient to produce the disease in as much as the disease generally proceeds to a greater extent after a warm wet winter.

Treatment. In consulting the book upon the treatment of pneumonia, we find that all of them (Wood, Dunglas, Dickson, Stokes,) commence the treatment of acute pneumonia with general and local bloodletting. That general bleeding is a rational plan of procedure in the acute form of this disease
can scarcely be doubted, when we look to the high authorities by which it is recommended, but farther south it is said to be extremely hazardous and is almost entirely abandoned; and in many parts of the south the physician who would dare to bleed in any form of pneumonia, would be regarded as a reckless experimenter with human life. I believe that it is generally conceded that the loss of blood is not so well borne in the southern as in the more northern latitudes. Local bleeding by scarifying and cupping is a valuable remedy in pneumonia. A mild mercurial purge is generally resorted to, and the calomel is generally continued in small doses, one or two grains at intervals of three or four hours. Saffron emetic is generally administered in combination with the calomel, and to this is frequently added nitrate of potassa and syrup of aqua vitae.
those object to opium in any form upon the grounds that it checks the expectoration. The long continued use of tawor unalike with opium frequently irritates the bowels to such an extent as to contradict its use. Poison is preferred by some to the tawor in the commencement of the disease.

Stimulating applications to the skin over the region of the affected side, blistering or are remedies that should never be overlooked, and the blisters may be reapplied through the whole course of the disease. The strangury resulting frequently from the continuation of blisters coming in some instances to act beneficially. But among the greatest of the remedies in this disease among our northern physicians, stands, Norwood's Tincture of Veratrum Viride. The use of this remedy is generally commenced early in the disease, in doses of four to six drops every three hours and increased one or two drops at each dose.
until it begins to produce its effect by reducing the
frequency of the pulse. It seems to exercise a complete
control over the heart's action, reducing the pulse from
one hundred and twenty to seventy beats to the
minute, in a few hours. The reduction in the pulse
may be carried beyond this, but it is not considered
necessary to reduce the pulse below a natural
standard. The veratrum is used in all forms of
pneumonia, and is supposed by many to be signally
beneficial. For bilious pneumonia, calomel is used
more freely to excite the action of the liver, and
quinine has its place in the treatment of various
forms of the disease, except in the advanced
stage of typhoid pneumonia when it fails. In
typhoid pneumonia, calomel is life saved and in
cases where there is prostration stimulants are resorted to
with great advantage. Opium is also used in this form
of the disease with advantage, but it becomes the
Physician to exercise a wise discrimination in the use of all remedies in the treatment of this form of the disease.