

ON CARDINAL PRINCIPLES IN CARDIOLOGICAL PRACTICE.

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In working for the Army Medical Services during the years of the war, and in working for the Ministry of Pensions since its inception, it has been my good fortune to have been more closely associated with my brethren of the medical profession in daily work than at any previous period. My duties have brought me exceptional chances of seeing the routine work of many medical men while they have been dealing with patients classed as cardiovascular. For a long while I have been aware that a large proportion of practitioners in this country experience a feeling of insecurity when they handle cardiac cases, and, during the period to which I have referred, it has been a special purpose of mine to understand why these maladies should be regarded as perplexing.

For very many years after Laënnec's discoveries the sounds of the heart and the murmurs produced at the several orifices have received extraordinarily minute attention. They have been divided and subdivided; they have been written of from this standpoint and that, though chiefly from the standpoint of the cause of the sounds. More recently, methods of percussion have undergone a similar and intensive study; more recently, and in great array, special instruments have been devised, including sphygmographs, polygraphs, electrocardiographs, sphygmanometers, special stethoscopes, and from those who have employed these there has streamed forth a prodigious amount of writing. During the last few decades the eager search for the new has piled up the mass of detailed knowledge; the pile has been growing in geometric progression. The day has long gone during which any general student of medicine could keep pace with contemporary writings. He is now faced with an extraordinary medley of statements, simple, simply abstruse or technically abstruse, of which it is no longer possible for any one individual to test or judge the accuracy. We know that some vital facts have come to light; we suspect or know that a considerable proportion of the claims set forth will not be justified by time.

Side by side with this progress new terms have been introduced, old terms have changed in meaning; throughout hypothesis has run riot. A very great deal of the work, a very great deal of the thinking, has, from the standpoint of the exact sciences, been conspicuously slipshod. The over conscientious and passive student quickly acquires a clogged mind. To judge the true from the false, the large from the small, tries the faculties of those who select and pursue a limited sphere of study; it is impossible to those who have no intimate knowledge of the subjects discussed. The effort to keep pace has led many, unwisely, to acquire a smattering of things beyond their province—to use terms the meanings of which they have never been able fully to grasp. Time for tests and for reflection is shortened or is gone; the mind is confused by an ever increasing flood of new ideas and suggestions. In this maelstrom general principles have striven to survive; some have succeeded, some have been raised to undue prominence, others have sunk from sight; in the raging of troubled waters all have been, and still are, in peril. There arrives a time when an attempt must be made to sift from the wreckage—a time when it is expedient to assess values.

Medical men are hampered in their work to-day by the complexity of ideas, by a consequent absence of system, by the use of terms which being undefined convey inexact or different meanings; by a failure to judge what is within or without their province and power.

In discussing problems of diagnosis and of prognosis certain questions recur. Of the many prevalent ideas some appear to me no longer acceptable or serviceable; a few of the more prominent of these I propose to discuss,

using them as illustrations of my general theme. But the main object of my lecture is to point to what I regard as essentials, not in research work upon heart disease, but in the routine handling of unselected patients. To simplify my subject I shall deal with chronic maladies only. I shall also confine myself to common maladies, for if we can devise a system of managing such, for the moment satisfactorily, we shall have accomplished the larger part of our task.

THE DIVISION OF HEART AFFECTIONS INTO ORGANIC AND FUNCTIONAL GROUPS.

An idea is conveyed to us, we receive and adopt it, and it grows. Sometimes it grows unreasonably, sometimes beyond recognition. But it has seized our minds, we encourage it, and in the end, if we allow it to do so, it masters us. The old idea of dividing heart affections into organic and functional is an instance of this kind; it has grown out of all reason. This preliminary classification no longer occupies the place proper to classification; a good classification is a servant. It has been so fostered that it has come to occupy a predominant place; latterly its hold upon the professional mind has seemed almost tyrannical. When the war came it entrenched itself behind earthworks long prepared for it, those preposterous terms, "V.D.H." and "D.A.H.," into which all patients with real and most of those with imagined affections of the heart were in the end strictly divided. Since the war the idea still remains firmly rooted, for with its great reserves it won the day; and with the fruits of that easy victory the medical services of the Ministry of Pensions are now ceaselessly struggling.

As it stands, the idea with its growth of associations is mischievous. It has become so by the inexactitude of its terminology. The most frequent question which I am to-day asked in regard to cardiac cases is this: "Is there or is there not organic disease?" The answer must be "Yes" or "No." It is a question which, personally, I studiously refuse to answer; it is a duty to refuse, and the duty, I think, of every medical man. The manner of the answer is dictated; "organic" disease is a disease in which there is structural change; the remaining cases are "functional."*

The issue seems clear: Is there or is there not structural change? But the issue is not clear, nor is it useful; on the contrary it is mischievous. We must inquire the purpose of the question, the manner in which the answer is to be used. If, in diagnosis, the cases are divided into two groups—"organic" and "functional"—according as there is or is not structural change, this division and its meaning will not be respected; for while I am asked whether structural change exists or does not, the answer is read as "serious" or "trivial." It never has been shown, nor will be shown, that all instances of structural change in the heart are serious; it never has been shown, nor will be shown, that affections in which the heart is suspect, but which are accompanied by no evidence of structural disease, are of trivial import. Yet such are the almost universal and instant assumptions as the affirmative or negative answer is given. The question is a concealed trap of our own setting. The answering of it is a prevalent cause of needless wrangling and heart searchings; the answer, when it comes, is a fertile source of misunderstanding and injustice. If there is no structural disease of the heart, it is usually true that the disturbance of the heart is not serious; but that does not mean that the malady from which the patient suffers is not serious, it may be extremely serious. The heart is a very susceptible index of health, and maladies which in the past have been regarded widely as trivial (functional) though primarily cardiac, are almost certainly not primary cardiac maladies, but as a rule disturbances of the heart secondary to disease elsewhere.

A sound knowledge of those affections which perturb without injuring the heart is essential in dealing with patients supposedly suffering from cardiac maladies. Three-fourths at least of the cases classed as cardiac at the present time are not primarily cardiac at all. Because the heart's action is disturbed in these patients, and because the most obvious symptoms and signs seem

* I am aware of my venturesomeness in thus interpreting the definition of this term; some will disagree with this interpretation; yet it is frequently, if not usually, used in this sense. When a medical term is open to two definitions it is time it was abandoned.

point to the heart, that organ gathers to itself almost exclusive attention. In such cases it is not infrequent that clear signs of disease in some other organ of the body are entirely overlooked; in such cases it is frequent that less conspicuous signs of disturbance elsewhere are passed by. It is a sound rule in dealing with a supposed cardiac malady to search the whole body minutely for sources of infection when signs of such heart mischief as is known to upset the circulation are not forthcoming. The question, "Is there or is there not organic disease?" is not a necessary question. A man who is wise cares little whether he has structural change in his heart or not; the State, if it were wise, would be equally indifferent. I place this statement in a context from which it is not to be removed. A wise man cares whether he is fit or not for work and if his prospect of health is good or bad; these are questions distinct from that under criticism. Here is an extreme illustration: A man has a scar in the skin of his leg and presents that leg for examination. Who cares that the scar constitutes structural disease? A man may have a similar scar on his pericardium or on the edge of his mitral valve, a healed scar which never has and never will cause him inconvenience, providing no medical man discovers in him the signs of it and misinterprets its significance. When we see the scar on the leg we want to know how the leg works; when we find the signs over the heart which *may* mean a scar in the heart, it behoves us to inquire how the heart does its work; that is the important consideration.

It will be perceived that I have in mind the systolic murmur and its significance. A systolic murmur over the precordium tells little or nothing of a man's capacity for work or the advisability of his engaging in it; it tells us little or nothing of the man's prospect in life. I do not propose to enter here in detail upon the evidence for this statement, for time is limited and I have somewhat recently written fully upon the subject.¹ But I suggest to those who still experience misgivings in the presence of systolic murmurs that they should examine a series of healthy young men, not, as is the custom, under conditions of rest, but after a few minutes of fairly strenuous exercise; they will discover that the healthy heart is not always so noiseless in its movements as has been imagined, and will, I think, be persuaded that systolic murmurs, soft, harsh or conducted, are natural phenomena when the organ is accelerated by exercise. They will find in these young men precisely the signs which have been used widely during the period of the war as evidences of "organic" disease of the heart, which have led to so many improper rejections of recruits, to so many improper discharges from the service, and now form the basis of many unnecessary or unnecessarily high pensions.

The other side of the picture shows men who are genuinely distressed when they exert themselves in any way, but who, presenting no cardiac signs other than those of a supposed "functional" condition, are dealt with casually or cavalierly. Thousands of these men were unwisely accepted as recruits; thousands more acquired their symptoms during service; and to the last group now belong many who, being regarded as "functional," suffer the innuendoes which that term frequently conveys, and receive as a consequence unjustly small pensions.

DISEASE OF THE VALVES.

Pick up an old, or modern, textbook of general medicine and you will find diseases of the heart classified. With one of the chief groupings I have dealt. A subgroup of structural disease is that of valvular disease, and this subgroup receives an emphasis to which it is by no means entitled. At the present day, if one asks graduating students directly, if one inquires less directly of medical practitioners, what varieties of chronic heart disease are recognized, the enumeration will almost always begin in the same way. There are four conditions which stand out in their minds; they are "aortic incompetence," "aortic stenosis," "mitral incompetence," and "mitral stenosis." As often as not the list begins there and ends there. Ask what cases lie in the wards of a hospital and, if there are serious heart cases, these are the conditions which will be most frequently named. Now these conditions are not diseases at all; they are descriptions of the events at two of the valvular orifices of the heart; they are dependent, if you will, on disease or imperfection of these valves. To the names as such there is no objection; the objection is

to the manner in which they are used. The terms are regarded individually as sufficiently descriptive of many a patient's case; actually each is wholly insufficient from this point of view; *a fortiori*, the term mitral incompetence is insufficient. If I state that I have under my care a patient who suffers from mitral incompetence, you cannot conceive whether the patient is engaged suitably in his everyday occupation or whether he lies moribund; you cannot tell whether his prospect in life is good or is bad; you cannot judge whether he requires treatment or not. The term, used in a diagnostic sense, conveys little or nothing of the facts of the case. "Mitral incompetence" constitutes a diagnosis by fashion only. Precisely the same remarks apply, though somewhat less forcibly, to the remaining terms.

A classification of heart disease of this kind has but a minor value for purposes of description, or for guiding prognosis or therapy. When medical men are so imbued with the supposed significance of valvular disease as to regard its diagnosis as the chief end point of the examination, then valvular disease occupies a grossly exaggerated position in their thoughts. Such, unhappily, it possesses in the minds of many, I would say of the majority of medical men to-day. How often is astonishment expressed when a patient comes for examination (or to autopsy) with dropsy, or a greatly enlarged heart, and no disease of the cardiac valves. The reiteration of such surprise is in itself remarkable. Grave disease of the heart, in the absence of disease of the valves, is extremely common in the elderly; it is also common enough in the young.

There is another curious way in which the emphasis of valvular affections leads to grave misconception. I have said that the named conditions of the valves are not diseases at all; yet they are commonly regarded as such by those who fail to reflect. Many intelligent students and graduated men are so misled by these terms that they come to regard the presence of two such conditions as constituting a double disease. The terms "double aortic," "double mitral" are sufficiently commonplace to bear witness to this tendency. Nevertheless, there is in these patients but one lesion of the valves. Loose speech of this kind consorts with loose thinking; the use of the adjective "double" conjures up a grave prognosis. Heedlessly, a man who presents aortic stenosis, and its almost invariably associated regurgitation, is regarded as in much more serious case than is he who presents regurgitation alone. I know of no evidence that this is so. The presence or absence of stenosis in a patient who shows regurgitation is certainly not a prime factor in arriving at the prognosis, it is at the most a very subsidiary point. The misconception is even greater when the mitral valve is in question. Often, after a diagnosis of stenosis of the mitral valve has been made, the doctor's expression grows ominous as he detects a systolic bruit. In point of fact, the detection of this second murmur adds nothing whatsoever to the seriousness of the prognosis; that it does is nevertheless a very common belief. It is a belief due to lack of reflection; there are good grounds for the view that stenosis of this valve is always accompanied by regurgitation. Might we not even argue in general that the greater the stenosis the less in all likelihood is the regurgitation? But it serves no good purpose to argue such matters, the practical test of those who watch the progress of these cases shows that the point is entirely subsidiary; so, incidentally, is a systolic apical murmur in a patient who has disease of the aortic valves. Detect mitral stenosis and you need waste no time inquiring into the question of incompetence; there are far more serious matters to weigh. At the present time cardiac prognosis, as it is widely practised, is perilously near to counting murmurs and assessing the gravity of the outlook in proportion.

Both for prognostic and therapeutic purposes there is value in ascertaining lesions of the aortic and mitral valve. Speaking quite broadly, there are two conditions of these valves which it is imperative should be recognized whenever it is possible; they are mitral stenosis and aortic incompetence. To recognize stenosis of the aortic valves when regurgitation is known to exist, to recognize incompetence of the mitral valve when mitral stenosis is known to exist does not advance us materially. To diagnose aortic stenosis in the absence of signs of incompetence is outside the province of general practice; it is for everyone a hazardous undertaking. To recognize that mitral incompetence is present, while mitral stenosis is

not, is a task fraught with not inconsiderable difficulties; furthermore, when it is done, it gives little or no aid when we come to the prophecy.

In brief, in dealing with chronic heart affections, there are but two conditions of the aortic and mitral valves, there are but two common conditions of any heart valves, which will repay a general physician expenditure of much time and thought; these are incompetence of the aortic valves and stenosis of the mitral valves. Both these conditions may usually be diagnosed with confidence, for it is their habit to present signs of an unequivocal nature. That is of high importance; a step taken with certainty is of far greater value than one taken even a little less confidently. A prognosis is too important a thing to mould on anything but a secure basis.

The comparative importance of these diseases of the aortic and mitral is to be emphasized from a second standpoint—the diagnosis carries conviction of an inflammatory or degenerative lesion of the heart. When we know that a patient has a regurgitant current of blood from aorta to ventricle, or when we know that the current is obstructed between left auricle and ventricle, we have learned something of extra burdens which the heart muscle must bear in its work. Nevertheless, that knowledge is outweighed by a further conclusion which may be formed for practical use. It is that the heart as a whole has been exposed to and has probably suffered damage; it is safe to assume for practical purposes that when these valvular lesions exist the muscle of the ventricles is in greater or lesser degree faulty. There are some exceptions to this rule, but these are comparatively rare; one of the surest ways of diagnosing a faulty myocardium is to diagnose it in those who present mitral stenosis or aortic disease, and to diagnose it purely on the knowledge that these valve lesions exist; especially does this statement apply to aortic disease. It is my confident belief that, had systolic murmurs and modifications of the heart sounds never been discovered, the practice of the profession would have stood on a much higher plane to-day than it actually does. (I do not say that it *must* have stood higher, but that it *would* have stood higher.) As these signs are used by medical men in general at the present time, they are productive of infinitely more harm than good. They are not useless signs, but they are signs frequently misinterpreted; their value is limited. When a police officer on his night round spies an open window, it behoves him to inquire; he is unwise to conclude there is a thief in the house. These cardiac signs are hints to us, useful guides to possible local mischief; that is their proper status in an examination, but it is not the status which they have.

Prognosis in cardiac affections, as it is generally practised to-day, is pitifully inaccurate; because that fact is generally recognized it is equally diffident; what is not understood is that far greater accuracy is easily within reach. Accuracy, or, more strictly speaking, comparative accuracy, is regarded as unattainable; that is chiefly so because the broad principles and the outstanding facts have been lost to vision in a cloud of relative trivialities. Methods of examination, some useful enough in their proper sphere, many more of very dubious value, have been introduced. The subject as it is written and expounded has grown inordinately in complexity and the landmarks have vanished. Because a physician has possessed himself of an electrocardiograph, a polygraph, an x-ray machine, a blood pressure instrument, or some ingenious form of stethoscope, it does not at all follow that he has become competent to judge a patient's condition; not infrequently the very reverse is the case, for more often than not the limitations of these devices are far from being comprehended. In this opinion I am absolutely at one with the recent pronouncement of Sir James Mackenzie. The signs which foretell favourably or the reverse can be elicited at the bedside by simple means, and the devices to which I refer had far better be left untouched than handled, as they often are, improperly.

The remedy, so it seems to me, which alone remains to the general practitioner to-day is simple but drastic. It is to fasten on to certain cardinal points and seriously to study their values—to take these cardinal points as a basis of everyday work and for the moment to discard what remains. It is to adopt a simple and broad scheme and to obtain a full knowledge of that scheme by applying it to patients; to disdain more comprehensive and flattering plans, of which at the most a mere smattering can be

acquired; to work with those instruments which are always at hand and familiar; to become expert in the use of simple means, rather than indifferent manipulators or puzzled worshippers of instruments wholly or partially beyond general comprehension; to start from an assured basis and to build from that *slowly* and steadily.

EXAMINATION OF CHRONIC CARDIAC AFFECTIONS.

I come to what I hold to be the cardinal points in the daily examination of chronic affections of the heart, and place first and foremost:

1. *The Symptoms and Signs of Cardiac Failure.*

These are subdivided into two categories:

(a) *The Early Evidences of an Impaired Circulation.*—These are constituted by the symptoms which produce distress on exercise, and the three chief are fatigue leading up to exhaustion, breathlessness, and pain. In all patients, whether they are the subjects of actual or supposed cardiac disease, to know the tolerance of physical work is more than half the battle in arriving at a correct estimate of the case. A knowledge of the body's reaction to exercise in health, in ill health, and in the chief forms of heart disease is paramount. I do not mean the rise and fall of pulse rate or of blood pressure; they are of service; but those who measure the reaction in this way almost completely fail to appreciate the essential, which is to know the amount of work which must be undertaken to bring forth *distress*. This method is of such importance that I shall emphasize it by the following considered statements.

No man is competent to manage affections of the heart who has not a thorough grasp of this method, a method which is within the easy reach of every medical practitioner. He may have an exhaustive knowledge of electrocardiography, polygraphy, blood pressure, percussion, the stethoscope, and what not; as a practitioner he is better without that knowledge if the first knowledge is lacking.

Standing by itself the method is of more consequence than the remaining cardinal points which I shall name. That is so because no patient who has a normal exercise tolerance has grave heart disease, and because the gravity of the disease in a series of real heart cases is proportioned to the degree of distress produced by a given amount of work more nearly than it is to any other observable phenomenon within our knowledge.

(b) *The Signs of Cardiac Failure of the Congestive Type.*—These require no description beyond the statement that I refer to cyanosis and to engorgement as observed in the veins of the neck and in the liver. The exercise tolerance is never normal or near normal when these signs are present; they are late signs. When signs of failure appear the disease is in an advanced state.

2. *The Signs of Cardiac Enlargement and its Degree, without Attempt to Differentiate Dilatation and Hypertrophy.*

Time will not permit me to expand on this subject. I would say only that, in respect of these, palpation ranks before inspection and percussion, and that the chief sign is the position and extent of the maximal thrust and the structures it involves.

3. *Signs of Valvular Disease.*

Cardinally these comprise (a) signs of aortic regurgitation, which are obtained reliably as often at the pulse as at the base of the heart, and (b) signs of mitral stenosis, of which but two are valuable—namely, a diastolic thrill in the apical region and a diastolic rumble of low pitch, audible over the maximal thrust, and best heard, often only heard, in the recumbent posture after the action of the heart has been accelerated by exercise.

4. *The Presence or Absence of Fibrillation of the Auricles.*

If the heart is beating irregularly it should be ascertained whether fibrillation of the auricle is present or not. To obtain the last knowledge a few simple tests nearly always suffice.

- (a) If there is constant quickening of the pulse during deep inspiration, fibrillation is not present.
- (b) If the heart beats at a rate of 120 or over,* or can be induced by any means to beat at such rates, while the pulse remains irregular, fibrillation is almost certainly present.

* The faster the rate attained the more certain the diagnosis.

These tests are not exhaustive, but they are sufficiently so for general practical purposes. The remaining disorders of cardiac rhythm, either on account of their comparative rarity or because their significance in treatment is far smaller, cannot be regarded as cardinal.

5. Infection.

No examination of the patient is complete until the presence or absence of infection has been fully considered. The chief signs are:

- (a) *Pallor*, especially when accompanied by sallowness or duskiness of the facies. This sign is of particular value in cases of aortic disease. Pallor in these cases is of ill omen.*
- (b) *Palpable enlargement of the spleen*, which is not a reliable sign of engorgement of the viscera, but is usually a sign of active infection of the valves in cardiac cases.
- (c) The presence of small petechial haemorrhages in the conjunctivae, buccal mucous membranes, or in the skin around the base of the neck and shoulders. They are far more frequent than has been suspected until recently, and should be searched for repeatedly in all sallow cardiac patients.
- (d) *Clubbing of the fingers*, which when slight, is, so I am inclined to think, more frequently accompanied by infective endocarditis than by venous engorgement.
- (e) The presence of *fever*, constantly or only from time to time.
- (f) A *pulse rate* constantly over 90 or 100 while the patient rests and the pulse is regular.
- (g) *Gradual but steady loss of weight*.

Signs (a) to (e) are more especially signs of infective endocarditis, a condition which in its subacute and chronic forms is much more widespread than is commonly believed, and terminates the lives of a goodly percentage of all cases presenting aortic regurgitation or mitral stenosis; signs (f) and (g) are also yielded by intoxications.

6. When Evidence of Disease is found, its Etiology is to be taken into Consideration.

It may be of rheumatic, syphilitic, or other infective origin, or it may result from senile changes. The etiology will control prognosis and treatment in no inconsiderable measure.

The Cardinal Points.

These are to my mind the cardinal points, for, in my experience, the great majority of all cases of chronic affections of the heart may be summed up efficiently and sufficiently in terms of them. In routine work instrumental examinations prove useful in checking or revising the bedside tests, but are essential only in a very small percentage of the patients; they prove in practice to be subsidiary methods of examination.

The value of the cardinal points is, so I think, scarcely to be overestimated. I have said that no patient possessing a normal capacity for exercise has grave heart disease; if his tolerance is normal, but he presents cardiac enlargement—considerable cardiac enlargement is always accompanied by a reduced tolerance of exercise—mitral stenosis, or aortic disease, there need be no immediate anxiety. In very rare cases fibrillation of the auricles or a congenital malformation may be seen in patients in whom exercise provokes no undue distress; in these cases also the prognosis is favourable. If a patient presents none of the symptoms or signs falling under the first three headings—that is to say, *if he takes exercise without undue discomfort*, has no cardiac enlargement, no aortic disease and no mitral stenosis—and his doctor tells him on that basis that his heart is sound, this opinion will be justified in all but very exceptional instances, and the chief exceptions are the rare cases of fibrillation of the auricles and of congenital heart mischief to which I have referred already, and rare instances of paroxysmal tachycardia; even in such cases the blunder would be a minor one; it would be a blunder of less consequence than gravely to warn a patient solely on the basis of a systolic murmur.

Briefly, the first three cardinal points are these which command consideration first; the last three assume cardinal importance in cases in which, on the basis of one or more of the first three points, disabling heart disease is already diagnosed.

Exercise Tolerance.

I come to an important consideration—namely, the value of exercise tolerance in the diagnosis of a deficient

* And is not due, as is commonly thought, to the actual regurgitation.

or overburdened myocardium. It is not a subject I propose to discuss here on a theoretical or detailed basis; my object is to formulate the following everyday rules which in my experience are at present sound:

(a) Where there is definite enlargement, or aortic disease, or mitral stenosis, or fibrillation of the auricles, then the safe course for doctor and patient is to attribute any undue distress on exercise to a cardiac lesion.

(b) In young subjects, if there is no such immediate evidence of heart disease as I have named in the last paragraph, then a deficient exercise tolerance should rarely, if ever, be ascribed primarily to the heart. To this class belong almost all patients who are supposed to be suffering from "heart strain," and a large number of patients incipiently infected with tuberculosis or chronically infected by pyogenic organisms.

(c) In elderly subjects, if there is no sign of structural disease, but a poor tolerance of exercise, the heart cannot be declared free of disease; on the contrary, the heart should be regarded as the probable seat of mischief. It is of course to this class that many cases of grave angina pectoris belong; but it also comprises many myocardial cases, in which the chief symptom is not pain but breathlessness or undue fatigue.

SOME GENERAL PRINCIPLES IN TREATMENT.

Regulation of the Heart's Work and Rest.

The cardinal principle in treating chronic heart disease is suitably to regulate the physical strains thrown upon the organ. When structural disease exists it is for the most part incurable, and as such it should be recognized. When, as an accompaniment of the minor forms of disease—for example, suspected scarring of the mitral valves—the capacity to exercise is unimpaired, there is no need to curtail the patient's energies. But if structural disease is judged to have limited the heart's reserve power, *because* effort is followed by undue breathlessness, by undue fatigue or by pain, then the patient's activities, in work and in play, should be controlled; they should be so regulated that such symptoms of distress are not provoked.

It is not often good practice to limit the activities because some physical sign other than a sign of distress is discovered.

It is not good practice willingly to allow a cardiac patient to call forth his whole reserve, and consequently to suffer pain, undue breathlessness, or fatigue. Those acts, strenuous or leisurely, which bring distress are to be prohibited; in one case strenuous games or heavy labour, in another case quick movement on stairs or road, in another the act of standing, in another unnecessary movement in bed, is to be forbidden, according as much or little exertion provokes symptoms. A cardiac patient is unfit to be on his feet if, when up, he becomes breathless, experiences cardiac pain, or quickly tires. The presence of symptoms in a cardiac patient when he stands at rest or moves leisurely is the first and chief indication of bed treatment. Cardiac patients who are breathless while in bed are usually very gravely ill, and in these it is necessary to try with all our means to reduce the work they do by waiting on them hand and foot. A very important consideration in such patients is to induce long hours of sleep, for during sleep the greatest measure of rest is obtained.

There are three indications which call for the bed treatment of cardiac cases. The first and most important I have indicated; it is that distress is caused by the act of rising to the feet or by walking leisurely. The second is that active infection is thought or known to be present. The third is that drastic treatment with a drug of the digitalis group is required.

The chief value of digitalis lies in its power to control the ventricular rate when fibrillation of the auricles has come. In most patients in whom this disorder of the heart is discovered the ventricles beat rapidly, at rates of 120, 140, 160, and even more per minute. It is this rapid action which fatigues the heart, and digitalis, by lessening the rate, lessens the fatigue. The normal heart rate, while the body is at rest—to take approximate and convenient numbers—is 60 beats to the minute. Each ventricular cycle lasts one second; of this, one-third is occupied by systole, two-thirds by the resting period of diastole. The heart works one shift and sleeps for two. But if the rate is 120 beats to the minute, then each cycle lasts half a second; systole lasts a quarter of a second and so does diastole. Work and rest alternate in equal shifts. As the rate of beating rises, so is systole increased relatively at

the expense of diastole. Very important is it, therefore, to reduce the heart rate where this is excessive. A chief cause of rapid heart action where heart failure threatens or has come is fibrillation of the auricles, and it is in this condition that digitalis acts so beneficially; it reduces and holds the rate within normal bounds.

The reduction of accelerated ventricular rate is the only important action of the drug upon the human heart of which we have knowledge. There are few, if any, instances of which we know with certainty in which digitalis acts beneficially, except cases of accelerated action; there are few instances of acceleration in which the drug produces unquestionable benefit apart from those provoked by fibrillation of the auricles. The principle of digitalis therapy—and when I speak of digitalis I include the allied drugs, strophanthus and squills—is that, administered to suitable cases, the heart, by means of it, obtains rest. The giving of this drug to unselected cardiac cases is much to be deplored. Those who regard digitalis as a cardiac stimulant mistake its character; its chief action is to rest the heart. *To the heart foreglove is not tonic, but powerfully hypnotic.* It extends the diastoles of the heart; it extends the period of sleep.

There is a direction in which medical men are much hampered in dealing with chronic heart disease. It is in trying to order the future lives of working class men to suit the heart's power of reserve. Many cardiac patients leave our hospital wards after a short period of rest, a period during which there has been much improvement of the heart's capacity for work. Yet these patients are but too often totally unfit to take up again those daily tasks in and by which they have already suffered. To tell a working class man that his former work suits him ill, to tell him that he must find new work of lighter grade, is good enough advice; but how often is it within the man's power to act on that advice? how often is it within the doctor's power to see that his advice is followed? We greatly need in this country a system by which disabled workers are placed and cared for in suitable employment. Cardiac cases are for the most part conspicuously willing workers, frequently too willing; there are many men doing heavy work in this country to-day, and at the same time surely, but may be slowly, dying of heart disease. It is a shameful thing that these unfortunates are put by hard necessity to tasks far beyond their endurance.

Work is good for cardiac cases, as it is good for men in whom the voluntary muscles of the body are ill conditioned, but only such work as falls well within the bounds of the heart's reserve is beneficial. It is a most important matter, and a matter very little attended to to-day in hospital practice, to test a man's capacity for work before he goes to his home; it is not sufficiently understood that discharge from hospital is read by many as a sanction to return to the old work.

Infection.

As infection is the chief cause of heart disease, in the stage of its inception, and in the stages of its advance, so, when we come to treatment, to stay the advance by removing the cause is a chief principle. The treatment of early syphilitic lesions of the heart by appropriate measures is a field as yet little explored, but one which is in promise fertile. To treat drastically local invasions by pyogenic organisms is clearly indicated, and of proved benefit in many cases. Even more important is it to guard against infection. Cardiac cases run very serious risks, risks which but too often cannot be avoided, by contact with those suffering from some infection of the respiratory tract. Nevertheless, much harm may be avoided by timely warnings of dangers, met in the family circle, in crowded buildings and in ill ventilated rooms, by the prescription of the open air régime, and, in bed cases, by rigorous separation from febrile cases.

REFERENCE.

¹ *The Soldier's Heart and the Effort Syndrome.* London: Shaw and Sons. 1918.

THE forty-third annual report of the Boston Medical Library recently issued states that on December 31st, 1918, there were 98,097 volumes catalogued and on the shelves, besides several thousands of others not yet catalogued. A number of current German periodicals were received after an interval of nearly three years. The number of foreign books received was small.

REMARKS ON THE FREQUENCY, DIAGNOSIS, AND TREATMENT OF CHRONIC PANCREATITIS.

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For some time it has been generally accepted that in many cases of disease in the abdomen a pathological tripod stands in that cavity with feet implanted in the appendix, biliary apparatus, and gastro-duodenal tract. The coexistence, or the sequential development in any order, of appendicitis, cholecystitis or cholangitis, and gastric or duodenal ulcer, is familiar to clinicians and surgeons. Opinions vary as to whether one or other of the three stands in causal relation to the others, or all three derive from a common and central source in the form of catarrhal inflammation of stomach and bowel. Much work has been done, and remains to be done, on the question.

Meantime, as the records of cases accumulate, it is becoming evident that the tripod is being gradually replaced in the problem by a quadrupedal figure. Pancreatitis is claiming increasing attention.

In the issue of the JOURNAL for July 12th last Sir Berkeley Moynihan publishes a very instructive lecture on "Disappointments after Gastro-enterostomy," in which he quotes me on one of them. In my experience chronic or subacute pancreatitis ranks next in order to chronic appendicitis and disorders of the biliary apparatus on the list of affections which mimic gastric and duodenal ulcer, and for which gastro-enterostomy is erroneously performed, with resulting disappointment.

Clinically pancreatitis occurs in two widely differing types—acute and chronic—which often prove equally elusive of diagnosis.

Acute pancreatitis (necrotic, haemorrhagic, and suppurative) is rarely suspected until discovered at an autopsy or in course of a laparotomy undertaken for a supposed perforated gastric or duodenal ulcer, a fulminating appendicitis, or other similar acute abdominal affection calling for operation. The case commonly goes on to the operating table a surgical puzzle and leaves the hospital by way of the mortuary a surgical disaster, though prompt operative treatment is claiming an increasing number of successful results.

Chronic pancreatitis (catarrhal and, later, cirrhotic) may, especially in its later phases, present suggestive diagnostic signs. Many cases, however, more especially of the earlier and slighter types, present no such signs, and the disease closely mimics other abdominal disorders, particularly duodenal and gastric dyspepsia and ulceration and affections of the biliary apparatus, for which supposed diseases the appropriate operative measures are apt to be erroneously carried out. The error in the case of gastro-enterostomy is unfortunate, for, while gastro-enterostomy may do the patient no harm in some cases, in others it aggravates his distress. In either event the operation results in disappointment. In the case of the biliary apparatus the error may ultimately be harmful or helpful; and this raises the whole question of the technique of cholecystectomy. If in a case of supposed cholecystitis which is really one of pancreatitis, or in a case in which pancreatitis complicates cholecystitis, the gall bladder is only partially removed and the cystic duct, and possibly also the common duct, drained, the pancreatic patient may benefit, though not to the degree possible had his pancreatitis been diagnosed and suitable dietetic and medicinal treatment prescribed. If, on the other hand, complete cholecystectomy with closure of the duct is carried out, all chance of surgical treatment of the pancreatitis is, for the time being at least, lost. Pancreatic drainage can only be carried out later by a much more serious operation and after valuable time has been wasted. It should be an unvarying rule not to remove the entire gall bladder without drainage of the ducts unless the surgeon is satisfied that pancreatitis is absent.

Diagnosis of Chronic Pancreatitis.

Chronic pancreatitis is of more frequent occurrence than has generally been supposed. It commonly complicates