Original Communications.

ON PROGNOSIS IN HEART-DISEASE.

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In all disease, next in importance to Treatment, is Prognosis. Diagnosis is required for both; but, on the whole, a more accurate knowledge of the pathological organic condition, and a more careful estimation of symptoms or departures from normal function, are needed for the prognostication of the result than for the application of remedies. In no class of cases is it more important to be able to foresee the probable course and term of the malady than in heart-disease; in none is there a wider range of contingencies, sudden death, a short and miserable existence, or life prolonged indefinitely and untroubled by evil consequences; in none is prognosis attended with greater difficulty.

It has appeared to me that prognosis has scarcely received adequate attention in systematic treatises on the diseases of the heart; and that it may be of service to bring to a focus on this point the opinions and experience of different writers, giving also the results of my own thought and observation on this subject, and on some collateral questions which arise in the discussion.

I have confined my observations almost exclusively to the chronic valvular affections. These are generally what we have in mind when we speak of heart-disease; and it is to them especially that the remarks which have been made as to the importance and difficulty of prognosis apply. In acute affections, the elements of prognosis lie on the surface; the degree of danger is shown by the general symptoms. Structural changes in the muscular substances not related to valvular disease—such as fatty degeneration and softening—are, on the other hand, often more obscure in their indications than chronic affections of the valves. They may be altogether latent up to a certain point, and indeed up to the moment of death. When they announce themselves by symptoms, or are capable of detection by physical examination, the danger is always considerable, but its imminence most uncertain. Adhesion of the pericardium, again, is attended with so much difficulty in the diagnosis, and so much uncertainty in its effects upon the heart and its influence on the duration of life, that an attempt to reduce its prognosis of definite rules would be unsatisfactory.

There can be no doubt that the tendency of valvular disease of the heart is to shorten life; but it is difficult to institute any comparison between it and other diseases in this respect. Statistics give little assistance. According to the Registrar-General's returns, out of 1000 deaths, 39 are from heart-disease, acute and chronic, valvular and muscular, together. At St. Mary's Hospital, in the years 1859-61, valvular disease was the cause of death in 49 cases; the total number of deaths in the same time in the medical wards being 315. And the average age at death of all the sufferers from this affection from 1858 to 1864 was, for males 40, for females 34; the extremes being 78 and 7. It is obvious that no conclusion can be drawn from these facts, and we must fall back upon clinical observation. It is found, then, that usually, sooner or later, valvular disease of the heart gives rise to secondary consequences which destroy life; or that, in affections themselves not directly dependent on the heart-disease, its symptoms arise and complicate the malady which has disturbed a nicely adjusted balance between the power of the heart and the mechanical difficulty with which it had to contend. And, although we meet almost daily with patients who have been the subjects of heart-disease for many years, it is by no means common to meet with cases cut off by other diseases in which this has existed, and has taken no part in the fatal result.

We may be called upon to form an opinion as to the probable course and term of heart-disease under very various circumstances. 1. The patient may be apparently in perfect health, free from inconvenience of any kind, capable of exertion, and having only a murmur at one of the valves. 2. He may be suffering from one or more of the symptoms to which heart-disease gives rise in different degrees, more or less shortness of breath on exertion, etc. 3. He may be in some stage of dropsy, or in the crisis of some pulmonary complication. Many considerations will enter into the inquiry; and these will have very different weight under the different conditions named.

One of the first of these will be the nature of the pathological process by which the valves have been injured. Setting aside congenital malformations, this may be acute endocarditis (usually rheumatic), chronic endocarditis, degenerative change, or accidental rupture. We may, in most cases, distinguish between these by inquiry into the history of a patient; for, while valvular disease is met with at every period of life, it has generally a different origin at different ages. In childhood and adolescence, almost the sole cause is rheumatic endocarditis. This may also be the cause later in life; but acute rheumatism is less common, and is less liable in adults to be complicated with endocarditis. In a case of heart-disease, however, an attack of acute rheumatism, at whatever age it may have happened, and especially if the heart have been affected, is an important fact in the history, as fixing the probable date and character of the valvular lesion. It is not often possible to assign a date to chronic endocarditis, or to be sure that this has given rise to a given murmur. We may conjecture that this is the case when the patient, especially if young, suffers from chronic rheumatism or gout, or is the subject of kidney-disease, and there is no history of acute cardiac mischief. Degenerative changes, atheroma, and its sequences, do not commonly arise till middle age or afterwards. Rupture may occur almost at any time; but very rarely happens to a healthy valve.

The great point to be ascertained, and fortunately this is in most cases easy, is whether the valvular change has had its origin in an acute inflammatory attack, or is the result of a chronic degenerative process. Most authors, however, neglect this as an element in prognosis. Drs. Walshe, Stokes, Markham, and Chambers, do not allude to it; and Dr. Fuller formally repudiates it. He says: "Clinically speaking, the precise form of lesion is of little importance"; and again (p. 112): "In all cases where a permanent endocardial murmur exists, obstruction or regurgitation is unmistakeably indicated; and whether the disease from which it originated was of an acute or chronic character, is perfectly immaterial."

My own observation of many cases has led me to an entirely different conclusion—that this is an element of the greatest importance in the estimation of the probable duration of life. In the numerous in-

stances in which valvular disease of the heart has been known to exist for twenty, thirty, or forty years, it must almost necessarily have come on in early youth or childhood; at a time, therefore, when chronic degenerative change is out of the question, and acute inflammatory mischief very common; in many, indeed, the history is clear. If degenerative disease were as frequently harmless, we should meet with it much more commonly in old people who had died from other causes. So also the cases which come into hospital again and again, with pulmonary or dropsical consequences brought on by exposure and hard work, and are again and again relieved and enabled to return to their occupations, the valvular disease apparently no worse, are mostly cases originating in acute rheumatism.

It is easily understood how it is that, in a given case of heart-disease, the prognosis is more favourable when it can be traced back to acute rheumatism. Inflammatory mischief in the heart, as elsewhere, after a certain stage, is stationary; degenerative change inevitably progressive. After acute endocarditis, the lymph deposited in and upon the valves and tendinous cords is developed into fibrous tissue; this process being accompanied by thickening and contraction according to the amount of exudation. These changes are comparatively rapid, and are soon completed. After a certain time therefore, when the lymph is organised, the unsoundness and impaired action of the valves remain at the same point, in the absence of new attacks. If the mischief is serious, it will soon give rise to secondary changes in the muscular walls of the heart and to symptoms; and when these do not appear, there is every reason to believe they may be indefinitely deferred.

The case is otherwise when the change in the valves is degenerative in character. The heart and system may have accommodated themselves to the existing amount of disease; but there is little hope that this will remain *in statu quo*. Slowly or rapidly it will progress; the obstruction to the circulation will gradually increase, and that at an age when the heart is little able to adapt itself to change or to meet a difficulty, and is moreover itself liable to structural decay. There is further the probability that the arteries and viscera may be undergoing degenerative change.

Dr. Latham who, considering heart-disease from a clinical point of view, has given greater prominence to prognosis than most other writers, presents this point so admirably, that I am tempted to give a rather long quotation from his 30th Lecture.

"There are cases," he says, "in which experience allows us to hope sanguinely and to promise largely upon the faith of good resolutions and fair obedience on the part of our patient. For, though he have immoveably fixed within his heart the elements of fatal disease, yet, upon the condition of strict and habitual temperance, and habitual self-control over body and mind (no easy condition, I allow), he may count upon postponing to a distant period the evils which threaten his state, or even upon escaping them altogether. Now there is in these cases a special and peculiar ground of hope; and it is well that we should see and clearly understand what it is. The small amount of valvular injury, and the probability that the heart has hitherto undergone little or no change of structure besides, and the present unembarrassed state of the general circulation, are all favourable conditions. Yet the special ground of hope does not rest here; but upon the fact that the valvular injury had its origin in a certain casual attack of inflammation. The valvular injury from this cause, hough it be incurable, does not increase, but remains (there is reason to believe) of the same exact amount, be it more or less, at which it was left when the inflammation finally ceased. If it be small, it remains small; and the evil consequences to which it naturally tends, such as dilatation and hypertrophy, are slow to emerge. If it be large, it remains large, but does not become larger, and its evil consequences emerge more rapidly.

"But the amount of valvular unsoundness left by acute rheumatism is not always small. It may be very large. And this is the chief cause of the widely different periods to which men are found to survive the damage thus done to the heart. The valvular unsoundness, according as it is small or great, considered as the form of future evil, takes a longer or shorter time to develope its consequences and to bring them to their fatal maturity. Be it, however, small or great, if its evil consequences have not yet arisen, there is always a better chance of postponing them in these than in other cases where there is the same amount of valvular unsoundness from other causes. That such is the matter of fact, *I am sure, from experience;* and that the reason of the thing is as I have stated I am pretty confident."

Having thus allowed Dr. Latham to speak for me, I have only to add that the cause and character of the valvular lesion is not of equal moment under all circumstances. It will not, for example, aid greatly in judging whether a patient will survive an existing attack of pulmonary apoplexy, or recover from present dropsy; but it is unquestionably a most important element in the estimation of the value of a life before these complications have arisen, its importance increasing as structural changes in the heart and symptoms of embarrassed circulation are less evident.

Little can be said as to chronic endocarditis. It is rare that a diseased condition of the valves can during life be referred to this with certainty. In adults near or after the prime of life, there are no means of distinguishing it positively from degeneration; and, were this possible, the prognosis would be similar in the two cases, as both might be expected to be progressive. Accidental rupture of a valve is attended with great danger. The history is usually clear: sudden pain in the heart during exertion, with dyspnœa or fainting; and, if not at once fatal, followed speedily in most cases by evidences of embarrassed circulation.

Age has, of course, to be taken into consideration in forecasting the probable course of heart-disease; but except as it aids in the determination of the character of the lesion, it furnishes no special indication. It is to be noted, however, that valvular disease is attended with greater danger in early childhood, when growth is very active, than at a rather later period. For this reason, we watch with the greatest anxiety the first few months after acute rheumatism with endocarditis in a child. If enlargement of the heart and symptoms of cardiac difficulty come on, even in a slight degree, the probabilities are that they will increase and prove fatal in a comparatively short time. Under these circumstances, puberty is often retarded; and not uncommonly it is at this period that the heart fails to keep pace with its difficulties. If, on the other hand, the heart remain of the natural size, and no symptoms appear although a permanent murmur remains, we can promise immunity with greater confidence than under any other circumstances.

Any of the valves of the heart may be the seat of disease, giving rise to constriction of the orifice, with obstruction or insufficiency of the valve and regurgitation; the relative frequency of the different affections being, according to Dr. Walshe, in the follow-

ing order,* MR, AC, AR, MC; TR, PC, PR, TC; and of combinations of two or more of them, AC + MR, AC + AR, MR + AR, MR + AC + AR, MR + MC, MR + TR, MR and C + AC + TR, TC + MC.

Different estimates have been given by other authors. This by Dr. Walshe, however, is founded on an application of the numerical method to his own cases, and may be taken as an exact representation of his extensive experience. It is the more valuable, as it distinguishes between obstruction and regurgitation, and does not, as is often the case, state merely that one or other valve was affected.

The source of danger is, of course, the mechanical interference with the onward course of the blood; and the degree of danger will be proportionate to the amount of this interference. It will vary, therefore: 1, according to the valve affected; 2, according to the effect of the disease on the action of the valve, giving rise to obstruction on the one hand or regurgitation on the other, or both; 3, according to the extent of the morbid change, and the amount of obstruction or regurgitation resulting therefrom.

But the circulation may be delayed in two ways; by an obstacle in front, or by interference with the propulsion from behind, the capillaries in the one case being full or even overloaded, in the other inadequately supplied with blood. These conditions, to which, for want of better, I shall apply the terms "obstruction" and "stagnation", are attended with distinct kinds of danger. "Stagnation" may lead to fatal syncope, by an insufficient supply of blood to the nervous centres. This most frequently occurs when the walls of the heart are fatty or feeble, from want of force to propel the blood; but waste of the *vis a tergo* will have a similar tendency, and, in so far as changes in the valves conduce to this result, they will share with structural changes in the muscular walls the liability to produce sudden death. Obstruction, on the contrary, tends towards congestion and dropsy, and very rarely causes sudden death; if it do this at all, it is by pulmonary or cerebral apoplexy, not by syncope.

Returning now to the three conditions named above, as affecting the transmission of blood through the heart—the seat, the character (obstructive or regurgitant), and the extent of the disease—we should *à priori* expect that affections of the arterial orifices and valves would cause less interference with the circulation than corresponding affections of the auriculo-ventricular valves, and that this interference would be in the direction of stagnation. In the latter case the tendency will be towards "obstruction" in the sense in which I have used this term.

Again, we should expect that constriction would cause less interference than regurgitation, and would be more easily compensated by increase of power in the heart.

It would be difficult to arrive by a mere process of reasoning at any conclusion respecting the comparative amount of danger attending disease of the right or the left side of the heart; and, fortunately, the comparative rarity of primary affections of the valves of the right side does not allow of the question being settled by extensive experience.

Too much weight must not be attached to *à priori* considerations as to the degree of danger to which affections of the different valves may give rise. It is easy to see what the mechanical effects of the changes must be at the valve itself; but these are modified by subsequent changes in the muscular walls, and complicated by the fact that the heart is double, so that a comparison between the ultimate result on the circulation is extremely difficult. We pass from them to the results of clinical observation.

Dr. Walshe places the valvular affections in the following order of relative gravity, considered not merely with respect to their fatal tendency, but also as to the amount of complicated misery they inflict: tricuspid regurgitation, mitral constriction and regurgitation, aortic regurgitation, pulmonary constriction, aortic constriction. Tricuspid regurgitation is, however, rarely primary; but occurs as a result of obstruction to the transit of blood through the lungs, either from disease in these organs or from valvular disease in the left side of the heart. It is, therefore, a mere link in the chain of disasters, and can scarcely be considered as the cause of the subsequent suffering and fatal termination. If we set aside tricuspid regurgitation as rather an important diagnostic and prognostic indication than itself a cause of death, and leave out of consideration pulmonary constriction, as we may safely do on account of its rarity, the valvular lesions would stand in the following order of gravity, mitral constriction and regurgitation, aortic regurgitation, aortic constriction.

Dr. Stokes, however, says that, if the cavities be yet unaltered, and the heart's action tranquil, there is in mitral disease a better chance of the prolongation of life than in a corresponding affection of the semilunar valves; giving as a reason, that the latter commonly leads to hypertrophy and dilatation. Dr. Chambers also places aortic before mitral disease in the scale of danger, founding his conclusion on statistics not merely of the numbers dying from each, but also of the effects produced on the walls of the heart. My own experience tends to confirm the conclusion of Dr. Walshe, with one important reservation—viz., that aortic regurgitation, coming on late in life from degenerative change in the valves, runs a more steadily downward course than any other form of heart-disease. Probably this reservation would bring all authorities into accord.

It is comparatively easy to learn which of the lesions named, mitral constriction or regurgitation, aortic regurgitation or constriction, is present in any given case; to ascertain two of the three conditions on which the amount of interference with the circulation will depend—(*a*) the seat and (*b*) character of the disease. The third and most important condition—the extent of this disease—is not so easily made out. By means of the murmurs to which changes in the valves give rise, we fix with an approach to certainty upon the valve affected, and upon the nature of its functional imperfection; but we cannot gather with any confidence from the loudness, tone, harshness, or any other character of the murmur, the degree of constriction or amount of regurgitation. A loud murmur may be heard when the lesion is comparatively trifling; and the murmur may be feeble, occasional, or may even disappear as the injury becomes most grave. But though, as a rule, the murmur tells us little beyond the seat and character of the valvular change, and though this, taken alone, teaches us very little as to the gravity of the disease, a careful study of the murmur has its use in prognosis. When, and especially in the early stage of degenerative affections, the murmur is found gradually to alter in tone, character, or force, and we can be sure that it is not merely from accidental circumstances, such as momentary excitement of the heart's action, we may conclude that change is going on in the orifice or valve; and, as this cannot be for the better, we have an unfavourable note to add to other indications. I may here mention also a physical sign proper which furnishes direct information

* A. Aortic. M. Mitral. P. Pulmonary. T. Tricuspid. } C. Constriction. R. Regurgitation.

as to the amount of valvular change—the presence or absence of the second sound in the neck in aortic regurgitation. At the base of the heart, a second sound will be heard, whatever the condition of the aortic valves may be, produced by the pulmonary valve; but if, with a diastolic aortic murmur, this sound is heard in the great vessels of the neck, it may be concluded that the aortic valves still act, and that the regurgitation is probably inconsiderable. When it is altogether absent, the probability is in the other direction. I ought to say that I owe the appreciation of this sign to Dr. Sibson.

With the exceptions just mentioned, as has already been said, the "physical signs proper" of valvular disease, the murmurs, fail to furnish any reliable measure of the extent of the morbid change or degree of obstruction or regurgitation. We possess such an indication, however, first, in the effects on the walls and cavities of the heart produced by the mechanical difficulty arising from the imperfect action of the valves—the degree of hypertrophy and dilatation; secondly, in evidences of obstructed circulation through the lungs or system.

[*To be continued.*]

EPILEPSIA ERRATICA.

By DRAPER MACKINDER, M.D., Gainsborough.

ON the 9th of October last, I was requested to visit a decorative painter, a well built, robust man, 27 years old, of florid complexion. He was just recovering from a fit of epilepsy, during which he had been struggling vigorously. These fits, I was informed, began in April 1865, whilst the patient was engaged in his business in London, and without apparent cause, an occasional "dizziness" only having been previously observed. The attacks had been very severe and very frequent, and were affecting the intellect, converting a clever into a stupid man. There was ptosis on the right side.

For several months he had been under the care of some eminent London physicians, but without benefit, his case being regarded by them as mysterious and incurable. Beyond a few general directions, I did not advise any treatment, but watched the case, as commanded.

One day it occurred to me that these fits might have been induced by excess in some vicious habits or immoral indulgence, and I questioned his father on the subject, but no further information could be gained. The fits continued with unabated force, and hopes of recovery had nearly fled; when, to the surprise of his relatives and friends, just twelve months after the first attack, he suddenly got married, suddenly heard his infant's cry, suddenly became well, and, as though forgetful of the frightful past, he suddenly began business on his own account, and is now thriving and enjoying the comforts of a happy home.

RESECTION OF SCAPULA. At the New York Pathological Society Professor Hamilton presented a scapula which had been removed entire from a soldier, who had been wounded at Fredericksburg by a shell. Necrosis of the scapula ensued, necessitating its entire removal with the acromion and coracoid processes. The patient had power to use the coracobrachialis and biceps, also tolerably well, the triceps and deltoid. He was able to carry the arm without a sling, although attachment of these muscles was simply to cicatricial tissue, there having been no formation of new bone.

The Medical Council.

REPORT OF PROCEEDINGS, MAY 1866.

FRIDAY, MAY 25TH.

G. BURROWS, M.D., President, in the Chair.

The minutes of the preceding meeting were read and confirmed.

Preliminary Education of Medical Students. The consideration of this subject was resumed. (See Report of Proceedings of May 21st.)

Dr. STOKES proposed, and Dr. STORRAR seconded—"That Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics, be adopted as one of the Optional Subjects."

Dr. ACLAND suggested that the optional subjects should be arranged in two divisions, one including Greek and Physics (or Natural Philosophy), and the other French and German; and that students should be required to take up one subject in each division. He suggested that some specific details as to the subjects required in Natural Philosophy should be given.

Mr. SYME said that no man ought to be admitted into the medical profession who had not been educated in Natural Philosophy.

Dr. STORRAR objected to specifying the details in regard to Natural Philosophy. He agreed with Mr. Syme that Natural Philosophy should, at some period, form part of the education of a medical man but the Council at present was dealing with school education. He thought it better not to lay down a temptation to boys to take up Natural Philosophy in place of Greek, which would be the case if Dr. Acland's proposal was carried out. Those examining bodies which attached importance to Natural Philosophy should insist that an examination in it should be passed at some time, either in the preliminary or in the professional examination.

Dr. STOKES said, that the object of the Committee had been to lay down a curriculum which should be within the reach of schools. If Natural Philosophy were made compulsory in youths just leaving school, nothing would be got but a superficial knowledge of the subject. The Council must remember, too, that Algebra and Geometry were made compulsory.

Sir DOMINIC CORRIGAN would ask for the withdrawal of Natural Philosophy from the curriculum of preliminary education. It should form one of the subjects of the first part of the professional examination.

Dr. PAGET said that to make Natural Philosophy one of the subjects on which boys just fresh from school should be examined, would be to accept a very meagre knowledge.

Dr. CHRISTISON asked whether it was intended to introduce Natural Philosophy into the curriculum of professional education. There was already a complaint that this contained too many subjects. It would be better to leave Natural Philosophy in the preliminary curriculum, with the option of taking it up during professional study. His observations in Scotland led him to question the statement as to the impossibility of obtaining a fair knowledge of Natural Philosophy from youths sixteen years of age.

After some further discussion, in which Dr. Andrew Wood, Mr. Hawkins, Mr. Syme, Dr. Sharpey, Dr. Acland, Dr. Apjohn, Mr. Cooper, Dr. Storrar, and Dr. Alderson took part, the motion was put to the vote and carried.

Dr. STOKES moved, and Dr. STORRAR seconded, the adoption of the following paragraphs of the Report.