in the chronic types, the pregnancy usually proceeds normally. There is no reason for terminating the gestation, because the children of leukaemic mothers do not appear to be affected by the disease (Chiari and Dantwitz). There is some danger of excessive bleeding during delivery, but this risk is at least as great after therapeutic abortion. Prompt transfusion will, almost certainly, prevent a fatal result.

The prognosis of the mother's disease does not appear to be affected by pregnancy, except that X-ray treatment is inadvisable during pregnancy, and the malady may, therefore, progress unchecked. On the other hand, arsenic, administered by mouth, will usually keep the disease within bounds until after delivery, when, if necessary, irradiation can be started again.

CONCLUSION

It may be said that the anaemias that are likely to develop during pregnancy do not, as a rule, greatly endanger life; but, unless adequately treated, may become a potent factor in the development of chronic ill-health. Only those who do many blood examinations on women, who allege that they have not felt well since the baby was born, will realise how often a moderate degree of hypochromic anaemia is the easily removable cause. It is, perhaps, because most of the haemic disorders of pregnancy are not spectacular in their clinical picture or in their immediate effects, that has led to their neglect, much to the detriment of women's health.

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HEART DISEASE IN PREGNANCY

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When a pregnant woman has heart disease the physician's problem is threefold: first, to determine the nature of the cardiac lesion; next, to assess the patient's fitness for pregnancy, and finally, to undertake any necessary supervision and treatment of the cardiac condition. It is therefore convenient to discuss the problem from the three aspects of diagnosis, assessment and management.

DIAGNOSIS

If heart disease has not been previously recognised, it is often suspected during pregnancy if the patient complains of breathlessness, swelling of the ankles, palpitation or pain in the region of the heart, or when routine antenatal examination reveals irregularity of the pulse, or a cardiac murmur. Such symptoms and signs are not invariably due to heart disease, and in

pregnancy may arise in three other ways: as symptoms of pregnancy, as manifestations of effort syndrome, or as minor anomalies of no significance. Thus dyspnoea and oedema of the ankles are not uncommon in the later months of normal pregnancy, while left submammary pain, breathlessness and palpitation are sometimes due to effort syndrome; premature beats may cause palpitation and irregularity of the pulse, and a systolic murmur or a triple rhythm may be physiological. Our first problem is therefore to decide when such findings are due to heart disease, and when they may be justly attributed to other causes.

When dyspnoea on exertion is due to heart disease it begins during exertion and is relieved by rest. In effort syndrome, on the other hand, although the patient may complain of breathlessness on exertion, further inquiry often reveals that the difficulty in breathing sometimes starts at rest, particularly if the patient is startled or worried. Such dyspnoea varies from day to day, depending on the patient's mental state, whereas the exertional dyspnoea of heart disease is constantly present whenever a certain amount of effort is undertaken.

Angina of effort is very rare in pregnant women; at this clinic, in over 1,000 cases of organic heart disease in pregnancy, we have never encountered an instance of true angina of effort. The chest pain which is common in pregnancy is left submammary in position, sometimes accurately localised to the palpable cardiac impulse, and aching or stabbing in character. It tends to be more troublesome when the patient is unoccupied, and to disappear if she has an interesting task to perform. It is often associated with other symptoms of effort syndrome, and is not likely to be confused with anginal pain, which is constantly related to exertion, relieved by rest, constricting in character, and usually starts in the midline.

Palpitation is often due to premature beats or to effort syndrome, and is much more rarely a symptom of heart disease. Premature beats usually occur when the heart rate is slow, and are therefore often noticed by the patient when in bed. In effort syndrome, palpitation is due to tachycardia and occurs under the same conditions as the dyspnoea.

In pregnancy, irregularity of the pulse is more likely to be due to sinus arrhythmia or to premature beats than to auricular fibrillation or heart block. In a recent series* of 100 pregnant patients with heart disease, premature beats were present in 15 cases, whereas auricular fibrillation occurred in only 2 cases, and heart block in only 1 case. On exertion, premature beats usually disappear, but the irregularity of auricular fibrillation often becomes more obvious. In doubtful cases, electrocardiography is advisable.

In the later months of normal pregnancy dyspnoea on exertion and some swelling of the ankles are common. Oedema of the ankles is not likely to be due to heart disease in the absence of other signs of right ventricular failure. In later pregnancy the elevation of the diaphragm by the gravid uterus displaces the cardiac impulse upwards to the fourth space and outwards as far as the midclavicular line; this displacement is to be distinguished from that of cardiac enlargement.

Pregnant women are often referred for an opinion on the heart on account of a systolic murmur. A soft, short and localised apical or basal systolic murmur can safely be ignored in the absence of other signs of organic heart disease. A systolic murmur which greatly diminishes or disappears with changes of posture, at one stage of respiration, or on exertion, is not often significant. On the other hand, a loud, harsh or long systolic murmur audible over a wide area is usually due to organic heart disease. "Musical" extracardiac murmurs are an exception, for they may be very loud, audible over a wide area, and even accompanied by a thrill, but are not due to heart disease. Such murmurs have a distinctive quality, and their point of maximum intensity is difficult to determine, for they may be almost equally loud over a large part of the praecordium. With that exception, a systolic murmur accompanied by a palpable thrill is always due to organic disease, and indicates an obstructive valvular lesion or a congenital anomaly. When a systolic murmur is of doubtful significance, radioscopy is often of considerable assistance; an apical systolic murmur with definite enlargement of the left auricle indicates rheumatic mitral disease, whereas a basal murmur usually signifies congenital heart disease if there is enlargement of the pulmonary artery or the right ventricle.

Triple rhythm may, of course, be due to heart disease, but three types occur also in health. The normal third heart sound, which occurs in early diastole, is best heard at the apex, and may become louder when the patient turns on the left side. When it is associated with an apical systolic murmur, the combination has led to a mistaken diagnosis of mitral stenosis, but is now

* The figures quoted in this paper are derived from an analysis of 100 consecutive cases of organic heart disease in pregnant women observed personally during the past two years.

generally recognised as physiological. In normal subjects, the first heart sound may be split at the apex; this type of triple rhythm is usually best heard when the patient is sitting or standing, for it often disappears in the supine position. The third type of physiological triple rhythm occurs when the second sound is split; this is most clearly heard in the second left interspace near the sternum.

Organic Heart Disease

Heart disease in pregnancy is representative of organic heart disease in young women; it is therefore not surprising that the majority of cases are rheumatic in origin. Of 100 patients in the present series, 87 had rheumatic heart disease; in 78 of these cases mitral stenosis was present.

The history is often a reliable guide to the likelihood of a rheumatic heart lesion. If there have been several typical attacks of rheumatic fever with prolonged periods of incapacity, particularly with progressive impairment of exercise tolerance, or recurrent haemoptysis, it is likely that a well-developed valvular lesion is present. In such cases the diagnosis is not difficult, but often there is no rheumatic history, and the patient is unaware of any disability. Such slight lesions form a large proportion of cases of heart disease in pregnant women, for routine antenatal examination leads to the discovery of many asymptomatic lesions which would not otherwise have been suspected. In the present series, 33 patients with rheumatic heart disease were asymptomatic before pregnancy. Such early lesions of the mitral or aortic valves may be overlooked for the physical signs are not always very obvious. In early mitral stenosis there may be nothing abnormal at rest apart from a rather sudden cardiac impulse accompanied by a loud first sound; when these signs are found a mitral lesion should always be suspected, and an attempt made to elicit the typical presystolic murmur. Sometimes turning the patient on the left side may bring out the murmur by increasing the rate of blood flow through the mitral orifice; sometimes the blood flow must be further increased by exercise, and even then the murmur may be present only during the few beats immediately following exertion. A mitral presystolic murmur may be confined to a small area, sometimes only an inch or so across, and or just medial to the cardiac impulse. It is therefore easily overlooked by listening in the wrong place; this is especially the case in pregnancy, when the cardiac impulse is displaced upwards and outwards by the raised diaphragm.

Aortic incompetence is not very common in pregnancy (15 of 87 cases of rheumatic heart disease), but striking arterial pulsation in the neck, a bounding pulse or, when the blood pressure is taken, the discovery of an increased pulse pressure should lead to a careful search for the characteristic high-pitched, soft, blowing diastolic murmur, usually maximal in the third or fourth left interspace near the sternum. This murmur is rarely loud, but is heard most distinctly when the patient stops breathing in full expiration; the most favourable position may be either the supine or the erect.

ASSESSMENT

In assessing fitness for pregnancy, the number and nature of the anatomical lesions is of less importance than their severity, and this is best judged by the ability of the patient to undertake exertion. During pregnancy the progressive increase in the cardiac burden leads to a corresponding increase in disability; it is desirable to assess the capacity for effort under constant conditions, and therefore it should be determined from the ability of the patient to perform her ordinary daily activities, such as housework and looking after her family, *before she became pregnant*. It is important to know whether there has been increasing deterioration of exercise tolerance during the years preceding pregnancy, for a rapidly progressive lesion is more likely to give rise to trouble than one which has been almost stationary for a number of years. If there has been a previous pregnancy any cardiac symptoms during pregnancy and labour, and any subsequent deterioration, should be noted. In taking the history it is necessary to make allowance for the patient's temperament; if she enumerates a large number of symptoms in dramatic language they are usually of slight significance, whereas if dyspnoea on exertion is her sole complaint it often happens that, in her preoccupation with the severity of this, she forgets to mention the cough and streaky haemoptysis which occur from time to time.

The degree of cardiac enlargement also affords some guide to the severity of the lesion; in this respect more importance attaches to ventricular than to auricular enlargement. Other

features of major importance, such as heart failure, auricular fibrillation and pulmonary congestion are discussed below.

By considering these features together, it is possible to divide cases of rheumatic heart disease into three groups (Table I) for which general lines of procedure can be suggested (Table II). It must be emphasised, however, that such a scheme not infrequently requires modification in individual cases. Thus the social circumstances of the patient, whether she has or can obtain assistance to look after her house and family, her temperament and her ability to co-operate in treatment, may all play a part in determining the course to be adopted in borderline cases.

The desire of the patient to bear children is relevant for if she thoroughly understands the nature of the risk and is prepared to accept it, there is rarely any alternative but to allow her to become pregnant or to continue an established pregnancy.

In considering fitness for pregnancy, one must bear in mind that the strain is not confined to gestation and labour, for the subsequent care of the baby will involve a considerable additional burden.

GROUP I (Tables I and II).

If there has been no impairment of exercise tolerance before pregnancy, if there is no appreciable general enlargement of the heart, and no likelihood of obstetrical complications such as disproportion, there is no danger in allowing a first pregnancy to occur and to proceed normally. The patient should be warned that it is inadvisable for her to become pregnant again until at least two years after the child is born, for when pregnancies follow closely upon each other the cardiac condition is more likely to deteriorate. A second pregnancy may then be permitted if there is no cardiac distress in the first pregnancy, and if the exercise tolerance is not subsequently impaired. In our experience cardiac breakdown is more likely to occur owing to a third pregnancy. For this reason, if a patient with heart disease already has two children, we should advise her not to become pregnant again, but, if she is already pregnant for a third or fourth time, it is not justifiable to interfere with the pregnancy so long as she remains free from cardiac symptoms.

TABLE I
Clinical Assessment of Rheumatic Heart Disease

Group	Severity	Clinical Criteria
I	SLIGHT	Valvular lesion(s): (a) Without definite impairment of exercise tolerance before pregnancy. and (b) Only slight radiological cardiac enlargement.
II	MODERATE	Valvular lesion(s) with: (a) Impairment of exercise tolerance before pregnancy. or (b) Moderate cardiac enlargement. or (c) Pulmonary congestion. but (d) No heart failure at any time. and (e) Regular rhythm.
III	SEVERE	Valvular lesion(s) with: (a) Present or past heart failure. or (b) Auricular fibrillation. or (c) Considerable pulmonary congestion.

GROUP II (Tables I and II).

If the exercise tolerance is impaired before pregnancy, or if a well-developed valvular lesion with moderate general enlargement of the heart is present, and particularly if there is pulmonary congestion, the patient will be well advised to be content with one child. Accordingly, if seen in her first pregnancy she can continue to term, provided there is no history of heart failure and auricular fibrillation is not present. If first seen in her second pregnancy it is often permissible to allow this to continue if there has been no deterioration in her condition following the previous pregnancy, if she can be under adequate supervision, take sufficient rest, and is willing to go into hospital for delivery. A third pregnancy is not advisable, and if this is already established

it is often necessary to terminate it if earlier than the twelfth week. When pregnancy is already advanced the danger of therapeutic abortion is little less than that of allowing the pregnancy to continue to term.

TABLE II
Suggested Procedure in Rheumatic Heart Disease

Group	If Not Pregnant	If Already Pregnant	
I	Two pregnancies, with not less than two years between, are usually safe	<i>First Pregnancy:</i> (a) Normal pregnancy usually under cardiac supervision (b) Safest to admit to hospital for delivery (c) If no deterioration, one further pregnancy after not less than 2 years	<i>Second Pregnancy:</i> As first pregnancy in Group II.
II	Generally only one pregnancy is advisable	<i>First pregnancy:</i> (a) Normal pregnancy under cardiac supervision (b) Delivery in hospital (c) Consider subsequent sterilisation	<i>Subsequent Pregnancies:</i> If deterioration following previous pregnancy, treat as Group III.
III	Should not be allowed to become pregnant	<i>Early in Pregnancy:</i> Termination and sterilisation	<i>Late in Pregnancy:</i> A difficult problem. Usually safest to continue, perhaps with C.S. near term.

GROUP III (Tables I and II).

In severe cases with much impairment of exercise tolerance before pregnancy and considerable cardiac enlargement, three additional features are of special importance: heart failure, auricular fibrillation, and pulmonary congestion.

Heart Failure.

A history of heart failure prior to pregnancy is an indication for prohibiting pregnancy and, if pregnancy is already established, for termination in the earlier months. If first seen in the later months of pregnancy there is a considerable risk of a fatal outcome.

Auricular Fibrillation.

This is undoubtedly a grave complication of heart disease in pregnancy; of 85 recorded cases, 35 died during or soon after pregnancy. Bramwell and Longson (1938), working in this clinic, described 17 cases in which fibrillation was present when the patient was first seen; in 8 cases therapeutic abortion was performed and none of these died; of the remaining 9 cases, 4 died, 1 from cerebral embolism and 3 from heart failure. They considered that in all three cases with heart failure a fatal issue might have been avoided by adequate supervision, and concluded that under the best conditions it was sometimes justifiable to allow pregnancy to continue even in the presence of fibrillation. Unless circumstances are exceptionally favourable, however, it is wiser to recommend termination early in pregnancy.

Pulmonary Congestion.

In cases of mitral stenosis with regular rhythm, acute pulmonary oedema is the commonest cardiac cause of death during pregnancy. In mitral stenosis, as in left ventricular failure, no clear dividing line can be drawn between chronic pulmonary congestion and its occasional sequel, acute pulmonary oedema. The degree of pulmonary congestion is therefore some measure of the liability to acute pulmonary oedema, and is correspondingly important in assessing fitness for pregnancy. Pulmonary congestion is indicated radiologically by increased pulmonary

vascular markings; in the severer grades examination will reveal moist sounds at the lung bases, and there is often a history of haemoptysis. The exercise tolerance is always impaired. Acute exacerbations of the congestion can give rise to paroxysmal dyspnoea.

If examination reveals considerable pulmonary congestion, and there is severe impairment of exercise tolerance, or a history of paroxysmal dyspnoea or of repeated haemoptysis, the procedure should be similar to that in cases with auricular fibrillation.

Congenital Heart Disease

In pregnant women congenital heart lesions are usually slight, and the patient is often unaware of them until routine antenatal examination reveals a harsh basal murmur often accompanied by a thrill. As in other forms of heart disease, the severity of the lesion should be assessed not by the loudness or harshness of the murmur, but by the impairment of capacity for exertion, the size of the heart, and, in these cases, by the ease with which cyanosis is evoked.

Women with slight lesions do very well and may safely be allowed two pregnancies with an adequate interval between them. Patients with cyanosis at rest or on slight exertion should not be allowed to become pregnant, and if already pregnant should be treated as rheumatic cases in Group III. In this clinic, other cases are assessed and treated on the same general lines as cases of rheumatic heart disease of comparable severity.

MANAGEMENT

(1) Termination.

Therapeutic abortion will usually be advised only in early pregnancy, and either in patients in Group II in a second or subsequent pregnancy, and usually comparatively fit, or in patients in Group III, when severe symptoms are often present (Table III). When the patient is comparatively well, termination involves only a slight risk, but in cases with heart failure, fibrillation or severe pulmonary congestion, termination is only less hazardous than allowing the pregnancy to continue. Sometimes these patients are admitted to hospital as urgencies, so desperately ill that to terminate pregnancy forthwith may seem an urgent necessity. In such cases therapeutic abortion carries a grave risk, but complete rest, control of fibrillation by digitalis, treatment of oedema by mercurial diuretics, restriction of fluid intake and adequate sleep will often rapidly effect such improvement that intervention becomes a reasonable surgical risk. There should therefore never be any question of terminating the pregnancy until the cardiac condition has been adequately treated.

TABLE III
Cases Terminated

Case	Group	Age	Pregnancy	Stage	Diagnosis	Reason for Termination
292	II	37	Second	8 weeks	Mitral stenosis	Dyspnoea and gross cardiac enlargement.
335	III	28	Third	12 weeks	Mitral stenosis	Heart failure in both previous pregnancies.
594	III	40	Sixth	12 weeks	Thyro-toxicosis	Auricular fibrillation, dyspnoea, loss of weight.
650	II	38	Fourth	14 weeks	Mitral stenosis	Dyspnoea and cardiac enlargement.
697	II	33	Fifth	8 weeks	Mitral stenosis	Dyspnoea and cardiac enlargement.
718	II	37	Fourth	12 weeks	Mitral stenosis	Pulmonary congestion, and cardiac enlargement.
843	II	35	Fifth	6 weeks	Mitral stenosis	Considerable dyspnoea, cardiac enlargement.
1041	II	33	Sixth	8 weeks	Mitral stenosis	Dyspnoea and cardiac enlargement.

(2) Supervision.

In the present series only one of the four patients who died had been under supervision at the clinic, and in that case cerebral embolism, following Caesarean section, led to death. The much higher mortality in patients admitted to hospital as urgencies, compared with those who have been under supervision, has been noted in a previous series of cases from this clinic (Bramwell and Longson, 1938), and by other workers. While it is not suggested that lack of supervision is the sole factor concerned, there is reason to suppose that it plays a part, and that regular supervision can diminish the danger of pregnancy in these cases. In five cases in the present series, early signs of heart failure appeared while under observation; all responded well to immediate in-patient treatment and continued to term. Similarly, many patients fail to appreciate the importance of taking adequate rest, and, when persuaded to do so, their condition improves correspondingly. For these reasons we advise regular supervision of the cardiac condition in all except the slightest lesions, and consider it essential if there has been impairment of exercise tolerance before pregnancy. Patients should attend the clinic monthly during the earlier part of pregnancy, and preferably every fortnight during the last two or three months.

The objects of supervision are to ensure adequate rest, to detect and treat the earliest signs of heart failure, and to secure proper management of intercurrent infections.

Rest.—In heart disease, freedom from symptoms depends upon the balance between the cardiac reserve and the demands made upon it. The cardiac reserve may be adequate for the demands entailed by the patient's ordinary activities prior to pregnancy, but inadequate when called upon to carry the added burden of pregnancy. To restore the balance either the cardiac reserve must be increased, and this is rarely possible, or the demands upon the heart reduced. Accordingly, if the patient is to remain in satisfactory health as the burden of gestation progressively increases, she must correspondingly limit her exertion. In general, she should have at least 12 hours in bed at night and an additional two hours' rest in the afternoon. In the later months of pregnancy even more rest may be essential, and in some cases almost complete confinement to bed is necessary. On the other hand, in slight lesions, when the patient is able to undertake considerable activity without distress, regular moderate exercise is beneficial for, like other muscles, the myocardium requires training to maintain efficiency. Naturally, the circumstances of the patient's life will play an important part in her ability to adjust her activity during pregnancy, and the prognosis is correspondingly better in a patient who can obtain adequate assistance to run her house and look after her family.

Heart Failure.—In rheumatic heart disease apart from pregnancy, the usual sequence of events is progressive impairment of exercise tolerance, followed by the onset of auricular fibrillation and the subsequent development of right ventricular failure, with systemic venous engorgement, tender enlargement of the liver and dependent oedema. In pregnancy, however, it is not uncommon for heart failure to develop while normal rhythm is still present, and in these cases the symptoms sometimes simulate those of left ventricular failure, with pulmonary congestion, paroxysmal dyspnoea, and even fatal acute pulmonary oedema. Pregnant women with mitral stenosis may thus die from heart failure without the development of cervical venous congestion or oedema; during pregnancy it is therefore as important to watch carefully for increasing pulmonary congestion and for haemoptysis as it is to detect early cervical congestion. Once signs of heart failure appear the patient should be admitted to hospital and the appropriate treatment instituted without delay, for early treatment is the secret of success in the management of heart failure. Under strict hospital regime a patient with early failure usually improves rapidly and can then return home to rest, if her environment is suitable. If auricular fibrillation commences during pregnancy the outlook is less good, for the ventricular rate is usually very rapid and severe heart failure may develop quite abruptly. Admission to hospital for control of the heart rate by digitalis is then a matter of urgency.

Infections.—Infections such as bronchitis, influenza and pyelitis are often the precipitating cause of heart failure in pregnancy. In cases with considerable pulmonary congestion respiratory infections are naturally particularly serious. In the present series, 20 per cent of patients under supervision developed upper respiratory infections during pregnancy. If neglected, even a common cold may seriously upset an already heavily burdened heart, and confinement to bed is essential until complete recovery has taken place; it is wise to warn the patient of this early in pregnancy.

(3) Confinement.

The management of confinement is principally a matter for the obstetrician, but he will require the co-operation of the physician if the cardiac condition is likely to cause anxiety.

If there has been no material impairment of exercise tolerance, and the obstetrical situation is satisfactory, labour can be allowed to pursue its normal course. In cases with moderate impairment of exercise tolerance a period of bed rest is often advisable before confinement. In severe cases it may be necessary to shorten pregnancy on account of cardiac failure or severe dyspnoea which does not respond to treatment. This may be undertaken either by the induction of premature labour or by Caesarean section. Many obstetricians believe that as induced labour often lasts longer than normal labour at term, it may involve a greater cardiac strain, and it is now rarely used in cardiac cases. Caesarean section, under local anaesthesia, is not devoid of danger from shock or embolism, but it has the advantage of sparing the heart the additional burden of labour, and most patients with heart disease tolerate it well. Obstetricians find, however, that if it is possible to allow such patients to go into labour at term, the soft, vascular cervix dilates rapidly during the first stage, and if the second stage is shortened by the application of forceps, the patient often suffers little cardiac distress.

(4) Sterilisation.

Of 100 pregnancies in the present series, 50 would not have been advised if the patient had been seen before pregnancy (Table IV), but in 24 of these cases the risk seemed insufficient to justify termination of an established pregnancy. Termination was advised in 8 of the remaining 26 cases; in the other 18 cases pregnancy was too advanced for safe termination. Of these 18 patients, 2 died owing to the cardiac condition, in 9 deterioration of exercise tolerance followed pregnancy, 4 appear to be as well as before pregnancy, and 3 have not been traced. The danger of ill-advised pregnancy is therefore considerable.

TABLE IV
Sterilisation

Group	Pregnancy								Total
	1	2	3	4	5	6	7	8	
I	21	10	3	2	—	2	1	—	39
II	19	16	4	4	6	1	—	1	51
III	3	4	2	—	—	1	—	—	10

The black line separates the cases in which we would have advised pregnancy from those in which we would not.

When pregnancy is obviously unsafe the patient is sometimes advised to adopt contraceptive measures, and if, despite these, she becomes pregnant, to report at once for termination while it is still safe. Unfortunately, such patients often do become pregnant and not infrequently fail to report until pregnancy is too advanced for safe termination. In such cases we consider that sterilisation affords the only reliable method of avoiding the dangers of pregnancy. Accordingly, if the patient is willing, we advise sterilisation whenever it is necessary to terminate pregnancy on account of cardiac symptoms, or when another pregnancy would carry a grave risk, and in all patients in Group III who are likely to become pregnant.

PROGNOSIS

The immediate effect of pregnancy upon the cardiac condition can be assessed by comparing the cardiac reserve after pregnancy with that prior to pregnancy (Table V). In over 90 per cent of cases in Group I there was no appreciable deterioration in exercise tolerance immediately

TABLE V

Immediate Prognosis

74 traced patients who went to term or died before term.

Group	Number of Cases	No Immediate Deterioration	At Least Temporary Deterioration	Died
I	32	91 % (29)	9 % (3)	0
II	36	64 % (23)	30 % (11)	6 % (2)
III	6	0	67 % (4)	33 % (2)

Note.—All deaths during or soon after pregnancy included. Therapeutic or spontaneous abortions (unless fatal) and untraced cases omitted.

Period of observation was between 2 and 18 months.

following the pregnancy; there is therefore no reason to believe that the pregnancy will materially affect the subsequent course of the disease in these cases. In Group II, about one-third of the patients were appreciably less well following pregnancy, though in some cases this deterioration may be only temporary. In this group, two patients with mitral stenosis died; in one case death occurred ten days after a Caesarean section (for disproportion) which was followed by cerebral embolism. The other patient was admitted to hospital as an urgency and died of acute pulmonary oedema in the fifth month of her first pregnancy; in this case severe repeated haemoptysis and attacks of paroxysmal dyspnoea from an early stage of pregnancy would have been an indication for termination had she been seen then. In Group III, two patients died, and in all the remaining traced cases pregnancy led to deterioration in the cardiac condition.

Congenital Heart Disease.

There were 10 cases in the present series. None of the 7 patients without impaired tolerance before pregnancy developed any impairment following pregnancy. Of two cases without appreciable cyanosis, but with impaired exercise tolerance, one is known to have deteriorated; the other has not been traced. One patient with perpetual cyanosis was first seen in the thirty-second week of pregnancy; premature labour commenced a fortnight later, and she collapsed and died within a few minutes of the onset of severe pains.

Of 16 cases of congenital heart disease in pregnancy reported previously from this clinic (Bramwell and Longson, 1938), only one caused any anxiety; she had perpetual cyanosis and died the day after Caesarean section.

Pregnancy should therefore be prohibited if there is perpetual or easily evoked cyanosis. In other cases, the prognosis appears to be at least as good as in rheumatic cases of comparable severity.

I am glad to have the opportunity of acknowledging my great indebtedness to Professor Crichton Bramwell for his guidance in the management of these cases, and for permission to publish details of cases seen in his clinics. I am most grateful to the Honorary, Resident and Nursing staffs of St. Mary's Hospital, Manchester, for their co-operation.

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