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Dissertation on pneumonia

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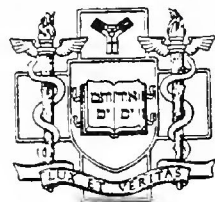


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Dissertations
by the
Candidates for Degrees and Licenses,
in the
Medical Institution of Yale College,
read at the
Annual Examination,
January 13th, 1851,
and during the
Academic Year 1850-1.



Dissertation by Warren Parker Beach, of Medford,
 Candidate for the Degree of Doctor in Medicine,

Examined by the Professors in Med. Inst^d of Y. College, Oct. 1. 1850.

on Pneumonia

Consists in inflammation
 of the substance of the lungs; and according to the
 changes produced in the pulmonary tissue, is most
 commonly divided into three stages. The first
 stage or condition is that of engorgement; in which the
 lung is found loaded with blood or bloody serum.
 The second is the stage of hepatization, in which
 it is solidified ^{by the effusion} of lymph; the third stage is that
 of purulent softening, or suppuration.

Pneumonia
 may be either double or single; in other words, inflam-
 mation may affect both organs at once, or it may af-
 fect one of them alone. Again, in one and the same
 lung, it may be partial or general, attacking the upper
 or lower lobe, be limited to the base, the root, or the
 centre of the organ. When inflammation affecting the
 parenchyma of the lungs is confined to certain of the
 pulmonary lobules, it is called accordingly; lobular
 pneumonia.

It has been asserted by some that all the different seats of pneumonia have been equally frequent; but this opinion I believe is rejected by most if not by all modern authors. Some numerical results would seem to settle the question that pneumonia does not affect all parts or both sides indifferently, it is stated Dr. Watson greatly more common on the right side of the body than on the left. The following is a statistical statement collected by Andral in respect to this point.

"Out of 310 cases of pneumonia there were, on the right side 121 on the left 58 both sides 25. cases where the seat could not be detected 6. Now at this rate pneumonia occurs on the right side twice, when it affects the ^{left} once, and does not affect both sides together so often as once in eight times."

again with regard to that portion of the lung which is most obnoxious to inflammation, there are great differences. It has been supposed that the upper pulmonary lobes are seldom affected with inflammation, but this opinion it would seem is not correct. The upper lobes are frequently affected, but it is well known says Dr. Watson that the lower lobes are more liable to inflammation than the upper.

Morgagni, Frank and Broupais, who draw their conclusions from dissections, state that the upper lobes are most frequently the seat of inflammation; Saenne and Andral on the other hand, who included cases of recovery in their calculations, found the lower lobes most commonly inflamed. This discrepancy may be reconciled as says Dr. Williams by assigning as the cause of it the fact, that inflammation of the upper lobes is the most frequently fatal.

Pneumonia as it generally occurs presents the following symptoms. Dry pain or stitch in the side - dyspnoea - viscid and bloody sputa - dull sound on percussion, and indistinctness or absence of the respiratory murmur, the patient lies on the sound side or back - the pulse strong, hard, and frequent, but subject to variations in its character - The fever is generally of the inflammatory kind.

Of the pain - the pain may have its seat (in different cases) in any part of the chest, but it is more commonly experienced about the sixth & seventh ribs, between their middle and sternal extremities; sometimes the pain is exquisitely

acute, and during inspiration almost intolerable; at other times it is more obtuse, giving the sensation of weight rather than pain, and in some cases the patient experiences no pain at all. In some instances the pain precedes by several days the other symptoms, in which case it is neither accompanied by fever, cough, nor dyspnoea; it simulates a pleurodynia or Rheumatic pain, It is generally aggravated by a full inspiration, by cough, by sudden changes ~~than~~ of position, by percussion and by lying on the affected side

Of the dyspnoea
dyspnoea is one of the most constant symptoms of pneumonia; it generally bears a direct ratio to the severity and extent of the inflammation. To this rule however there are many exceptions, for as pneumonia may exist without pain; so also it may occur without dyspnoea, so that the degree of dyspnoea experienced by the patient is not in all cases a certain measure of the seriousness and extent of the inflammation.

It appears ceteris paribus, that inflammation of the upper lobes causes greater dyspnoea than an equally extensive inflammation of the lower lobes; the dyspnoea experienced in pneumonia varies very much in different

cases, it is so slight in many instances when it exists, that the patient scarcely complains of it; in other cases it is so severe and distressing that the patient seems unconscious of all that is passing around him, and is wholly occupied with sighing; his face now expresses great anxiety, the nostrils are dilated, the lips are livid, the respiratory movements are very frequent and short, as if the air could not penetrate beyond the primary divisions of the bronchi; few patients recollect when the difficulty of breathing is thus extreme.

Of the Sputum

At the commencement of pneumonia there is either no expectoration at all, or the matter spat up is simply catarrhal; but as the small crepitation (which occurs about the second or third day) becomes marked, the sputa assume their characteristic form; it becomes bloody, i.e. it is composed of mucus intimately combined with blood: not streaked with blood as in bronchitis: neither has it the appearance of the blood ejected in hæmoptysis, which is pure or nearly so. The peculiar appearance or colour of the sputa is determined by the quantity of blood present: they are either yellow, of the colour of rust, or of a

marked red. The sputa at this period of the disease are tenacious and viscid, adhering together so as to form a homogeneous mass; but they are not yet sufficiently viscid to adhere to the sides of the vessel:

"So long as they flow readily along the sides of the vessel when it is tilted: says Dr. Watson so long have we reason to hope, that the inflammation of the lung does not pass its first degree" but the sputa frequently acquire a very great degree of viscosity; so that they are no longer detached from the vessel when it is inverted, we have reason to fear when this is the character of the matter expectorated, that the disease has reached its second stage. As the sputa increase in viscosity, the chest when percussed yields a duller sound and the vesicular breathing is gone altogether, and bronchial respiration has taken its place. The pneumonia is now at its acme, and may remain for a time stationary, or it may subside, or it may go on from bad to worse until it reaches the third stage - that of Suppuration. In this stage of pneumonia the sputum is generally characteristic, it frequently occurs under two forms; the one, as Andral says, resembles

Siquorice water or plumb juice, while the other has all the characters of true pus. Pneumonia may, and sometimes does, run through its different stages without its existence being made known in any way by the expectoration; which has been perhaps either devoid of character, or altogether absent. Should pneumonia pass through its several stages and at length terminate in gangrene, it would be announced by a greenish or dirty grey colored expectoration and exhaling a fetid odour resembling that which emanates from gangrene of the external parts.

The Pulse at the commencement of in most other phlegmasia, is generally strong, hard, and frequent, but when the inflammation is very intense it is sometimes remarkably small and oppressed, and subsides again on blood-letting. Some have observed that in pneumonia the pulse differs on different sides of the body, that it was more obscure on the affected side; whether this is or is not I have had no means of determining. It has been farther observed in regard to this disease, that great frequency of the pulse announces a fatal termination, and that recoveries are rare when the pulse exceeds 130 in a minute. It is sometimes the

case, in the last stages of this affection that the pulse loses its frequency and returns nearly or quite to its normal state, though the respiration becomes more and more accelerated. This is usually a fatal symptom."

Delirium is a symptom which frequently makes its appearance in the course of an attack of pneumonia; it usually occurs during the night; if it is but slight in degree, and only occurs at intervals, it is a symptom of but little importance; but when it assumes a more violent character, it then becomes a more formidable symptom: indicating "that the due aëration of the blood is largely interfered with by the pulmonary affection, and it is a direct evidence that the pectoral mischief is telling through the circulation of venous blood upon the brain."

Cough although it is a very constant ^{attendant} on all inflammations of the thoracic viscera, yet in pneumonia it has no particular ^{character}, and affords but little information. Although it is dry at the outset of the disease, it seldom continues so during its progress, but in a few hours it is attended by the expectoration of

peculiar sputa, which constitutes one of the most certain signs of the presence of pneumonia

Of the Physical Signs.

First Stage— It has been observed by some that an intense peculiarity of respiration will be found to exist in the affected part for some hours before the peculiar crepitation is heard; but as soon as the first stage is fully developed the natural respiratory murmur loses its clearness; it is obscured or rather mixed to some extent with what is called by Laennec *crepitation rhonchus*, by Dr. Watson minute or small crepitation. This sound has its seat undoubtedly in the air vesicles and is caused by the formation and bursting of minute bubbles in the air cells or as some have supposed by the separation of the adhering walls of the vesicles in inspiration; and resembling observes Dr. Williams the sound caused by rubbing a lock of hair between the thumb and finger close to the ear. This sound (though it may be confined to a small portion at first) denotes engorgement of the lung- and whilst it is heard, it teaches us that the inflammation has not passed its first stage. The sound on percussion is but slightly impaired in the first

stage of pneumonia. But as the engorgement advances and the quantity of air admitted into the inflamed spot of lung is diminished, it becomes more dull over the corresponding part of the chest.

Second Stage of the pneumonic inflammation continues the lung presents that appearance called by Laennec hepatization. In this condition the air vesicles of the affected portion of lung are obliterated; the lung no longer crepitates on pressure, its specific gravity is increased, it is evidently solid, and its cut surface resembles the cut surface of liver. The large tubes of the bronchi remain pervious, but there is dullness on percussion, bronchial respiration, and a loud resonance of the voice called bronchophony. Now these sounds are most distinct when the inflammation occupies the upper portion of the lung, or that portion called the root. These signs furnish a tolerably accurate measure of the extent or intensity of the disease. The bronchial respiration which specifically marks the second stage of pneumonia is said to resemble the sound produced by blowing through a small quill, and is sometimes so loud as to amount to a whistle.

We may generally hear (at this stage of the disease) in those parts of the inflamed lung that are healthy, Puerile respiration, which is a strong symptom that a portion of the lung is impermeable by air, and that the remaining part is endeavoring to compensate for the deficiency.

Universal dulness on percussion, absence of the respiratory murmur, and resonances of the voice, are symptoms which inform us that the whole lung has become solidified.

Should the patient recover at this stage of the disease, the bronchial breathing and the voice disappear and the vesicular murmur begins again to mix with the crepitation and at length supersedes it altogether.

Chird. Page

Dr. Watson observes that after we have traced the disease through the stage of engorgement and hepatization we possess no means of tracing it farther with any degree of certainty, but when this stage does arrive the diseased lung becomes infiltrated with a purulent matter which at first has some consistency, but soon acquires all the characteristics of common pus.

Abscess - It was formerly supposed, that the formation of an abscess in the lungs as the result of acute or chronic

inflammation was of common occurrence; but a circumscribed collection of pus, surrounded by hepatized lung, as the result of common pneumonia, must be an exceedingly rare event; as Jaenec in several hundred dissections of persons died of pneumonia, only found one large abscess of that sort." When abscess however does form in an hepatized lung, it will be indicated by the passage of air through a liquid, giving rise to a gurgling sound or cavernous strorhus, and when the cavity has been emptied of the pus by expectoration, we may hear by applying the ear to the chest, pectoriloquy and cavernous respiration. — The termination of pneumonia in gangrene (which is very rare) usually proves fatal. The distinctive signs of gangrene are the fetid odour emitted from the diseased lung in respiration and cough; there is also diminished pain; the cheeks become red, the pulse sinks, and the matter expectorated assumes an ichorous appearance; these symptoms are soon followed by a collapse of the features, paleness of the countenance, cold clammy sweat, together with extreme prostration of the vital powers. Thus the patient soon expires.

Autopsic Phenomena.

In the first stage of pneumonia, the stage of engorgement

the lung is infiltrated with a frothy sanguinous serosity it is of a dark red colour externally and crepitates less under pressure than sound lung does. at the same time its cohesion is diminished, for it can be easily broken down when pressed between the fingers. The mucous membrane lining the small bronchi is of a deep red colour. Although the affected portion of lung presents an increase of weight, it will nevertheless almost always float on water.

In the second stage, the lung no longer crepitates on pressure; its specific gravity is now so much increased as to cause it to sink in water; it ~~is~~ presents a red appearance both externally and within, in short it resembles very much the liver; in weight, consistence, and colour; having entirely lost its cellular structure and acquired a granulated appearance, with no extravasated fluid in its substance. Its friability is now so great that a moderate degree of pressure between the fingers is sufficient to reduce it to a reddish pulp.

In the third stage the pulmonary tissue (as in the last) remains dense, solid, and impervious to air, yet it has undergone important changes; the colour, which was red has now become of a straw or sulphur yellow owing to the greater quantity of liquid pus which is present.

The little red granulations which were observed in the second stage have now assumed a whitish or gray appearance; the texture is still more friable than in the last stage, and if the lung is cut, small drops of pus appear on the cut surface, which seem to issue either from the orifice of the capillary bronchi, or from the granulations themselves.

There has been such a discrepancy of opinion in regard to the duration of pneumonia, among those who have had ample means of judging from experience, that it would be almost superfluous for me to say anything on this point. Dr. Watson observes that its duration may be laid upon an average at ten days.

In a table collected by Andral the duration in 112 cases varied from four days to six weeks, but ^{one} only was thus protracted; 23 cases lasted each seven days, and only 15 of the 112 cases continued longer than a fortnight.

It would be equally unnecessary for me to offer any remarks concerning the tendency of pneumonia to form a crisis. I shall therefore merely give the opinion of Prof. Hooker, who has for many years been a zealous and successful cultivator of the science of Percussion and Auscultation, and whose opinion is often solicited and universally respected in affections of the Thoracic viscera; he states

that at the expiration of five full days or at the commencement of the sixth, he always expects a crisis in this affection, and that its appearance seldom fails to justify his prognosis-

Of the Cause of pneumonia. Sometimes no cause can be assigned, at others it is evidently the result of exposure to cold, especially when the skin is damp from perspiration. All extremes of weather may act as exciting causes. Plethora, full living, indolence, repelled eruptions, suppressed exertions &c. have all been ranked among the causes of pneumonia: Those causes which act directly on the lungs, and violent exercise causing the blood to pass rapidly through them; violent coughing, adhesions of the pleura, asthma, hydrothorax &c. may excite inflammation in the lungs.

Diagnosis. There are few diseases whose diagnosis is more simple than that of pneumonia; yet there is no symptom in pneumonia which is not met with in other diseases; few are more frequent than cough, pain in some portion of the chest, obstructed respiration and fevers but when we find these symptoms combined, we may generally be assured of the presence of pneumonia. The diseases with which

pneumonia is most likely to be confounded with Bronchitis, pulmonary oedema, and pleurisy; but it will be sufficient here I trust, to mention some of the ^{sties} characters by which this disease may be distinguished from pleurisy - The pain in uncomplicated cases of pneumonia is usually moderate and dull; in pleurisy sharp and severe; in the former we have the viscid and rusty sputa, in the latter the expectoration is transparent or simply streaked with blood. Strong pressure made on the abdomen in pneumonia, immediately excites distressing cough, oppression, and a sense of suffocation.

In pleurisy pressure made on the abdomen does not aggravate the pain; the patient lies on the unaffected side or back in pneumonia; in pleurisy, on the affected side. Pressure on the intercostal spaces produces pain in pleurisy; but not in pneumonia. An inflamed lung does not distend the cavity of the chest and obliterate the intercostal depressions; but copious pleuritic effusions most frequently does; in pleurisy the small crepitation of pulmonary inflammation is quite wanting; in pneumonia the friction sound and egophony of pleurisy is absent. On percussion of the chest, dullness may be perceived earlier in pleurisy

than in pneumonia, and in the more advanced stage is more complete in pleurisy the dullness often changes with the position of the patient, which is not the case in pneumonia.

Prognosis. Recovery may almost always be confidently predicted in cases of pneumonia occupying a portion of one lung only, and when it occurs in persons of ^a good constitution and without complication of any kind. - Resolution, which is the only favourable termination of pneumonia, is generally attended with a copious and free expectoration. Increased discharge of urine, general but not profuse perspiration with an abatement of pain, oppression, and cough, are ranked among the favourable symptoms. While severe pain, great oppression, dry cough, or thin dark coloured expectoration; countenance livid great dyspnoea, weak soft and frequent pulse, delirium, coma, rattling in the chest, with a disposition to elevate the head and shoulders and bare the breast, are considered unfavourable signs. - Under other heads allusion has been ^{incidentally} made to points which perhaps should have been inserted here, it is however unnecessary to revert to those points again; therefore I pass to the

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Treatment of Pneumonia.— The remedies to be employed in the treatment of this affection, are much the same as those employed in other phlegmasia. Venesection, Antimony, and Mercury, are the chief agents more commonly used, and of these (in persons possessing a vigorous constitution) bloodletting is the most efficient remedy.

There is no disease that bears the loss of blood better than pneumonia; general blood-letting in the first place tends to subtrain or extinguish the inflammation of such. In the second place by diminishing the amount of blood we diminish the labour of the lungs, and thus procure rest for the diseased organ, so far at least as this is possible. In deciding upon the quantity of blood to be taken, we must be guided by the stage of the disease, the state of the pulse, and the constitution of the patient. Age and sex are also to be taken into the account.

Venesection will be effectual ceteris paribus in proportion as it is early; during the first stage, in a vigorous patient with a strong pulse, from 16 to 20 ounces may be taken at the first operation, or continue the bleeding until some sensible impression is made on the system; until the pulse becomes softer, or if depressed until it becomes

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fuller; until the constriction is abated and the dysp-
-nea relieved, or until syncope appears to be at hand.

Should the abatement of the symptoms be but slight
we may as a general rule bleed again in the course of
a few hours, and it may be necessary to repeat the op-
-eration even a third time should the pulse not have
been reduced, nor the inflammatory symptoms deci-
-dedly checked. Much more might be said on the subject
of venesection, but I pass by simply remarking that
in pneumonia, bleeding (when it is indicated) should
be performed with determination; at the same time an
indiscriminate use of the lancet must be productive of
great mischief, by emptying the patient's veins unneces-
sarily and thereby taking away the strength requisite
for the laborious work of respiration and expectoration.

"We want some remedy says Dr. Watson to assist
the lancet or to employ alone, when the lancet can do no
more; and we have two such in Tartarized Antimony
and in Mercury." the tartarized antimony I believe to
be best adapted to the first degree of the inflammation,
that of engorgement; and the mercurial plan to the second
that of hepatisation. — The bowels having been evacuated

with Calomel and Jalap, or the infusion of Senna with Sulph. Magni. recourse may now be had to the Tartar emetic - giving gr ʒi dissolved in water with a few drops of Sinct. opii. every hour, after having given a few doses the quantity may be doubled, and in the course of a few hours it may again be increased to a grain every hour. Should the medicine operate favourably it will relieve the dyspnoea without causing more than very light vomiting or purging.

In those cases where the Tartar Emetic is inadmissible, or where the inflammation has reached the second stage, Mercury is to be preferred to the Antimony, Calomel may be given internally combined if necessary with Opio, if a quick and decided impression is necessary, Mercurial inunction may also be employed. The bowels should be kept soluble in this disease by the use of saline Cathartics, Castor oil, or Magnesia combined with Rhei, or what may sometimes be preferable, Enemata. It very often happens however that the remedies employed to meet other indications, have the effect of sufficiently loosening the bowels, so that measures are not required for that purpose especially. - Counter irritation by means

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of blisters (after the acute inflammatory stage is past) is often productive of great good in relieving the pain and dyspnoea, also the oppression and tightness experienced in the chest. Local bleeding is also highly recommended by some (as an auxiliary to the lancet) by means of cupping-glasses or by Leeches. By others local bleeding from the chest is thought to be productive of but little if any good. — Expectorants are often highly serviceable after the general febrile excitement has been moderated. Such as Syr. Scilla and Senega or Sanguinaria. Also Mucilage of Gum Acacia, of ^{cont.} *Ulmus fulva* or pith of Sassafras &c. In the declining stages of the disease where there is a pallid face, sunken features, coldness of the surface with a feeble and irregular pulse, we should administer stimulant & cordial medicines, as Carb. Ammon. in an infusion of Serpentina. Wine, Brandy &c. And if symptoms of hectic make their appearance, recourse should be had to Sulph. Quinine. Oil of Turpentine has sometimes proved ~~good~~ serviceable when given in large doses; Should symptoms of gangrene appear they should be met with Chloride of Lime, opium, Quinine, and the Mineral acids especially the Nitro. Muriatic — There are other remedies recom-

-mended and by some used with asserted benefit in the treatment of pneumonia: such as Hydrocyanic acid, Digitalis, Acetate Lead, Muriate of Ammonia, the Alkalies and alkaline Carbonates, these articles however are more particularly adapted to the earlier stages of pneumonia. In the advanced stages after the disappearance of fever, the lungs yet remaining solid, the Iodide of Potassa has been recommended - Conium, Hyoscyamus, and other articles of this kind may be substituted, when opium disagrees with the patient.

The regimen in pneumonia should be strictly antiphlogistic, and with a view to prevent vomiting, very little liquid should be allowed during the antimonial treatment - During convalescence from this and all other acute diseases of the chest, visitors should be excluded, as talking even in an under tone is injurious to the patient.

This then is the treatment which I conceive to be most likely to benefit those who are affected with acute idiopathic pneumonia; different cases will of course require different modifications of it, for which no particular rules can be laid down.

W. P. Beach.



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