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ON THE PROGNOSIS AND TREATMENT OF ORGANIC DISEASES OF THE HEART.

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THERE is perhaps no group of internal structural diseases, which are more accurately distinguished by their physical signs than those of the heart. The modes of determining the condition and action of the muscular substance of the organ, made known by Corvisart, Avenbrugger, Laennec, and their successors, and the method of interpreting the valvular murmurs, which I first proposed in 1835, have rendered the Diagnosis of the more common ORGANIC DISEASES OF THE HEART comparatively easy and accurate. But the general knowledge of the PROGNOSIS and TREATMENT has not advanced in an equal degree; and mistakes are often occurring, in consequence of the misapplication of the long prevalent notions respecting the prospects and treatment of heart disease to cases which, although correctly diagnosticated as such, are not of the grave nature which is apprehended. It is a satisfactory result of extended experience on this subject, that organic lesions of the heart, even of considerable amount and complexity, are not incompatible with prolonged life, and, under favourable circumstances, with a moderate share of health and comfort. For example: About fifteen years ago, I was consulted by a medical man of middle age, who presented formidable signs and symptoms of obstructive and regurgitant disease of the aortic orifice, with greatly enlarged heart, and dilatation of the ascending aorta. The symptoms, at that time, were not only those of inordinate action of the heart, but the functions of the brain were occasionally impaired; exertion or emotion sometimes causing confusion of thought and indistinct articulation. Yet this gentleman has been engaged in a pretty extensive country practice ever since; and within the past year, when I last heard of him, he had not abandoned his professional duties. And when at length death does occur in such cases, I have been often surprised at the enormous amount of disease that had gradually accumulated, yet sometimes without causing those alarming and distressing sufferings, which occur in other instances, where the lesions are much less consi-

derable. The largest human heart that I ever saw, weighed, when empty, 40½ ounces, and measured in circumference of the ventricles, 14½ inches; in length, from arteries to apex, 8½ inches, and in thickness of the walls of the left ventricle, from 1 to 1½ inches; yet this monstrous organ carried on the circulation of its owner, a man of fifty years of age, with so little disturbance, that, until within a few weeks of his death, he was able to perform his duties as hall-porter in the town-house of a nobleman, and he had not failed to partake of the abundance of creature-comforts which such situations commonly afford.

In many other examples, I have felt the heart's impulse extending from the midsternum to the seventh or eighth rib, beyond the line of the left nipple; I have heard the harshest and loudest valvular murmurs; and, in the most tranquil state of the circulation, the walls of the chest have been visibly shaken by the strong exaggerated movements of the diseased organ; yet the patient has complained of little or no suffering, and, under favourable circumstances, has survived, and even enjoyed life, for years.

With such instances we may contrast others, in which, with signs far less prominent—an impulse rather tumultuous and irregular, than extended and violent, and murmurs rather peculiar and deep-seated than loud or long—the distress and disturbance of the circulation have been sudden and serious, and death has occurred within a few days or weeks from the first development of the symptoms.

It is, then, evident, that the pronounced character of the signs is no measure of the severity or danger of a disease of the heart; and the PROGNOSIS is to be determined by a consideration of other circumstances. My experience leads me to point out the following, as the most significant on this subject; and I shall afterwards show, that they are equally important in relation to the treatment. They may be conveniently grouped under the following heads:—

1. Circumstances relating to the Heart itself.
2. Circumstances relating to the state of the Blood, and to its General Circulation.

Each of these heads will need some illustrative comments.

1. A Structural Disease of the Heart may be considered serious and dangerous, in proportion as it impairs the power of the organ to carry on the circulation. We may judge of this power, both by the physical signs of the action of the heart itself, and by the condition of the circulation at large. The power of the heart to carry on the circulation is represented by its natural sounds; and so long as they are distinct, with their proper characters, of comparative dulness or prolongation of the first or systolic, and clearness or shortness of the second or diastolic,—then, no matter how loud the accompanying murmurs, the heart is doing its work,¹ and there is little ground of present alarm. If, on

¹ The true causes of the natural sounds of the heart have been so fully and satisfactorily demonstrated by the experiments which I conducted in 1835, and which have been subsequently repeated and varied by numerous observers, in Europe and America, that it seems very strange that much difference of opinion should exist about them. Yet, every now and then, we hear of new explanations proposed, suggested by some crude experiment or observation of a monstrosity. A curious instance of the latter, is the account of the sounds of the heart given by M. Cruveilhier, derived solely from the observation of the heart of a new-born infant, which,

the contrary, the natural sounds are indistinct, or considerably altered, being too faint to be audible in the usual position, or superseded (not merely masked) by abnormal murmurs,—then, whether there be loud murmurs or not, whether there be palpitation or irregular action or not, whether the impulse be strong or weak, it may be inferred that the heart's action is seriously impaired; and the lesion must be considered of a dangerous kind.

I have notes of more than a score of cases, such as the following:—A physician of eminence was consulted on account of a young lady, who had a slight pain in the chest, with moderate palpitation. On applying his ear to the chest, he heard so loud and harsh a cardiac murmur, that he was alarmed, and recommended that I should see her. On examination, I found a very loud, grating systolic murmur, having its greatest intensity to the left of the sternum, between the second and third ribs, where there was a palpable thrill. According to Dr. Hope's rules of diagnosis, this must have been situated in the pulmonary artery; but finding the murmur distinct also in the carotids, I considered it to be in the aortic orifice; this opinion was confirmed by a perceptible thrill in the pulse. But it is more to the present purpose, that this murmur, loud as it was, did not supersede the natural double sound; and the impulse, although stronger and more heaving than natural, was not far beyond its proper position. I judged, therefore, that there was no present danger; and the regularity and moderate frequency of the pulse, as well as the absence of other serious symptoms, pointed to the same conclusion. This lady had some years previously suffered from some inflammation in the chest, and had ever since felt more or less palpitation on over-exertion. Such an exertion was the cause of her present ailment, which, to her own feelings, subsided after some days' rest and the use of very simple remedies; yet the murmur remained nearly as loud as ever. After being directed to pursue the rational plan of caution against all circumstances likely to derange the circulation or general health, this lady returned to the country quite well, and pursued her usual occupations and amusements. This was six years ago; I have seen her three or four times since, enjoying her usual health; but the murmur remained nearly as loud as ever. In this case, I consider that there was a small body projecting into the aortic orifice, and that, although causing noisy vibrations in the current, it did not oppose the passage of the blood sufficiently

from deficiency of the walls of the chest, lay exposed to view. Some years ago, I saw a precisely similar case at Bristol, with Dr. Symonds and Dr. O'Brien; and to show how little observations in such a case are to be relied on, I may state, that although we were all well practised in the examination of the heart, we could not agree as to the order and succession of the motions and sounds in the turbulent little object before us. In fact, with a heart beating from 130 to 160 in the minute, and in continual motion, it is not possible accurately to analyse the visible or audible phenomena. It is no wonder that, in such a case, M. Cruveilhier should deny that there is any period of rest; but I do wonder that he should have applied the same inference to a healthy heart, soberly beating some 60 or 70 per minute. All my best observations were made on the hearts of large animals, when they were beating slowly but vigorously, and every movement and sound could be deliberately noticed. Under such circumstances, the true relations of the motions and sounds soon display themselves clearly; and being once well perceived and understood, the phenomena become familiar and easily appreciable, even in cases of greater difficulty.

to disorder the proper action of the heart and its valves. Hence these, in their usual transition from slack to tight, in systole and diastole, still produced their natural sounds; which were thus a proof of the sufficient integrity of the heart in its functions.¹

The following case of regurgitant aortic disease bears on the same point. A man, aged about thirty, who had formerly suffered from acute rheumatism, was admitted into the hospital for a slight ailment, attended with palpitation. The remarkable feature of his case was, a very loud musical murmur, of a cooing tone, following the second sound. Although most intense at and near the midsternum, it was distinct in every part of the chest; it could be heard not only in the arteries of the neck, but faintly even in the radial artery of the wrist. This patient was quite a stethoscopic curiosity, and was kept in the hospital on that account, rather than because he required special treatment. Accordingly, the natural sounds of the heart were quite distinct,—proving a fair performance of the natural function; although the systole, in its duller sound and extended and lifting impulse, implied some degree of hypertrophy of the left ventricle. As far as regarded the heart disease, therefore, in spite of the loudness of the morbid sound, the prognosis was not unfavourable; and we learned from his history, that for several years the noise in his chest had been noticed, when his health had not materially suffered. It happened, however, unfortunately, that he took a prevailing typhus fever, and died in the hospital. On examination of the body, the ventricles were found moderately enlarged and thickened, and the valves all healthy, except the aortic, one of which had the free margin neatly retroverted, so as to leave a fine, smooth chink for regurgitation. Some of those present at the examination, expressed themselves disappointed at finding so little lesion to account for so remarkable a sound; but, considered acoustically, it was precisely calculated to explain the sign, by affording a narrow slit for a uniform refluent jet, producing the rapid, equal, and prolonged vibrations, which constitute a musical tone.

Instances of noisy mitral regurgitation, without dangerous heart disease, are still more common. I have a great many patients on my books, whom I have occasionally seen for several years past, who have the systolic murmur below the left breast, which, in 1835, I proved to be characteristic of mitral regurgitation; and which, provided it merely accompany, and do not greatly supersede the natural double sound of the heart, is by no means so formidable a sign as is generally supposed. In some of these cases, the patients complain less of their heart than of their breath, or their digestion, &c.; in others, nervous palpitation or pain is a troublesome symptom, and aggravates the sufferings and fears of the invalid: but none of these symptoms are adequately proportioned to the cardiac lesion; and they may come and go, whilst this is constant.

¹ This is my explanation of the natural sounds, inferred from the experiments before referred to. The ventricles, with their valves, at each systole, are suddenly tightened on the contained blood, and thus produce the first sound, which is more or less prolonged till the vibrating, and therefore sonorous tension, ends in the diastole: then the ventricles are relaxed, but the parts suddenly tightened now are the arterial valves, which simultaneously closing under the recoiling column of blood, give the second or diastolic sound.

But so long as the natural sounds of the heart are distinct, and the impulse does not spread far beyond its natural limits, although the murmur be loud and the symptoms distressing, we need not despair of amendment and restoration to moderate health.

In all cases, however, in which the existence of a valvular lesion is proved by the persistence of a murmur, the prognosis must take into account not only the present amount of the lesion, but what it is likely to become; whether it be stationary or progressive; and whether, although now it do not seriously affect the ordinary work of the heart, as evidenced in its motions and sounds, it may not be so increasing, as to tend to interfere with them, and thus to develop dangerous disorder. To determine this point, we have to consider the recent history of the case, and watch its progress for some time. Thus, if symptoms of disordered action of the heart have manifested themselves only recently, in consequence of an accident, a sudden mental shock, or an inflammatory attack in the chest, then it is possible that the disease, although moderate now, may be on the increase; and even in a case of slight lesion, a favourable prognosis cannot be pronounced, until further observation shall prove that there is no tendency to increase. But if the history give no evidence of a sudden or recent affection of the heart, and if examination, repeated after the lapse of a week or so, discover no remarkable variation in the physical signs, it may be inferred, that the lesion is stationary, and may be considered less formidable in proportion as the natural sounds remain unaffected.

With the cases above described, as presenting through their physical signs a favourable prognosis, may be contrasted those of an opposite description, equally declaring themselves by their physical characters. We have seen that it is not the loudness nor harshness of the morbid murmurs, that proves the formidable nature of a cardiac disease; but rather the degree and mode in which natural sounds are superseded, or changed from that type in which they represent a healthy working organ. Thus when, instead of the natural first sound and impulse, there is only a soft blowing or musical murmur, with little or no impulse, or when a murmur of any character supersedes completely the natural second sound,—we have, at once, the proof of a serious and dangerous alteration of structure: and this is commonly, but not constantly, evinced by faintness, distressing palpitation, or irregular action, with other symptoms of failing function in the centre of the circulation. The most formidable cases of this description, are those in which the valves of an orifice have been broken down, either by some violent exertion, or by a sudden increase of endocarditis or degenerative softening. I have met with several examples of this kind. There had been the signs of a moderate lesion previously,—a murmur accompanying one or both natural sounds; when, after a violent strain, or excessive mental excitement, sometimes with the sensation of something suddenly giving way, the action of the heart becomes tumultuous and irregular, with more or less faintness or oppression; and the sounds of the heart are found to have become changed, the natural sounds being indistinct, the rhythm irregular, and the murmur altered in character, but not always increased in intensity. In other instances, a similar change has occurred less suddenly, but still within a few days, by the rapid destruction resulting from

acute endocarditis, or from fatty degeneration of the valves; in such cases, general symptoms of cachexia, and of serious disorder of the blood and excrement function are also present, to give warning of the impending danger; for destructive endocarditis, and degeneration of textures, do not occur in a healthy constitution. But the change in the sound of the heart is here all the more sure token of evil, and the sufferer seldom survives many days, or weeks at furthest.

When the lesion of the valves is slower in progress, and only gradually impairs the natural sounds, its fatal influence is often successfully counteracted, for a time, by the powers of nature. This they can do in slow cases, by developing increased strength and substance in the muscular walls of the heart. The more this is done by simple hypertrophy, without degeneration, or much dilatation, the better will it accomplish its end,—the augmentation of the damaged power of the heart to propel the blood. It is thus that we sometimes find the most formidable kinds and degrees of organic disease of the heart *gradually* developed, without sacrificing life, and, occasionally, without altogether precluding a limited amount of health. We do, now and then, meet with examples of most frightful amounts of change of structure—the normal sounds superseded by all kinds of unnatural blowing, sawing, or grating noises—the impulse exaggerated into a wide, tumultuous heaving stroke, which, with its almost equally violent diastole, so shakes the walls of the chest, as to give a shock to the whole frame; yet the patients complain of little or no palpitation or discomfort, and have far less of suffering or fear, than most of those persons who are affected with merely functional disorder. By substituting increased force for completeness of mechanism, nature does manage to compensate for the defects for a while, and, under favourable circumstances, to maintain the circulation to a degree that is surprising, considering the amount of the lesion. But this compensatory power is very uncertain and unruly; it is very apt to exceed its due bounds, and further to damage the heart and adjoining vessels by its violence; or to falter and suddenly fail, when exhausted by an unusual effort: so that even these cases, the best of their class, hold life by a very uncertain tenure. The machine, working at a high pressure, to which it is not adapted, may suddenly stop from the expenditure of its power, or soon become worn out by the strain; and thus we are justified in applying a more or less unfavourable prognosis even to chronic cases, where the natural sounds of the heart are materially impaired.

In many cases, the compensatory efforts of nature are even less successful than in those last noticed; the hypertrophy of the walls is frustrated by dilatation, which implies the expenditure of the force on the cavities; or it is vitiated by fatty degeneration, which not only deprives the muscular fibres of their contractility, but renders them yielding and lacerable, and liable to functional failure or fatal rupture. Hence, a dilated flabby heart is the worst addition to valvular disease, and may render formidable even that which is not in itself dangerous. In this case, the systolic sound may be distinct, and even loud, and heard over a wide extent; but it is short, and with the brief knocking impulse, expressive of the deficiency of contractile power. The rhythm is commonly irregular, and the pulse very weak and unequal.

2. The second group of circumstances that affect the prognosis of organic diseases of the heart, are those relating to the Condition and General Circulation of the Blood.

The mechanism of the heart is adapted to certain degrees of spissitude and quantity of the blood, and the vital properties of the organ are sustained by its richness and purity. Any considerable deviations from the normal state of the blood, will disorder the action even of a healthy heart, much more that of one, the structure of which is imperfect. Thus, a thin watery state of blood will mechanically exaggerate the unnatural vibrations and regurgitations arising from valvular disease, and will increase the murmurs which these occasion; whilst the vital properties of the heart, being alternately irritated and exhausted by the irregular quantity and quality of its sustaining fluid, will be still further disordered, and raise the functional disturbance to its greatest possible height. Hence there are no cases which are more distressing, or seem more alarming, than those of valvular disease combined with *anæmia*; and many such instances have I seen, reduced to this condition by the injudicious employment of an antiphlogistic or lowering treatment. But so long as the natural sounds and impulse of the heart are distinct, and there is no evidence of a worse complication than *anæmia*, although the murmurs may be very loud, the palpitation very violent, the occasional faintness distressing, and all manner of anginal pains and oppression be present, and even although *anasarca* may have begun to appear, yet these cases are by no means hopeless. In many instances, they improve so much under a soothing and sustaining treatment (including sedatives, chalybeate tonics, and nutritious diet), that the patients sometimes think themselves cured: but the valvular lesion is still detected by its murmur, although its diminished intensity shows that it is of minor importance, now that a better state of blood has restored to the heart its proper sustenance. It may be inferred, therefore, that simple *anæmia*, although often greatly aggravating the symptoms, and exaggerating the signs, of heart-disease, is not a dangerous complication, if it be seasonably and properly treated.

The same observation will apply to *general plethora*, or simple excess of blood. This too, by exalting the vital properties of the heart, and by putting its mechanism to a strain, increases the intensity of the symptoms of organic disease; and, if uncontrolled, tends to spread its destructive effects. Under such circumstances, the prognosis is unfavourable only when the proper antiphlogistic and sedative treatment cannot be practised, or has been neglected too long: when these are judiciously and seasonably employed, the amelioration of the symptoms, and the diminution of the morbid sounds and impulse, are often very remarkable.

But the most common of all the complications of heart disease, and the most important to be considered in the prognosis and treatment, is that with *deteriorated quality* of blood. *Cachexia* and *toxæmia*, in all their varieties, *uræmia*, *cholæmia*, *lithæmia* (lithic acid in the blood), *oxalæmia*, *pyæmia*, and others, which it would be hard to name, might be exemplified from clinical experience as constituting prominent elements in the history of cases of organic disease of the heart, and almost stamping them with the proper indications for their treatment. The

subject is too wide to be discussed in full, it must suffice to take the more common examples of blood depraved by the retention of excrementitious matter in it.

Experienced practitioners have long been familiar with the fact, that in organic diseases of the heart, and, in fact, in most chronic maladies, it is of the first importance to attend to the state of the digestive organs, and to the secretions of the liver and kidneys. In truth, so prominent is this practical fact, and so manifestly does disorder of these several organs give occasion to the troublesome symptoms in the heart, that both practitioners and patients not uncommonly jump to the conclusion, that the true seat of the disorder is the stomach, or liver, or kidneys, and that the heart is only "sympathetically affected." The auscultator avoids this mistake; he is well assured, by the signs, that organic disease exists in the heart; but he will fall into an error of equal practical importance, if he neglect the consideration of those derangements of other viscera which react on the damaged heart, and render its imperfections more serious and distressing. The mode of their influence is, doubtless, in some cases, conveyed through the medium of nerves; and, therefore, may be called "sympathetic"; as where a bit of shell-fish or bitter almond in the stomach instantaneously causes palpitation or syncope, (this may happen without any organic disease, but it is more likely to happen with it). In other cases, the disturbing influence is merely mechanical; as where a stomach, inflated with gas, or distended with bulky crudities, presses on the heart; or where an enlarged liver has a similar effect. But most commonly, the medium which conveys the disturbing influence is the blood; loaded with morbid matters, resulting from bad digestion or imperfect excretion, it disorders the various organs through which it is distributed; and none more than the heart, whose injured structure makes it most susceptible of the disturbing influence: hence ensue attacks of palpitation or irregular action, and other symptoms of disturbance, which magnify a disease, before quiescent and scarcely observed, into a distressing and possibly dangerous malady.

Nor is the permanent affection of the heart unconcerned in producing the functional disorders which react thus severely upon it. These may be more or less owing to constitutional peculiarities, or accidental causes; but they are, in part, the result of the disturbed circulation connected with the cardiac lesion. This always operates, in some degree, by inducing congestions or irregular flows of blood in the several parenchymatous organs. The lungs, the liver, the kidneys, and the mucous membranes, especially suffer from this disturbance; and, although insufficient to produce prominent symptoms, it sooner or later impairs or disorders their functions. Hence, we find the subject of organic disease of the heart occasionally, and in some instances almost periodically, suffering from biliary or stomach disorders; from asthmatic or catarrhal affections, or from some of those multiform rheumatic, gouty, and kindred ailments, that are connected with imperfect elimination by the kidneys. Any additional circumstances, tending further to lower the regular force of the circulation, may prove co-operating causes; such as exposure to cold, undue exertion or fatigue, irregularities of diet, and the like. And under their superadded influence, the exacerbation of the heart disorder will take place sooner, and with greater severity.

The primary pathological condition in the affected viscera thus induced by a heart disease, is generally congestion. Often we have the physical signs of congestion in the lungs, or liver, and, I may add, sometimes in the kidneys.¹ Their functions are then more or less impaired; and in no symptom have we better evidence of this, than in the state of the urine, which generally becomes scanty, high coloured, and occasionally turbid, and in severe cases, albuminous; less commonly, it is pale and watery. As this proceeds, the action of the heart is more deranged, until more or less of a paroxysm of inordinate or irregular action is developed, with the usual distress and increased disturbance of all the functions. Here we trace the influence of the defective excretion in impairing the quality of the blood, and in developing and aggravating the imperfections of the organ, which propels it. In the same cases conjointly, in others separately, the liver may likewise suffer, and in its increasing bulk and tenderness, it gives evidence of congestive enlargement; whilst, in many instances, a tinge of the conjunctiva, and even of the skin, porphuria, and various other signs of bilious derangement, affords proof of the presence of bile in the blood. Here the heart soon feels the deterioration of its proper stimulus; and faintness or irregular action, sometimes with a peculiar kind of breathlessness, is the consequence.

These secondary disorders, arising from imperfections in the heart, and reacting on and aggravating them, are, if opportunely and properly treated, quite tractable in connection with the more moderate degrees of cardiac lesion; but, if neglected, they tend to become inveterate and unyielding, and to involve the system in a state of constitutional disease and cachexia, which, in various ways, may hurry the malady to a fatal termination. In my *Principles of Medicine*, I have pointed out the most important steps in this process of extension and aggravation of disorder; and did space allow, I could cite numerous histories of cases, in exemplification of various modes of this progress: but to avoid the tediousness of detail, I will enumerate the several changes of structure and function, which commonly precede the fatal termination of organic diseases of the heart. Whilst the pathologist will not fail to perceive the mutual relations of these changes, the practitioner will recognise in their symptoms, phenomena long empirically known as "bad signs", marks of a "break up", indications of failing vitality.

The following Table contains the elements of the complications most commonly occurring in the progress of organic disease of the heart; and it is sufficiently obvious, that in proportion as these secondary lesions become permanent, they react on the original disease in the manner described, and both by aggravating it, and by injuring other functions, and the general health, they render the prognosis more unfavourable, and even to lesions of moderate extent may give a fatal tendency.

¹ The physical sign of congestion of the kidney is a temporary enlargement, ascertained by palpation through the walls of the abdomen in the supine posture. In persons that are not fat, I have generally been able to reach the body of the kidney by gradual rotatory pressure, which, by displacing the intestines, brings them to the fingers in apposition to the posterior walls of the abdomen. This method of determining the size of the kidney is much more feasible than that

SECONDARY EFFECTS OF ORGANIC DISEASES OF THE LIVER.

ON THE LIVER.	CHIEF SIGNS OR SYMPTOMS.	COMMON RESULTS.
Congestion	Soft and varying enlargement	Increased secretion or deposits.
Deranged and interrupted secretion	Bilious attacks—jaundice, etc.	Cholemia, malnutrition, dyspepsia, etc.
Interstitial deposits	Enlargement.	
——— soft—plastic ...	——— soft, uniform...	Functional disorders, general weakness, etc.
——— fatty	——— ditto	Cachexia, dyspnoea, general dropsy.
——— hard—granular	——— hard, irregular	Jaundice, cachexia, malnutrition, purpura.
——— contractile	Size progressively decreasing, with rounded induration	Intestinal hæmorrhages, ascites, cachexia.

ON THE KIDNEYS.

Determination of blood—congestion	Secretion first increasing, then diminished and albuminous or bloody—Lumbar pains and tenderness.....	Disordered secretion, temporary albuminuria, uræmia, etc.
Increase and casting of epithelial cells of tubuli	Soft enlargement—Urine diminished, and containing casts of cells and albumen	The same in a more confirmed degree.
Gradual filling of tubuli with common granular cells, sometimes degenerating into fat	Secretion less urinous, more albuminous	Permanent albuminuria, uræmia, and its consequences, cachexia, spæmia, dropsy, etc.
Exudation on vessels, causing partial contraction and atrophy	Secretion less albuminous, more watery	

ON THE LUNGS.

Congestion and determination of blood	Dyspnoea, cough, catarrhal expectoration. Obstructed breath-sounds, moist crepitus in back, wheezing, etc.	Pulmonary catarrh, or emphysema.
Interstitial deposits and obstructions of vessels	Confirmed dyspnoea. Signs as above, with partial dulness and tubular sounds	Hydrothorax and general dropsy, aggravation of heart disease.
Pulmonary apoplexy and consolidation	Increasing dyspnoea and cough. Expectoration viscid, and sometimes bloody	

ON THE ARTERIES.

Irregular distension—partial inflammation	Strong pulsation; sometimes murmurs. Pain or soreness. Jarring pulse	Excitement and derangement of function of part.
Deposits on the coats.....	Hard pulse—unequal.....	Irregular supply of blood, and liability to rupture, aneurism, gangrene, atrophy, or malnutrition.
Fatty and calcareous degeneration	Ditto	

(To be continued.)

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