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## Mitral Stenosis and Pregnancy.\*

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### INTRODUCTION.

THERE is a large amount of literature upon this subject. Many of the papers contain accounts of small numbers of cases only. References are given at the end of this article.

Berthiot's (3) book, published in 1876, and Macdonald's (11), published in 1878, have long been the standard works upon the subject. More recent publications which go fully into the question are those of Handfield-Jones (8) and Allyn (1), in 1896; Jess (9), who has collected all the published material upon the subject up to 1898; and Nicholson (13) and Mackenzie (12) in 1904.

There are certain points in regard to valvular heart disease and pregnancy upon which there is general agreement. These we do not propose to discuss further, because they appear to be well established. They are the following:—

(1) Of all the varieties of chronic valvular heart disease, mitral stenosis is that most commonly accompanied by heart failure during pregnancy.

(2) Aortic lesions without mitral are rare in women; few cases of pregnancy in women who have aortic without mitral disease come under observation.

(3) When symptoms of heart failure have preceded pregnancy they are made worse by pregnancy.

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(4) Repeated pregnancies at short intervals cause greater risk of heart failure than do few pregnancies at longer intervals.

There are, on the other hand, some points upon which there is not the same agreement. Among these, one of the most important, perhaps, is the question of whether a young woman with mitral stenosis should marry. It is to this question in particular that we devote our attention in the present paper.

#### THE VIEWS OF OTHERS.

The serious view that has been taken of the prognosis in patients with mitral stenosis who become pregnant is shown by the following quotations:—

Jellett, in his "Manual of Midwifery," 1905, p. 591, says:—"Finally, the question must be answered, Should a woman with valvular disease marry? The answer to the friends or relatives of the patient must be 'No.' Our advice will probably not be taken, but, all the same, it should be given, and none the less definitely on that account. There is no use in 'hedging' by saying that if failure of compensation has ever occurred, or if the damage to the valve is considerable, or if some particular valve is affected, she should not marry. In view of the sequence of events which we know to be usual in any case of valvular lesion, and remembering that a woman has duties as a wife and as a mother which require her health and strength for their due performance, there should be no hesitation in the mind of the physician as to what answer he would give to such an inquiry. It is astonishing how frequently the question is raised in text-books and how evasively it is answered. That 'the perils of marriage should be clearly stated to both the contracting parties,' as advised in a very recent American treatise on 'The Heart,' is not the way out of the difficulty. The physician has many puzzling questions to answer, but this is not one of them, and, as his opinion has been asked, it should be given in a definite and unequivocal manner."

P. Brouardel (21), quoting Porak, confirms the axiom, "Pour une cardiopathe, jeune fille, pas de mariage; mariée, pas de grossesse."

These opinions are based upon the following statistics:—

*Macdonald's figures:*

	No. of Cases.	No. of Deaths.	Maternal Mortality.
Mitral stenosis ... ..	14	9	64·4 per cent.
Mitral regurgitation ... ..	8	3	37 "
Aortic regurgitation ... ..	5	2	40 "

*Porak's figures :*

	Premature Births.	Maternal Mortality.
Aortic lesions ... ..	25 per cent.	23 per cent.
Mitral regurgitation ... ..	50 "	13 "
Mitral stenosis ... ..	30 "	61 "
Mitral stenosis and regurgitation	42 "	45 "
Complex lesions ... ..	43 "	50 "

We would point out, however, that these statistics are based upon what are virtually selected cases. They only cover those in whom the cardiac symptoms had led the patients to seek medical advice. They do not include the patients in whom pregnancy produced little or no heart failure.

This is a very important omission. We have not been able to find an analysis of any large number of cases of women suffering from mitral stenosis in which this source of fallacy has been taken into account.

We have, therefore, analysed the obstetric histories of 300 consecutive cases of mitral stenosis in women over twenty, who have been in Guy's Hospital.

We realize that it is extremely difficult to be certain of the date at which a grown-up woman with valvular heart disease first acquired it. In many cases of mitral stenosis there is no history of acute rheumatism or chorea. The mitral stenosis may be proved by autopsy to be old. It is believed that such cases have had endocarditis in childhood, when the joint pains have been so slight that they have escaped the attention of the parents.<sup>1</sup>

Even when there has been an attack of rheumatic fever in early youth there is often no means of determining with certainty that the valvular disease has dated from it. In our analysis we have excluded all cases where granular kidney was possible, and also those cases where the patient stated that rheumatic fever first occurred after twenty years of age. We have taken those in which the clinical diagnosis has been old-standing mitral stenosis, with or without other lesions, and in which there has been either rheumatic fever or chorea in childhood or youth, or no history of acute rheumatism at all. We have accepted the same evidence in all the cases, whether in married

<sup>1</sup> Taylor, in 'The Practice of Medicine,' 1904, p. 157, says: "... the cardiac lesions may occur without any obvious affection of the joints at all. This greater liability on the part of the heart is especially frequent in children. . . ."

women not pregnant, in married women pregnant, or in single women over twenty, so that the analyses of each class are comparable. Our cases are given in tables at the end of the paper.

#### MANY MITRAL STENOSIS PATIENTS BEAR CHILDREN WELL.

The likelihood is, that any woman who has mitral stenosis will, sooner or later, suffer from the results of failing compensation. There are all degrees of mitral stenosis, and of the power of different hearts to maintain their compensation. Some hearts will fail early, whatever the woman does. Other hearts seem able to carry on their work almost as well as if no valvular disease were present. Even when heart failure comes on during pregnancy or the puerperium it is difficult to be sure that the heart would not have failed in any case, even had there been no pregnancy.

We have analysed over 300 cases as justly as we are able, attributing heart failure to child-bearing in as many as we felt we honestly could. We have come to the conclusion that the greater number of pregnancies in women with mitral stenosis, whose compensation has not previously failed, run their course as naturally as do the pregnancies of healthy people.

Thus, of the 300 consecutive cases, 205 were married. Of these, 135, or 66 per cent., did not attribute their ultimate heart failure to pregnancy, nor could we satisfy ourselves that there was any direct relation between the pregnancy and the heart failure. In one of these cases there had been as many as 17 children born alive, and the average number of children was 4.5 per mother. If 135 mothers with mitral stenosis can bear 608 children without losing cardiac compensation, it would seem unjust to prevent a young woman with compensated valvular heart-disease from getting married.

We found a direct relation between child-bearing and heart failure in 57 women, or 28 per cent. In many of these, however, there had been previous children born without trouble. In one case, indeed (No. 168), the labours with twelve children had been uneventful, heart failure occurring for the first time with the thirteenth. Upon twelve separate occasions this case might have come into our group of cases without heart symptoms; but the thirteenth transfers her to our group of cases where heart failure is related to pregnancy. It seems worth while to represent the relationship between pregnancy and heart failure in mitral stenosis in another way, as follows:—

				Associated with Heart Failure.	Not Associated with Heart Failure.
1st pregnancy	...	...	...	15	177
2nd	"	...	...	16	139
3rd	"	...	...	10	116
4th	"	...	...	14	95
5th	"	...	...	13	74
6th	"	...	...	14	61
7th	"	...	...	5	50
8th	"	...	...	8	38
9th	"	...	...	1	30
10th	"	...	...	2	26
11th	"	...	...	2	18
12th	"	...	...	2	13
13th	"	...	...	2	10
14th	"	...	...	0	7
15th	"	...	...	0	2
16th	"	...	...	0	2
17th	"	...	...	0	1

THE TIME AT WHICH, WHEN RELATED TO PREGNANCY, HEART FAILURE SETS IN.

We appreciate fully the fact that an existing tendency to failure of compensation is aggravated by child-bearing. Some of these patients, when they do go wrong, break down badly. Others, however, respond no less readily to treatment than do non-pregnant cases. It is difficult to determine the prognosis in any given case.

Amongst the 57 patients (see Table, Nos. 149—192) in whom we relate the cardiac failure to child-bearing we were uncertain in 7 whether the symptoms came on before, during, or after the birth of the child. In the remaining 50, 25 dated their heart trouble to the time when they were pregnant, 25 went to term without difficulty, and the cardiac symptom set in during the puerperium.

THE PROGNOSIS WHEN HEART FAILURE IS RELATED TO PREGNANCY, LABOUR, OR THE PUERPERIUM.

The prognosis in regard to heart cases is always difficult to estimate from hospital records. Many patients recover sufficiently to go away to their homes, but there is no evidence to show how long their cardiac compensation is maintained. Some such cases doubtless die comparatively soon. Others remain chronic invalids for years. A few recover sufficiently to do their work for a longer or shorter time. It is a matter of every-day experience to find heart cases, men and women alike, coming into hospital for a few weeks, recovering cardiac compensation to some extent, going away to their homes only

to return again and again to the hospital. Those who die at home are not heard of again. Those who recover completely for the time being are also lost sight of. They change their address and cannot be traced. There is the greatest difficulty, therefore, in determining whether women with mitral stenosis, whose cardiac compensation has broken down in relation to child-bearing, have a worse prospect of life than have other patients whose heart failure has been due to other causes.

The proportion who die in the hospital is really no criterion, because we do not know what proportion of the others die soon after discharge; but since this source of error is common to all hospital statistics, we give the proportions for what they are worth:—

(a) Of 135 mitral stenosis patients who had borne children, but whose heart failure did not date from child-bearing, 44, or 33 per cent. died in hospital.

(b) Of 57 mitral stenosis patients who had borne children, and whose heart failure did date from child-bearing, 20, or 35 per cent., died in hospital.

(c) Of 13 mitral stenosis patients, married but never pregnant, 6, or 46 per cent., died in hospital.

(d) Of 95 mitral stenosis patients, unmarried, 17, or 18 per cent., died in hospital.

At first sight this would seem to indicate that the prognosis was worst in the sterile women, best in the unmarried, intermediate in those who had families. A glance at the relative ages in the different groups shows that this deduction is unwarranted; for the average age of all the cases in the four groups was:—

	Average Age. <sup>1</sup>		Maximum Age.		Minimum Age.
(a)	41 years	...	71	...	22
(b)	32 "	...	48	...	20
(c)	34 "	...	55	...	25
(d)	30 "	...	60	...	20

The average age of the single women was less than that of the married; the mortality amongst them should naturally be less. Could we trace the unmarried patients forward into the ten years to come, we should find that many would ultimately die in hospital, and some of these would probably have entered into the married

<sup>1</sup> The average age at death of married women with mitral stenosis is obviously less than that of healthy women. If the fact that the wife is likely to predecease the husband is regarded as a bar to marriage in all cases, then we agree that women with mitral stenosis should not marry. Our point is that we think the grave influence of pregnancy upon mitral stenosis has been over-estimated.

state before they died. Many of our married patients had come in and out of hospital half a dozen times or more before they ultimately died.

We think the hospital mortality statistics afford no sound basis for any deduction; but if we drew any deduction at all it would be that, allowing for differences of age, the mortality of matrons with mitral stenosis is not materially different from that of spinsters with mitral stenosis.

#### THE PROGNOSIS WHEN HEART FAILURE SETS IN DURING PREGNANCY.

The paragraph above indicates how difficult it is to say whether or not a given woman, a hospital patient suffering from mitral stenosis, with symptoms of heart failure, will ultimately die in hospital or not. It is less difficult to say whether or not a given woman, being pregnant, and admitted to hospital with cardiac symptoms from mitral stenosis, will leave the hospital alive, and whether or not she will approximately reach term and bear a living child.

Amongst over 300 consecutive cases, 22 were admitted whilst actually pregnant. For the details of these we refer to the table at the end of the paper. In addition to these, we have found fourteen other pregnant mitral stenosis patients, who came into the hospital either before or after the period of our 300 consecutive cases. The following are notes of these additional patients:—

(i) Aged 43. She was admitted for retroverted gravid uterus, and had no cardiac symptoms; there was well-marked mitral stenosis. The uterus was replaced, the patient being in the ward only five days. She had been married fifteen years, and had had seven living children and one miscarriage. The last labour was seventeen months before, at full term. She was now pregnant four months.

(ii) Aged 36. She was admitted when seven months pregnant for orthopnoea, precordial pain, hæmoptysis, and bronchitis, without œdema. She gave no history of acute rheumatism, but was found to have old mitral stenosis. With rest in bed and digitalis she improved rapidly. She went to term. The labour was natural. She and her child both did well. She had had ten living children previously, and with each pregnancy had had some dyspnoea in the later months, but had recovered completely soon after labour.

(iii) Aged 22. She was admitted when eight months pregnant for her eleventh attack of acute rheumatism. She had mitral stenosis and regurgitation, and aortic stenosis and regurgitation, but neither

now nor previously had she suffered from her heart. She went to term; labour was natural; mother and child did well. She had had one child previously, stillborn at full term, without difficulty. She had been in Guy's Hospital eleven times before, once for hæmatemesis and (?) gastric ulcer, ten times for acute rheumatism. The heart lesion was old.

(iv) Aged 40. She had been married only six months, and was five months pregnant on admission. She came in for dyspnœa. She rested in bed for a fortnight, and went out on the twenty-fourth day, free from dyspnœa, still pregnant. The heart lesion was old mitral stenosis.

(v) Aged 25. She came in for dyspnœa when four months pregnant, and was found to have a large, irregular heart, and mitral stenosis and regurgitation. She was only in the ward six days, when she went home of her own accord, still pregnant. She had had rheumatic fever four times.

(vi) Aged 19. She came in when pregnant nearly to term for a sudden hemiplegia. This was found to be due to cerebral embolism from mitral stenosis. There were no cardiac symptoms. She went to term. Labour was natural. Mother and child did well, but the hemiplegia passed off but partially. There was weakness of the affected side a year later, but no heart failure. There was no history of rheumatic fever.

(vii) Aged 33. She came in for acute bronchitis and orthopnœa, without œdema, when six months pregnant. She was found to have mitral stenosis, but gave no history of acute rheumatism. She was immediately relieved by rest in bed, and went out in fifteen days, still pregnant. She had had some trouble with her first pregnancy, but had recovered completely, and had borne seven living children.

(viii) Aged 20. She had had acute rheumatism many times, first when eleven. She had aortic stenosis and regurgitation, and mitral stenosis and regurgitation. She had had one living child two years before without difficulty, and had now missed two menstrual periods. Until just before admission she had worked hard at a jam factory, carrying trays of jars of jam up and down stairs. She was seized with acute rheumatism again, and came to hospital with a certain amount of dyspnœa also. She rested in bed, recovered rapidly, and went out on the twentieth day, able to walk actively without dyspnœa. It was jam-jar carrying rather than pregnancy that had caused the cardiac symptoms.

(ix) Aged 29. She gave no history of acute rheumatism, but had old mitral stenosis. She had had four children previously without



difficulty. Eighteen days before admission orthopnoea and cough came on simultaneously with an abortion. She was attended in the out-door maternity department and transferred to the wards. She rested, and had digitalis; on the twenty-sixth day she went out, free from dyspnoea.

(x) Aged 25. She had had acute rheumatism at sixteen and at twenty-one. She came in for dyspnoea in the later months of pregnancy, and was found to have mitral disease. The notes are incomplete; it is not known if she was married or if she had had a previous pregnancy. With rest and digitalis she became free from dyspnoea, and went out on the twenty-fourth day, still pregnant.

(xi) Aged 27. She had had no acute rheumatism, but had old mitral stenosis. She had been married four years. Her first pregnancy ended at the seventh month in the delivery of a still-born child. The second pregnancy went to term naturally, and there was no heart failure, but when two and a half months pregnant she had a "fit," which left her with hemiplegia. This passed off completely after labour. Dyspnoea first began fourteen months ago, and on admission she was eight and a half months pregnant, orthopnoeic, and cyanosed. With rest in bed and digitalis she reached full term, and was delivered of a living female child weighing 6 lb. 8 oz. She and her child did well, and she went out early in the puerperium. The dyspnoea was still present on exertion, but not with ordinary walking.

This patient became pregnant again a year and a half later. She was admitted at the fourth month for hæmatemesis, and rapidly recovered from this, but all through the pregnancy there was severe dyspnoea with swelling of the feet. Cyanosis became extreme, and just before term labour was induced. Unassisted delivery took place twenty-four hours later, and was accompanied by post partum hæmorrhage. The child was 17 inches long, weighed 6 lb. 8 oz., and lived. The mother had severe dyspnoea and bronchitis during the early part of the puerperium, but under treatment the œdema disappeared and the cough decreased. She walked from the hospital, but readily became dyspnoeic on exertion.

(xii) Aged 22. She gave no history of acute rheumatism, but was found to have mitral stenosis. She did not come in for heart failure in the ordinary sense, but for acute pericarditis. She refused to stay in the hospital. On the third day she insisted on going home, notwithstanding that she had acute pericarditis and was very seriously ill. She was pregnant five months at this time, and had borne one child eighteen months previously without developing cardiac symptoms.

(xiii) Aged 26. She gave no history of acute rheumatism, but was found after death to have chronic valvular heart disease, both aortic and mitral, and a fatty heart. She had been married a year, and was pregnant nearly to term. She had developed acute dyspnœa three weeks before. Labour was induced and a living male child born. The patient became much worse the day after the confinement, and the heart did not respond to any treatment. The mother died on the ninth day after labour, the child lived.

(xiv) Aged 24. She gave no history of acute rheumatism, but had mitral stenosis. She had had twins prematurely thirteen months before. The infants were born living, but both died. There had been no cardiac symptoms with that pregnancy. When five months pregnant for the second time she became very dyspnœic and cyanosed. When admitted, it was thought she must die; she recovered rapidly with rest in bed and digitalis, and was able to go home, still pregnant. She was re-admitted at the seventh month, extremely dyspnœic, with œdematous legs and a rapid, irregular pulse. She was bled, and digitalis was given, and she rested in bed. The pregnancy continued naturally; the cardiac symptoms all abated; she was delivered at full term of a living child weighing 5 lb. 6 oz. Both mother and child did well, and the mother was free from dyspnœa on ordinary exertion when she left the hospital.

We have, therefore, 36 cases in which mitral stenosis patients have come into Guy's Hospital when pregnant. These are all we have been able to find in a period of over twenty-five years. Leaving out patients under twenty years of age, the number of women with mitral stenosis who were admitted during the same period was something like 750. If cardiac symptoms from mitral stenosis were the rule during pregnancy, surely more patients would have sought admission when actually pregnant.

Of the 36 patients, not one died during pregnancy, if we exclude Cases Nos. 149 and xii, who refused to stay in and whose fate is not known. Not one died during labour. Nine had no heart failure, but came in for other things (Nos. 4, 5, 8, 165, 168, i, iii, vi, xii). Twenty-four went out with restored cardiac compensation (Nos. 4, 5, 8, 151, 152, 153, 155, 161, 163, 165, 166, 168, 169, 171, i, ii, iii, iv, vi, vii, viii, ix, x, xiv). Only five died within three months after labour (Nos. 174, 177, 180, 183, xiii), and of these one (No. 180) died, not of mitral stenosis, but of chorea gravis and infective endocarditis.

In regard to the children, the fate of ten is unknown, because the mothers recovered and went out to be delivered elsewhere. Of the remaining 27, 23, including twins in one case, were born living, at

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term, or within a month of term (Nos. 4, 5, 8, 151, 155, 161, 163, 165, 166 (twins), 169, 174, 177, 178, 182, 183, ii, iii, vi, xi (?), xiii, xiv). In two cases (Nos. 153, 171) the child was born at or near term, but dead. There were two abortions (Nos. 180, ix), and the former of these was due to chorea gravid.

These figures are very different from those of Macdonald (11), as will be seen by comparing them side by side:—

	Maternal No. of Mortality within Cases. . Three Months.		Abortions.	Lesion.
MACDONALD: (Published cases)	14	64·4 per cent.	14·3 per cent.	Chronic mitral stenosis only.
OURSSELVES: (Consecutive hos- pital cases)	36	13·9 „	5·5 „	Chronic mitral stenosis, with or without other lesions.

We very much wish we had a larger number of cases in which the course of pregnancy in mitral stenosis had actually been observed in hospital. We feel that the great difference between Macdonald's statistics and our own is in part due to the small number of cases we each have. Nevertheless, we feel convinced that Macdonald's figures overstate the seriousness of the prognosis. His own words are:—  
“We have thus nine cases out of fourteen, or 64·4 per cent., fatal, which indicates a tendency to death which is surely sufficiently grave. It will be observed that the deaths occurred either suddenly during the labour or within a few days or weeks afterwards.” We agree that the cardiac failure, once begun, may become very grave during the puerperium, but we have no single instance in which death occurred during labour.

The patients behave very much like other cases of heart disease. Even when the heart condition seems hopeless they may recover and bear other children. An instance in point is No. 169, whose history was shortly as follows:—

She became dyspnoëic during her first pregnancy, and had had cardiac trouble many times since. On two separate occasions her symptoms were so grave that labour was induced at the eighth month; on one of these there was post partum hæmorrhage, which nearly proved fatal. After her fourth child she was discharged from the hospital, with the note in her report that she was “a wreck”; at that time it was thought impossible that she could live, but she recovered

at home, and bore two more children. The last, and sixth, was born at term, without induction of labour; it was a transverse presentation and version had to be performed; the mother and child both did well.

#### THE TREATMENT OF MITRAL STENOSIS PATIENTS WHEN PREGNANT.

The patients with mitral stenosis who have come into Guy's Hospital pregnant have, almost without exception, been treated as though they were not pregnant. Rest in bed, with digitalis, given with the same precautions as in other cases, has almost invariably brought relief, and enabled the patient to go on to natural labour at or near term. Induction of labour has hardly ever been resorted to, as reference to the cases at the end of this paper shows. Labours have in almost all cases been easy and natural, and free from post partum hæmorrhage.

It is true that the same might not hold good for ladies in higher ranks of life. The physical work of women living in the "Borough" is hard, that of most well-to-do women is less so. The relief to the "Borough" woman's heart is proportionately greater than is that to the rich lady's when she goes to bed. Nevertheless, we hold the view that the treatment of a pregnant woman with mitral stenosis should not be different from that of a non-pregnant woman with the same heart lesion. If the patient can be up and about, without cardiac symptoms, it is better for her to live as usual, and by moderate exercise maintain the reserve power of her heart, rather than lie up and diminish this reserve power by prolonged rest. If cardiac symptoms supervene, the treatment should then be rest on a couch for mild cases, rest in bed for severer cases, rest in bed and digitalis for severer still. The pregnancy should, if possible, be allowed to run its course. Induction of labour in cardiac cases brings no immediate abatement of symptoms, as it does in many cases of eclampsia, for example. The puerperium is not less dangerous than is pregnancy itself to a patient with mitral stenosis. The cardiac condition should be restored to as fair a state of compensation as possible before the time of labour arrives, and then forceps may be used to assist Nature. In a word, treat the patients exactly as though they were non-pregnant; treat them for mitral stenosis, do not treat them for pregnancy.

#### STERILITY IN MITRAL STENOSIS.

The opinion has been expressed that many women with mitral stenosis are sterile. Allyn (1), for example, says that "mitral disease, particularly stenosis, is much graver, as a rule, than aortic, but

there is an attempt at a natural prevention of this, owing to the high proportion of sterile women among the subjects of mitral stenosis."

We do not agree with this. Out of the 205 married women in our table, only thirteen had not been pregnant. One of these had but recently got married, so that the proportion of presumably sterile women was only 5·8 per cent. The remainder had borne, upon the average, between four and five children apiece.

#### THE LIABILITY TO ABORTION IN MITRAL STENOSIS.

Allyn (1), quoting Porak (22), states that cardiac disease in the mother has a very grave influence upon the foetus, abortion being very common.

Unfortunately, this point was not particularly attended to in many of our cases. In our epitomes we have only put down whether abortions had occurred or not when we had definite statements from the patient to that effect. We have left the doubtful cases blank.

In 90 of the women who had been pregnant we ascertained the history in regard to abortions, and found that 40 of them had never had any abortion at all. The remainder had had 91 abortions between them. The general average was thus 1 per mother. The majority did not tend to abort, but in a few there were repeated abortions—in Case No. 56 as many as six.

It will be noticed that some of the abortions occurred when there was no heart failure at all. In these the association was possibly adventitious. In others the heart failure dated from an abortion, and it seems likely that in some of these the heart trouble was directly responsible for the miscarriage.

Upon the whole, however, we do not think that the tendency to abortion is obviously greater amongst mitral stenosis patients than it is amongst other "Borough" women.

#### CASES IN WHICH WE KNOW THAT THE MITRAL STENOSIS CERTAINLY ANTEDATED THE PREGNANCIES.

As we have pointed out in the early part of this paper, it is impossible to state with absolute certainty in a large number of cases that the mitral stenosis was present before marriage. We have said that this is a flaw in our arguments, and might render the deductions we have drawn from our 300 cases invalid. There is, however, a small number who had been in the hospital, or under observation, years previously, and in whom we know that mitral stenosis was pre-

sent before marriage. We will now consider these, seventeen in number, by themselves, and see whether what we have said about the generality of the cases holds good of these also.

CASE No. 6.—Valvular disease was known to exist at ten. There had been one child, and there had never been cardiac symptoms. The patient was admitted for a fourth attack of acute rheumatism, with good cardiac compensation.

CASE No. 12.—There had been acute pericarditis before marriage. There had been one living child and one miscarriage. The patient was admitted for recent cardiac symptoms, not related to child-bearing.

CASE No. 59.—The physical signs of mitral disease had been present for thirty years. The patient had borne ten children without difficulty. Heart failure did not set in till she was fifty-six.

CASE No. 75.—The mitral bruits were present at twelve. The patient had had five children. She came in for acute rheumatism, and had never had cardiac failure.

CASE No. 89.—Heart disease was known to exist at fourteen. There had been one child, without difficulty. The patient came in for lobar pneumonia, and recovered without a symptom of heart failure.

CASE No. 90.—The bruits were known to exist before marriage. There had been three children, born without difficulty.

CASE No. 91.—The bruits were known to exist before marriage. The patient bore five children, and her heart failure did not come on in relation to any of these.

CASE No. 92.—Heart disease was known to exist at thirteen. There had been three children, pregnancies and labours being uneventful.

CASE No. 93.—Heart disease was known to exist at thirteen. There had been four children and two miscarriages, without trouble.

CASE No. 94.—Heart disease was known to exist at sixteen. The four children had been born without cardiac symptoms.

CASE No. 95.—Heart disease had been known to exist for ten years. There had been eight children, and no heart failure with any of them.

CASE No. 96.—Heart disease was known to exist in girlhood. There had been one child, born without trouble.

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CASE No. 97.—The bruits were known to be present at nineteen. There had been one child, born without trouble.

CASE No. 138.—Heart disease was known to exist at sixteen. There had been six children. Cough and dyspnoea had occurred during each pregnancy, but there had been good recovery of compensation each time.

CASE No. 148.—Heart disease was known to exist at sixteen. The first five children had caused no cardiac symptoms. Failure of compensation set in with the sixth.

CASE No. 153.—This patient had been in and out of hospital seven times for heart failure before marriage. She married notwithstanding. The cardiac symptoms were severe during pregnancy. A dead child was born at the eighth month. The mother recovered rapidly enough to leave the hospital on the fourteenth day after labour.

CASE No. 161.—This patient was in hospital when eighteen for heart disease. She married after this, and bore four children without heart trouble. When pregnant with her fifth child, cardiac symptoms appeared. The patient lay up in hospital for four days only, and then went home and went naturally to term.

There were, it will be seen, many children borne by women who were known to have heart disease before marriage. In 13, or 76·5 per cent., the ultimate heart failure was not directly related to child-bearing. In 4, or 23·5 per cent., pregnancy and heart failure coincided, but even in some of these previous children had been born without causing heart trouble. None of the patients died during pregnancy or labour. All recovered and left the hospital.

If we compare these figures with those for the generality of women with mitral stenosis, we find:—

	Heart Failure not directly related to Pregnancy.	Heart Failure directly related to a pregnancy not necessarily the first.
When the mitral stenosis was old, but of unknown date (175 cases, taken consecutively) ... ..	69·7 per cent.	30·3 per cent.
When the mitral stenosis was known with certainty to date from before marriage (17 cases, taken consecutively) ... ..	76·5 „	23·5 „

The results are closely similar. We are fully conscious that the number of cases in which we know that the mitral stenosis certainly preceded marriage is small. In the remainder the evidence that the mitral stenosis was present before marriage is presumptive only. We do not know how to collect a large number of cases where this presumption is avoidable. We have taken only those cases where the bruits suggested an old-standing valvular lesion, and have only accepted cases where there had either been acute rheumatism or chorea in youth or else no rheumatism at all. The fact that the results are so similar in the total number of cases to what they are in those where heart disease was known to antedate the pregnancies affords, we think, additional ground for the justness of the conclusions we have drawn.

#### ASSOCIATION OF OTHER HEART LESIONS WITH THE MITRAL STENOSIS.

Most observers are of the opinion that the prognosis is less good when aortic or other disease is present as well as mitral stenosis. We have taken our cases consecutively as they were admitted to the hospital, and have made no distinction between cases where mitral stenosis alone was diagnosed and those where other lesions of the heart were present also. Amongst the associated lesions will be found mitral regurgitation, aortic regurgitation, aortic stenosis, aortic stenosis and regurgitation, pulmonary stenosis, tricuspid stenosis, pericarditis, and adherent pericardium. Notes of these are given in the epitome of cases in the table at the end of this paper. They should make the prognosis in the affected cases proportionately worse. We do not intend to enter upon this question here. We have discussed the cases as though the patients were suffering from mitral stenosis only.

#### THE INCIDENCE OF FUNGATING ENDOCARDITIS.

In all the patients who died the diagnosis was verified by autopsy. We have been struck by the large proportion of mitral stenosis patients who die of a terminal fungating endocarditis. Thus :

Of 43 fatal cases where failure was not dated to pregnancy, 10, or 23 per cent., of the patients died of fungating endocarditis.

Of 22 fatal cases where failure was dated to pregnancy, 9, or 41 per cent., of the patients died of fungating endocarditis.

Of 6 fatal cases in patients who were married, but had not been pregnant, 0 per cent. died of fungating endocarditis.

Of 18 fatal cases in patients who were single, 7, or 39 per cent., died of fungating endocarditis.



Of the total 89 fatal cases, 26, or 29 per cent., of the patients died of fungating endocarditis.

At first we thought there might be a special tendency for pregnancy or the puerperium to lead to fungating endocarditis, but we do not think this can really be so, seeing how high the proportion of cases of terminal fungating endocarditis is in single women with old mitral stenosis.

SUMMARY.

We believe that heart failure is to be expected sooner or later in almost all cases of valvular heart disease.

We do not deny that pregnancy may cause serious, and even fatal, cardiac failure in cases of mitral stenosis.

We think, however, that the dangers of pregnancy in these cases have been overstated.

We attribute the overstatement to the fact that previous statistics have been based mainly upon cases of mitral stenosis which came under observation because heart failure had developed during, or soon after, pregnancy. We feel that statistics so obtained leave out of count all those patients with mitral stenosis who go through pregnancy without developing cardiac symptoms.

We have tried to obviate this source of error by analysing the obstetric histories of 300 women over twenty who had mitral stenosis with or without other lesions. We have not selected our cases, but have taken them consecutively as they came into Guy's Hospital.

We conclude :—

- (1) That comparatively few are sterile.
- (2) That they are not especially liable to abort.
- (3) That the majority bear children well.
- (4) That when heart failure develops in relation to pregnancy it is very often not with the first pregnancy, but after several pregnancies.
- (5) That the treatment should be the same as for a non-pregnant patient with mitral stenosis.
- (6) That it is not just absolutely to negative marriage in all women with mitral stenosis. The dogmatic "no" of Jellett and of Porak (p. 2) is, we think, unjustifiable. It is right that the physician should make clear to the contracting couple, or to their near relatives, the risk run. He should use his discretion, and distinguish between one case and another. The risk should not be minimized, but it should not be exaggerated. Whether the woman marry or not, it is

likely that she will not reach old age. She should not have successive children rapidly. But if she has survived the age of twenty, with good cardiac compensation, the likelihood that pregnancy will accelerate the time of heart failure does not seem to be so great as has been declared in text-books.

We thank the Treasurer of Guy's Hospital and the Physicians to Guy's Hospital for their kind permission to use the statistics embodied in this paper.

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Analysis of 300 Consecutive Cases of Mitral Stenosis, with Special Reference to Pregnancy and Labour. No Case is included under the Age of 20; and in all Rheumatism or Chorea had occurred before 20, or not at all.

A. Those who had been Pregnant, and did not date Cardiac Symptoms to Pregnancy or Labour.

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result*
1	22	None	1	0	Mitral stenosis, acute bronchitis, erythema nodosum	Edema and dyspnoea	7 weeks	Married 18 months. One child, full term, 8½ months ago without trouble	R.
2	24	19	1	0	Mitral stenosis and regurgitation, infective endocarditis, various emboli	Pyrexia and rigors	No heart failure	The pyrexia and sepsis date from 1 month after labour; the pregnancy and labour had been free from cardiac symptoms. The infection may have been directly due to the puerperium, but there was no cardiac failure	D.
3	25	None	1	0	Lobar pneumonia (double), mitral stenosis	Pneumonia	No heart failure	The child was born at full term 12 days before admission. There were no cardiac symptoms at all	R.
4	27	"	3	0	Chorea, mitral stenosis	Chorea	No heart failure	Two full-term children without trouble. At present 7 months pregnant; subsequently went to term without cardiac symptoms	R.
5	27	13	1	0	Chorea, mitral stenosis	Chorea	No heart failure	Patient unmarried, and 4½ months pregnant on admission. Recovered from chorea; went to term naturally	R.

\* R = recovered and went home D = died in Hospital

6	27	6	1	0	Acute rheumatism (4th), mitral stenosis	Rheumatism	No heart failure	R.	Known to have had heart disease at 10; no cardiac symptoms since last confinement was 4 years ago; miscarriage 10 weeks ago.
7	33	10	4+ 17D.	1	Acute rheumatism (2nd), mitral stenosis and regurgitation	Rheumatism	No heart failure	R.	No heart failure at labours
8	36	None	8	0	Acute rheumatism (1st), old mitral stenosis	Rheumatism	No heart failure	R.	Had had 7 children, last 2 years ago. Now admitted at term; labour natural; no cardiac failure
9	25	18	3	0	Cerebral embolism, mitral stenosis and regurgitation	Hemiplegia	No heart failure	R.	First child born at 18, second at 19, third at 28; no cardiac failure with any of them. Transient hemiplegia 14 months ago; complete, 7 months ago
10	24	15	1	—*	Mitral stenosis and regurgitation, bronchitis, enlarged liver	Precordial pain and dyspnoea	1 month	R.	The child was born without trouble 2 years ago
11	28	None	3	2	Mitral stenosis, tricuspid regurgitation, oedema.	Cyanosis and dyspnoea	3 weeks	R.	There had been no cardiac symptoms with any of the pregnancies
12	30	20	1	1	Mitral stenosis and regurgitation	Dyspnoea	Acute	R.	There had been pericarditis before marriage; the pregnancies had been uneventful
13	31	16	2	—	Mitral stenosis and regurgitation, pleurisy with effusion	Dyspnoea	1 year	R.	Pregnancies uneventful
14	32	14	2	—	Mitral stenosis and regurgitation	Dyspnoea	Recent	R.	Pregnancies uneventful
15	32	None	1	—	Mitral stenosis, tricuspid regurgitation	Ascites	3 months	R.	Child was born 7 years before
16	33	Childhood	5	—	Mitral stenosis and regurgitation, tricuspid regurgitation, pleurisy	Dyspnoea and rheumatism	Recent	R.	Last child was born 2 years before, without trouble
17	34	None	1	0	Mitral stenosis and regurgitation, tricuspid regurgitation	Oedema	Recent	R.	Child was born 5 years before
18	36	None	1	—	Mitral stenosis and regurgitation	Oedema and dyspnoea	5 years off and on; acute 3 weeks	R.	Child was born 11 years ago, without cardiac trouble
19	36	"	2	—	Mitral stenosis, aortic regurgitation	Precordial pain, angina	Acute 14 days	R.	Pain of an anginal character had been present off and on for several years; the pregnancies had been uneventful, without heart failure or increase of pain

+ D = stillborn \* The mark — signifies that it is not known whether there had been any miscarriages or not

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
20	36	19	6	—	Mitral stenosis, aortic stenosis and regurgitation	Dyspnoea and oedema	18 months off and on; acute 3 months	There had been no dyspnoea except on exertion until quite lately; the pregnancies had occurred without heart failure. She had not noticed any cardiac symptoms until 3 years before; the pregnancies had been uneventful.	R.
21	36	Childhood	6	—	Mitral stenosis and regurgitation	Dyspnoea and cough	Acute recently	The patient stated that she had not felt thoroughly well for many years; had had no trouble with any pregnancy or labour, and had only recently felt worse than usual.	R.
22	37	16	2 + 1 ½†	2	Mitral stenosis and regurgitation	Dyspnoea	Recent	Pregnancies uneventful	R.
23	38	8	3 + 1 d.	—	Mitral stenosis and regurgitation, tricuspid regurgitation	Oedema and dyspnoea	1 year	Pregnancies uneventful	D.
24	38	Childhood	8	2	Mitral stenosis	Dyspnoea and precordial pain	On and off for 12 years; acute 1 month	Had been married 18 years. Though there had been shortness of breath on exertion for 12 years, the pregnancies had not caused any serious trouble.	R.
25	38	16	2	0	Mitral stenosis	Oedema of legs	14 days	Last child was born 14 years ago.	R.
26	38	None	8	—	Mitral stenosis, tricuspid regurgitation, enlarged liver	Hæmoptysis and hepatic pain	2 weeks	There had been twins twice. With each of these there had been hæmoptysis, but beyond that no heart trouble till 2 weeks ago.	R.
27	39	"	6	—	Mitral stenosis and regurgitation, enlarged liver, ascites	Oedema and ascites	2 months	Pregnancies uneventful	R.
28	39	Childhood	2	1	Mitral stenosis and regurgitation, tricuspid regurgitation, ascites	Dropsy	2 months	Pregnancies uneventful	R.

† 1/12 = 7 months child.

29	39	None	8	4	Mitral stenosis and regurgitation, pericarditis	Precordial pain	Acute	R.
30	39	"	3	—	Mitral stenosis	Dyspnoea	On and off for 4 years	R.
31	40	"	13	—	Mitral stenosis, enlarged liver	Dyspnoea and cedema	On and off for 7 years; acute for 5 months	R.
32	40	14	1	0	Mitral stenosis, aortic regurgitation, tricuspid regurgitation	Palpitation and cedema	12 years on and off	R.
33	40	None	0	2	Mitral stenosis and bronchitis	Dyspnoea	2 years on and off	R.
34	42	"	2	—	Mitral stenosis, tricuspid regurgitation, bronchitis	Dyspnoea	2 years on and off	R.
35	42	Girlhood	4	—	Mitral stenosis and regurgitation, ascites	Œdema and ascites	2½ years on and off	R.
36	43	None	1 + 3 d.	1	Mitral stenosis and regurgitation	Dyspnoea and precordial pain	2 years	R.
37	43	20	8	—	Mitral stenosis, tricuspid regurgitation	Dyspnoea and cough	8 years on and off	R.
38	43	3	3	3	Mitral stenosis and regurgitation	Dyspnoea and cough	14 days	R.
39	43	17	1	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Œdema and cough, ascites	2 years; ascites 6 weeks	R.
40	44	10	2	0	Mitral stenosis	Dyspnoea and precordial pain	Slight	R.
41	44	9	1 + 1 d.	1	Mitral stenosis, angina pectoris	Angina and hæmoptysis	6 years	R.
42	45	None	1 d.	—	Aortic stenosis and regurgitation, mitral regurgitation, pericarditis	Precordial pain and dyspnoea	2 months	R.
43	46	14	7	0	Mitral stenosis and regurgitation, aortic stenosis, pleurisy	Acute pleuritic pain	None	R.
44	47	20	8	—	Mitral stenosis and regurgitation	Bronchitis and cedema	5 months	R.
45	47	18	4	0	Mitral stenosis and regurgitation, bronchitis	Cough	3 years on and off	R.
46	47	None	14	1	Mitral stenosis and regurgitation, enlarged liver	Dyspnoea and vomiting	4 days	R.

Pericarditis was the main cause for admission. No previous heart failure  
 Last child 12 years ago  
 Pregnancies uneventful  
 Child 23 years ago  
 Miscarriages were 20 years ago with first husband. Married <sup>e</sup> second time, no children  
 There was hæmiplegia 11 years ago; the pregnancies were uneventful, and there was no cardiac failure till 2 years ago  
 Last child 6 years ago  
 Last child 7 years ago  
 Last pregnancy long preceded heart symptoms  
 Pregnancies uneventful; miscarriages without heart failure  
 The pregnancy was 25 years ago  
 The patient was married at 17 and quickly had 2 children  
 Pregnancies uneventful  
 Child was stillborn 20 years ago  
 Last child 6 years ago  
 Pregnancies uneventful; quite well till hæmoptysis 5 months ago  
 Married at 18; youngest child is 25  
 Last pregnancy 2 years ago

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
47	47	11	2	—	Mitral stenosis and regurgitation, bronchitis, enlarged liver	Œdema and cough	6 weeks	Last child 20 years ago	R.
48	47	None	6	1	Mitral stenosis	Œdema and palpitation	2 months	Married at 15; pregnancies uneventful	R.
49	48	16	9	—	Mitral stenosis and regurgitation; hæmaturia	Dyspnoea	6 months	Married at 19; pregnancies in eventful	R.
50	49	None	14 + 1 D.	1	Mitral stenosis and regurgitation, ascites	Œdema	2 years	Married twice; 8 and miscarriage by first husband; 6 and 1 still-born at 7 months by second	R.
51	50	"	11	—	Mitral stenosis and regurgitation	Palpitation and œdema	3 years on and off	Last child 7 years ago; patient has been a widow for 5 years	R.
52	50	"	9	—	Mitral stenosis	Dyspnoea and œdema	6 years on and off	Pregnancies uneventful	R.
53	51	"	14	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Anasarca	3 years	Pregnancies uneventful	R.
54	53	14	1	—	Mitral stenosis and regurgitation	Dyspnoea	2½ years	Child born many years before	R.
55	53	None	17	—	Mitral stenosis and regurgitation, tricuspid regurgitation, ascites	Dyspnoea and œdema	1 year	Pregnancies uneventful	R.
56	54	7	2	6	Mitral stenosis, bronchitis, extreme cyanosis	Dyspnoea	1 month	Pregnancies uneventful	R.
57	55	15	14	—	Mitral stenosis and regurgitation, bronchitis	Dyspnoea and œdema	1 year	Last child 15 years ago	D.
58	56	20	14	—	Mitral stenosis, ascites	Cough and œdema	10 weeks	Married at 20, and had her children quickly and without heart trouble	R.
59	56	15	10	—	Mitral stenosis	Dyspnoea and œdema	1 year	There was no trouble with pregnancies, except that the first and last labours were prolonged. The physical signs of heart disease were known 30 years before; failure was recent	R.
60	58	16	6	—	Mitral stenosis and regurgitation.	Dyspnoea and œdema	3 years	Pregnancies uneventful	R.
61	59	None	3	—	Mitral stenosis, aortic regurgitation, ascites	Dyspnoea	9 months	Sent to an infirmary a wreck; in all probability died soon after	D.



62	64	1	—	Mitral stenosis and regurgitation,	Dyspnea and cough	1 year	R.	Child born soon after marriage at 23
63	69	9	2	Mitral stenosis, pleurisy	Cough and chest pain	3 years	R.	Pregnancies uneventful
64	71	4	—	Mitral stenosis	Palpitation	6 months	R.	Pregnancies uneventful
65	22	10	0	Mitral stenosis and regurgitation, acute rheumatism	Rheumatism	None	R.	Child born a year before, without heart symptoms
66	22	15	0	Mitral stenosis and regurgitation, acute rheumatism	Rheumatism	None	R.	Child born 5 months before, without heart symptoms
67	23	10	0	Mitral stenosis and regurgitation, aortic regurgitation, acute rheumatism	Rheumatism	None	R.	Last child 14 months ago. Has never had cardiac symptoms since pericarditis at 13 years
68	25	10	2	Mitral stenosis and regurgitation, acute rheumatism	Rheumatism	None	R.	Pregnancies natural
69	25	20	2	Mitral stenosis and regurgitation, acute rheumatism	Rheumatism	None	R.	Pregnancies natural
70	Child-hood	6	1	Mitral stenosis, acute rheumatism	Rheumatism	None	R.	Miscarriage 1 month ago; no cardiac symptoms
71	28	14	1	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Angina (1 year)	None	R.	Child born without trouble
72	30	3	—	Mitral stenosis, acute rheumatism (5th attack)	Rheumatism	None	R.	Pregnancies natural
73	30	0	2	Mitral stenosis, general debility for 2 years	Debility	None	R.	Last miscarriage 8 years ago
74	31	3	1	Mitral stenosis and regurgitation, pneumonia	Pneumonia	None	R.	Abortion 2 months ago, pneumonia followed; there were no cardiac symptoms
75	35	5	0	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, acute rheumatism (4th attack)	Rheumatism	None	R.	Was known to have bruits at 12; has never had heart failure; last child 7 months ago
76	36	4	—	Mitral stenosis and regurgitation, pleurisy	Pleurisy	None	R.	Pregnancies natural
77	36	3	—	Mitral stenosis, diabetes mellitus	Diabetes	None	R.	Pregnancies natural
78	37	5	0	Mitral stenosis, movable kidney	Pain in loin	None	R.	Pregnancies natural
79	37	7	1	Mitral stenosis, hemiplegia (sudden embolism)	Hemiplegia	None	R.	Last child 2 years ago without trouble
80	37	13	1	Mitral stenosis, diabetes mellitus	Diabetes	None	R.	Child born 5 years ago
81	37	15	1	Mitral stenosis, acute rheumatism	Rheumatism	None	R.	Pregnancy natural
82	40	2	—	Mitral stenosis, carcinoma of liver	Malignant	None	Worse	Last pregnancy 3 years ago

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
83	40	None	3	0	Mitral stenosis and regurgitation, chronic osteoarthritis	Chronic joints	None	The chronic joint trouble (? septic synovitis) dated from a labour 2 years before; there had been no cardiac symptoms	R.
84	41	15	5	—	Mitral stenosis and regurgitation, acute rheumatism and simple stricture of œsophagus	Dysphagia	None	There had been no heart symptoms; she came in for simple stricture of œsophagus, and developed acute rheumatism in the ward	R.
85	44	14	7	—	Mitral stenosis, cerebral embolism, acute rheumatism	Hemiplegia	None	Last pregnancy was 6 years ago; there had been no cardiac symptoms; the hemiplegia was recent	R.
86	47	Child-hood	4	—	Mitral stenosis, phthisis	Acute abdominal pain	None	Pregnancies uneventful; there had never been cardiac symptoms	R.
87	51	None	10	—	Mitral stenosis (old and fibrous) found p.m., admitted for perforated gastric ulcer, the mitral disease was unsuspected	Abdominal	None	Pregnancies uneventful; there had never been cardiac symptoms	D.
88	56	18	8	2	Mitral stenosis, hystero-epilepsy	Hysterical	None	Pregnancies uneventful; there had never been cardiac symptoms	R.
89	28	14	1	—	Mitral stenosis, lobar pneumonia	Pneumonia	None	Heart disease known since 14; no cardiac symptoms	R.
90	30	20	3	1	Mitral stenosis and regurgitation, ascites	Palpitation; and œdema	3 months	No heart symptoms till 3 months ago; bruits known before marriage; pregnancies uneventful	R.

91	31	16	5	0	Mitral stenosis and regurgitation, enlarged liver, ascites, double pleural effusion	Dyspnoea, ascites	6 months acute, 15 years chronic	R.	Has had dyspnoea since she was 16, when she was known to have heart disease; she married in spite of this, and has had 5 pregnancies without increase in symptoms; two of the children were short of full term, but lived; the acute symptoms definitely did not date from the last pregnancy
92	33	5	3	—	Mitral stenosis and regurgitation	Dyspnoea and precordial pain	Acute	R.	Was known to have heart disease at 13. The pregnancies caused no cardiac symptoms
93	41	12	4	2	Mitral stenosis and regurgitation	Ascites and bronchitis	7 weeks	R.	Has had dyspnoea and palpitations off and on since 13; she had no increase of symptoms during child-bearing
94	41	16	4	—	Mitral stenosis and regurgitation, aortic regurgitation	Dropsy	Recent	D.	Has had dyspnoea off and on since 16; she had no increase of symptoms during child-bearing; she was married at 19
95	42	Child-hood	8	—	Mitral stenosis and regurgitation, anasarca	Dyspnoea and dropsy	8 months	R.	The last pregnancy was 3 years ago. She was married at 22. The bruits had been known to exist for 10 years. She bore her children without cardiac symptoms, but transient hemiplegia occurred 3 days after last labour, 3 years ago
96	43	None	1	—	Mitral stenosis	Dyspnoea	Acute lately	R.	She has had dyspnoea on exertion as long as she can remember; the child was born 25 years ago without any trouble
97	69	19	1	—	Mitral stenosis and regurgitation	Precordial pain and dyspnoea	Recent	R.	Cardiac bruits known since 19
98	24	8	1	0	Mitral stenosis and regurgitation, pericarditis, ascites	Pericarditis	Recent	D.	The only pregnancy was 5 years ago, without trouble
99	28	8	1	—	Mitral stenosis and regurgitation, infective endocarditis	Dyspnoea and weakness	Gradual onset for 1 year	D.	The only pregnancy was 9 years ago, without trouble
100	28	None	1	3	Mitral stenosis and regurgitation, infective endocarditis, thromboses	Œdema and dyspnoea	2 months	D.	Married 8 years, no recent pregnancy

Case Number	Age	Age at which rheumatism or chorea	Number of children	Number of miscarriages	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
101	28	None	2	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, ulcerative endocarditis	Hemiplegia, acute 3 months ago, vomiting	Diagnosed as gastric ulcer 3 months ago, no cardiac symptoms	Pregnancies uneventful	D.
102	32	10	3	—	Mitral stenosis and regurgitation, infective endocarditis	Pyrexia and joint pains	Recent	Pregnancies uneventful	D.
103	32	Childhood	5	—	Mitral stenosis and regurgitation, anasarca	Dropsy and dyspnoea	Getting worse for 1 year	Married at 16, last labour some years before admission, without difficulty	D.
104	33	None	2	0	Mitral stenosis and regurgitation, enlarged liver, etc., infective endocarditis	Dyspnoea	11 months	Last pregnancy was 3 years ago, without trouble. The mitral stenosis found p. m. was extreme	D.
105	35	"	7	—	Mitral stenosis, pericarditis, pneumonia; the mitral stenosis was unsuspected, but was found p. m.	Pneumonia	Acute	No cardiac symptoms, pregnancies uneventful	D.
106	36	"	4	1	Mitral stenosis, enlarged liver, etc.	Dyspnoea	A few months	Last child 8½ years ago; husband died 6 years ago	D.
107	36	"	4	—	Mitral stenosis, aortic regurgitation, infective endocarditis	Dyspnoea and œdema	4 weeks	Pregnancies uneventful	D.
108	37	Childhood	4	—	Mitral stenosis, pleurisy, enlarged liver, œdema, etc.	Dyspnoea, dropsy	2 years, recent	Pregnancies uneventful; last some years ago	D.
109	37	17	1	—	Mitral stenosis and regurgitation, pericarditis, anasarca	Edema and ascites	Gradual onset for 2 years	Last pregnancy 13 years ago	D.
110	37	16	0	1	Mitral stenosis, pleuritic effusion	Dyspnoea and œdema	On and off for 4 years acute a few months	The pregnancy was several years before	D.
111	38	14	6	—	Mitral stenosis, lobar pneumonia, empyema	Pneumonia	None before admission	Last child 9 years ago	D.
112	38	Childhood	1	—	Mitral stenosis and regurgitation, aortic regurgitation, pleuritic effusion	Dyspnoea and œdema	1 month	Married at 18. Had child without trouble	D.
113	39	"	2	—	Mitral stenosis and regurgitation, ascites	Anasarca and orthopnoea	2 years	Had had very many attacks of rheumatism before 20. Pregnancies uneventful	D.

114	40	19	3	—	Mitral stenosis and regurgitation, enlarged liver, ascites	Dyspnoea and anasarca	A cardiac wreck for the last 4 years	D.
115	40	17	10	0	Mitral stenosis, aortic stenosis, enlarged liver, infarcts, spleen and kidneys, lungs	Dyspnoea and hæmoptysis	Off and on 6 years, anasarca 1 month	D.
116	40	15	6	1	Mitral stenosis and regurgitation, infarcts, antemortem thrombi	Dyspnoea and anasarca	Getting worse, 2 years	D.
117	41	None	2	—	Mitral stenosis and regurgitation, aortic regurgitation	Precordial pain, œdema	4 months 1 month	D.
118	43	14	1	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, infective endocarditis, adherent pericardium	Rheumatic pains	Recent	D.
119	43	None	4	Sev- eral	Mitral stenosis, tricuspid stenosis	Hemiplegia	Sudden embolism	D.
120	44	"	13	—	Mitral stenosis and regurgitation, aortic regurgitation, adherent pericardium, infarcts in kidney and spleen	Dyspnoea	Sudden onset 3 months ago	D.
121	44	7	2	—	Mitral stenosis and regurgitation, aortic regurgitation, tricuspid stenosis	Dyspnoea	2 years, on and off	D.
122	44	20	3	—	Mitral stenosis and regurgitation, adherent pericardium	Palpitation	3 months	D.
123	45	Girl- hood	6	0	Mitral stenosis and regurgitation, extreme cyanosis, œdema	Dyspnoea and œdema	12 years off and on, present attack began 1 month ago	D.
124	46	Child- hood	7	—	Mitral stenosis and regurgitation, aortic disease, infective endocarditis, enlarged liver, etc.	œdema and dyspnoea	1 year	D.
125	49	None	7	—	Mitral stenosis and regurgitation, enlarged liver, etc.	œdema and dyspnoea	5 years	D.
126	49	Child- hood	8+	0	Mitral stenosis, ascites, infective endocarditis	œdema and dyspnoea	8 months	D.
127	49	None	5	—	Mitral stenosis, thrombosis renal and radial arteries and aorta	Acute pains	Acute	D.

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
128	51	"	14	—	Mitral stenosis and regurgitation, adherent pericardium	Acute pain in chest	Acute	Pregnancies uneventful; the mitral stenosis was extreme	D.
129	52	12	2	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, enlarged liver, ascites, pleural effusions	Dyspnoea and oedema	Recent	Pregnancies uneventful	D.
130	52	None	11	2	Mitral stenosis, tricuspid regurgitation, ascites	Anasarca	6 weeks	Pregnancies uneventful	D.
131	57	18	9	2	Mitral stenosis, oedema, etc.	Cough, oedema of legs	On and off 7 years 2 weeks	Pregnancies uneventful; on one occasion twins	D.
132	58	None	7 + 3D.	—	Mitral stenosis and regurgitation, ascites, etc.	Anasarca	1 year	Pregnancies uneventful	D.
133	61	"	0	4	Mitral stenosis, quite unexpected, but found p. m. There had been no bruit, kidneys healthy	Dyspnoea and weakness, oedema	2 years, recent	Pregnancies uneventful	D.
134	61	14	2	3	Mitral stenosis, aortic stenosis, tricuspid stenosis, pulmonary stenosis	Dyspnoea and weakness	2 years	Pregnancies uneventful	D.
135	71	None	11	—	Mitral stenosis found p.m., no bruit during life, kidneys sound	Oedema and bronchitis	5 months	Pregnancies uneventful	D.
136	24	"	2	1	Mitral stenosis and regurgitation, ? tricuspid stenosis	Palpitation	4 months	We are not certain of the relation, but suspect it	R.
137	26	"	4	2	Mitral stenosis and regurgitation, ascites, tec.	Ascites	14 years	Married 9 years. We suspect the condition was made worse by child-bearing	R.
138	33	"	6	—	Mitral stenosis, bronchitis	Bronchitis	16 years on or off	She dates her trouble from small-pox at 16. She had her first child 12 years ago, the last 9 days ago. She has had bronchitis and dyspnoea badly with each pregnancy, recovering between. The present attack has been her worst, and dates from soon after labour, 9 days ago	R.

139	37	15	12	—	Mitral stenosis and regurgitation	Dyspnoea	2 months	R.	Eleven pregnancies were uneventful; dyspnoea came on 10 days after her twelfth labour, 2 months ago
140	38	None	4	2	Mitral stenosis and regurgitation, anasarca	Œdema and dyspnoea	4 years	R.	She had no symptoms of heart trouble until just after the last labour, an 8 months living child, 4 years ago
141	39	17	4	3	Mitral stenosis and regurgitation, enlarged liver, etc.	Œdema and dyspnoea	6 years	R.	We do not know for certain the relationship, but suspect heart trouble was made worse by pregnancies; she had been married 11 years
142	39	None	6	2	Mitral stenosis, bronchitis	Cough	—	R.	She had had bronchitis each time she was carrying; no œdema
143	40	14	6	—	Mitral stenosis, pulmonary regurgitation, ascites, etc.	Œdema	11 years on and off	R.	She dates her cardiac symptoms from soon after the birth of her second child, 11 years ago; she has borne 4 children since, each time with but slight exacerbation of her symptoms
144	46	18	11	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, ascites	Palpitation, etc.	4 years	R.	She was quite well until 4 years ago, having borne 10 children without trouble; she dates her symptoms from shortly after the birth of her eleventh child (a living 7 months infant), 4 years ago
145	47	None	3	—	Mitral stenosis and regurgitation, pleurisy	Pleurisy	Heart trouble on and off 9 years	R.	Last child 9 years ago; the two previous gave no trouble
146	26	13	2	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Dyspnoea	2 months acute	R.	Was quite well till 3 months after birth of first child, when she had acute dyspnoea; the second pregnancy was uneventful except for persistent dyspnoea, which became acutely worse again some while after labour

Case Number	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
147	25	None	2	0	Mitral stenosis and regurgitation, pleuritic effusion, old hemothorax	Dyspnoea	On and off ever since a child	The last pregnancy was 2 years ago; there was no trouble with the previous child, nor indeed with the last, but the dyspnoea got gradually worse and worse after the labour; she was still alive 3 years later	R.
148	33	16	6	—	Mitral stenosis, tricuspid regurgitation	Œdema and precordial pain	8 weeks	No trouble with first 5 pregnancies, though heart disease was known from 16; 3 weeks before sixth child was born œdema of the legs began; after labour this went on to anasarca; she recovered	R.
149	21	None	1	0	Infective endocarditis, an old mitral stenosis	Hæmoptysis, and splenic pain	6 weeks	No trouble with pregnancy or labour; is now 5 months pregnant; went out, still pregnant, against advice	Worse
150	23	12	4	—	Mitral stenosis and regurgitation, ascites, etc.	Dyspnoea	3 years, acute 3 weeks	The 4 children were born without trouble, but 3 weeks ago, 2 months after last labour, acute dyspnoea set in	R.
151	24	Girlhood	1	—	Mitral stenosis, bronchitis	Cough, no œdema	Recent	Was pregnant 5½ months on admission; she got much better and went out; relapsed, came in again, recovered, went out again, and went to term without further trouble	R.
152	24	None	0	0	Mitral stenosis	Dyspnoea and hæmoptysis	3 months	Was pregnant 5 months on first admission; got better on treatment, went out, relapsed, came in again, got better, went out again still pregnant	R.



153	24	16	1 d.	—	Mitral stenosis, aortic regurgitation	Dyspnoea (not bad)	Years	R.
154	27	17	0	1	Mitral stenosis, ascites, tapped	Ascites	1½ years	R.
155	27	None	4 + 1 d.	—	Mitral stenosis	Dyspnoea, hæmoptysis	14 months, 6 months	R.
156	28	16	4	—	Mitral stenosis and regurgitation, ascites, pleuritic effusion	Ascites	5 months	R.
157	28	None	1 + 1 d.	—	Mitral stenosis and regurgitation, ascites	Dyspnoea and ascites	6 months	R.

Married 12 months. Had been in and out of hospital seven times for heart disease before marriage. She was in bed in hospital 203 days; was then delivered of a dead 8-months fetus, and went out 14 days after labour pretty well. She has been married 2 years. Ascites developed during first pregnancy and caused miscarriage. She has had œdema and ascites on and off ever since.

She bore 3 children without trouble. The fourth was 4 years ago; 5 months before this labour she had a cerebral embolism with hemiplegia. She got better of this, and had no heart trouble till 14 months ago, when dyspnoea began; 7½ months she became pregnant again, and 1½ months later hæmoptysis started. Cough increased during pregnancy, but she went almost to term, and had a living child weighing 6 lb. 8 oz., natural delivery. She went out fairly well.

The first 3 labours were natural. Soon after the fourth child was born cardiac trouble began.

She had no trouble with first pregnancy, 6 years ago. Soon after the second, 6 months ago, ascites began and increased

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
158	29	None	4	2	Mitral stenosis, aortic regurgitation, pleuritic effusion	Hæmoptysis, severe dyspnoea	3 years on and off, 1 month	The third full-term child was 3 years ago; she dates hæmoptysis from then. After that she had two miscarriages; a month ago she was delivered of her fourth full-term child, living, and has been in bed with severe dyspnoea since	R.
159	30	Childhood	2	0	Mitral stenosis and regurgitation, tricuspid regurgitation, etc.	Severe dyspnoea	11 months	There was no trouble with the first child; the second was born 11 months ago, and following labour the dyspnoea set in	R.
160	31	None	3	0	Mitral stenosis and regurgitation, œdema	Bronchitis, œdema	Some years on and off. 20 months	Was quite well till after first labour; bronchitis then set in, and recurred with each of the two pregnancies; the last labour was 20 months ago; œdema set in after this last labour. Ineffective endocarditis was suspected on last admission, on account of pyrexia; she went home worse	Worse
161	32	Girlhood	5	0	Mitral regurgitation	Hæmoptysis	Recent	She was in hospital at 18 for palpitation and dyspnoea. She married subsequently, and had 4 children without trouble. When 6 months pregnant of fifth child she had sudden hæmoptysis, lasting 4 days. There was no other cardiac trouble; she only lay up 4 days; she went to term naturally	R.

162	33	None	4	—	Mitral stenosis, bronchitis	Dyspnoea and bronchitis	8 months, worse 1 week	R.
163	33	Child-hood	7	1	Mitral stenosis	Dyspnoea	Many years	R.
164	34	20	7	1	Mitral stenosis and regurgitation, infarcts in spleen and lungs	Œdema and ascites	4 months	D.
165	34	Child-hood	2	0	Mitral stenosis, pleurisy	Pleurisy	None	R.
166	36	None	2	0	Mitral stenosis, tricuspid stenosis	Dyspnoea	4 months	R.

Three pregnancies gave no trouble; early in the fourth dyspnoea and hæmoptysis set in; she went to term, and the child was born alive; the dyspnoea got worse after labour; she came to hospital for relief and recovered with rest in bed. The first four children caused no heart symptoms; with fifth and sixth there was dyspnoea. She is now pregnant 7 months, having had hæmoptysis for 7 months; œdema set in at 7 months, and got worse to term. The child was born living naturally; there was a bad attack of dyspnoea on fourth day after labour; the mother responded to treatment, and went out moderately well. She dates her heart failure directly to her miscarriage 4 months ago, when 6 months pregnant. There was no trouble with any of previous 7 children. She came in with a week's history of pleuritic pain when pregnant nearly to term. A pleuritic effusion was found. Labour at term was natural. No trouble with pregnancy till fourth month, when acute dyspnoea set in. She had several attacks of dyspnoea, but went to term, and was delivered of living twins (boys) naturally. Two weeks after labour there was another very acute attack of dyspnoea; the patient rallied rapidly, and went out apparently well.

Case Number	Age	Age at which rheumatism or chorea	Number of children	Number of miscarriages	Main diagnosis	Symptoms for which admitted	Duration of cardiac failure	Details	Result
167	37	None	5	1	Mitral stenosis and regurgitation, ascites, etc.	Orthopnoea and œdema	9 weeks	She was quite well during five former pregnancies, but had a miscarriage 9 weeks ago, since when she has not been well. She had no trouble at all with the first 12 children; when 4 months pregnant with the 13th she got very bad rheumatic fever, and was found to have signs of old mitral disease. She recovered and went out still pregnant.	R.
168	37	None	12	—	Mitral stenosis and regurgitation	Acute rheumatism	No real heart failure	She got dyspnoic during her first pregnancy, and has been bad with each subsequently. On two occasions labour was induced at the 8th month for heart failure, on one of which occasions p. p. h. was almost fatal. After her fourth child she was discharged "a wreck," but recovered at home, and bore two more children. The last of these was born without induction; it was a transverse presentation; version was performed; the mother and child both did well.	R.
169	38	20	6	—	Mitral stenosis and regurgitation	œdema and dyspnoea	Many years on and off	There was no trouble with first nine children; after the birth of the tenth, 14 months ago, dyspnoea set in, and has been getting worse and worse since	R.
170	38	12	10	—	Mitral stenosis and regurgitation	Dyspnoea	14 months		

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171	41	16	5 + 1 D.	2	Aortic disease and mitral stenosis	Dyspnoea	Recent	R.	No trouble with former labours. When pregnant for eighth time, and near to term, dyspnoea began, followed by easy labour and recovery. The child was dead
172	43	18	13	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Œdema	5 months	R.	12 pregnancies were uneventful; with the 13th cardiac symptoms began; œdema set in 2 months after labour, and grew worse. She recovered with rest in bed
173	41	None	7	—	Mitral stenosis and regurgitation,	Anginal pain	14 years	Very ill	3 pregnancies were uneventful; after the fourth labour anginal attacks began. Notwithstanding these, she bore three more living children, the last six years ago. She is a chronic invalid
174	25	None	1	—	Mitral stenosis, thromboses, anasarca	Dyspnoea	14 days	D.	The child was born living 14 days ago; there were no symptoms till after labour
175	38	"	8	—	Mitral stenosis and regurgitation, calcareous vegetations	Dyspnoea	11 weeks	D.	Was quite well until after last confinement, 11 weeks ago; the first 7 pregnancies were uneventful
176	31	"	8	—	Mitral stenosis, pleuritic effusion	Anasarca, precordial pain, dyspnoea	7 weeks, many years on and off	D.	She had cardiac symptoms shortly after second pregnancy, and was short of breath through all the subsequent ones; the first was natural, the last was 7 weeks ago
177	31	"	5	1	Mitral stenosis and regurgitation, aortic stenosis, infarcts in lungs	Dyspnoea and œdema	1 year	D.	She came in pregnant and got better under treatment; she went out and went to term naturally; she came in again a few weeks afterwards. She dated her heart symptoms to the miscarriage 1 year ago

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
178	30	17	1	0	Mitral stenosis, tricuspid stenosis, aortic stenosis, infarcts in lungs, gastric ulcer	Anasarca, dyspnoea, and hæmatemesis	Some months	The cardiac symptoms came on early in the only pregnancy, but she rested and went to term; the child was small, living; she collapsed 10 days after labour, a few days before admission; she got worse and worse, and died	D.
179	25	None	2	2	Mitral stenosis, infective endocarditis, various infarcts	Œdema and weakness, and acute hemiplegia	Recent, some years	The first labour at term was natural; then followed two miscarriages, and there were cardiac symptoms with each; the last labour at term was 16 months ago, without much trouble, but the patient has never been well since; the progress was downhill continuously	D.
180	23	"	3	1	Mitral stenosis, infective endocarditis, various infarcts	Chorea	Recent	There had been no previous chorea; the three children were born without trouble. When pregnant fourth time, she developed chorea at sixth month and aborted 21 days afterwards; she went rapidly downhill and died 23 days after the abortion	D.
181	31	12	5	—	Mitral stenosis and regurgitation, adherent pericardium, ascites, etc.	Cough, œdema	9 years, 2 years	The first 4 children were born without trouble; the fifth was born alive at term 3 months ago naturally; œdema of legs and ascites came on one week after labour; the patient went rapidly downhill	D.

182	20	14	1	0	Mitral stenosis and regurgitation, infective endocarditis, pericarditis	Œdema	2½ years	D.	Symptoms of heart failure came on early during the only pregnancy, 2½ years ago; the cardiac symptoms were so bad that labour was induced at the eighth month; the child lived. The mother recovered a little, but was a chronic invalid, and finally developed malignant endocarditis
183	28	None	4	0	Mitral stenosis, tricuspid regurgitation	Dyspnœa	Some months	D.	She "had never been ill in her life" until when 4 months pregnant of the fourth child, symptoms of dyspnœa and cough came on; after rest and digitalis in hospital she got better and went home. She returned at term, and had a living child easily; the mother did well at first, but a few days after getting up she developed further heart symptoms, and rapidly went downhill and died
184	24	16	1	—	Mitral stenosis and regurgitation, bronchitis	Dyspnœa and œdema	18 months	D.	Heart failure began during the pregnancy, but acute symptoms did not arise until a living child had been born at term. Since then she had been in and out of hospital 5 times in a year, never really recovering compensation
185	40	None	4	4	Mitral stenosis, infarcts in kidneys	Dyspnœa	5 months	D.	She had always been well, except that 10 years ago she was in hospital for albuminuria during pregnancy. Four labours and 3 miscarriages were without cardiac symptoms; the latter date from a miscarriage at the 3rd month, 5 months ago

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
186	28	Child-hood	1	—	Mitral stenosis, tricuspid stenosis, aortic regurgitation	General failure	2 years	She was quite well till the child was born, 2 years ago; heart failure set in soon after labour, and she has never been well since	D.
187	28	None	1	—	Mitral stenosis, hæmiplegia, infarcts, tricuspid vegetations	Palpitation and hæmoptysis	5 years	Palpitation and hæmoptysis have recurred during the last five years. The only child was born living at the 7th month, 8 months ago, and the cardiac symptoms became much worse. She has gone downhill ever since	D.
188	32	17	2	—	Mitral stenosis and regurgitation, hæmiplegia	Œdema	3 years on and off	The first child was born normally. The symptoms date from soon after the birth of the second child, 3 years ago	D.
189	38	6	1	—	Mitral stenosis, infective endocarditis, pleuritic effusion, various infarcts	Dyspnoea and hæmoptysis	7 months	The child was born naturally 9 months ago. Two months later dyspnoea and hæmoptysis set in; the heart symptoms went from bad to worse	D.
190	41	8	6+ 1 D.	1	Mitral stenosis and regurgitation, infective endocarditis	Œdema, dyspnoea, acute	9 months, 2 weeks	There was no trouble till the last child was born, 2 years ago. Soon after she had hæmiplegia. No other cardiac symptoms followed until 9 months ago, when œdema appeared; she became acutely dyspnoic 2 weeks ago and died in a few weeks	D.



191	43	8	2	—	Mitral stenosis and regurgitation; vegetations, œdema, hæmoptysis	Dyspnoea, œdema	1½ years, 1 month	The first child brought no heart trouble. Three months after the birth of the second, 1½ years ago, the patient became dyspnoeic. She was able to do her work until 1 month ago, when œdema came on, and she died soon after admission. It is doubtful if this can really be attributed to the pregnancy	D.
192	48	Girl-hood	8	4	Mitral stenosis and regurgitation, general heart failure	Dyspnoea	10 years	The patient directly dates symptoms to a labour 10 years ago. She has since been pregnant 3 times. The eldest child is 25, the youngest 6. She has never been well since the last was born, though she has done her work on and off till recently	D.
193	25	18	—	—	Mitral stenosis and regurgitation	Rheumatism	None	Married 3 years	R.
194	26	None	—	—	Mitral stenosis and regurgitation	Dyspnoea and precordial pain	2 years	Married recently. Heart troubles started before marriage	Worse
195	26	Girl-hood	—	—	Mitral stenosis, bronchitis	œdema and cough	5 weeks	—	D.
196	29	None	—	—	Mitral stenosis, tricuspid regurgitation	Dyspnoea and weakness	6 years	Married 9 years	D.
197	31	16	—	—	Mitral stenosis and regurgitation, bronchitis	Cough and precordial pain	2 months	Married 11 years	R.
198	34	None	—	—	Mitral stenosis and regurgitation, pulmonary regurgitation, ascites, etc.	œdema and ascites	2 months	Married 8 years, and has been out of health on and off ever since	R.
199	34	"	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Dyspnoea and œdema	4 months	—	R.
200	35	16	—	—	Mitral stenosis, general failure	Dyspnoea	18 months	Has been in Guy's Hospital more than a dozen times. She recovers quickly, but soon relapses. She is a widow	R.
201	36	7	—	—	Mitral stenosis, anasarca	Dyspnoea and ascites	1 year	Had cerebral embolism 9 years ago. Married 18 years	D.
202	36	None	—	—	Mitral stenosis and regurgitation, tricuspid regurgitation	Orthopnoea and œdema	17 years	Married 8 years. A chronic hospital inmate	R.

Case Number.	Age.	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
203	39	"	—	—	Mitral stenosis, epithelioma of cesophagus	Dysphagia	None	Married 9 years. Mitral stenosis, unsuspected, found p. m.	D.
204	41	4	—	—	Mitral stenosis and regurgitation, double aortic disease	Dyspnea	Months	—	D.
205	55	12	—	—	Mitral stenosis, hæmatemesis	Dyspnea and cyanosis	28 years on and off	—	D.
206	20	6	—	—	Mitral stenosis	Dyspnea, hæmoptysis	2 years	—	R.
207	20	None	—	—	Mitral stenosis, aortic stenosis	Dyspnea and palpitations	2 months	—	R.
208	20	None	—	—	Mitral stenosis	Dyspnea	3 years	—	R.
209	21	Child-hood	—	—	Mitral stenosis, acute rheumatism	Precordial pain	None	—	R.
210	21	19	—	—	Mitral stenosis and regurgitation, acute rheumatism	Dyspnea	2 years on and off	Hemiplegia due to cerebral embolism occurred just before admission	R.
211	21	12	—	—	Mitral stenosis and regurgitation	Dyspnea	Acute	—	R.
212	21	Girl-hood	—	—	Mitral stenosis and regurgitation, aortic stenosis, acute rheumatism	Precordial pain	3 months	—	R.
213	21	12	—	—	Mitral stenosis and bronchitis	Cough and dyspnea	7 years	—	R.
214	21	None	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Precordial pain	Acute	—	R.
215	21	10	—	—	Mitral stenosis and regurgitation, bronchitis	Cough and pain in chest	2 weeks	—	R.
216	21	10	—	—	Mitral stenosis and regurgitation, anasarca	Dyspnea and œdema	Recent	—	R.
217	21	7	—	—	Mitral stenosis and regurgitation	Pain in side, œdema	Recent	—	R.
218	22	14	—	—	Mitral stenosis and regurgitation, paracentesis abdominis	Precordial pain, ascites	1 year	—	R.
219	22	10	—	—	Mitral stenosis and regurgitation	Dyspnea	Recent	—	R.
220	22	10	—	—	Mitral stenosis and regurgitation, large liver, etc.	œdema	1 month	—	R.
221	22	None	—	—	Mitral stenosis and regurgitation, bronchitis	Dyspnea and œdema	6 months	Was often admitted afterwards A chronic invalid	R.



Case Number.	Age.	Age at which rheumatism or chorea.	Number of Children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result
246	27	7	—	—	Mitral stenosis and regurgitation	Edema	2 weeks	—	R.
247	27	12	—	—	Mitral stenosis and regurgitation, aortic regurgitation	Bad dyspnoea and cough	Years	Has been in and out of hospital nearly a dozen times	A wreck
248	27	7	—	—	Mitral stenosis and regurgitation, aortic stenosis	Dyspnoea and palpitation	7 months	—	R.
249	28	10	—	—	Mitral stenosis and regurgitation	Edema	2 years	—	R.
250	28	16	—	—	Mitral stenosis, chronic osteo-arthrititis	Deformed joints	None	—	R.
251	28	12	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Pleuritic effusion	Acute	—	R.
252	28	Child-hood	—	—	Mitral stenosis, tricuspid regurgitation	Dyspnoea and œdema	1 year	—	R.
253	28	None	—	—	Mitral stenosis and regurgitation, cerebral embolism	Hemiplegia	None	—	R.
254	29	11	—	—	Mitral stenosis and regurgitation, aortic regurgitation, enlarged liver	Orthopnoea	4 years	—	R.
255	30	10	—	—	Mitral stenosis and regurgitation, aortic regurgitation	Hæmoptysis	Recent	—	R.
256	30	6	—	—	Mitral stenosis	Precordial pain	4 years	—	R.
257	31	18	—	—	Mitral stenosis	Hæmoptysis	None	—	R.
258	31	14	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Dyspnoea	1 year	—	R.
259	32	None	—	—	Mitral stenosis and regurgitation, enlarged liver, etc., ascites	Orthopnoea	6 years	—	Worse
260	32	12	—	—	Mitral stenosis and regurgitation, pleurisy, typhoid fever	Enteric	None	—	R.
261	32	None	—	—	Mitral stenosis	Dyspnoea, hæmoptysis	6 months	—	R.
262	33	"	—	—	Mitral stenosis and regurgitation, bronchitis	Dyspnoea	1 year	—	R.
263	33	16	—	—	Mitral stenosis and regurgitation	Pleurisy	None	—	R.
264	34	7	—	—	Mitral stenosis and regurgitation	Dyspnoea	Years	Known to have had heart disease at 15	R.

265	34	None	—	—	Mitral stenosis, transverse myelitis	Paraplegia	R.	—
266	35	"	—	—	Mitral stenosis, carcinoma of breast	Dyspnoea	R.	11 years
267	35	5	—	—	Mitral stenosis, appendicitis	Appendicitis	R.	None
268	35	16	—	—	Mitral stenosis and regurgitation, tricuspid regurgitation	Dyspnoea	R.	9 years
269	35	Child-hood	—	—	Mitral stenosis and regurgitation, aortic regurgitation	Dyspnoea	R.	3 years
270	35	None	—	—	Mitral stenosis	Precordial pain	R.	8 months
271	36	"	—	—	Mitral stenosis	Cough and weakness	R.	1 year
272	37	"	—	—	Mitral stenosis, acute rheumatism, mania	Insanity	R.	None
273	37	16	—	—	Mitral stenosis, cerebral embolism	Hemiplegia	R.	6 years
274	38	Girl-hood	—	—	Mitral stenosis, gastric ulcer	Hæmatemesis	R.	None
275	39	20	—	—	Mitral stenosis, mad with delusions	Hæmoptysis	R.	11 years, on and off
276	40	None	—	—	Mitral stenosis, aortic regurgitation	Dyspnoea	R.	6 weeks
277	40	19	—	—	Mitral stenosis, tricuspid regurgitation, bronchitis	Dyspnoea and cough	R.	3 years
278	40	None	—	—	Mitral stenosis, pelvic tumour, no operation	Dyspnoea	R.	Many years
279	43	"	—	—	Mitral stenosis and regurgitation, aortic stenosis	Dyspnoea	R.	Years
280	45	Child-hood	—	—	Mitral stenosis and regurgitation	Dyspnoea and cedema	R.	4 months
281	47	20	—	—	Mitral stenosis and regurgitation, enlarged liver, etc.	Dyspnoea and pain	R.	Years
282	48	None	—	—	Mitral stenosis and regurgitation, enlarged heart, bronchitis	Dyspnoea and cough	R.	1 year
283	60	"	—	—	Mitral stenosis and regurgitation	Dyspnoea and pain	R.	1 month
284	21	None	—	—	Mitral stenosis and regurgitation, aortic regurgitation	Dyspnoea	D.	1½ years
285	23	9	—	—	Mitral stenosis, pericarditis	Dyspnoea	D.	1 year
286	23	None	—	—	Mitral stenosis, infective endocarditis, infarcts	Malaise	D.	Recent

Case Number	Age	Age at which rheumatism or chorea.	Number of children.	Number of miscarriages.	Main diagnosis.	Symptoms for which admitted.	Duration of cardiac failure.	Details.	Result.
287	23	16	—	—	Mitral stenosis and regurgitation, acute endocarditis	Dyspnœa	7 years	—	D.
288	23	None	—	—	Mitral stenosis, pericarditis, infective endocarditis	Dyspnœa and pain	4 months	—	D.
289	24	12	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation	Angina pectoris	6 years	—	D.
290	26	None	—	—	Mitral stenosis (old), infective endocarditis	Dyspnœa	2 years	—	D.
291	26	"	—	—	Mitral stenosis, pericarditis, pleurisy, exophthalmic goitre	Joint pains	None	—	D.
292	28	Childhood	—	—	Mitral stenosis, tricuspid stenosis, dropsy	Dropsy	3 years	—	D.
293	29	15	—	—	Mitral stenosis, pericarditis, pleuritic effusion, infarctus	Dyspnœa	Recent	—	D.
294	33	None	—	—	Mitral stenosis, infective endocarditis, infarctus	Sudden hemiplegia	Recent	—	D.
295	38	"	—	—	Mitral stenosis and regurgitation, enlarged liver, infarctus	Dyspnœa	2 years	—	D.
296	40	Childhood	—	—	Mitral stenosis and regurgitation, adherent pericardium	Dyspnœa	Recent	—	D.
297	42	None	—	—	Mitral stenosis and regurgitation, tricuspid stenosis, anasarca	Dropsy	Recent	—	D.
298	44	"	—	—	Mitral stenosis, enlarged liver, ascites, pericarditis, pleuritic effusion	Dropsy	Recent	—	D.
299	44	12	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, adherent pericardium	Dyspnœa	Years	—	D.
300	41	19	—	—	Mitral stenosis and regurgitation, aortic stenosis and regurgitation, infective endocarditis	Dyspnœa	4 months	—	D.