The Mutual Relations between Cardiac & Pulmonary Disease.

The healthy functions of the Heart & Lungs — if not the most vitally important — are at least two of the three which do in the whole animal economy — for should either cease for a very brief period — at the same time ceases existence — and so much is the healthy state of the whole body dependent on their due performance that any disease or other cause interfering with, or interfering these, necessarily produces results, which this most early fatal — will seriously threaten ultimate health tending to produce such a state of the system, as is specially prone to the appearance of diseased action. 

While we consider also the very intimate relation existing between the Heart & Lungs — how much they are dependent on each other — how disease, originating in either of these vital organs, may readily become the cause of disease in the other — when we reflect
upon the vast number of maladies—both organic and functional, to which these organs are liable—the vital importance of correctly diagnosing—of studying their causes—their direct relation to one another—and their frequent combination—presents abundant evidence of the importance and absolute necessity of a thorough investigation of the diseases of the heart and lungs—Davies says—"we may safely conclude that the number of fatal cases due to affections of the respiratory and circulatory organs, amounts almost to one third of the entire mortality of the country."

The purpose of this paper is to show the very intimate relation existing between the diseases of these organs, and the great readiness with which disease existing in one may produce disease in the other—a fact of the greatest practical importance, as it is almost daily presenting itself thus in our clinical practice.
of disease. Thanks to Lagened's admirable invention — diseases of the chest which only a few years ago were among the most vague & difficult. Respecting which we had to form a correct diagnosis — are now by the aid of the stethoscope &c among the most easy & satisfactory. Of any with the Physician has to deal; diseases the nature of which our forefathers could form no idea, are now clearly unravelled & placed before us with as much clearness & certainty — as if we had our demonstration. What was all guess work & chance is now plain & sure — so that we are almost on the same equal footing in this respect with the Surgeon. In no instance can the advantages derived from these new auxiliaries in diagnosis be of greater importance, than in aiding us to distinguish the different affections of the heart & lungs — that is in finding out how far each is concerned in producing
Symptoms—while frequently present themselves, when there is disease coexisting in each organ—and so often enabling us to ascertain the organ primarily affected—causing the complication—and thus allowing us of directing our remedial means to the right quarter—that is, to the organ originally in fault—and this too frequently in affection of these organs we can do nothing more than palliate, relieve suffering—a resort for a time their fatal tendency—yet it is only by a thorough knowledge of the best of the disease, & its tendency in its onward course to produce secondary complications in the other organ—that we are enabled to effect even this kind of relief, and avoid such treatment as might aggravate disease—Shorten Health—
The subject I shall divide into three parts—
First—A very brief sketch of the healthy function of the Heart & Lungs—
Secondly - The several diseases of each organ which mutually relate to one another -

Thirdly - The practical advantage derived from a knowledge of the same -

Then the healthy function of the Heart -

The Heart is a double muscular organ - whose function it is to propel the blood through the whole body it admits of division into two parts - with the exception of greater circulation, commencing at the left side of the heart, from which arterial blood is propelled through the whole body, for the nourishment of the different tissues - terminating at the left side where the venous blood is collected prior to its renewal - Secondly, the pulmonary right or lesser circulation beginning at the left side from which the venous is sent through the lungs there to undergo that change by oxidation by which it is rendered fit for re-circulation - and ending
at the left side of the breast where we commenced—

of the lungs — The lungs are also double organs

and their functions are not be equally divided, differ

ing also from that of the heart, being to a

certain extent under the influence of the tobe—pro

ordinarily going on quite independently of it—it

consists in the purification of the blood—The changing

of it from dark or venous loaded with Carbonic acid,
tied or arterial unpregnated with Oxygen—They

are also the means of discharging from the body a

quantity of aqueous vapour—

So closely allied are their respective functions, connected

and mutually dependent on each other for

their due performance — that any considerable in-
terference in either must soon come to endanger the

other — and as it is, that disease of either heart or lung,

does frequently secondarily affects the originally sound

organ — and hence the often combination of diseased

condition—
Secondly - The normal diseases of each organ which mutually relate to one another.

Of course it won't be for me to enumerate all the many numerous diseases by which the heart & lungs are liable, but to confine myself to those alone which originate in either organ are specially liable to affect the other, to point out the mode in which this is affected, &c.

First these pulmonary diseases — Pulmonary Emphysema — this presents somewhat varied but essentially consists in the air cells being dilated or much larger than in healthy lung — it may be general or partial — where the former, it may affect one lung or both — or a considerable part of both — the latter may affect the whole of a whole or separate limbs.

The origin of this condition is various — but may arise from be produced by more mechanical causes which give rise to irregular distension of the lung — such as are frequently induced by Bronchitis — as obstruction.
Caused by thickened mucous - The thickening of the textures are in some of the bronchial tubes by means of which the air force is applied to those cells the tubes of which are free or the cells may give way to the direct straining efforts of prolonged fit of coughing - hooping cough - & after the tendency seems to be hereditary or rather perhaps the affection strong by predisposing to the occurrence of this condition is hereditary - At all events from Whaters and produced we find that this condition of the lung materially interferes with the free performance of its function - its inherent plasticity is lost - it unable to collapse - & consequently the air cannot be perfectly expelled during expiration so that the lung remains always more or less full - & from this permanent condition of the organ, the normal amount of air can not be admitted in inspiration - Thus we have inspiration seriously impeded - as evident from the
the habitual dyspnoea - easily apprehended by whatever
will further obstruct the passage of air - we shall also
have the pulmonary circulation seriously interfered with,
secondarily the Heart - let us now inquire how this
is brought about - When simplesima exists to any extent,
the lung is rendered unfit for the expeditious mutual
action of the air & blood - which is known to be in one
way or other an auxiliary cause of motion of the blood.

Here - consequently from this impediment - there is
habitual slow motion of the blood through the lungs - as
a result of this obstruction, hypertrophy & enlarge-
ment of the right side of the heart - indicated by
palpitation - pulsation at the Carotids - & some
times in the jugular veins - The hypertrophy is a
salutary means adopted by nature to overcome the
impediment to the blood's passage - to enable it
to traverse the altered lungs, & reach the left side of
the heart - but at the same time, the Throat a wide
provision - with chronic organic disease - with the hypertrophy there are usually other changes, namely, dilatation of the cavities of the left side & incompetence of their valves - an extensive diseased condition in which there very generally present further complicating phenomena - obvious congestion, especially of the liver, & more frequent pleural effusions seen in pulmonary oedema - it thus plainly evident how disease of the right side of the heart - results directly from this condition of the lungs - what will be the effect on the left side of the heart? This will be little affected in the pulmonary - but from the blood reaching it both directly & diminished quantity - salt & perfectly stagnated - we may expect it to be in a condition opposite to that of right - its due amount of stroke thus being reduced - its action will be more feeble & inefficient - & thus we find both the systemic & pulmonary circulation affected.
I think some important some important practical deductions may be derived from a knowledge of these facts — thus being well acquainted with the tendency of certain pulmonary affections — especially bronchitis to produce emphysema — which in its turn is nearly certain to establish cardiac complication — we shall anticipate these results — bring over in one sound to avoid them by suitable expectant treatment — well knowing that when once esta.

Hitherto cure is beyond our power — for the vast number of affections frequently we see the primary pulmonary to take no cure — yet we may often palliate diminish them or at least prevent their increase — but only by a thorough knowledge of the nature of the disease — we are enabled effectually to contend with that tendency to extension and complication which is always evinced in their onward progress
Spasmodic Asthma — this very frequently exists in connection with Simplexma, but not necessarily by it is meant generally — dyspnoea occurring in paroxysms — it seems to be a purely spasmodic affection, consisting of an undue contraction of the circular muscle fibres of the bronchial tubes — the disposition in most instances seems to be hereditary — it is very frequently combined with organic changes within the thorax (such for instance as bronchial congestion or some degree of inflammation, by which the irritability of the tubes is increased) which changes are to be regarded as so many predisposing causes — they induce a readiness to take on spasmodic action — and some of them are peculiarly aggravated, or perhaps induced, by the fits of asthma, upon which they afterwards act injuriously — in some instances asthma seems to be purely of a nervous character — the organic changes with which spasmodic asthma is most
frequently connected, are emphysema, and structural changes of the heart, great blood vessels. Now in very many cases, the cardiac disease results in the first instance, from the asthmatic paroxysms which are characterized by great dyspnea besides which there is generally some degree of shortness of breath during the intervals which P. Williams attributes chiefly to habitual strain of a minor degree but probably also to the very frequent accompanying emphysema. It is evident though how constantly recurring paroxysms of asthma tend to induce organic changes in the heart, the severe emphysema with Williams says the spasmodic constriction of the bronchial tubes, the consequent violent yet ineffectual respiratory efforts produce a congested state of the pulmonary vessels and partial obstruction of the circulation, tending therefore to the production of hypertrophy and dilatation of the heart—of course into the right.
side which undergoes these changes—Again when organic cardiac disease does exist—we can easily see how this determines paroxysms of Asthma, by causing congestions in the membranes & structure of the lungs, increasing their irritability & sensibility—acting as an exciting cause to the fibers already pre-disposed to it—so that any extraordinary task, imposed upon a heart which is barely equal to its function—while the body is in Repose, may induce a paroxysm of Asthmatic dyspnoea.

Thus it will be evident how Asthma may cause secondarily disease of the Heart, & how this being established, becomes of serious consequence—

for Asthma when uncomplicated is seldom of itself fatal—but from frequently recurring attacks, we see how liable it is to induce organic changes in both lungs & Heart—& then we can not expect Asthma as free from dangerous tendencies—The importance
therefore of to conducting such cases, at an early period, that all these things may be avoided, which are likely to produce an attack; for we find that their return is greatly facilitated, by their frequent occurrence, and that by their frequent occurrence, those permanent changes take place in the structure of lungs & heart.

Having now described the pulmonary affections which have a strong tendency to produce organic changes of the heart, which, when left to themselves, most adversely will do to—without further speciation or description of individual pulmonary diseases, I shall endeavor, in one general view, to show how all the various affections of the lungs, (chiefly by interfering with the pulmonary circulation) incline secondarily to produce some morbid condition of the heart—accounting perhaps for more than five-sixths of the apparent reason or apparent arrangement— at least in the first instance, but by continuance, leading directly to a strongly
pre-disposing to organic changes—thus may the circulation (general) become so much disturbed to produce as in its turn still more various dangerous complications throughout the whole system.

We know how closely the heart is linked with the lungs, by the circulation even more closely than by mere position; for the lungs may be said to lie between the two compact masses of the heart, and any considerable obstruction in the lungs will change the usual relations of these compact masses; there is there a distortion or over-stimulated union of the right side of the heart, while the left receiving a diminished quantity of blood, that not thrice deranged is left excited than usual, as is often evidenced by the well-known smallness of the pulse—that by no means represents the condition of the whole vascular system.

The Pulmonary circulation, in health, is exceedingly
rapid, the same account having to pass through the lungs in a given time - as through the systemic circulation.

In the general tendency of pulmonary affections, is to change the pulmonary circulation by impeding the passage of blood through the lungs - whether acute or chronic. They have the same tendency to produce more or less obstruction of the circulation - the former act more directly - for being more sudden in their onset - and more rapid in their progress - the more structural changes to which they lead - or the impairment of function. They may occasion, being also soon induced do not admit of that mutual accommodation, between the quantity of blood to be oxidized and the capability of the lungs to perform this function, which in nature always tends to adapt in the more chronic diseases. The obstruction of the lungs as in severe and very extensive cases of Pneumonia or Bronchitis - of purpura pleuritis effusion -
The capacity causes, that overloading of the right cavities of the heart, which inadequate liability of imperfectly arterialized blood, in the left, already mentioned. Should the pulmonary affection not soon be recovered from, or should it leave it leave structural changes behind, which may cause a permanency of obstruction of the pulmonary circulation, it very evident that the cardiac arrangement will continue and generally increases, so as to result in more extensive organic change. The thing in favour of the acute disease is, that generally they are more quickly recovered from so that their duration may not have been long enough to have caused such arrangement of the heart, but may also be recovered from, upon removal of the cause. Or such having been this case in the first attack, yet from the known liability to recurrence of these
Pulmonary affections— the heart, becoming secondarily involved in the lung fever attack, may ultimately become permanently changed.—

Chronic pulmonary affections do not affect the heart so much at first—but by their continuance, the circulation being more or less altered, they ultimately induce the same changes— as more quickly supervene in the acute diseases—and as the cause is more lasting—as in the long run to the cardiac complication become more and more these, leading to permanent organic changes— seldom does we meet with pulmonary affections of long standing, in which the heart is not more or less altered either functionally or structurally—this is alone perhaps forming an exception to this rule in which disease however it is not unusual to find slight hypertrophy—

Embarrassment of the fact pulmonary circulation
Then, looking at the dangerous effects, the
natural consequences of the heat,
which, being caused by the effects of the
head, will have a direct effect on
the heart, the brain, the lungs,
and the blood. Therefore, the
primary consideration is the
halt of the disease, which
leads to the conclusion that,
the treatment should be
of a preventive nature,
not of a curative nature,
but rather a preventive
measure to prevent the
disease from occurring.

This Dr. Jay S. H. claims that the disease may be
prevented by the use of
herbs and natural remedies,
which will help to
strengthen the body,
and prevent the disease
from occurring.

However, Dr. Jay S. H.
also warns that the
disease may be
prevented by the use of
herbs and natural remedies,
which will help to
strengthen the body,
and prevent the disease
from occurring.

However, Dr. Jay S. H.
also warns that the
disease may be
prevented by the use of
herbs and natural remedies,
which will help to
strengthen the body,
and prevent the disease
from occurring.
to produce cardiac lesions—either functional or organic—often these cardiac complications, come ultimately to maintain & aggravate the pulmonary affections which caused them.

A knowledge of these facts, may often be turned to considerable practical advantage by the physician—he anticipates the results which will most generally follow, should the disease proceed unchecked—its natural tendencies to secondarily complicate the heart—having these in this mind, he may often ward off their occurrence by judicious treatment—well knowing, that the cardiac affections, when established, are apt to form the worst part of the malady—& that the primary disease which might previously have yielded—is now rendered intractable & permanent—
Having shown the manner in which affections of the lungs secondarily induce cardiac disease, I shall proceed next to indicate the mode in which disease of the heart, may produce pulmonary disease.

Diseases of the heart are exceedingly frequent. Conisart estimated that the number of deaths resulting from them next in frequency to those produced by phthisis. A Condensning shows that what phthisis is in point of frequency & mortality prior to the middle period of life, diseases of the heart become subsequently. I shall endeavour to show how very frequently they give rise to pulmonary affections, or greatly aggravate their danger where inflammation coexisting. Thus the coincidence of the lining membrane of the heart with pleurisy & pneumonia is of frequent occurrence. & Boy says, "Pulmonary congestion & inflammations more especially those having their seat in the bronchial membrane,
and paping under the vague title of asthmatic affections - occur it must be confessed, sooner or later, in nearly all diseases of the heart. When there exists a considerable mechanical obstruction to the blood - and also when the action of the organ is greatly debilitated - if the impediment be on the left side, the lung will probably be the seat of the earliest obvious functional disturbance. Again, of the occasional immediate consequences of disease of the heart, besides enlargements of the abdominal viscera, dyspepsia etc. - yet it is the respiratory system which most invariably suffers - as we might readily have anticipated, from the close physiological connection of the heart and lungs. Asthma, dropsy - the chronic cough of the aged, so often mistaken in former times for primary affections, have as is now well made out,
most frequently their source in disease of the heart.

Respecting the manner, in which cardiac affections (reserving a full explanation till I treat the diseases separately) produce disease of the lungs, it is sufficiently obvious in most cases in which the left side is at fault, but with regard to those of the right, there seems to be some discrepancy of opinion. Thus Jay, in speaking of hyper trophy of right ventricle says: "The lungs suffer more particularly, or at least earlier in the course of the disease as is attested by the frequent occurrence of hemorrhagic pulmonary phthisis &c." Now Dr. Watson says "Simple hypertrophy of right ventricle, when it occurs results from actual or virtual insufficiency to the passage of blood, from the ventricle into the lungs — that the increased thickness of the walls of that chamber, visible
Omits mention of contractor and date on free
a measure of the difficulty, and of the freedom of force with which the blood is conveyed to the lungs. That pulmonary apoplexy does not. be due to the vital force causing effusion of the blood on the lungs.—Lastly, he says, he never met with pulmonary apoplexy with mere hypostrophy of the lungs. He is a direct minority of opinion respecting the capability of hypostrophy of the lungs to produce pulmonary apoplexy—but seeing that this to condition of the heart is rare, except as caused by some pulmonary obstruction, which has already been shown attending this result. I should therefore feel disposed to coincide with Dr. Watson in considering the pulmonary apoplexy as arising from some structural change of the lung, inducing obstruction to the circulation, and consequently congestion, defects the hypostrophy as the result of this obstruction—
In fact as a general rule — we shall find the secondary affections arising from disease of the heart, will be on the further side — or its effects travel in a direction contrary to that of the blood. But without further digression — I shall go on to speak more particularly of Diseases of the heart, the organic changes that occur in this organ, the way in which they secondarily affect the lungs —

The morbid conditions involving the muscular substance of the heart, spring very frequently indeed from pre-existing morbid conditions of the membrane better lining, or investing the organ — when pericarditis is present, to also lie the great majority of cases, does endocarditis exist. Not from these inflammatory affections, that changes are ultimately produced, which in time come to affect the lungs — Thus Pericarditis, generally,
when not proving early fatal from extensive effusion, produces adhesion of the pericardium & heart, which, by its contrivance, causes a degree of stricture to the movements of the heart, as to lead to hypertrophy—But a much greater cause of the same change is, the frequently coexisting Endocarditis—which affecting the valves & fibrous rings from which they spring, principally (more particularly on the left side) leads to more structural changes in them by which they are rendered incompetent—or so rigid, as to cause a direct obstruction to the passage of blood—leading to dilatation, hypertrophy, degeneration &c. & consequently producing congestion of the parts behind them, the lungs especially—inducing diseases present by the noticed. But with acute Pericarditis, Pleurisy & Pneumonia exist are present in the greater number of instances—Louis Lap profound
in at least two thirds of the whole—Probably
This is to be explained not so much on the phlegmo-
logical connection of the lungs & heart, nor from
the extensiveness of the disease from one organ to the
other—But rather to the same exciting cause giving
rise to inflammation in all these tissues—but
that pleurisy should very frequently coexist with
is no more than we might naturally expect
Pleurisy—from the antiquity—aology
of structure, of the two membranes—also the great
tendency of all fibrous tissues to take on inflamma-
tory action in inflammation—the disease with Wh:
Pleurisy is most frequently associated. This
in those cases of pleuritic complication, especially
by which that portion that lines the diaphragm
is affected. That the most suffering both pain
local & local—& in more cases, where there is extreme
sense of suffocation, a tendency to tachycardia; there
generally exists, an abundant effusion into the
pleura, as well as pericardium.

Now although the pleuro-pneumonia cannot be said to result directly from pericarditis, still the frequency of their coexistence sufficiently warrants their mention in this paper. The importance of being acquainted with their liability to occur together, will be very evident, for thus we have the three most important inflammatory affections within the thorax, at the same time, or if not bearing it in mind, the symptoms of one, or two, or the diseases, may be so strongly masked by the predominance of those of the other, as altogether escape our attention.

Hypertrophy is the most common of all the changes to which the heart is subject, and condemning also ascertainment it to be an exceedingly common affection. There are three recognised varieties viz.

1. Simple hypertrophy
2. Hyp. with dilatation
3. Isometric hypertrophy
Hy: with Contractions — the Second Variety is the Most
Each

common by far. Latter may exist without any valu-
urable or other complication — caused merely by di-
creased demands on the actions of the heart, or,
from long continuance of functional disturbance,
as palpitation &c. When hyperthrophy exists it
always strongly predisposes into inflammatory
action — and indeed when left uncontrolled its
fatal tendency, of the variety of complications
along with which it presents itself, either as a con-
sequence, concomitant, or cause, must still be held
in remembrance — But without going into
all these, I must confine myself to those alone
lying into this subject — namely, how uncompli-
cated hyperthrophy may in time come to affect
the lungs — It would seem, in short hyperthrophy,
there is tendency to move a life consolato of most
parts of the body, especially the head & lungs, the
Latter indicated by the tenderness of pulmonary
membranes & dyspnœa, the latter often from
an early date, especially on exercise—how this
is most likely owing to their being an increased
account of blood to the six, circulating through
the lungs, diminishing their capability of pro-
perly performing—and at the same time de-
manding an extra amount, of function—i.e. if fact
they are in a condition unfit, for the mutual
action of air & blood. In such a state of the
organs as this, it is easy to account for the little-
pulmonary complications that generally occur,
such as, very considerable dyspnœa, cough, &c.
Haemoptyses is also very frequently present, as
also chronic bronchitis, & paroxysms of asth-
ma—these however not partaking of to inculcate
a character, more susceptible of alleviation
by judicious treatment, than, where they originate
in obstruction. Moreover it would seem highly probable, that the Pleuro-pneumonia accom-
pagnying the pericarditis, when the latter is un-
connected with rheumatic origin, but occurring
during Myositis, which so strongly predisposes
to it — is as frequently & easily induced by this
altered & engorged state of the lungs. Again
the influence of Myositis in the aggravation
of pulmonary diseases, originating during its course,
is also very conspicuous — thus the prognosis of
Phthisis, Pneumonia, &c is rendered much more
unfavorable by its presence — which is what we
might have foreseen & expected.
Such being the pulmonary complications likely
to result from uncomplicated Myositis, urge
us strongly to the necessity of early directing our
remedial efforts to the primary Cardeaic disease;
for these alone are we likely to be successful in
wasting them off — it is now well known that half the pulmonary affections, which used to be considered as primary, result from cardiac disease, and are consequently inremediable, the latter having elapsed, when by judicious management they might have been altogether averted.

Having thus sketched the manner in which simple uncomplicated hypertrophy may disturb, originate diseases, in the respiratory system, we shall be better prepared to trace, how valvular and other obstructive diseases of the heart, induce many pulmonary complications, partaking of the same character as the preceding, but generally much more insidious and serious, difficult, if not impossible to treat, because dependent on an organic change of the heart, over which we have little influence, and whose removal is beyond our reach — it has already been mentioned how valvular disease most generally
result from the changes produced by plastic exudation in endocarditis — by which their structure is so much altered, that they are rendered incompetent — and also how much more frequently this occurs in the left, than in the right, side.

Again from the valvular obstruction, we generally have accompanying hypertrophy and dilatation, and from this not uncommonly degeneration from the insufficiency of the valves to close the orifice.

Now in all these cases of obstruction in the heart, we shall have, sooner or later, an alteration of the pulmonary circulation — in fact the blood passage must be impeded, consequently the lungs become engorged — indeed not infrequently to such an extent, that the effects extend backwards through the lungs to the right side of the heart, their causing destruction, valvular incompetence, the venules being often rendered inefficient.
Disease of the mitral valve leads more especially to accumulation in the left auricle, pulmonary veins, and in the lungs themselves—but also to obstructive disease of the left side of the heart, producing the same effects to a greater or less extent.

In such an engorged condition, the lungs are much more liable to be affected by the various exciting causes of pulmonary complaint—In fact they are strongly predisposed to diseased action, being incapable of resisting it when occurring. But beside this, such a state, directly induces some affections as pulmonary haemorrhage; there is so much mechanical congestion, that the blood at length bursts through the bronchial membrane, haemorrhage is slow, or copious, effuses from the air spaces, and pulmonary aspiration forms—be it known, that next to phthisis, of which this is symptomatic, its most frequent cause is organic disease.
of the heart—a view before decided, in favour of disease of the left side. Again we readily see how adenae of the lungs should be directly induced from such mechanical congestion, so that becoming more and more infiltreted with blood, so to speak, it will be still further incapacitated from performing their function. But as before said, it particularly predisposes to certain pulmonic affections—this is what we might expect, for we know that congestion of a part or organ, is the first step in the inflammatory process. The very condition which exists in the lungs—a thing it cannot be regarded as the same active congested state as commences inflammation. Still it is a condition very nearly akin to it, requiring very slight exciting cause to light up inflammatory action. Hence, we have chronic bronchitis, as a very frequent accompaniment of disease of the
left side of the heart, produced, &c. &c. &c. Resulted in this constant congested state of the bronchial membrane — often the state of symptoms are those of dry cough, which may exist to a dangerous degree, being very scarce difficult of removal; but more frequently they believe themselves by coryza discharge — again the same condition of the bronchial membrane; frequently induces asthmatic paroxysms — for in this very state of the bronchial tubes, which is so often the cause of that spasmodic contraction of their tubes — and it is this way that cardiac disease, whether primary, or secondary, to asthma — so frequently causes as aggravates the paroxysms — with regard to pneumo-

nia, Williams says — All those causes which tend to induce asphyxia — produce also that congestion of the pulmonary vessels, which added to irritative exhalation, may constitute inflammation.
Thus we see that various causes which disturb
gually the balance of the circulation—particu-
lary the leakage of blood through the lungs—may
become causes of pneumonic inflammation."
Now as this is exactly what cardiac disease does,
it is not at all surprising, should pneumonia pre-
sent itself as a result of disease of the heart,
and that it should be a very serious complica-
tion when occurring—too often quite beyond
our control.
Thus we see how cardiac affections of the left side
of the heart, depending on structural change, in-
duce secondary pulmonic complications—often
some, often dangerous, little amenable to de-
medication, or our powers of demoral. Consequently
one's treatment in these cardiac affections shal
be principally prophylactic—doing all in our
power. The causes liable to induce the pulmonic
affections—
We have now considered how uncomplicated, by sickness, in that existing with valvular disease, may induce disease, secondarily, in the lungs; it yet remains to see how simple dilatation of the heart, caused by obstruction in the circulation, a weakness of force in the heart, may come to implicate the respiratory organs — where the power of the heart is not proportioned to the mass of the blood to be circulated; it should give motion, nor to the extent of the circulation — there is necessarily a tendency to accumulation & dilution. Of the predisposing causes of this condition — one of the most probable is, weakness of one or more of the compartments of the heart, of congenital disease — or, a similar state induced under the influence of disease of the organ — also various debilitating causes of the system, & also impairment of the nutritive & stimulating qualities of the blood. Now we shall
find that the condition of the lungs themselves, very frequently, in the first instance, leads to this dilatation of the heart - thus chronic obstruction in the lungs, a habitual paroxysms of dyspnoea - which may demand a frequent & protracted suspension of the respiration, may act as powerful agents in producing this state of dilatation - more especially, as in such cases, there is generally the predisposing cause of debility already in action - these however only acting on the right side of the heart, 

This simple dilatation, together with, as is often the case, a preternatural enlargement of the orifices of communication - with in its turn, tend to render the pulmonary circulation weak & imperfect, favouring engorgement, increasing disease already present - a predisposing to the assumption of imperfect action from slightly exciting causes.

A similar dilated condition of the left side oc-
casionally exist—caused generally by some obstruction beyond weakness of the organ pre-existing.
Now when this occurs, especially when of some duration, a similar condition of the right side almost invariably takes place—and in consequence we have the lung healthy & much expanded—their serous being overdistended with blood & the pulmonary tissue infiltrated—circumstances which explain the distressful tendency to dyspnæa, haemoptysis, & habitual cough—with copious watery expectoration &c.

The signs of simple uncomplicated dilatation are not always very plain, & may be readily overlooked, the two serious pulmonary complications have occurred to admit of demoral—yet in the earlier stages of dilatation, the prognosis is not very unfavorable, especially when simple & moderate in degree—in deed much less formidable.
than where there is expectoration — but this is not the case. The lungs have been allowed to dry, in vain endeavors to remedy the pulmonary complaints — instead of attacking their cause. Then indeed we are likely to have a state of matters, both in the heart and elsewhere — which render remedial means unavailing. But in those cases in which there is permanent obstruc-
tion in one or more of the orifices of the heart, or a congenital, or deeply seated, or long established de
teriority of the organ exists — it only remains for us to palliate existing symptoms, or prevent if possible the superintention of new ones. Then it becomes our care and precaution to guard against the exciting causes of, or subject by appropriate means, catarrhal affections — as they tend to materially to aggravate the dyspnoea, or favour the development of the morbid condition now under consideration —
Having now considered the manner in which all the chief Cardiac diseases come to induce Secondary pulmonary affections complications— I think it not necessary to mention some other rare Case Morbid conditions of the organ separately—but merely to state, that many of the various diseases to which the subject, by interfering with the due performance of its function (if tending to arrange the pulmonary circulation of the large majority of these do) induce a state of the Lung especially prone to the assumption of morbid action—and also rendering the prognosis of the disease as occurring exceedingly unfavourable. Thus it is, that we find sooner or later, those various pulmonary complications, almost invariably acc- companying Cardiac Disease—
Lastly we have briefly to consider—What pecu-
lar advantage we derive, a knowledge of these facts
Having very imperfectly shown the close and intimate
relation existing between the lungs and heart, in health
and disease, as well as in disease, health—first, let me
endeavour to impress the very great importance, in
a practical point of view, of the bearing in conne-
tion with the extreme liability of disease, originating
in either of these organs, specially when some, or of
long duration—coming soon to involve and incapacitate
the other, as yet sound organ. It only by recol-
lecting this fact, that we are enabled to bring these
facts, perhaps most important kind of treatment
in this class of disease, to the prophylactic, it is
by knowing this natural tendency, that we can
anticipate the results—by carefully guarding
against and avoiding all those causes which induce
the secondary complications—frequently, in this
way, our efforts crowned with success.

Secondly, when such complications do exist, there may be some doubt as to which organ may be the primary cause—or being led away by some of the more conspicuous symptoms then present, I having diagnosed the presence of one disease, we may best satisfy ourselves without further investigation—leaving the primary or most important disease undiscovered.

And yet should we make our diagnosis, it may be of vital importance to our patient—a case of life or death—all important time may be lost, in directing our treatment to some secondary affection—the error of which is impossible, so long as the maintaining cause—the primary disease, is still in action—once we discover our mistake, it may be too late to rectify it.

Now it's only by an intimate acquaintance of pre-existing facts—the manner in which these complications
arise, that we are enabled, aided by the powerful
means we now possess—of pushing our investigations
so as to arise at the primary seat of the disorder.
If we do this before, are we likely to be successful
in our treatment—by directing against this, this
frequently not curable, not admitting of removal—
our remedies—be able even to alleviate, to induce
such a change as to place it in our power to to remove
the secondary diseases—
And thirdly let me in conclusion, say a few words
of the importance of making ourselves thoroughly
masters of the diagnosis of diseases of the chest—without
which the preceding knowledge will be un-
meaning—of what use can it be to know how
these diseases of these organs affect one another, if
if shown placed before, we can not distinguish a dis-
Lographic pain—first there must be master the
the complicated forms—all these are we in a position.
to recognise them where occurring in combination.
And when we remember the great frequency of
Cardiac & pulmonary diseases — the immense
propensity they hold in our lists of mortality, we
can not but be struck with this all important
branch of our profession — having conquered
this — we then go forward — with good assurance
in our somewhat difficult task — by this know-
ledge alone rendered easier — of warding off, or
coping with when existing, the various compi-
lations arising from the mutual relation be-
tween cardiac & pulmonary disease —

Edward Long