STATISTICAL REPORT
UPON
CASES OF DISEASE OF THE HEART
OCCURRING IN ST. GEORGE'S HOSPITAL,
ESPECIALLY IN RELATION TO
RHEUMATISM AND ALBUMINURIA.

BY
DR. BARCLAY,
THE MEDICAL REGISTRAR.

Received Nov. 8th.—Read Nov. 11th, 1851.

EXAMINATION OF FATAL CASES, IN THEIR RELATION TO
RHEUMATISM AND ALBUMINURIA.

SINCE drawing up the Report on Valvular Diseases of the Heart, which the Society did me the honour to publish in the 31st Volume of its Transactions, my attention has been a good deal turned to the same subject; and it did seem that some of the questions connected with the pathology of this organ might be elucidated by an accumulation of carefully recorded clinical observations, not in a few selected instances, but throughout the whole range of cases supplied by a large hospital, and thus the appointment I hold, be made subservient to the advancement of science. It is true that the most certain results are those derived from *post-mortem* examination, yet there are circumstances connected with structural change which can only be learned at the bed-side of the patient. We have no means of learning the history of rheumatism after death; and the permanent presence of albumen in the urine during life is of greater importance than structural alterations in the kidney revealed

by dissection. It therefore became a matter of importance that the table of *post-mortem* appearances should only include those whose clinical history was known as having a bearing on these subjects; and hence, patients dying in the medical wards only are considered, and from among these all such are excluded as were brought to the hospital dead or dying, all whose history contains no allusion to disease of the heart during life, and all in which partial evidence of old pericarditis, or specks of atheroma on the valves were found as the only condition of disease after death, which could give rise to no symptoms, and therefore could have no history.

The present communication is not confined to valvular lesion, because pericardial is so bound up with endocardial disease, and both together with alterations in the muscular structure, that it becomes impossible to study one without considering the other morbid changes to which the heart is more or less liable. Some of the deductions differ in a few particulars from those which seemed warranted by the previous collection of cases; and while it is true that my opportunities for obtaining accurate information have been greater, it is also true that the liability to error always increases in an inverse ratio to the number of instances. This circumstance only lays on me the greater obligation to present to the Society this additional Report.

The cases are arranged in the Table in the following order:—1st, cases of acute rheumatism fatal during the rheumatic attack; 2d, cases of recent pericarditis, independent of recent rheumatism; 3d, cases of recent lymph on the valves not previously recorded; 4th, adherent pericardium and extensive old pericarditis, with no recent condition of inflammation; 5th, remaining cases of old valvular disease divided into thickening and atheroma; and, lastly, cases in which alteration in muscular structure was the prominent feature. Under each head rheumatic cases generally stand first, and the rest either in distinct groups or following the order of ages.

1. *Cases of Acute Rheumatism fatal during the Rheumatic Attack.*

Of this there are eight instances. In two of these, suppuration had occurred within and around the joints, and it has been questioned whether such are not of a nature somewhat different from ordinary rheumatism ; in one of them, however, the pericardial membrane was in the first stage of inflammation, and in the other, both aortic and mitral valves were opaque, a condition which would seem to be allied to inflammation. Five cases are examples of rheumatic pericarditis in its ordinary form, one of which derives interest from the circumstance that no friction sound was ever heard during the continuance of the patient in the hospital, although from the alteration of rhythm it was often listened for, and the pericardium was found filled with recent lymph, and its two layers only very partially adherent to each other ; in three of them there was also evidence of previous inflammation of the pericardium.

In three of these cases of pericarditis, distinct evidence was also found of recent endocarditis, associated in two instances with old disease. In the only instance in which recent lymph was found on the valves after a first attack of acute rheumatism, it was confined to the mitral valve. Although it appears that pericarditis existed in a considerably larger proportion of these cases than endocarditis, it does not follow that it is a more common, but only a more immediately dangerous complication of acute rheumatism, because in each instance the obstruction to the circulation consequent upon it, was the chief cause of the fatal termination.

The remaining case is one of great interest ; because during life an endocardial murmur at the base of the heart was distinctly made out at an early period of the disease, and yet no valvular lesion existed. The history is shortly this : S. A—, æt. 23, unmarried, catamenia regular, of pretty full habit of body, and good complexion, was seized with pains in her joints on the 17th January, 1850 ; had

been under treatment since the 19th; and was admitted into the hospital on the 24th with a first attack of acute rheumatism. She complained of some catching in the breathing; and a slight roughness with the first sound of the heart was first heard on the 26th, and a distinct systolic endocardial murmur was heard at the base of the heart on the 28th. She became slightly delirious, with tremulous movements, on the 1st February; the delirium was very violent on the evening of the 2d; and she died comatose on the morning of the 3d. Throughout the case there was great febrile disturbance; the face was flushed and the pulse full and frequent; and after death large clots of recent lymph were found in the synovial cavities. With such a chain of symptoms, it would not have been unreasonable to suppose that a gradually increasing endocardial murmur, heard first on the tenth day of her illness, depended on the presence of vegetation on the aortic valves: and hence its importance, as showing that in the acute stage of rheumatism, with no indications of impoverishment from other causes, the physical properties of the blood may be so altered, as to produce a bruit de soufflet, without any alteration of structure, either within or without the heart.

11. *Recent Pericarditis independent of recent Rheumatism.*

The Table contains sixteen¹ examples of this condition, four of which are associated with traces of old disease. Nos. 9 and 10 seem directly due to inflammation of the peritoneum spreading through the diaphragm,—the one alleged to have been caused by injury; the other known to have supervened on paracentesis abdominis. No. 11 probably owed its origin to extensive and severe pleurisy, with which, at the least, it was associated. In none of these did rheumatism precede or accompany the attack. In No. 10 there

¹ Among the cases omitted in consequence of their having no clinical history, is one of a patient admitted dying of dysentery, in which the only discoverable lesions were extensive ulceration of the large intestine, and pericarditis.

was also albuminuria; and there are besides six cases, Nos. 12—17, in which pericarditis occurred just before death in persons of a cachectic aspect, from long-continued disease of the kidney. It was accompanied in one case by recent pleurisy, and in another by diffuse cellular inflammation; these had never had rheumatism; in one no record has been kept, while in another there had been a rheumatic attack eight months before admission, and in this case only was the pericarditis of very severe character. In the remaining case, No. 13, the patient had suffered from acute rheumatism twenty-six years before, with probably corresponding disease of the mitral valve; but there had been no recent attack.

In No. 18, none of the preceding causes was in operation; he had never suffered from rheumatism, the urine was not albuminous, and there was no where else inflammation of the serous membranes; but there was lymph on the endocardium and valves, with congenital malformation, and, as the most prominent feature of the case during life, tumultuous action of the heart. It was pointed out in the former report, that malformation of the valves almost always leads to further changes, an observation I am glad to find confirmed by Dr. Ormerod,¹ and in these cases it would appear that the exciting cause is the increased action induced by an impeded, and especially regurgitant circulation. The same principle probably applies to the pericardium; and in closely watching those fatal cases of albuminuria which have been associated towards their close with pericarditis, it has seemed to me that the turbulent action of the heart has played a most important part in developing the disease. Indeed, it must be evident that albuminuria acts more especially in establishing a predisposition to serous inflammations, and in this, differs entirely from rheumatism, which, for the most part, acts directly as an exciting cause of cardiac inflammation, and within certain limits, in proportion to its severity. In No. 16 it is probable that the albuminuria had less to do with the pericarditis than the general disturbance

¹ Gulstonian Lectures at the College of Physicians, anno 1851.

to the circulation, caused by the altered relations of the chest to the heart and great vessels, in consequence of spinal curvature, which gave rise to a loud systolic murmur, for which no other cause was found after death, as the heart was free from valvular lesion. Another case also deserves notice, from the circumstance that the condition of albuminuria with which the pericarditis was associated, appeared to depend on scirrhus obstruction to the ureters, giving rise to dilatation and dwindling of the kidneys.

In the four cases in which old and recent inflammation are found associated, no especial cause for its occurrence demands notice; but if it were true that old inflammation acted as a predisposing cause of a fresh attack, it ought, perhaps, to have been found in a larger number of the cases given in this Table.

Four cases of pericarditis next claim our attention, in which the deposit of lymph was not quite recent. In Nos. 24 and 26, there is a history of rheumatic fever occurring in the one twenty-five, and in the other six years before, with no subsequent recurrence; they were free from symptoms referable to the heart until after what was described as a "severe cold" with pain in the chest at four and six months before admission; both were unhealthy subjects, and one had disease of the kidney. In No. 25 there would appear to be nothing to fix the date. In No. 27 there is also chronic thickening of the membrane indicating a previous attack, both apparently corresponding to *post-mortem* appearances of two successive attacks of peritonitis, during the latter of which she was under observation, but the existence of pericarditis, if present at that time, was not observed.

III. *Recent Endocarditis independent of recent Rheumatism.*

There are four instances in which, without any evidence of previous inflammatory action, recent lymph was found on the valves; in Nos. 18 and 28 associated with malformation of the aortic valves; in Nos. 24, 28, and 29, with disease of the kidney; and in No. 24, with a report of acute rheumatism

six years before, of which, however, no trace had been left in any alteration of structure about the heart.

There are seven cases in which recent lymph was found associated with previously existing disease of the valves; in No. 17 alone, is there no history of rheumatism; in Nos. 21 and 32 there was calcareous deposit, and it may be questioned whether such a condition can be traced to acute rheumatism as its source, but in the others, the probability is fair, that the primary disease was rheumatic endocarditis; and it is remarkable how much more frequently the thickening, arising out of this condition, is associated with recent inflammatory action than any other form of old valvular lesion. It was associated, in one case, with an attack of pleurisy; in another, with acute bronchitis; two had albuminous urine, but did not exhibit an advanced state of disease of the kidney.

In two cases lymph was found, "not quite recent," on the valves, Nos. 35, 36, probably corresponding to rheumatic attacks, which were reported to have occurred some months before death. In both of these the deposit was found only on the mitral valve; as was also the case in the only instance, No. 4, in the Table, of rheumatic endocarditis without previous thickening. Of the two cases in which malformation existed, No. 18 had recent lymph on both sets of valves, and No. 28 only on the aortic. In the two cases combined with albuminuria, recent lymph was found in one on the mitral, and in the other on the aortic valves. Among the cases in which recent lymph was found associated with old disease of rheumatic origin, it occurs in three instances on both sets of valves, in three, on the aortic alone, in two, on the mitral alone. The only case in which old thickening and recent lymph were found together, without rheumatism, No. 17, had both conditions limited to the mitral valve.

IV. *Old Pericarditis.*

In a large proportion of the *post-mortem* examinations, traces of old inflammation of the pericardium are recorded;

in some, the membrane being universally adherent, while in others the adhesions were more or less limited, or patches of partially absorbed fibrin were observed on its surface. In very many instances clinical history fails to throw any light on the origin of these attacks, and we can do little beyond inquiring in what proportion there is a history of previous rheumatism, or evidence of albuminuria; although it must be remembered that it does not follow, even when present, that either was the efficient cause of the attack.

Traces of previous inflammation are found in eleven out of twelve cases reported to have suffered from acute rheumatism; and in twelve out of thirty-one reported to have suffered from any kind of rheumatism whatever; but the single instance (69) associated with slight rheumatism is of very trivial character. In all the cases in which it is associated with a distinct history of acute rheumatism, the pericarditis appears to have been of considerable extent. There are fifteen other instances of severe old pericarditis, thirteen of which are reported never to have suffered from rheumatism.

There are six cases in which the pericardium was universally, firmly adherent; one with a history of acute rheumatism five years before, one in which there is no history of rheumatism, with malformation of the aorta and old pleurisy, and four who never had rheumatism, in three of which the kidney was diseased, two had old pleurisy, and one old peritonitis. In three cases, the adhesions were nearly universal with histories of acute rheumatism, one having also had pleurisy. In seventeen cases the pericarditis was considerable, but there were either no adhesions, or they were very slight: six of these correspond to histories of acute rheumatism; one had rheumatic fever only six months before, with very old pericarditis, and also aneurism of the aorta; in one there was old pleurisy, with no history regarding rheumatism, and nine are said never to have suffered from it. Of the last, it was associated in four instances with disease of the kidney, in four with more or less severe pleurisy, one with peritonitis, one with aneurismal dilatation of the heart, and in one no distinct cause was observed.

It is worthy of remark, that while all the cases of rheumatic pericarditis appear to have been severe, only one has distinctly terminated in complete adhesion; and on the contrary, the majority of the cases of adherent pericardium occur among persons who have never suffered from rheumatism at all. This series of cases does not seem to indicate that complete adhesion is the most favorable termination of the attack, whether the ages of the patients or the condition of the heart be taken as an indication.

v. *Valvular Lesion.*

If it be true that very many cases of pericarditis take their rise independently of acute rheumatism, the same fact is only more plainly indicated in regard to valvular lesion. After the admirable lectures on this part of the subject delivered by Dr. Ormerod in the present year, I shall do little more than point out wherein the present series of cases differs from that which I formerly collected.

Including recent cases with those of longer standing, there are in the table sixty-two cases of valvular lesion; of which—

- 23 are associated with a history of acute rheumatism; but in three of these the lesion did not appear to be of rheumatic origin.
- 26 occur in persons who never had suffered from rheumatism at all.
- 8 are cases (chiefly of slight disease) in which no record on this subject has been kept.
- 2 are associated only with slight rheumatism, in which the lesion does not appear to have had an inflammatory origin.
- 1 was said to have been "slight rheumatism," and
- 1 said to have been "gout," in each of which the probability is, that the disease was primarily rheumatic endocarditis.
- 1 was hereditary gout with a deposit of lithate of soda on the valves.

There are therefore twenty cases in which we may be tolerably certain that the disease was rheumatic, and twenty-six in which it was positively denied that the individual had ever suffered from rheumatism at all. From these two classes we obtain the following numbers as representative of the liability to disease of the aortic and mitral valves:

	Rheumatic.	Non-Rheumatic.
Disease affecting both sets of valves . . .	19	10
Disease of mitral valve alone . . .	7	11
Disease of aortic valve alone . . .	1	5

Whence it appears, that there is a greater liability in rheumatic cases to simultaneous lesion of both sets of valves, as well as a greater preponderance of disease of the mitral over the aortic valves in them, than in non-rheumatic cases.

This may be further illustrated by examining more closely the cases in which both valves are implicated. It appears that one valve is described as being in a more advanced state of disease than the other in five of the twelve rheumatic cases, and only twice among the ten non-rheumatic; in the former it is always the mitral that is most affected, in the latter it occurs once in each set of valves. Again, we have found in the recent cases, that when not associated with previous thickening, the lymph was always found on the mitral valve in rheumatic cases, while in non-rheumatic or doubtful cases it was twice found on the aortic valves, and once on the mitral. In the majority of instances, therefore, in this table, rheumatic endocarditis was first marked by a deposit of lymph on the mitral valves, followed by thickening and contraction; and there, with or without a renewed attack of acute rheumatism, inflammation was again readily set up, spreading in most instances also to the aortic valves.

Of nineteen instances in which a history of rheumatic fever some years previously was distinctly made out, fifteen indicate severe valvular lesion of long standing. In three of these, atheromatous or calcareous deposit was found along with old thickening; in which it must always be to a certain extent doubtful, whether the atheromatous disease have arisen out of the purely inflammatory alteration in texture, produced by acute rheumatism, or out of those independent conditions, from which it more generally originates. In the one view, the thickening would be the primary lesion; in the other, it would only be secondary. And this series

appears, like my former collection of cases, to contain examples of both conditions. In almost all the cases in which recent lymph is found in addition to old standing disease, a history of having at one time or other suffered from acute rheumatism is obtained.

With regard to the association of albuminuria and valvular lesion, it may be stated generally, that, taking into consideration all conditions of disease of the valves, there were found,—

In 22 instances, diseased kidney, with albuminous urine ;
in 26 instances, healthy kidney; and
in 13 instances, evidences of disease, which were more or less obscure.

The tricuspid valves are stated to have been diseased in ten instances. In six they were thickened; three being associated with a history of acute rheumatism, and two with Bright's disease. In two instances these valves were affected with atheroma; in one they were opaque; and in one atrophied. In the last instance the pulmonic valves were also affected with atrophy. No other instance of disease of these last occurs in the Table.

VI. *Hypertrophy and Dilatation.*

Scarcely a single instance occurs in the Table of old lesion of the valves or pericardium, in which alterations are not found in the thickness of the walls, or the dimensions of the cavities of the heart. But these are not the only causes of change: atheromatous degeneration of the arterial coats exerts considerable influence; and the rationale of this is simple enough. It implies the loss of one of those conditions of health, which are the most favorable to the onward flow of the blood; and hence arises either accumulation of blood in the heart, in the form of dilatation, or, what is much more common, a compensating power in increased thickness of its walls, to overcome the retardation. Albuminuria also acts as a cause of alteration, chiefly in the direction of hypertrophy; but it is one for which it is very

difficult to find a reasonable explanation. It is not that disease of the kidney first makes itself felt in valvular lesion, or inflammation of the pericardium, and only secondarily in alteration of dimension; but the two conditions are so often found coincident, when clinical investigation and post-mortem examination alike fail to detect any other cause for the disturbance of the circulation, that we cannot withhold our assent to the proposition, that they bear some relation to each other. Some idea may be formed of the frequency of this association, from the circumstance that in going over the post-mortem records at this hospital for a period of about three years, I find 141 cases in which the kidney is noted evidently diseased; and among these hypertrophy is noted as occurring 55 times, and dilatation 36 times, either together or separately, in sixty-three individuals, while there are only seventy-eight instances, very little more than half, in which the heart has retained its natural dimensions.

These alterations are less easily recognised during life, than when complicated with valvular lesion; and consequently these two causes, (although always stated when present in cases finding place in this Table,) may not be enumerated so frequently as they actually occur in proportion to other lesions having a similar tendency. Nevertheless an attempt may be made by placing them in a tabular form to show their several relations to conditions of greater or less hypertrophy and greater or less dilatation.¹

¹ It is plainly necessary to exclude such lesions of either set of valves as cannot be any impediment to the onward flow of blood, or cause of regurgitation, and also cases of pericarditis, which merely consisted in a patch of old lymph on the surface of the heart. When the amount of disease might or might not have deranged the circulation, the cases are marked as doubtful, and where albuminuria did not exist during life, altered structure of the kidney discovered after death, are also enumerated as doubtful causes of alteration. The last of two numbers placed together includes these doubtful cases.

One case of aneurismal dilatation, one of aneurism of the aorta, and one of congenital constriction, are excluded.

	Simple hypertrophy.	Considerable hypertrophy, comparatively little dilatation.	Great hypertrophy, with great dilatation.	Moderate hypertrophy, with moderate dilatation.	Considerable dilatation, with little hypertrophy.	Great dilatation, with more or less hypertrophy.	Simple dilatation.
Number of cases	15	6	3	17	7	10	12
Adhesions of pericardium . . .	1	3 or 5 ?	2 or 3 ?	3	2 or 3 ?	2	4 or 6 ?
Disease of aortic valves . . .	4	2	1 or 2 ?	3 or 4 ?	3 or 4 ?	4 or 5 ?	2 or 4 ?
Disease of mitral valves . . .	3 or 4 ?	3	1 ?	8 or 9 ?	2 or 3	6	5 or 6 ?
Atheroma of aorta . . .	9	3	1	6	2	1	1
Disease of kidney . . .	9 or 11 ?	3	2	11	2 or 3 ?	3	3 or 6 ?
None of the above causes . . .	1	1	0	0	0	1	2

It would appear from this arrangement of the cases, that disease of the aortic valves is rather more associated with hypertrophy than dilatation, the latter occurring chiefly with regurgitation, while disease of the mitral valve is more decidedly associated with dilatation. Adhesions of the pericardium are also more associated with dilatation than with hypertrophy. Atheroma of the aorta and disease of the kidney, each accompany a large majority of the cases of simple hypertrophy, and the former in particular seems to have very little to do with cases of dilatation. Of course it is impossible to assign to each, among so many causes of change, its own particular value, except in a very general manner, when the two states are conjoined.

GENERAL STATISTICAL RELATIONS OF RHEUMATISM TO DISEASE OF THE HEART.

The whole number of patients admitted into the medical wards of any large general hospital would very soon supply an accurate basis for statistical relations between two diseases of such common occurrence as rheumatism and disease of

the heart, were the facts but sufficiently simple, or capable of being resolved into elements on which reliance could be placed. But we are unfortunately, as yet, in ignorance of the essential element of rheumatism, and the most practised ear may be deceived in a diagnosis of disease of the heart. In entering on such a field it therefore becomes necessary to select such definitions as may, at least, be intelligible, and by acknowledging the sources of fallacy, and endeavouring to exclude the cases affected by them, to obtain credit for accuracy in the remainder. For the purposes of the present inquiry, rheumatism has been simply divided into acute, subacute, and chronic, because the first is that especially in which cardiac inflammation is liable to occur.

I have adopted for acute rheumatism, the somewhat antiquated definition of inflammation, "rubor et tumor, cum calore et dolore." If all these be present, gout being excluded, the case is classed as one of the acute form; if redness be absent, unless there be very marked febrile disturbance, or rapid transition from one joint to another, mere puffiness and tenderness are only taken as evidence of a subacute form,¹ to which is also consigned the whole class

¹ I believe I have erred on the side of too great exclusiveness, because, until very recently, I had never seen inflammation of the heart *commence* in the subacute form; and no such case occurs among the reports on which this paper is based. Hospital practice is not the most favorable for ascertaining such a point, and the advantage of increased accuracy was not lightly to be thrown aside, when the facts seemed to warrant the conclusion that inflammatory action was restricted to the acute form. The doubtful cases are few: one, a lad of 17, suffering also from phthisis, who had been ill only a week, but had been obliged to keep his bed the whole time, admitted with a first attack of rheumatism, not presenting any symptom of an acute form, save a quick and excited action of the heart, with a *bruit de soufflet* heard, first over the aortic valves, and two or three days later more loudly towards the apex, and persistent. Another, a lad of 15, who had been suffering from rheumatism for six weeks before admission, and had palpitation of the heart, according to his own account, some weeks previously, having only experienced a very slight attack of rheumatism four years before, he was believed to have disease of the aortic valves. In addition to these, there were two cases of a first attack of rheumatism, of eight

of what has been called synovial rheumatism. This definition has the advantage of making the question intelligible to the patients themselves whether any rheumatic attack they may have experienced has been acute or not. It is, indeed, difficult to say what relation chronic rheumatism bears to what has been well denominated rheumatic fever; and of subacute rheumatism it may probably be said with truth, that some instances are merely a milder form of the same disease, while others have very little in common with it. In children especially, it is found that great febrile disturbance is often present, indicating true rheumatic fever, with scarcely any external signs of inflammation.

The case already detailed (pages 3-4) shows what caution must be exercised in forming a diagnosis of endocarditis commencing in an attack of rheumatism. The stethoscope will not serve alone for a diagnosis; and therefore, where other signs of endocarditis are wanting, the case must be regarded as doubtful. With pericarditis, the difficulties, though not less, are of a different character; here sometimes the sound is so transient that it is not caught until the roughened surfaces have come into opposition, and one instance has been mentioned (page 3), in which all the requisites being found for its production, except perhaps the presence of fluid, of which there was none, no friction was ever heard. Neither can the ear take cognisance of previous attacks. But once heard and recognised I am not aware of any fallacy that attends the existence of friction as and ten weeks' duration respectively, which, so far as could be ascertained, had probably commenced as acute rheumatism, and had degenerated into the subacute or almost chronic form, in which they were admitted, with cardiac affection. There are also six examples in females suffering from subacute rheumatism, of a *bruit de soufflet* being present with no history of an acute attack, but in these the abnormal sound was believed to be merely functional. In the table of *post-mortem* examinations only one case occurs, where, with a distinct history of rheumatism never of an acute character, the lesions are such as might have been due to rheumatic inflammation of the heart at an earlier period. Quite recently I have met with a case in which pericarditis commenced in an attack altogether unaccompanied by acute symptoms, not included in these statistics.

an indication of pericarditis. Here the error is on the side of omission; in endocarditis the error is on the side of excess.

1. *Of Rheumatism generally.*

The cases, of which notes more or less extended have been kept, include 152 of acute rheumatism, 178 subacute, and 358 chronic. Exclusive of doubtful cases, these give severally the following proportions of cardiac complications :

	Total.	With Cardiac Complications.	Per Cent.
Cases of acute rheumatism	152	67	44.0
„ subacute „	178	20	11.2
„ chronic „	358	14	3.9

In all the chronic cases,¹ and in the majority of the subacute, in which the heart was affected, there was a history of previous rheumatism of a more severe character; and in regard to the former, there can be no doubt that the disease was of a date prior to their admission.

The two sections of acute and subacute cases may be arranged in periods of years, indicating the proportion for different ages of first and subsequent attacks, and also the number suffering from cardiac complications; but it must be remembered that these are not the ages at which disease of the heart begins.

ACUTE ON ADMISSION.

Age on Admission.	No previous Rheumatism.	Have had Rheumatism.	Total.	With Cardiac Complication.	Per Cent.
Under 10 years	2	0	2	1	50.0
over 10 under 15	3	3	6	6	100.0
„ 15 „ 20	24	14	38	20	52.6
„ 20 „ 25	27	15	42	19	45.2
„ 25 „ 30	14	11	25	7	28.0
from 30 to 40	13	16	29	11	37.9
over 40 years	3	7	10	4	40.0

¹ Two cases of chronic rheumatism are omitted, in which, never having had rheumatism previously, old disease of the heart with hypertrophy was found on admission, which could not have had a rheumatic origin.

SUBACUTE ON ADMISSION.

Age on Admission.	No previous Rheumatism.	Have had Rheumatism.	Total.	With Cardiac Complication.	Per Cent.
Under 10 years	2	0	2	0	0.0
over 10 under 15	3	4	7	4	57.1
„ 15 „ 20	21	18	39	7	17.9
„ 20 „ 25	23	10	33	4	12.1
„ 25 „ 30	22	8	30	2	6.6
from 30 to 40	16	13	29	2	6.9
over 40 years	20	18	38	1	2.6

The chief point of interest here is to observe that the two classes bear pretty nearly the same proportion to different ages up to 25 ; and subsequently, the numbers suffering for the first time from rheumatism, are very much more frequently found in the subacute than in the acute class. It is also worthy of note, that while cardiac complications generally bear a much larger proportion to the acute than to the subacute cases, the ratio is less dissimilar before 25 years of age than it is after it. These two observations serve to illustrate each other.

II. *Of Acute Rheumatism.*

As a most unquestionable cause of inflammation of the heart and pericardium, it becomes of interest to inquire not only in what proportion of instances, endo- and pericarditis are associated with acute rheumatism, but also if possible to ascertain what influence external circumstances of age and sex have in determining the cardiac affection. For this purpose, it is essential to distinguish first and subsequent attacks of rheumatic fever, because when an endocardial murmur is heard, it is not always possible to determine whether it depend upon recent or on old disease, and knowledge of a previous attack admits the possibility at least of its having a prior existence. The proportions will be best seen in a tabular arrangement :

Cases of a first attack of acute rheumatism			88
Males			38
Cases of endo- and pericarditis	14	36·9 per cent.	
Doubtful cases	4	10·5 „	
Cases with no cardiac affection	20	52·6 „	
Females			50
Cases of endo- and pericarditis	22	44·0 per cent.	
Doubtful cases	9	18·0 „	
Cases with no cardiac affection	19	38·0 „	
Cases of a subsequent attack of acute rheumatism			64
Males			38
Cases of endo- and pericarditis, or of old disease	17	44·7 per cent.	
Doubtful cases	5	13·2 „	
Cases with no cardiac affection	16	42·1 „	
Females			26
Cases of endo- and pericarditis, or of old disease	14	53·9 per cent.	
Doubtful cases	3	11·5 „	
Cases with no cardiac affection	9	34·6 „	
All cases together :			152
Cases of endo- and pericarditis, or of old disease	67	44·1 per cent.	
Doubtful cases	21	13·8 „	
Cases with no cardiac affection	64	42·1 „	

From this Table it will be seen that among this collection of cases there is a greater proportion of females than of males admitted with a first attack, and *vice versa*, a larger proportion of males with a subsequent attack ; whence we may conclude, if these proportions hold generally true, that on the whole, females are somewhat more liable to the disease than males, but that the latter are more exposed to its recurrence. Similarly, it appears that females are in a small proportion more liable to cardiac complication than males : that this excess is not due to functional murmurs being mistaken for endocarditis is proved by the fact, that in twenty-eight of the sixty-seven cases of heart affection, pericardial friction was noted, and of these eighteen were females, and only ten males. As might have been anticipated, the proportion of cases with old or recent disease of the heart is

increased in the subsequent attacks, about 18 or 20 per cent., so that of patients who have escaped in their first seizure, one in five may be expected to suffer from it in any subsequent attack.

The influence of age is considerable, but not so great as mere post-mortem evidence led me formerly to conclude. Excluding the doubtful cases, we derive the following proportions for different ages of heart affections attending on a first attack of acute rheumatism.

Age on Admission.	Total.	Heart Affected.	Per Cent.
Under 10 years	2 .	1 .	50·0
over 10 under 15	4 .	4 .	100·0
over 15 „ 20	18 .	13 .	72·2
„ 20 „ 25	23 .	10 .	43·5
„ 25 „ 30	14 .	4 .	28·5
from 30 to 40	13 .	4 .	30·7
over 40 years	1 .	0 .	0·0

In the greater number of those suffering from subsequent attacks, the date of their first attack is preserved.

Age at First Attack.	Total.	Heart Affected.	Per Cent.
Under 10 years	5 .	4 .	80·0
over 10 under 15	14 .	8 .	57·1
„ 15 „ 20	9 .	6 .	66·6
„ 20 „ 25	12 .	6 .	50·0
„ 25 „ 30	6 .	3 .	50·0
from 30 to 40	6 .	2 .	33·3
over 40 years	1 .	1 .	100·0?

It is not meant to be alleged that in all these instances the first attack was that in which the disease of the heart commenced; on the contrary it is to be remembered that not only are there among these cases, in which inflammation of the heart commenced along with their subsequent attack, but also cases must be included which were not due to rheumatic inflammation at all, and in which the diseases were merely coincident: the last case in particular was believed to be one of this sort, where the disease of the heart was believed to have been prior to his first rheumatic attack.

The age on admission of those contained in the last Table, gives the following proportions:

Age on Admission.	Total.	Heart Affected.	Per Cent.
Under 10 years	0	0	0·0
over 10 under 15	3	3	100·0
„ 15 „ 20	10	6	60·0
„ 20 „ 25	11	8	72·7
„ 25 „ 30	6	3	50·0
from 30 to 40	16	7	43·7
over 40 years	7	3	42·9

This Table, compared with one at page 16, containing the ages of all the acute cases on admission, shows the additional ratio of cardiac affection for each period, due to renewed attacks of rheumatism. The general fact which they all indicate is, that up to 25 years of age, there is a much greater liability to disease of the heart following on acute rheumatism. But this is less in cases of a repeated attack, not only relatively to more advanced ages, but absolutely in proportion to the number of cases.

III. *Of a History of Acute Rheumatism.*

In addition to the record of previous attacks in acute cases, an attempt has been made in all the rheumatic cases¹ together, to ascertain how many had at any time suffered from acute rheumatism, and to note the condition of the

¹ In making this inquiry it was to be remembered how difficult it is to obtain correct information of this sort from Hospital patients, and it therefore seemed desirable to limit it to persons who, being at the time subjects of rheumatism, might the more readily answer whether they had ever been before similarly affected, while there would be in the condition of the patient himself at the time, a standard of comparison with which to contrast his own account of his previous state. It was necessary in this case to adopt the limitation of acute rheumatism already noted, and a useful adjunct was found in the question whether the person had been at any time unable to feed himself, and for how long. There seemed also to be an advantage in selecting a class of cases in so far similarly circumstanced, for statistical purposes, in preference to making the same inquiry of every patient for a limited time. The conclusions are open to the fallacy already noticed, that disease of the heart does sometimes occur, although very rarely in a subacute attack; but the question was always put before the heart was examined, and the result was that in only two instances, as already noticed, the heart was affected with a history of merely slight rheumatism. The ratio of diseases of the heart has, therefore, only been given for acute cases.

heart. In 450 instances this record has been kept, when it appeared that 200 had had previous attacks of some sort or other, while 250 had never suffered from it before to their knowledge. In 88, so far as could be made out, the attack was acute, and 32 had disease of the heart, only 2 being marked as doubtful. In almost all, the date of the first attack has been recorded.

ADMITTED WITH SUB-ACUTE RHEUMATISM.

Age at first Attack.	Rheumatism not Acute.	Acute Rheumatism.	Heart Diseased.	Per Cent.
Under 10 years	0 .	3 .	3 .	100·0
over 10 under 20	6 .	16 .	8 .	50·0
„ 20 „ 30	9 .	18 .	7 .	38·9
„ 30 „ 40	6 .	7 .	0 .	0·0
over 40 years	7 .	2 .	0 .	0·0

ADMITTED WITH CHRONIC RHEUMATISM.

Age at first Attack.	Rheumatism not Acute.	Acute Rheumatism.	Heart Diseased.	Per Cent.
Under 10 years	0 .	1 .	0 .	0·0
over 10 under 20	4 .	14 .	6 .	42·3
„ 20 „ 30	27 .	13 .	5 .	38·5
„ 30 „ 40	19 .	12 .	3 .	25·0
over 40 years	34 .	2 .	0 .	0·0

Much reliance cannot, I fear, be placed on these proportions, although every effort has been used to obtain accurate results. If they be worth anything at all, they give a very favorable view of the ultimate progress of cases of acute rheumatism, especially where there has been no recurrence of the disease in an acute form.

IV. *Confirmed Disease of the Heart.*

In addition to 82 cases of disease of old standing to be found in the Table of *post-mortem* appearances, there are records of 124 which left the hospital more or less relieved; 206 in all. Among these there is a distinct history of acute rheumatism in 69 instances; but in 4 instances, from *post-mortem* appearances, and in 3 from clinical examination, there was reason to doubt whether the lesion could have been the result of rheumatic inflammation. Such cases must be regarded as doubtful, as well as those having a history of

only slight rheumatism or gout, for though on reference to the Table it will appear that in the majority the two diseases are merely accidentally coincident, still to this there are exceptions; one has been already mentioned (page 14); another stated that he had suffered from gout at 18, which he alleged to be hereditary; but *post-mortem* evidence showed the disease to have had an inflammatory origin, whence the presumption is that the attack was of the nature of acute rheumatism rather than gout. To these doubtful cases must be also added all in which no record on this point has been kept, for in reference to such a question negative results are as important as positive ones; and it was my intention to record both, the omission having chiefly occurred in cases affording no evidence of anything beyond alteration in dimensions, which the mind does not naturally refer to rheumatism as one of its causes.

The whole number recorded as never having suffered from rheumatism at all was 73: and if from the rheumatic cases all questionable ones be excluded together, there will remain 62 rheumatic, and 71 doubtful.

In considering the influence of sex, it is necessary to bear in mind, that taking all medical cases together at St. George's Hospital, the proportion of admissions and deaths for each sex is nearly equal throughout the year. Thus, for example, the physicians' patients admitted during six months ending in March, 1851, were 347 males and 344 females, while the deaths during the same period were 41 males and 41 females. In confirmed disease of the heart, there is a very decided preponderance of the male sex, there being 119 males and 87 females. The per-centage of mortality is also higher, being about 45 for males and 36 for females. This is the more remarkable, as we have found females somewhat more liable than males to disease of the heart from acute rheumatism. The relation of sex to a rheumatic origin may be represented thus for the 206 cases under consideration:

Males.

Of rheumatic origin	.	.	34 or 16·5 per cent.
non-rheumatic „	.	.	41 or 20·0 „
doubtful „	.	.	45 or 21·8 „

Females.

Of rheumatic origin . . .	28 or 13·6 per cent.
non-rheumatic „ . . .	32 or 15·5 „
doubtful „ . . .	26 or 12·6 „

Whence it appears, that although this preponderance does not exist to the same extent in cases decidedly rheumatic, still, even in those there is an excess of males admitted labouring under confirmed lesion.

The influence of age with reference to a rheumatic origin seems to be very considerable. The cases may be arranged, according to their ages at admission, in periods of ten years.

Age on Admission.	Of Rheumatic Origin.		Non-Rheumatic.		Doubtful.	
	Fatal.	Not Fatal.	Fatal.	Not Fatal.	Fatal.	Not Fatal.
Under 10 years . . .	0	2	0	1	0	1
over 10 under 20 . . .	4	17	0	1	1	2
„ 20 „ 30 . . .	4	10	5	8	1	7
„ 30 „ 40 . . .	4	7	5	13	7	7
„ 40 „ 50 . . .	4	5	13	6	13	7
„ 50 „ 60 . . .	2	1	7	5	10	5
over 60 years . . .	0	0	8	2	1	10

The striking fact here is, that up to the age of 20 almost the whole, and even as far as 30, considerably more than half the cases, are ascribed to a rheumatic origin; between 20 and 30 the non-rheumatic cases first appear; in the two succeeding periods they nearly double the rheumatic; and after 50 there are scarcely any rheumatic cases at all. The ratio of mortality sensibly increases in each period, beginning with one fifth of all the cases between 10 and 20, and reaching to two thirds between 50 and 60. I am quite unable to explain the anomaly of only 1 death among 11 cases in the last column, over 60 years of age.

In 59 of the cases supposed to be of rheumatic origin, the age at the period of the first attack has been recorded, and is here given for comparison with preceding Tables:

Age at first Attack.	Males.	Females.	Total.
Under 10 years . . .	3	5	8
over 10 under 15 . . .	11	5	16

Age at first attack.	Males.	Females.	Total.
over 15 under 20 . . .	4 .	8 .	12
from 20 to 30 . . .	13 .	1 .	14
„ 30 to 40 . . .	3 .	4 .	7
over 40 years . . .	1 .	1 .	2

Among the fatal cases of rheumatic origin, the period from the first attack of acute rheumatism to the fatal termination, may afford some evidence of the general duration of cardiac disease; but the instances are very much too few to form the ground of anything but the most general conclusions. Recent cases must be excluded, and also those doubtful ones of which the commencement in rheumatism was uncertain. As might be anticipated, the laborious occupations of the male sex among hospital patients materially shortens their duration; thus there are 2 deaths at 4 years after the first attack of acute rheumatism, 2 at 5, 2 at 6, 1 at 8, and 1 at 23, as well as 1 at 30 years after. It is unfortunately not recorded in either of these last instances whether there had been any subsequent attacks. Among females there are 2 deaths at 12 years, 1 at 13, 2 at 15, and 1 at 16 years after their first attack.

In conclusion I may be permitted to recapitulate the several results of this statistical inquiry. Of 8 cases fatal during the rheumatic attack, 6 had pericarditis, 3 endocarditis, and 2 no inflammation of the heart. One case of pericarditis gave no friction sound, and one case with no valvular lesion gave a distinct endocardial murmur.

Two other cases of pericarditis are traced to acute peritonitis, and one to recent pleurisy; a large proportion of the remainder were associated with albuminuria, but it has seemed in these instances that the tumultuous action of the heart during life had had very much to do with the traces of pericarditis found after death. In one instance there was no other cause known.

Two cases of recent lymph on the valves are traced to malformation, and two to disease of the kidney; almost all the remaining instances occurred among patients in whom old thickening was found, which was probably due to bygone attacks of rheumatism.

More than half the cases which had at one time suffered from acute rheumatism indicate old pericarditis. The pericardium was found six times universally firmly adherent, in only one of which there was a history of rheumatism; in three, the adhesions were nearly universal with histories of acute rheumatism; and about a third of the remainder with only slight or no adhesions were also rheumatic: hence it would appear that universal adhesion is not the common result of rheumatic pericarditis, nor does the condition of the heart in these cases appear to indicate that it is the most favorable termination.

About a third of the cases of valvular lesion are associated with a rheumatic history, and among them there is a great preponderance of cases of simultaneous lesion of both sets of valves, next of the mitral alone, and scarcely any in which the aortic valves alone are diseased; it seems in most of these cases probable that during the first attack of rheumatism the mitral valves were alone inflamed, and at some future period also the aortic secondarily. In more than half the cases of valvular lesion the kidney was not quite healthy.

Disease of the aortic valves is more frequently associated with hypertrophy, and of the mitral with dilatation; adhesions of the pericardium mostly with dilatation. Atheroma of the aorta and disease of the kidney, each accompany a large majority of the cases of simple hypertrophy. In nearly half of all cases of disease of kidney indiscriminately, there is alteration in the muscular structure of the heart.

In regard to acute rheumatism it is shown that in the greater number of instances it occurs before 25 years of age, and that the largest proportion of cardiac inflammations are found between 10 and 15 years of age. Females are in a slight degree more liable to it than males, and are also more subject to cardiac complications. On the other hand, there are many more males than females admitted with confirmed disease of the heart, but the difference is less when the disease is of rheumatic origin. At the earlier ages almost all cases of confirmed disease of the heart, owe their origin to acute rheumatism, at more advanced ages it almost ceases to be found among the causes.

No.	Lesions of Pericardium.	Alterations in		Condition of Valves.		Sex.	Age.
		Muscular Structure.	Cavities.	Aortic.	Mitral.		
1	Thick layer of recent lymph; some adhesions; membrane thickened.	—	—	Recent lymph.	Thickened and recent lymph.	M.	12
2	Recent lymph; firm adhesions; numerous shreds of lymph.	Hypertrophied.	Dilated.	Recent lymph.	Thickened and recent lymph.	F.	17
3	Recent pericarditis; much serum.	—	—	—	—	M.	31
4	Thin layer of recent lymph.	Fatty.	—	—	Recent lymph.	F.	30
5	Recent lymph and old white patch.	—	—	—	Slightly atheromatous.	F.	41
6	Very slight effusion of lymph.	—	—	—	—	M.	25
7	2 oz. of serum.	—	—	—	—	F.	23
8	—	—	—	Opaque.	Opaque.	F.	45
9	Numerous shreds of lymph.	—	—	—	—	M.	16
10	Feebly adherent; recent lymph.	Hypertrophied.	Dilated.	—	—	F.	46
11	Thick layer of recent lymph	—	—	—	—	M.	43
12	Coated with effused lymph.	Hypertrophied.	—	—	—	F.	15
13	Few shreds of lymph.	Slightly atrophied.	Dilated.	—	Greatly thickened.	F.	38
14	Recent pericarditis.	Hypertrophied.	—	Atheromatous.	Atheromatous.	F.	33
15	Much recent shreddy lymph.	Slightly hypertrophied.	—	—	—	F.	40
16	Some shreds of lymph; large quantity of serum.	Hypertrophied.	—	—	—	F.	40
17	Small fringe of recent lymph.	—	—	—	Thickened and recent lymph.	F.	44
18	Few flakes of lymph.	Hypertrophied, flabby.	Greatly dilated.	Malformation; recent lymph.	Recent lymph.	M.	25
19	Few flakes of lymph.	Hypertrophied.	Greatly dilated.	Greatly thickened.	Opaque, slightly thick.	M.	35
20	Several patches of recent lymph, large old white spot.	—	Dilated.	Slightly thickened.	Thickened, contracted.	M.	32
21	Few shreds of lymph; two white patches.	Slightly hypertrophied.	Dilated.	Thickened, calcareous, recent lymph.	—	M.	40
22	Firm, thick, false membrane; patches of shreddy lymph.	—	Dilated.	Opaque.	Thickened.	M.	45
23	Layer of recent lymph; grey patch on heart.	Hypertrophied.	—	—	—	F.	43
24	Partial adhesions; not quite recent lymph.	Greatly hypertrophied.	Dilated.	—	Recent lymph.	M.	50

History of Acute Rheumatism.	State of Kidneys.	Other important Lesions.	Clinical Observations.
On admission and 6 years ago.	—	Tricuspid thickened; recent pleuritis and pneumonia.	Acute rheumatism of 15 days' duration; murmur at base and apex, and friction sound.
On admission and previously.	—	Recent pleuritis; capsule of liver thick.	Third attack of acute rheumatism; friction sound, and an indistinct systolic murmur.
On admission.	—	—	Acute rheumatism of 7 days' duration; collapse on admission.
On admission.	Slightly granular.	Atheroma of aorta.	Acute rheumatism of 12 days' duration; friction sound.
On admission.	—	Enlarged Peyer's glands; congested lungs; atheroma of aorta.	First attack of acute rheumatism, fatal in 22 days; no friction sound ever heard, rhythm altered. (Continued fever?)
On admission.	—	Suppuration in and round joints; congestion of brain.	Acute rheumatism (?) of 13 days' duration; suppuration, delirium.
On admission.	—	Small quantity of turbid serum in peritoneum.	Acute rheumatism; delirium; systolic murmur above base of heart.
On admission.	—	Pus in synovial cavities of both wrists.	Moribund; treated before admission for rheumatic fever; collections of matter at wrists.
Never (?)	—	Recent peritonitis and pleuritis.	Peritonitis from injury (?), rapidly fatal.
Never.	Granular.	Recent peritonitis and pleuritis; cirrhosis of liver.	Dropsy, especially ascites; heart's action extended; dyspnoea; albuminuria; peritonitis, &c., occurring after paracentesis abdominis.
—	—	Extensive recent pleuritis and pneumonia.	Pleuro-pneumonia; heart's sounds distant and obscure.
Eight months ago (?)	Right, mottled; left, dwindled.	Recent pleuritis; serous effusion in brain.	Albuminuria; facial hemiplegia; pericardial friction.
First attack, 26 years ago.	Fuckered, cysted.	Recent lymph on tricuspid, and thickening; old pleuritis; capsule of liver thickened.	Dropsy; systolic murmur at apex of heart; very little albumen in urine.
Never.	Granular	Atheroma of aorta; slight recent pleuritis; nutmeg liver.	Dropsy; dyspnoea; heart's action increased, systolic murmur at apex; urine very albuminous; diffuse cellular inflammation.
—	Contracted, granular.	Liver enlarged, nutmeg; atheroma of aorta.	Albuminuria and enlarged liver; pericarditis supervening before death.
Never.	Cysted, congested.	Lateral curvature of spine; large nutmeg liver.	Dropsy; loud systolic murmur; albuminuria.
Never.	Dilated, cysted.	Scirrhus of uterus and vagina pressing on ureters.	Anasarca, albuminuria, cancer of uterus, &c.; heart's sounds obscure, apparently a double murmur.
Never.	—	Tricuspid and pulmonic valves atrophied; lymph on endocardium; nutmeg liver.	Dropsy; dyspnoea; heart's action tumultuous; no bruit made out; hæmoptysis.
Occasional slight, never acute.	—	Lungs congested, rather emphysematous, commencing peritonitis.	Cough and palpitation, never previously; heart's action increased; double murmur at base; latterly dropsy.
First attack, 6 years ago.	—	Tricuspid thickened.	Dropsy; heart's action increased; loud systolic murmur at apex; slight murmur at base (?); urine transiently albuminous.
First attack, 5 years ago.	—	Tricuspid slightly thickened; old pleuritis.	Chronic rheumatism; double murmur at base of heart; anasarca; dyspnoea.
Six months ago.	Cysted.	Aneurism of aorta.	Dropsy; heart's action irregular; no albumen in urine.
—	Granular, cysted.	Atheroma of aorta.	Hæmoptysis; œdema of ankles; heart's action increased, sounds indistinct; albuminuria; friction before death.
First attack, 6 years ago.	Dwindled, adherent capsules.	—	"Severe cold" four months before; dropsy; dyspnoea; heart's sounds muffled and obscure; albuminuria.

No.	Lesions of Pericardium.	Alterations in		Condition of Valves.		Sex.	Age.
		Muscular Structure.	Cavities.	Aortic.	Mitral.		
25	Universally, not firmly adherent.	Slightly hypertrophied.	Slightly dilated.	Thickened.	Thickened, calcareous.	M.	54
26	Universally adherent, rather recent lymph.	Slightly hypertrophied.	Dilated.	—	—	M.	58
27	Chronic thickening, and rather recent lymph.	Partially atrophied.	Greatly dilated.	—	Opaque.	F.	35
28	— —	Hypertrophied.	—	One flap large, recent lymph.	—	M.	25
29	Chronic thickening of membrane.	Hypertrophied.	Dilated.	One spot of recent lymph.	—	M.	45
30	Considerable old adhesions.	Hypertrophied.	Dilated.	—	Contracted and recent lymph.	F.	16
31	Almost universal firm adhesions.	Greatly hypertrophied.	Dilated.	Recent lymph.	Thickened and recent lymph.	M.	20
32	— —	Hypertrophied.	Dilated.	Thickened, calcareous, recent lymph.	Greatly thickened, calcareous	F.	37
33	General old adhesion.	Attenuated.	Dilated.	Thickened.	Thickened and recent lymph.	F.	38
34	Large patch of old lymph.	Greatly hypertrophied.	Dilated.	Thickened and recent lymph.	Greatly thickened.	M.	42
35	Universally firmly adherent.	—	—	—	Not quite recent lymph.	M.	17
36	— —	—	—	—	Not quite recent lymph.	F.	43
37	Universal old adhesion; adherent pericardium.	Greatly hypertrophied.	Dilated.	Thickened calcareous deposit.	—	M.	33
38	Universal old adhesions.	Hypertrophied.	—	—	Slightly roughened.	F.	40
39	Universally firmly adherent.	—	—	—	—	M.	43
40	Universal old adhesions.	Pale, atrophied.	Dilated.	—	Thickened, atheromatous.	M.	46
41	Universal old adhesion.	Greatly hypertrophied.	Greatly dilated.	—	—	M.	55
42	Membrane thickened; large old patch of lymph.	Slightly hypertrophied.	Greatly dilated.	Thickened.	Thickened, calcareous deposit.	M.	22
43	Considerable old adhesions and large white spot.	Slightly hypertrophied.	Greatly dilated.	—	Thickened.	F.	27
44	Considerable firm adhesions.	Greatly hypertrophied.	Greatly dilated.	Slightly thickened.	Slightly thickened.	M.	26
45	Several white patches.	—	—	Thickened, atrophied.	—	M.	45
46	Whitish membranous layer.	Slightly hypertrophied.	Dilated.	—	—	F.	46
47	Partial old adhesions.	—	Aneurismal dilatation.	—	—	M.	50
48	Several white patches.	Attenuated.	Dilated.	—	—	M.	51

History of Acute Rheumatism.	State of Kidneys.	Other important Lesions.	Clinical Observations.
First attack, 30 years ago.	Granular.	Slight old pleuritis; extensive old peritonitis.	Ascites and anasarca; albuminuria; heart's action irregular; obscure systolic murmur.
25 years ago.	—	Atheroma of aorta; tubercles and consolidation of lungs; liver rounded, nutmeg.	"Severe cold" six months ago; palpitation four months; heart's action irregular; phthisis; anasarca; no illness for 25 years past.
Never.	—	Tricuspid opaque; peritonitis old and tolerably recent.	Dropsy; heart's action extended; urine transiently albuminous; local peritonitis two months before death.
Never.	Large, smooth, mottled.	Old peritonitis; atheroma of aorta.	Double murmur at base of heart, with increased action; general dropsy; no illness for 20 years.
Never.	Granular, cysted.	Old pleuritis and peritonitis; nutmeg liver.	Dropsy; heart's action increased; albuminuria.
First attack, 13 years ago.	—	Lymph on endocardium; atheroma of aorta; congestion of lungs.	Cough and palpitation; dropsy after admission; heart's action increased; loud systolic murmur at apex.
First attack, 4 years ago.	Large, congested.	Old pleuritis.	Dropsy; moribund on admission; heart's action tumultuous; murmur at apex; albuminous urine.
First attack, 22 years ago.	Extravasated blood.	Old and recent pleuritis.	Dropsy; heart's action increased, systolic murmur at base and apex; urine very albuminous; hæmoptysis.
First attack, 21 years ago.	—	Old pleuritis; inflamed bronchi; old peritonitis; nutmeg liver.	Three times in hospital with anasarca and ascites; double murmur at base of heart.
First attack, 23 years ago.	—	—	Twice previously in hospital with cardiac pain and spasm; slight anasarca; heart's action increased, murmur at apex and base (?).
Five years ago & just before admission(?)	—	Inflammation of spinal chord.	Chorea; heart's sounds excited and indistinct; systolic murmur at apex.
Six months ago.	—	Tolerably recent lymph on lining membrane of left auricle.	Dyspnoea; heart's action excited and irregular; systolic murmur at apex.
—	Right atrophied.	Congenital malformation of aorta; old pleuritis; nutmeg liver.	Pain in region of liver; dyspnoea; double murmur at base of heart; hæmoptysis.
Never.	—	Old and recent peritonitis; old pleurisy on right side.	Ascites with anasarca; paracentesis twice in four months; peritonitis followed on second operation.
Never (?)	Small.	Cirrhosis of liver.	Ascites with anasarca; no albuminuria, no cardiac symptoms; no previous illness.
Never.	Coarse, granular.	Old and recent pleuritis; nutmeg liver.	Dropsy; heart's action feeble, murmur at apex; no albumen observed in urine.
Never.	Somewhat dwindled.	—	General dropsy, dyspnoea, hæmoptysis; heart's sounds muffled, irregular; urine transiently free from albumen.
Eight years ago.	—	Emphysema of lungs; pleuritis not quite recent.	Excessive dyspnoea; pulse 240 (?); heart's action very greatly excited; sounds imperfect.
15 years ago.	—	Nutmeg liver.	Dropsy; heart's action irregular; murmur at apex.
Never.	—	Old pleuritis on left side.	Dropsy; heart's action increased, systolic murmur at apex.
Never.	Right, puckered, congested.	Atheroma of aorta.	Dropsy, hæmoptysis; double murmur at base of heart; urine transiently albuminous.
—	—	Old pleuritis and peritonitis; nutmeg liver.	Dropsy; heart's action irregular, feeble.
Never (?)	—	Lining membrane of aorta thickened.	Dropsy; double murmur over centre and base of heart.
—	—	Emphysema and bronchitis; slight old pleuritis; vomicae, and few crude tubercles.	Excessive dyspnoea; anasarca; heart's sounds loud; peritonitis, &c.

No.	Lesions of Pericardium.	Alterations in		Condition of Valves.		Sex.	Age.
		Muscular Structure.	Cavities.	Aortic.	Mitral.		
49	Firm band of old adhesion.	Slightly hypertrophied.	Dilated.	Ulcerated.	—	M.	55
50	Large patch of old lymph.	Greatly hypertrophied.	Greatly dilated.	Thickened.	Slightly thickened.	M.	56
51	Two white patches; slight adhesions.	Hypertrophied.	Dilated.	Thickened, atheromatous.	Thickened, atheromatous.	M.	73
52	— —	Hypertrophied.	Dilated.	—	Thickened, contracted.	M.	24
53	— —	Slightly atrophied.	Dilated.	—	Slightly thickened.	F.	43
54	— —	Slightly hypertrophied.	Greatly dilated.	Slightly thickened.	Thickened.	F.	51
55	— —	Fatty, hypertrophied.	Dilated.	Opaque.	Opaque.	F.	44
56	— —	Greatly hypertrophied.	—	—	Thickened, contracted, and atheromatous.	M.	32
57	— —	Greatly hypertrophied.	—	Deposit of lithate of soda.	—	M.	40
58	— —	Hypertrophied.	Dilated.	Slightly atheromatous.	Slightly atheromatous.	M.	54
59	— —	Hypertrophied.	Greatly dilated.	Slightly thickened.	Atheromatous.	M.	23
60	— —	Hypertrophied.	—	Atheromatous.	—	M.	45
61	Small patch of old lymph.	Pale.	—	Atheromatous.	Atheromatous.	M.	46
62	— —	Slightly hypertrophied.	Dilated.	Slightly atheromatous.	Slightly atheromatous.	F.	49
63	— —	Greatly hypertrophied.	Slightly dilated.	Slightly atheromatous.	—	M.	54
64	— —	Slightly hypertrophied.	—	Calcareous.	Calcareous.	M.	57
65	— —	Greatly hypertrophied.	Dilated.	Atheromatous.	Atheromatous.	F.	58
66	— —	Slightly hypertrophied, fatty.	Dilated.	—	Thickened, calcareous.	F.	64
67	White patch.	Greatly hypertrophied.	—	Slightly atheromatous.	Slightly atheromatous.	M.	66
68	Small white patch.	Hypertrophied.	Dilated.	—	Thickened, atheromatous.	F.	68
69	Two small white patches on heart.	Greatly hypertrophied.	Dilated.	—	—	M.	52
70	— —	Hypertrophied.	Dilated.	—	Slightly thickened.	F.	35
71	— —	—	Greatly dilated.	Slightly thickened.	Slightly thickened.	M.	36

History of Acute Rheumatism.	State of Kidneys.	Other important Lesions.	Clinical Observations.
Never.	Dwindled, capsules adherent.	Tricuspid thickened; atheroma of aorta; recent pleuritis; nutmeg liver.	Dropsy; dyspnoea; albuminuria; heart's action irregular; murmur with second sound at base.
—	Granular, cysted.	Atheroma of aorta.	Dropsy; hæmoptysis; albuminuria; heart's action increased; double murmur at base.
Never.	Cysted, adherent capsules.	Atheroma and ulceration of aorta; old pleuritis and peritonitis.	Dropsy; urine very albuminous; heart's action feeble, tumultuous; obscure systolic murmur.
Four years ago.	—	Recent pleuritis, from pulmonary apoplexy (?)	Slight dropsy; great dyspnoea; heart's action much increased; musical murmur at apex.
Many years ago.	Large, granular.	Tricuspid thickened; atheroma of aorta; extensive old pleuritis.	Dropsy; heart's action irregular; murmur at apex; no albumen in urine.
First attack, 15 years ago.	Granular, cysted.	Old pleuritis; capsule of liver thickened.	General dropsy; albuminuria; heart's action irregular; systolic murmur most distinct at apex.
Slight rheumatism, 7 months ago.	Large, coarse.	Pneumonia.	Dropsy; heart's action irregular; albuminuria.
Gout (?), 14 years.	—	—	Heart's sounds loud and shrill; urine albuminous; dropsy; sphacelus after acupuncture.
Hereditary gout, 20 yrs.	Granular.	Recent pleuritis; pneumonia; liver large, rounded, various deposits of lithate of soda.	Epistaxis; albuminuria; pleuro-pneumonia.
Slight rheumatism, 31 years ago.	Granular, cysted.	Atheroma of aorta; old pleuritis; capsule of liver thickened.	General dropsy; albuminuria; heart's sounds obscure; no bruit.
Never.	Congested.	Atheroma of tricuspid; old and recent pleuritis.	Dropsy; dyspnoea; heart's action tumultuous, murmur at apex; urine highly albuminous.
Never.	—	Aorta dilated, roughened with atheromatous and calcareous deposit.	Dropsy; double aortic murmur.
Never.	—	Atheroma of tricuspid, of endocardium, and aorta; liver large, fatty.	Jaundice; ascites; delirium; very dissipated habits; no cardiac bruit.
Never.	—	Old and recent pleuritis; liver congested, capsule thickened.	Dropsy; heart's action feeble; died suddenly.
—	Granular, mottled.	Atheroma of aorta.	Dropsy; hæmoptysis; albuminuria; heart's action increased; double murmur at base.
—	—	Calcareous deposit in aorta; bronchitis; liver contracted, granular.	Dropsy and bronchitis; dyspnoea; heart's action quiet; no bruit.
Never.	—	Atheroma of aorta; old pleuritis.	Dropsy; hæmoptysis; heart's action increased; double murmur at base, systolic at apex.
Never.	Large, mottled.	Organs all loaded with fat; liver contracted, granular.	Anasarca; lividity of skin; no albumen in urine; heart's action very feeble; murmur at apex.
—	Granular, cysted.	Atheromatous deposit in coronary arteries; emphysema of lungs; thickened capsule of liver.	Dropsy; albuminuria; heart's action irregular; indistinct systolic murmur.
Never.	Rough, adherent capsules.	Old pleuritis.	Dropsy; hæmoptysis; no albumen in urine; heart's action excited; no bruit.
Slight rheumatism many years ago.	Granular.	Atheroma of aorta; old pleuritis.	Slight chronic rheumatism; constant vomiting; albuminuria.
—	Granular.	Old and rather recent pleuritis; liver large, congested.	Anasarca; albuminuria; heart's action tumultuous; murmur at apex.
Never.	Coarse, lobulated.	Nutmeg liver.	Dropsy; hæmoptysis; heart's action turbulent; no albumen in urine; of intemperate habits.

No.	Lesions of Pericardium.	Alterations in		Condition of Valves.		Sex.	Age.
		Muscular Structure.	Cavities.	Aortic.	Mitral.		
73	— —	Slightly hypertrophied.	Greatly dilated.	—	Thickened.	M.	53
73	— —	Fatty degeneration.	Dilated.	Opaque.	Opaque.	F.	60
74	— —	Right especially hypertrophied.	Right side dilated.	—	Thickened.	M.	65
75	Small white patch.	Slightly hypertrophied.	—	—	Slightly thickened.	F.	75
76	Small white patch.	Hypertrophied.	Greatly dilated.	—	Slightly thickened.	M.	35
77	— —	—	Greatly dilated.	—	Much thickened, contracted.	M.	43
78	— —	—	—	Atrophied, perforated.	—	M.	31
79	— —	Slightly hypertrophied.	Slightly dilated.	Much thickened; atheromatous.	Thickened, contracted.	F.	40
80	— —	Hypertrophied.	Greatly dilated.	—	—	M.	34
81	— —	Hypertrophied.	—	—	—	M.	45
82	— —	—	Dilated.	—	—	F.	46
83	— —	Hypertrophied.	—	—	—	M.	51
84	— —	Right side hypertrophied.	Right side dilated.	—	—	M.	24
85	— —	Hypertrophied.	Dilated.	—	—	M.	29
86	— —	Slightly hypertrophied.	Greatly dilated.	—	—	M.	39
87	— —	Hypertrophied.	Dilated.	—	—	F.	40
88	— —	Hypertrophied.	Dilated.	—	—	M.	44
89	— —	Greatly hypertrophied.	—	—	—	M.	45
90	— —	Hypertrophied.	Dilated.	—	—	F.	47
91	— —	—	Dilated.	—	—	M.	71
92	— —	Slightly hypertrophied.	Greatly dilated.	—	—	F.	54

History of Acute Rheumatism.	State of Kidneys.	Other important Lesions.	Clinical Observations.
Never.	—	Tricuspid thickened; atheroma of aorta.	Dropsy; heart's action irregular; murmur at apex.
Never (?)	Granular, cysted.	—	Anasarca; heart's action feeble; sounds indistinct; albuminuria.
Never.	Coarse, mottled, cysted.	Calcareous deposit in aorta; emphysema of lungs; capsule of liver puckered.	Dropsy; dyspnoea; heart's sounds prolonged; urine transiently free from albumen.
Never.	Cysted.	Atheroma of aorta; old pleuritis; capsule of liver thickened.	Dropsy; heart's action very irregular; urine transiently albuminous.
Never.	Granular, cysted.	Old and recent pleuritis.	Dropsy; pleuro-pneumonia; heart's action tumultuous; murmur at apex; urine not albuminous (only one examination).
Never.	Capsules adherent.	Aneurism from atheroma and calcareous deposit in aorta.	Dyspnoea; double murmur over aortic valves.
—	—	Recent pleuritis; emphysema.	Pleurisy and bronchitis; no cardiac murmur.
—	Small, pale, mottled.	Atheroma of aorta.	Slight jaundice, followed by dropsy; urine for some time free from albumen; heart's action tumultuous; no bruit heard; latterly albuminuria.
Only slight rheumatism.	Granular, cysted.	Old pleuritis; contracted nutmeg liver.	Dropsy; heart's action increased; murmur at apex; urine transiently albuminous.
Gout, 19 yrs.	Atrophied, granular.	—	Dropsy; albuminuria.
Slight rheumatism, 17 years ago.	Mottled, cysted.	Old pleuritis; emphysema of lungs.	Dropsy; albuminuria; heart's action excited.
Gout, 20 yrs.	Granular, cysted.	Old pleuritis; miliary tubercle.	Dropsy; dyspnoea; epistaxis; albuminuria.
Never.	—	Great emphysema and bronchitis; old pleuritis; liver large.	Great dyspnoea; slight anasarca; heart's action turbulent, feeble.
—	—	Extensive old peritonitis; liver, much enlarged, nutmeg; pneumonia.	Ascites; heart's sounds obscure.
—	—	Pleuritis not quite recent.	Pleuro-pneumonia six months before death; dropsy; increased impulse of heart.
—	Mottled.	Liver nutmeg, with rounded edges.	Dropsy; heart's action increased; albuminuria.
—	Congested, adherent capsules.	Pleuritis, old and recent; liver friable.	Dropsy; great dyspnoea; heart's action irregular; urine slightly albuminous.
—	Granular, atrophied.	Atheroma of aorta; slight old pleuritis; apoplectic clot in ventricle of brain.	Dropsy two years ago; albuminuria; heart's action apparently very little increased; apoplexy occurring in hospital.
Never.	Granular, cysted.	Calcareous deposit in aorta; nutmeg liver.	Dropsy; albuminuria; heart's sounds shrill.
Never.	Right, large; left, dwindled.	Endocardial membrane thickened; old pleuritis.	Anasarca; albuminuria; palpitation; heart's sounds indistinct.
Never.	Congested, granular.	Bronchitis and emphysema of lungs.	Cough and palpitation three years; anasarca; albuminuria; heart's action tumultuous; systolic murmur at apex.