The Oliver-Sharpes Lectures

ON

HEART FAILURE.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS
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BY

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LECTURE I.—AN ANALYSIS OF THE PRESENT-DAY CONCEPTION OF HEART FAILURE.

MR. PRESIDENT AND GENTLEMEN,—I thank you for the honour you have conferred upon me in inviting me to give these lectures.

In seeking for a suitable subject, I considered the type of lecture usually given before you, and I found that most of your lectures deal with observations made in laboratories, or drawn from hospital experiences, and rarely, if ever, deal with practical observations derived from general practice. It is now many years since it was forced upon me that the study of disease and its treatment would never be satisfactorily accomplished until the general practitioner took his share in the work of research. Hitherto his position in the rank of investigators has not been appreciated, and if he has had no actual discouragement, his attempts have been too often received with a chilling indifference. The need for his help will be realized if we but reflect upon our imperfect knowledge of the course of many chronic diseases, where neither the inception nor the different phases of the progress are understood. Usual exponents of medical science are not brought into intimate contact with the varying manifestations of disease. The trivial ailments by which the beginning of the diseases are often made manifest are lost to them. The subtle changes that go on as the disease advances are usually missed, and the links between the stages are too often based on inference alone. When such a process takes the place of observation in the study of disease, it may be taken for granted that the result will be entirely unsatisfactory. On the other hand, the general practitioner has the opportunity of seeing all the changes as they proceed and the behaviour of the individual under all sorts of conditions. Were he helped and encouraged, his assistance would be found invaluable. But it needs a patience and a perseverance that is called for in no other line of investigation, for he may have to watch individuals for decades for the solution of a problem.

I have therefore chosen my subject with the twofold object of demonstrating, first, the need for observation, such as the general practitioner alone can undertake; and, secondly, the results that have been obtained by such a line of observation. I feel, however, that an apology is needed for the imperfection of the observations I propose to place before you. When I began these observations it was not with any expectation that they would yield results of much value, and it was only as time went on that the importance of the investigations dawned upon me. Imperfect as they are, I am not without hope that they may throw some light on disease processes, and justify the views I have expressed as to the line of observations I have mentioned.

If an attempt be made to obtain some definite conception of the present-day aspect of heart failure and the significance of symptoms, no account of sufficient precision is to be obtained from the study of any textbook. The subject is of so much importance and touches the members of the profession so closely and at so many points that it is a matter for marvel that writers have not realized the necessity for formulating their ideas in language that the student or reader can appreciate. The reason for this absence of definition is probably because most writers have not had the opportunity of watching the development of disease in individual cases for long periods of time. They have devoted themselves mainly to describing the details of the numerous features by which the circulatory

system is made manifest to us. As these features vary in character, those that most impress the observer's senses have been elevated above their fellows, and an undue significance attached to them. For this reason, phenomena that appeal to the sense of hearing are considered to be the chief manifestations of disease, and we find that the majority of diseases of the heart are described according to the auscultatory phenomena associated with them. In thus accentuating the importance of limited lesions, the appreciation of the heart's action as a whole has been lost sight of, with the result that the real significance of symptoms has never been fully appreciated, while the study of heart affections from the point of view of isolated disease has actually led to a misinterpretation of the meaning of many of the most obvious phenomena.

It seemed, therefore, not inappropriate that I should take the opportunity of presenting to you a view of heart failure which I have employed for many years, and which in the vast majority of cases has given me a satisfactory basis on which to determine the value of phenomena, even when I had a very imperfect notion of the manner of their production.

Before elaborating the manner in which I seek to estimate the degree of heart failure and the significance of symptoms, I think it necessary to demonstrate the need for such a procedure, following in this respect the method of theologians, who teach that, before a sinner is fit for repentance, he must be brought to an appreciation of his own shortcomings.

The Popular Conception of Heart Failure.

Let us consider how the average medical practitioner acquires his ideas of heart failure. A young fellow has passed all his examinations, and may have had some hospital experience as a house-physician. He passes into general practice, and is surprised to find that diseases present very different aspects from what he expected. During his hospital experience he has seen many patients seriously ill from heart failure. In some murmurs have been detected, and the valve lesions have been regarded as the cause of the heart failure. The patients have died, and the diagnoses have been verified, for the suspected valves have been found thick and shrunken, and the cause of death has been duly certified as disease of the valves. The manner in which heart failure had been brought about has been explained to him: the systolic murmur indicated incompetence of the mitral valve, the leak from the left ventricle had distended and embarrassed the left auricle, stasis in the lungs, with subsequent embarrassment of the right ventricle had been produced, and this, again, had been followed by dilatation of the right ventricle, with consequent tricuspid regurgitation, irregularity of the heart's action, embarrassment and dilatation of the right auricle, back pressure into the veins, followed by dropsy and enlargement of the liver. This view presented such a simple and intelligible explanation that he never dreamt of calling it into question.

With this belief in the mechanical production of heart failure, we can readily understand how the practitioner came to estimate the significance of a mitral systolic murmur. The heart failure is sometimes divided into stages, more or less corresponding to certain evidences, which are taken to indicate stages in the gradual process of heart failure by backward pressure. Consequently any given case is placed in a definite stage, according to the presence or absence of certain phenomena. Even a person who is in perfect health, when a murmur is detected, is looked upon as being in the first stage, with what is called "good compensation." That is to say, the individual is considered to have a valve defect, and that defect indicates disease, or at least impairment of the functional activity of the heart, and it is but a matter of time when the heart will no longer be able to maintain the circulation, and heart failure is bound to follow.

He has also been taught that a heart to be normal must be regular in its action, so every form of irregularity is looked upon as a form of disease. As time goes on he finds murmurs and irregularities at all ages, in the young, in the middle-aged, and in the old. He detects them in people in the enjoyment of good health. He frightens many with his evil prognostications, he forbids the young to play games, he rejects people for life insurance. As

years pass, for one case where his prognosis has come true there are dozens who have falsified it. He seeks more light, and turns to the writings of authorities. He wants to know the significance of irregularities. His own ideas are confused, and the numerous authorities but add to his bewilderment. Many carefully avoid all reference to the subject, others speak with mingled courage and fear—irregularities may be of little significance, but on the other hand, they may be grave—in certain cases they are of no importance, in others they are of serious importance. But how to distinguish the serious from the harmless he can find no answer. It is the same in regard to murmurs. His experience has shown that many individuals in whom he detects murmurs do not suffer from heart failure. Again, authorities are silent on the differentiation of the serious from the harmless, and although most writers recognize that there are differences of significance, yet practically all agree that murmurs are evidence of impairment, if not disease, and no clear definition can be gleaned of the real significance.

The views I have put forth represent broadly the manner in which heart failure is viewed by the practitioner, and when we come to the higher authorities we get little further satisfaction. It is a matter of everyday experience to find cases judged and treated, because of some supposed abnormality, as a murmur, an irregularity, or an increase in the size of the heart. I fully acknowledge that many physicians do recognize differences in the significance, and do give valuable and trustworthy opinions. But when we inquire upon what grounds this differentiation is based they fail to produce evidence sufficiently tangible for practical use, and I do not think I am overstating the case if I assert that to-day many leading authorities would admit that a murmur or an irregularity or an increase in the size of the heart, singly or altogether, implies impairment if not disease.

Origin of the Conception of Heart Failure.

In order that the profession may appreciate the position held in regard to heart failure and the significance of such symptoms as murmurs or irregularities, it will be profitable to inquire into the origin of some of our most cherished beliefs. If we would really seek to find the true reason for many accepted beliefs, we must first consider those who propound them. For that purpose it is necessary to consider the mental attributes of the physician himself. It is a characteristic of the human mind, seen in primitive man, in the child, and in the scientist, to attribute to malign influences phenomena which are obscure in origin and which are assumed to be unnatural.

Our profession is not immune from this trait of seeing evil in the unknown. It is the cause of many gloomy forecasts. The real nature of heart failure not being understood, and experience showing that death occurs unexpectedly, signs or symptoms which are considered abnormal, and whose nature is not known, are viewed with suspicion or as portents of evil. So general is this tendency to imagine evil in the unknown that I am continually seeing members of our profession who are apprehensive because in themselves or their patients some supposed abnormality has been observed in the heart's action. I also see a large number of people who are handicapped in their life's work, subjected to long periods of treatment, and made readily apprehensive because of this tendency to see evil in that which is not understood.

To obtain a just appreciation of the significance of any symptom it is simply necessary to seek out its cause and its bearing on the heart's efficiency. Before we proceed to inquire as to the significance of such symptoms as murmurs and irregularities, it will be instructive in the first instance to see on what grounds they were assumed to be evidence of cardiac infirmity. Practically in all the present-day teaching their significance is taken for granted. If it be borne in mind that murmurs were practically not recognized till the days of Laënnec, we shall find how this mystery of sound has affected the whole profession. In Laënnec's time murmurs were looked upon as evidence of heart disease. It will be observed that this view was taught and accepted at a time when the cause of murmurs was not understood, and before any physician had observed individuals for a sufficient length of time to acquire the knowledge of what happened. That is to say, before even the most elementary facts were appreciated, a definite

decision was accepted, with the result that the views so hastily acquired remain the accepted beliefs of this day. No doubt support of this view was supposed to be found in the fact that patients died from heart failure who had had murmurs during life. Later the identification of specific murmurs with certain diseased valves was supposed to establish this view. The profession, influenced by this very limited experience, has been so impressed with the association of murmurs and heart failure and diseased valves, that the great majority of heart diseases are distinguished by the noise that the heart happens to make, although these noises may have little or no connexion with the heart failure.

The Significance of Murmurs.

I repeat that I am well aware that many physicians do distinguish between murmurs that are functional and organic, and that some regard the former as of little significance. But I want to direct attention to the fact that the outcome of all these attempts to appreciate the nature of murmurs has been to impress the majority of the profession with the idea that murmurs are evidences of an impaired heart; and so strong is the hold that this view has upon the profession that many physicians reject all candidates for appointments or life insurance in whom a murmur is present, and army medical officers unhesitatingly reject all candidates who show a murmur or an irregularity. If you inquire from the latter the reason for this rejection, you will be told that many soldiers break down from valvular disease and irregular hearts. But I may point out that this is not proof, inasmuch as those who have murmurs or irregularities are not admitted into the army, and that those who do break down have never previously been shown to have had these symptoms.

Considering how widespread is this belief among many members of the profession, that functional murmurs may lead to heart failure, it would have been expected that numerous instances would have been published. Strange as it may seem, there is not in all the literature which I have searched the record of a single instance where people with these so-called functional murmurs have suffered from heart failure. What we do come across occasionally is an isolated reference to a case concerning which the writer expresses surprise that an individual in whom a murmur has been detected had falsified entirely the prognosis of the physician.

Seeing that murmurs were considered to be evidences of disease before even the nature of their causation was understood, it is surely time that we sought to estimate them at their real value.

Are Murmurs Necessarily a Sign of Impairment?

What ground is there for supposing that a perfectly normal heart should of necessity be free from murmurs? I have put such a question to many of my colleagues, and the mere suggestion of such an idea has seemed to them absolutely uncalled for. It is an article of belief so deeply and firmly embedded as to be beyond the province of dispute, but, as a matter of fact, it is based on the assumption that the function of the valves is only to close the orifices. And yet there are no grounds to justify the belief beyond the fact that certain valvular murmurs are associated with conditions that lead to heart failure. But surely it is not logical to reason that because some valve murmurs indicate defects all valve murmurs are therefore signs of defects. The assumption has been made and taken for granted without sufficient evidence. That these orifices and valves have other functions has not yet entered into the imagination of most physicians.

If we consider the function of a healthy heart, we shall realize that a murmur may be quite consistent with perfect health. Let us take into consideration the mechanism of the tricuspid valve, for instance. John Hunter described the tricuspid valve as being barely sufficient to close the tricuspid orifice, and the experiments and clinical observations of Gibson have shown how easy it is to induce tricuspid regurgitation. A well-acting heart possesses the power of altering the size of its chambers in accordance with the calls made in its work, apart altogether from its systole and diastole. This is due to the muscular walls possessing the function of tonicity—a function which enables the heart to alter the size of the chambers in order to accommodate itself to the exigencies

of life. When we consider the extremely varied amount of effort which the heart is called upon to expend, it will be easy to understand that a physiological dilatation may often be called into operation. If, then, the tricuspid valves are barely competent, it is readily understood that a slight degree of physiological dilatation will render them incompetent.

The Function of the Auricles.

Moreover, if we consider the functions of the auricles, we shall find out that they are specially constructed to meet this incompetence. The older physiologists were wont to describe the main function of the auricles as being that of reservoirs, capable of varying their contents to meet the varying circumstances of cardiac activity. This is probably their most important function, for in many cases the work of the heart can be carried on efficiently when the auricles cease to act as contracting chambers, as, for instance, in certain cases of auricular fibrillation, to which I shall allude later.

The Function of Tricuspid Incompetence.

Wilkinson King has shown that this tricuspid incompetence, with the reservoir function of the auricles and great veins, and even of the liver, is a special provision in diving animals, and he described the modified condition in man as the "safety valve function" of the tricuspid valve.

What is the common notion of tricuspid regurgitation? In many textbooks it is looked upon as the beginning of the end. When tricuspid regurgitation sets in, the heart is supposed to have entered on a critical phase of exhaustion. This view is simply the outcome of the back pressure conception of heart failure. Many writers recognize the normal incompetence of the tricuspid valve, but the vast majority of writers do not appreciate the simple mechanism of its production in healthy hearts.

The Harmlessness of Mitral Incompetence.

What I have said of tricuspid incompetence applies also to mitral incompetence. The mechanism by which a functional murmur arises is probably the same. But in the case of the mitral valve we get better evidence of the harmlessness of mitral regurgitation due to damaged valves, from the study of cases with organic changes in the valves, for, as I shall show later, mitral regurgitation can go on for fifty years, with absolutely no crippling of the heart in its work.

Are Irregularities Necessarily a Sign of Impairment?

The same form of inquiry reveals that the significance of irregular action of the heart is misunderstood. On what grounds is it assumed that a heart to be normal must be regular in its action? A historical retrospect will throw little light upon the subject, for from the dim pages of history obscure references to irregular heart action show that it has been regarded as abnormal long before any true idea was acquired of the real causes of its production, and long before it was shown that irregularities were of different kinds, and had widely divergent significance.

Let us consider the irregularity so common in the young, where its presence is often looked upon as a sign of disease or of impairment. We know that the heart is remarkably sensitive to nerve influences. In certain individuals the respiratory movements, by stimulating the vagus nerve, produce a transient slowing of the pulse, and this may be so marked that a recognizable form of irregularity may arise from this cause alone. This irregularity occurs most markedly in the young, and mainly, if not entirely, in those with a perfectly healthy heart muscle. Any cause that irritates or excites the heart muscle, as fever, excitement or effort, at once abolishes the irregularity. So marked are these causes in abolishing the irregularity that I have for some years looked upon the presence of the irregularity as a possible evidence of the integrity of the heart muscle, and so far from considering it an evidence of disease or of infirmity, it may, within certain limits, be considered a positive evidence of a healthy heart.

The Real Test of the Significance of Murmurs and Irregularities.

Although it might be objected that this way of looking upon certain murmurs and irregularities as within normal

and physiological limits is purely conjectural, I do not base my argument solely on such grounds. The real test of this reasoning is the practical one of close observation of individuals who have shown these murmurs and irregularities for many years, while they have been exposed to all the exigencies of a strenuous life. This test I have applied in so many cases and watched individuals for so many years that I have no hesitation in saying that the irregularity and murmurs found so frequently in the young are evidence neither of disease nor of infirmity, but are normal phenomena, and, in many cases, are positive evidences of a healthy heart.

I know very well that many physicians recognize the harmlessness of irregularities and murmurs, and are quite prepared to admit the position I have taken up when the matter is the subject of an academical discussion. I have, however, found from practical experience that these phenomena are taken, to all intents and purposes, as abnormal signs when any particular individual presents them. Thus, for instance, a youth at school or college is examined by a physician, and when these phenomena are present the symptoms are looked upon as signs of weakness, if not disease, and treatment is at once directed to their cure, and the youth is forbidden to indulge in those games and pastimes which call for strenuous exertion. Not only have I watched with particular interest individuals with these functional murmurs and irregularities, and have never seen one suffer from heart failure, but what is more significant, I have never seen, in the twenty-eight years I spent in general practice, a single case of heart failure from a functional affection of the kind with which I am dealing. I may point out that my experience has been a very extensive one, and that people whom I have observed have led hard and strenuous lives, so that the condition of life would aggravate any defect that tended to heart failure.

The Harmlessness of Organic Murmurs.

So far I have been dealing with what are described as functional murmurs, and many physicians recognize that these are of less significance than murmurs due to an actual lesion of the valves, and teachers usually describe certain evidences which distinguish an organic from a functional murmur. In order to appreciate better the significance of murmurs, I can cite from my experience cases with mitral disease whom I have watched for twenty to thirty years, and who have never shown the slightest sign of heart failure. From this it will be seen how unjustified is the view that mitral regurgitation is of necessity a serious trouble. The view that the auricles are adaptable reservoirs is supported by such evidence as that of a heart unimpaired by mitral regurgitation which has been going on for fifty years. Take, for instance, cases with a history of rheumatic fever, after which a rough systolic mitral murmur was left, which from its character and history and propagation leaves no doubt as to its being the result of an endocarditis, acquired during the attack of rheumatic fever. What is the significance of this murmur? We may take it for granted that an individual with such a murmur would be rejected for life insurance or made to pay an enhanced premium, while for all occupations, as the army or navy, he would be unhesitatingly rejected. Yet I have observed such patients pass into middle life and old age, some of them leading strenuous lives, and have never shown the slightest sign of heart failure.

The Harmlessness of Organic Irregularities.

Irregular action of the heart is in the same unsatisfactory position. Though irregularity in the human heart is a phenomenon of the greatest frequency from youth to old age, few writers attempt to deal with the subject in such a manner as to enable the reader to understand their position. They either ignore the subject (and you may find textbooks of considerable size where the subject receives at the most only an incidental reference), or they deal with the subject in such an indefinite manner that no clear idea of their position can be ascertained. On the other hand, when we come into everyday dealings with the subject, we find that irregular action of the heart is looked upon by our profession as an evidence of serious heart impairment. From middle age onwards, sometimes before, there appears in most people an irregular action of the heart of a very characteristic form. This is due to the

auricle or ventricle contracting prematurely. The contractions are often so small as not to be perceptible in the pulse, which is then spoken of as being intermittent.

As a matter of fact, after watching individuals for long period of years, I can say that the great majority of those people are in no danger, the irregularity is of no grave significance, and treatment is unnecessary. In certain grave conditions its presence may be one of several symptoms, and in such instances it is difficult to tell whether the condition producing it is related to the cause of the heart failure, and in such cases the physician must base his opinion on a study of all the symptoms. There are indeed certain irregularities which are evidence of grave exhaustion, but there are other signs by which we can appreciate the gravity of the case.

The Back Pressure Theory of Heart Failure.

I have already referred to the notion that heart failure with valvular incompetence or disease is due to the gradual increase of pressure in the lungs and in the chambers behind the incompetent valves. Practically the whole conception of the significance of regurgitant murmurs has been based on this conception of back pressure. In order to get a clear idea of the unsatisfactory basis on which the present day conception of heart failure rests, it is necessary to look a little more closely into this accepted doctrine.

I have failed in my endeavours to trace the origin of this notion, but have come across it evidently in full acceptance in Bellingham's *Diseases of the Heart*, published in 1857. At the period when it was accepted the meaning of the signs on which it was based were imperfectly understood. Like all theories based upon the application of mechanical laws to vital phenomena, there is some truth in it, but like all such theories, it leaves out of consideration so many factors as to render it in the main untrue. Considering the assurance with which this view is taught it might be assumed that abundant evidence was forthcoming for its support. We do, indeed, get many realistic diagrams, illustrating imaginary changes in the circulation, but there is a sad lack of trustworthy detail. I may say that I have failed to find in literature the record of a single case giving evidence sufficient to justify this explanation. Moreover, I have seen cases with their first attack of endocarditis; I have patiently followed their subsequent progress, and have seen heart failure and death ensue, but never in my experience have I seen one case which followed the course supposed to be characteristic of heart failure from back pressure. Although back pressure may be present, and may modify the symptoms of the heart failure, the back pressure is never the essential cause of the heart failure.

The Essential Causes of Heart Failure.

When we watch cases with heart lesions, associated with mitral disease, which ultimately lead to heart failure, we shall find symptoms arise which, if properly appreciated, give us a clue to the essential cause of heart failure. We may find, for instance, the character of the murmur changing, and the appearance of new murmurs as the years go on. This indicates that the lesion producing the murmur is not stationary, and that there are slow insidious changes going on in the heart. Now these changes are never limited to the endocardium or the valves, but invariably involve the heart muscle. When it is borne in mind that the whole efficiency of the circulation depends upon the integrity of the heart muscle it will be seen how important it is to appreciate these myocardial changes. I shall in my next lecture point out that the essential cause of heart failure is due to the changes in the heart muscle, which, by impairing its contractile force, render it unable to maintain the circulation. The valve defect which is revealed by the murmur is, as a rule, a mere embarrassment to the heart in its work. Moreover, there are many fatal forms of heart failure in which the valves are perfectly competent till the end. It must be further understood that the coincident changes in the muscle, which lead to heart failure, are not limited to one chamber, but may affect all the chambers of the heart.

Not only does this view of back pressure overlook the real source of the heart's inefficiency, but it has misinterpreted the most significant change in the heart's action, a change which induces or precipitates those signs of heart

failure which are looked upon as characteristic of back pressure. It is frequently recognized that, accompanying such signs of heart failure as dyspnoea or orthopnoea, the rhythm of the heart has become irregular. The symptom is worked into the back pressure theory as being due to the distension of the auricles. As a matter of fact, the onset of the irregularity precedes the heart failure in a large proportion of cases, and is itself a sign of a change which has taken place in the heart's action, which at once embarrasses the heart in its work, and leads directly to extreme heart failure. This change is due to the auricles passing into a state of fibrillation, a condition which alters the whole aspect of the mechanism of heart failure.

Auricular Fibrillation.

In order to obtain a better view of extreme heart failure, and in order to call attention to probably the greatest discovery of practical importance that has yet been made in the domain of the clinical pathology of the heart, I will briefly describe some of the features of the condition, which we now recognize to be due to fibrillation of the auricle. I think it all the more necessary to deal with this matter, because even yet many observers who detect the cause of the altered rhythm of the heart are not aware of its immense importance. The recognition of this condition and the phenomena accompanying its onset presents the subject of the most common form of heart failure in an entirely new light, and affords grounds on which a sound prognosis and a rational therapy can be based, in many obscure cases. The response of hearts affected with auricular fibrillation to remedies differs so much from the response of hearts with the normal rhythm, that its recognition throws a light upon the action of cardiac remedies which modifies the whole conception of cardiac therapy.

Definition of Auricular Fibrillation.

Within the last few years the attention of those engaged in the study of the heart's action has been directed to a condition of which little has hitherto been known. Physiologists have long recognized that under certain obscure circumstances the muscular fibres of the heart muscle, in place of contracting in a normal and orderly fashion, could be put into a state where the individual fibres or small bundles of fibres contract, rapidly, and apparently independent of each other, so that the chambers cease to contract as a whole but stand still, while all their fibres are in incessant movement. The result of these fibrillary contractions is at once to suspend the contractile function of the chambers affected. When the ventricles pass into a state of fibrillation death ensues, and MacWilliam suggests that this is, in all probability, the cause of sudden death in the human subject. When the auricles pass into fibrillation death does not ensue, for the fibrillation cannot pass along the bundle which connects the auricles with the ventricles. But what does happen is that the stimuli for contraction are rapidly and irregularly thrown upon the bundle by the fibrillating auricles; and if the bundle is able to transmit the stimuli, and the ventricles are able to receive them, the ventricles are stimulated in a rapid and irregular manner. In some cases we find the onset of auricular fibrillation accompanied by a rapid and irregular pulse, in others by one of moderate rate or even slower than the normal, but almost invariably irregular. This variation in rate depends upon the susceptibility of the auriculo-ventricular bundle or of the ventricle to stimuli—a point of the greatest importance when treatment has to be considered.

Pathological Changes Inducing or Associated with Auricular Fibrillation.

The cases in which fibrillation is most frequently found are those with a previous history of rheumatic fever, or in elderly people. The pathological changes found in the heart which seem to bear upon this question are an increase of fibrous tissue and of nucleated cells in the walls of the auricles. There are also in many cases calcareous changes in the arteries. Accompanying these changes in the auricle are similar, and sometimes more extreme, changes in the muscle walls of the ventricles, and it is very probable that the degrees of heart failure that follow the onset of auricular fibrillation are dependent on the extent of these changes in the ventricular muscle.

Frequency of the Occurrence of Auricular Fibrillation.

This condition, as I have already remarked, is of great importance when we come to deal with cases of heart failure. I have observed nearly a thousand cases, and watched a large number for many years. About 70 per cent. of the cases of severe heart failure met with in general practice, with dyspnoea and dropsy, owe the onset of heart failure to this condition. There are, of course, underlying conditions of the heart muscle which lead up to it, and so far as the future of the patient is concerned, it depends upon the degree of impairment of the heart muscle. In addition to cases of severe heart failure, auricular fibrillation is frequently met with in people with heart failure of varying degrees, in some with little or no impairment of the heart's efficiency, in others with long and persistent enfeeblement.

Auricular Fibrillation and Heart Failure.

Although I was at a loss to account satisfactorily for the mode of production of the phenomena produced by what I now know as auricular fibrillation, I had recognized twenty years ago that the group of symptoms in these patients indicated a very definite condition, which I described in my writings first as paralysis of the auricle, and later as nodal rhythm. I had therefore little difficulty in recognizing the condition when it arose. By keeping in touch with my patients I had observed cases when the fibrillation started and watched their progress. In many I found that the onset of heart failure was directly due to the fibrillation. Some of them have drifted and died, irresponsive to all treatment, within a few weeks or a few months. Others have responded to treatment, and led useful lives for many years, while others have maintained but a crippled existence. Some, on the other hand, have been very little affected, and have led energetic lives with little or no treatment. In order to be able to give a reasonable opinion as to the prospects of these cases, I have carefully observed the phenomena which distinguished those who fared badly from those who have been but little affected, and by this means I have obtained an estimation of the value of some of the phenomena and their bearing on heart failure, which I will describe in my next lecture.

Auricular Fibrillation and the Back Pressure Theory.

It is necessary to recognize that auricular fibrillation is not the outcome of back pressure, inasmuch as I have seen it repeatedly in individuals in whom there were no signs of cardiac enfeeblement, even after its inception. In many cases its inception was at once followed by the first symptom of heart failure. Why this should happen will be understood when it is recognized that the four chambers of the heart are simultaneously thrown into abnormal action. The auricles are standing still, so that the heart loses what benefit is obtained by the orderly contraction of these chambers. In the cases that do badly the ventricles are stimulated to rapid and irregular action. They are not filled in the normal fashion. The periods of rest between the beats are shortened, and are of insufficient length to restore the strength of the heart muscle. The beats therefore are less effective, and with persistence of the rapid rate, exhaustion of the heart muscle sets in, and gradually there supervene all the phenomena which we recognize as characteristic of extreme heart failure. This explanation dealing with a certain class is borne out in many ways, but I refer to it here in order to show that heart failure in these cases does not follow the route mapped out in the scheme of back pressure, but that all four chambers are at once rendered inefficient.

The Inadequacy of the Back Pressure Theory to Explain Heart Failure.

To sum up, the theory of heart failure from back pressure lays stress upon and magnifies factors of little importance and ignores entirely the essential factors in the production of heart failure. The back pressure theory leaves out of consideration the fact that the valve lesion may be a steadily progressive one, and it omits the still more important fact that there are coincident changes going on in the structure of the heart muscle, impairing its efficiency, and leading up to the essential cause of heart failure. But most important of all, this back pressure

theory has failed to recognize that the changes which have led directly to the production of heart failure and produced such symptoms as dyspnoea, dropsy, enlargement of the liver, are due to the sudden inception of a different rhythm in the heart's contraction by fibrillation of the auricle.

The main object I have had in this lecture was to show that the accepted view of heart failure has been based upon a misconception of the means by which it has been brought about, and that certain phenomena associated with heart failure had attributed to them, in consequence of this association, a significance which they do not possess. To obtain a just estimate of their significance, and a clear idea of what is really the essential nature of heart failure, is the subject to which I propose to devote myself in my next lecture.

An Address

ON

ANTIVIVISECTIONISTS AND THE
RESEARCH DEFENCE
SOCIETY.*

BY

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MR. CHAIRMAN, LADIES, AND GENTLEMEN,—I have thought that it might be of interest to this society to put before it the views which have been propounded by the antivivisectionists, seeing that it is the object of our society to combat those views. In order to obtain them we need look no further than the five volumes which have been already issued in the reports of the Commission on the Act which is known as the Cruelty to Animals Act, 39 and 40 Vict., cap. 77. I am not going to burden you with many details upon this subject, but in order that you should understand the kind of views which are held by our opponents I have culled a few excerpts from the statements of representatives who were sent up to give evidence before the Commission on behalf of their societies.

Place aux dames. One lady, an authoress and theosophist, appeared as the representative of a society calling itself the Parliamentary Association for the Abolition of Vivisection. She began by stating that the practice of vivisection causes great moral and ethical deterioration of the race which far outweighs any conceivable value. She then proceeded, on being questioned with regard to this extraordinary statement, to admit that she had no evidence in support of such deterioration, but that in her opinion animal experimentation was not justifiable, even if 20,000 lives a year could be saved by it. That, for example, in India, where 20,000 people a year are killed by snake-bites, if a method could be devised which involved experiments on animals, and which would prevent these deaths, it would not be justifiable to employ it. She further admitted that, in her opinion, it is not justifiable to inoculate a guinea-pig with milk in order to determine whether the milk is deleterious to infants—whether it is capable of communicating tubercle or other disease to them. This lady objects to any exploitation of animals. She was not asked the question, but I have no doubt that, quite consistently, she would object to the miner taking a mouse with him into the pit in order to see if the air which he was to breathe was respirable or irrespirable, or of a sparrow being lowered into a well in order to see if a man could live in that well or not.

Another lady, also an authoress, who came as a representative of the same association, objected to animals being even treated by inoculation to prevent illness. She thinks this should be left to Nature; if Nature chooses to kill an animal by a particular illness, then let it die. This is not a sentiment which would appeal to farmers, who know that by certain inoculations they can save their animals in times of epidemic, but it is, at any rate, consistent. She does not deny the possibility of prevention or cure,

*Delivered at the annual meeting of the Dublin Branch of the Research Defence Society, held on March 24th.