and also perhaps an orthopaedic hospital and a crippled children's society; and yet in a great many there is no adequate system for treating cases of chronic illness requiring an open-air school hospital. A patient is operated upon in one hospital and then returns home to relapse; he is then taken to another hospital as an out-patient, where he attends until the expiration of his note; he drifts into the Poor Law infirmary, where he stays for a few years; he is befriended by the cripples' society, which sends him away into the country for a few months; or he comes to the health committee, which sends him away to a distant county, because this seems easier at the moment than the provision of efficient treatment at home.

It would seem so obvious that all those who are responsible for the treatment of the sick ought to co-operate instead of competing with one another. But this is apparently impossible because their independence would be threatened if each ventured to join hands with the others, even for the common good.

The Ministry of Health, one would have thought, would be the ideal agency to invoke to bring about hospital reform. But a Ministry will never take action until popular feeling is aroused, and the only way to arouse popular feeling is for the members of the medical profession, who know the facts, to explain them to the public.

It would seem to me that the essential needs of our long overdue hospital reform are as follows:

1. All hospitals should be controlled by a single committee of management in each county or administrative district. Each hospital would still require its house committee, but in matters of policy the interests of each institution would be subordinated to those of the community at large.

2. The financial basis of our national hospital scheme should be made worthy of this great and rich country, and the present jumble of municipal rate aid, State aid, haphazard philanthropy, and importunate begging or gambling should cease. National insurance should be the basis of hospital finance.

3. The treatment of all cases of chronic illness should be conducted in open-air school hospitals in the country.

At present only one political party, and that the socialists, have ever thought it worth while to formulate a hospital policy; and the socialists' policy is so identified with the idea of whole-time State service as to make it repugnant to the medical profession. But the essential ideals of hospital reform in no way necessitate this State service, and it is our duty to aim for these ideals in every way in our power, both in season and out of season.

REFERENCE.

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SOME FEATURES OF THE RHEUMATIC INFECTION.

BY

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The following investigation was undertaken in order to gain information regarding (1) the life-history of the rheumatic infection in childhood, and (2) the effect of different methods of treatment of the first rheumatic manifestation. The analysis was made from the records of 141 cases of rheumatic infection which had been admitted to the Royal Hospital for Sick Children, Glasgow, between the years 1916 and 1921 inclusive. In 1923 the cases were traced, those available were examined, and their histories subsequent to dismissal from hospital obtained.

The period between the onset of the first rheumatic manifestation and the final examination varied from one to eleven years; in 20 cases the period was under three years, in 98 between three and seven years, and in 23 cases between seven and eleven years. Since their dismissal from hospital the majority of the children had been leading ordinary home lives and receiving no special care or treatment.

Manifestations of the Rheumatic Infection.

The following lesions have been considered as indicating rheumatic infection: (1) arthritis, (2) chorea, (3) carditis, (4) subcutaneous nodules, (5) tonsillitis, (6) cutaneous lesions—namely, psoriasis, erythema nodosum, erythema multiforme, purpura, and urticaria (these are only included when developing in cases with some other rheumatic manifestation).

First Rheumatic Manifestation.

The relative frequency of the different manifestations during the first definite rheumatic attack is shown in the following table. As it is impossible, except from physical examination, to gain exact information regarding the presence of carditis, it cannot be said how often this was present as a first manifestation, and hence in the table cases of carditis associated with any other rheumatic manifestation have been omitted.

TABLE I.—Relative Frequency of Various Rheumatic Manifestations during First Attack.

Rheumatic Manifestation.	Cases.	Percentage.
Arthritis	79	56.0
Chorea	35	25.0
Carditis without other lesion	10	7.0
Tonsillitis	7	5.0
Arthritis + chorea	5	3.5
Arthritis + tonsillitis	5	3.5

ARTHRITIS.

Though in the whole series of cases cardiac mischief occurred slightly more frequently as a manifestation of the rheumatic infection than did implication of the joints, arthritis will be considered in the first instance, not only because it occurred much more frequently as the first manifestation, but also because it is usually looked upon as the most characteristic of the various lesions. Arthritis occurred at some stage of the disease in 103 cases—that is, 73 per cent. of the total 141 patients. In 89 cases it was the first manifestation, but followed chorea in 10 cases and tonsillitis in 4 cases. It showed in addition a strong tendency to recur, 41 per cent. of the 103 cases having had four or more attacks, 6 per cent. three attacks, and 20 per cent. two attacks. In only 33 per cent. of the cases was there no recurrence.

Age of Onset and Sex Incidence.—No case of arthritis was recorded during infancy. One occurred during the second year, two during the third, and two during the fourth; 10 cases (10 per cent.) were under 6 years of age, 63 cases (61 per cent.) were from 6 to 10 years, and 30 cases (29 per cent.) were over 10 years of age at the onset of the first attack; 62 of the patients (60 per cent.) were girls and 41 (40 per cent.) boys, giving a ratio of 1.5:1.

Seasonal Incidence.—Although developing at all periods of the year, arthritis showed a definitely greater prevalence during the autumn and winter months. October and November were responsible for the onset in 32 per cent. of the total cases, while only

10 per cent. commenced during June and July (see chart). In Nordgren's series of cases for Stockholm the greatest number likewise occurred in October and November. In London, on the other hand, rheumatic arthritis would appear to be most common in September and October,² or May and November,³ while

American figures^{2,4} reveal the greatest prevalence during the first four or five months of the year.

Associated Lesions.—Arthritis was seldom the only manifestation of the infection. Only 6 cases gave no history, either previously or subsequently, of any other manifestation. The frequency with which other rheumatic lesions were associated with arthritis was as follows: with carditis 87 cases (84 per cent.); chorea 45 (44 per cent.); tonsillitis 32 (31 per cent.); nodules 10 (10 per cent.); and skin lesions 6 (6 per cent.).

CHOREA.

Authors differ in their opinion regarding the relative frequency of rheumatic and non-rheumatic chorea. For the purpose of the present investigation I selected all the cases of chorea from the hospital records, and in the series of 67 cases 50, or 75 per cent., presented at the time of the first observation, or gave a history of, some other manifestation indicative of the rheumatic infection. These 50 cases had all been classed "rheumatic" chorea, whereas the remaining 17 had been provisionally diagnosed "non-rheumatic" chorea. When, however, the latter group of 17 cases was reinvestigated in 1923, at periods varying between one and a half and six years after their dismissal from hospital, it was found that 9, or 53 per cent., of them had developed some manifestation definitely justifying their inclusion in the rheumatic series. Carditis had developed in 6 cases (35 per cent.), arthritis in 5 cases (29 per cent.), tonsillitis in 3 cases (18 per cent.), and skin lesions in 3 cases (18 per cent.).

Since the freedom from some subsequent rheumatic manifestation in the remaining 8 cases would seem to be due to the method of treatment adopted, rather than to any other factor (as will be revealed later when discussing the question of therapy), and since the vast majority of the children gave a history indicative of rheumatism, one feels, with Thomson,⁶ "that it is well to regard every choreic patient as probably rheumatic and to be ready to treat him accordingly."

Chorea as a First and Subsequent Manifestation.—It is remarkable that when chorea did occur it most frequently developed as the first rheumatic manifestation. In 40 of the 67 cases it occurred as a first rheumatic manifestation; in 19 cases it followed arthritis and carditis, in 4 arthritis and tonsillitis, in 3 tonsillitis, and in 1 pericarditis. Noteworthy, too, is the fact that recurrences were not infrequent: 35 per cent. of the children had suffered from four or more attacks, 10 per cent. from three attacks, and 21 per cent. from two attacks. It is interesting to note the increase in the incidence of the various rheumatic manifestations in the total series of cases of chorea between the time of their coming first under observation and that of the final examination in 1923. During this period the percentage of cases presenting a cardiac lesion had risen from 54 to 70; arthritis from 57 to 64; tonsillitis from 25 to 30; and skin lesions from 1.5 to 6. There did not occur, however, any increased incidence of subcutaneous nodules, which still remained at 7 per cent. This is probably accounted for by the fact that by the time nodules appear the patient has usually passed through the whole gamut of rheumatic lesions.

Age of Onset and Sex Incidence.—No example of chorea was recorded under 3 years of age. In three cases it developed during the fourth year, in three during the fifth year, and in six during the sixth year of life; 18 per cent. of the patients were under 6 years of age; 55 per cent. were between 6 and 10 years; and 27 per cent. were over 10 years when they first suffered from chorea. This age incidence accords with that described by previous workers. Fifty-one of the cases were girls and 16 were boys, giving a ratio of 3:1.

Seasonal Incidence.—The seasonal incidence of chorea was remarkably similar to that of arthritis. November and February were the months showing the greatest prevalence, together accounting for 32 per cent. of the cases, while May and June were responsible for only 7 per cent. (See chart.)

Lesions Associated with Chorea.—Chorea was associated with other rheumatic manifestations in 59 cases, the most frequent from personal observation being carditis. Though chorea has been described by other writers as running concurrently with arthritis, such has not been noted in our cases. True, in the histories of some of the patients this had been recorded as having happened previous to their admission to hospital, but the association of chorea and arthritis was never observed while the patients were under our direct observation. We have seen one case, however, in which arthritis developed immediately after the cessation of chorea.

CARDITIS.

All cases of organic heart disease are considered under this heading, whether the pericardium, the myocardium, or the

endocardium was specially involved. Of the total 141 cases 107 (76 per cent.) had a cardiac lesion of some nature.

Carditis as a Primary Rheumatic Manifestation.—As many of the patients were not under observation during the first attack of rheumatism, it is impossible to determine accurately how frequently there had been cardiac involvement from the beginning. The fact, however, that 58 per cent. of 83 cases admitted to hospital during the primary attack did present a cardiac lesion would seem to indicate that the heart is often affected early in the course of the disease.

Carditis as a Subsequent Manifestation.—We had, however, frequent opportunities of observing the development of carditis subsequently to some previous rheumatic affection. For example, 46 cases either observed with arthritis or chorea, or giving a history of arthritis and chorea, were dismissed from hospital after their first period of residence without any evidence of cardiac implication, but at the time of the final review in 1923, 12—that is, 26 per cent. of these so-called "potential cardiac cases"—were found to have developed some heart lesion. The details regarding the above-mentioned cases are summarized in Table II.

TABLE II.—Subsequent History of Three Groups of "Potential Heart Cases."

Rheumatic Manifestation.	No. of Cases Without Carditis on Dismissal from Hospital (916-21).	No. of those who had Developed Carditis by time of Final Examination in 1923.
A. Arthritis	15	1 = 7 %
B. Arthritis and chorea	14	6 = 43 %
C. Chorea	17	5 = 29 %
		12 = 26 %

Although in the total series of cases (141) studied carditis was more frequently associated with arthritis than it was with chorea, the after-history of these potential cardiac patients shows (see Table II) that carditis had more frequently developed in those who had been in hospital on account of chorea than in those who had been treated for arthritis—for example, 7 per cent. of the latter as against 35 per cent. of the former. This apparently paradoxical finding we are in the meantime inclined to explain on the ground of the varying methods adopted in treating the examples of chorea. Without exception, all examples of arthritis were treated with salicylates, whereas in only a proportion of the cases of chorea was this line of treatment adopted, and, as will be shown later (p. 499), the incidence of subsequent cardiac disease in chorea was least in those who had been submitted to a course of salicylates. St. Lawrence,⁶ in a recent study of his clinical material, also elicited the fact that cardiac disease is more frequent after chorea than after arthritis. In no case of arthritis did he find later affection of the heart, whereas in 39 per cent. of his patients suffering from chorea subsequent examination revealed a cardiac flaw. St. Lawrence, however, gives no details regarding the method of treatment adopted in the cases of chorea, and it is therefore not improbable that the high incidence of cardiac disease, which he also found following chorea, may be due, as in our series, to the neglect of specific antirheumatic therapy.

Age of Onset and Sex Incidence.—Because, as previously mentioned, many of the cases when first seen already presented evidence of a cardiac lesion, it was seldom possible to have any but an approximate idea of the age at which carditis developed. The youngest case observed with a definite cardiac lesion was aged 3½ years; 14 per cent. of the children were under 6 years; 61 per cent. were between 6 and 10 years; and 25 per cent. were over 10 years of age when the cardiac mischief was first observed. Sixty-three of the cardiac cases were girls and 44 boys, giving a ratio of 1.4:1, which is practically the same ratio as obtained in the series of cases of arthritis.

Lesions Associated with Carditis.—Of the 107 cases with carditis 100—that is, 93.5 per cent.—presented, or had suffered from, some other rheumatic manifestation. In only 7 cases had there been no other evidence of the rheumatic infection, but not one of these gave a history of any other disease—for example, scarlet fever, diphtheria, or influenza—to which the cardiac lesion might be attributed, and we have therefore considered them as most probably rheumatic in nature. The relative frequency with which the other manifestations were associated with carditis was as

follows: with arthritis, 87 (81 per cent.); with chorea, 41 (44 per cent.); with tonsillitis, 25 (23 per cent.); with nodules, 10 (9 per cent.); and with skin lesions, 5 (5 per cent.).

Frequency of Various Cardiac Lesions present.—The following table (No. III) shows the relative frequency of the various lesions or combination of cardiac lesions and the frequency with which the different structures were affected.

TABLE III.—Showing the Relative Frequency of Various Lesions or Combinations of Cardiac Lesions Present.

Cardiac Lesion.	Cases.	Percentage.
Mitral incompetence	43	44
Mitral stenosis and incompetence	35	32
Pericarditis, mitral stenosis, and incompetence ...	5	5
Aortic incompetence and mitral incompetence ...	5	5
Aortic incompetence, mitral stenosis, and incom- petence	3	3
Pericarditis, aortic incompetence, mitral stenosis, and incompetence	3	3
Pericarditis, aortic incompetence, and mitral in- competence	2	2
Pericarditis and mitral incompetence	1	1
Mitral, aortic, and tricuspid incompetence	1	1
Mitral, aortic, and pulmonic incompetence	1	1
Mitral stenosis	1	1
Pericarditis	1	1
Hypertrophy and dilatation	1	1

Frequency with which Various Structures were Involved.—Mitral valve, 105 cases (98 per cent.); aortic valve, 15 cases (14 per cent.); pericardium, 12 cases (11 per cent.); tricuspid valve, 1 case (1 per cent.); pulmonic valve, 1 case (1 per cent.).

Result of Cardiac Involvement.—The all-important point in carditis is, of course, the degree of disability resulting. It is this which imparts to the rheumatic infection its seriousness and which has aroused the present almost world-wide interest in the subject. Of the 107 cases of carditis 28 had died by the time of the review of the material in 1923, but there were available for investigation and estimation of the resulting disability 79 children. Of these 79 children 9, or 11 per cent., were incapable of following any occupation or attending any other than a special school; 57, or 73 per cent., were leading moderately active lives, but gave a history of precordial pain or dyspnoea after exertion; and 13, or 16 per cent., were entirely free from any symptoms of cardiac disease.

Nature of Lesion.—In Table IV the results are summarized and classified according to the nature of the lesion present. As is to be expected, since of all rheumatic cardiac lesions that of the mitral valve is the most frequent, more had died and a greater number were markedly disabled through mitral disease than either aortic or pericardial mischief, but proportionately, aortic disease and pericarditis were much more serious lesions: 67 per cent. of the cases of pericarditis died, 47 per cent. of those with aortic disease, and only 17 per cent. of those with simple mitral disease. One was astonished that comparatively few of the cardiac patients were greatly disabled, the great majority of those living being only slightly inconvenienced. An equal proportion of both the mitral and aortic cases were devoid of any disability, but all the examples of pericarditis presented some symptom of cardiac distress.

TABLE IV.—Result of Cardiac Lesion Classified according to Structure Involved.

Lesion.	Total No. of Cases.	Died.		Markedly Disabled.		Slightly Disabled.		Not Disabled.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Mitral alone ...	84	14	17	8	9	51	61	11	13
Aortic ...	15	7	47	—	—	6	40	2	13
Pericarditis ...	12	8	67	1	8	3	25	—	—

In the following table (No. V) are summarized the results in the cardiac cases which have been grouped according to the age of onset of the first rheumatic attack, and from this

it is seen that on the whole the earlier the age of onset the greater the tendency to a fatal issue or marked disability.

TABLE V.—Prognosis in Relation to Age at First Rheumatic Attack.

Age at First Attack.	Deaths.	Marked Disability.	Slight Disability.	No Disability.
	Per cent.	Per cent.	Per cent.	Per cent.
3-5 years ... 13 cases ...	22	11	55	11
5-7 " ... 32 " ...	41	9	41	9
7-9 " ... 21 " ...	26	10	52	13
9-11 " ... 25 " ...	12	4	63	16
11-13 " ... 11 " ...	18	9	55	18

Analysis of the fatal cases reveals the fact that death occurred in the great majority of instances comparatively soon after the inception of the infection. Of the 28 patients who died, the fatal issue ensued within three months of the onset of the symptoms in 7=25 per cent.; within one year in 16=57 per cent.; and within two years in 21=75 per cent.

SUBCUTANEOUS NODULES.

In marked contrast to their prevalence in some previously published reviews—for example, those of Still⁷ and Poynton and Paine⁸—subcutaneous nodules were noted in only 10 (7 per cent.) of our cases. They developed during the first attack of rheumatism in 4 cases, during the second attack in 4 cases, and during the third attack in 2 cases.

Age of Onset and Sex Incidence.—One case was under 6 years of age, 3 cases were from 6 to 10 years of age, and 6 were over 10 years when the nodules were first observed. Seven of the patients were girls and three boys.

Associated Lesions.—In all the patients some other rheumatic manifestation was present. All 10 cases had carditis, and all had, or had had, arthritis, while 5 also gave a history of chorea and 2 of tonsillitis.

Prognosis.—It is generally agreed that this manifestation is of grave significance, indicating the presence of serious and progressive cardiac disease, and pointing to "lowered power on the part of the cells to destroy the infective agent."¹⁰ It proved so in our cases, 60 per cent. of whom died, while the rest presented marked cardiac disability.

TONSILLITIS.

The opinion is general that there exists a definite and frequent relationship between tonsillitis and rheumatism, and recent writers from America⁹ have stated that tonsillectomy more than any other measure prevents recurrence of arthritis and chorea. In the present series of cases under review, however, a history of sore throat was only obtained in 39=28 per cent. In only 7 cases did tonsillitis precede any rheumatic manifestation. In 5 cases it occurred simultaneously with some other manifestation, while in 13 it followed arthritis, in 10 arthritis and chorea, and in 4 chorea.

CUTANEOUS LESIONS.

Psoriasis, urticaria, erythema multiforme, erythema nodosum, and purpuric erythema have all been considered of rheumatic significance by many writers. Recently, however, their association with rheumatism has been questioned, and it seems doubtful whether these cutaneous affections occur with greater frequency among "rheumatic" patients than among those with other infections. In this series cutaneous lesions developed in only 8 cases (7 females and 1 male)—that is, 6 per cent. of the total 141 cases. Psoriasis occurred in 2 cases, erythema multiforme in 2 cases, erythema nodosum in 1 case, and urticaria in 3 cases.

EFFECT OF TREATMENT.

Though undoubtedly prophylaxis is the ideal form of treatment, absence of definite knowledge regarding the etiology of rheumatism makes discussion of this aspect of the subject futile. However, when the infection once declares itself there would seem little doubt that heroic and efficient treatment is well worth while. This is well borne out by contrasting the after-results of the cases of arthritis and chorea which were treated during their first attack at home with those treated in hospital. In many cases the home treatment was nil, or rest in bed for varying periods with or without the administration of salicylates. So far

as the cases of arthritis admitted to hospital were concerned, the treatment consisted in routine rest in bed for eight to twelve weeks, and the administration of sodium salicylate in doses of 60 to 180 grains a day. No less attention was paid to the slight cases than to the severe, it being, in fact, considered more important to treat efficiently cases of chorea or arthritis without cardiac involvement than those in which damage to the heart had already occurred. In these groups of cases reference is only made to the treatment of the first rheumatic attack. The results are summarized in Table VI.

TABLE VI.—Results of Home Treatment and Hospital Treatment of Arthritis and Choreia Contrasted.

Predominant Rheumatic Manifestation.	Cases Treated at Home during First Attack.		Cases Treated in Hospital during First Attack.		
	No. of Cases Treated.	No. who Developed Carditis.	No. of Cases Treated.	No. Admitted without Carditis.	No. of latter who Developed Carditis.
Arthritis ...	32	29 = 91 %	33	12	1 = 8 %
Chorea ...	46	34 = 74 %	21	13	5 = 38 %
Total ...	78	63 = 82 %	54	25	6 = 24 %

In contrasting these results it must be admitted, of course, that of the cases treated at home it would only be those in whom some serious rheumatic lesion subsequently developed who would come under further observation, and this naturally would raise the percentage of bad results in the home cases. The contrast, however, between the two groups is so marked that the benefit of thorough treatment in hospital cannot be gainsaid. While of the hospital cases of arthritis only 8 per cent. subsequently developed carditis, 91 per cent. of the home cases, on the other hand, suffered later from heart disease. The same difference, but to a less extent, is observed in the case of chorea, 38 per cent. of the hospital cases as against 74 per cent. of the home cases presenting later a cardiac lesion.

The greater tendency to the development of a cardiac lesion after chorea than after arthritis has already been referred to, and has been remarked upon by other writers. A critical analysis of our material strongly suggests that the tendency or otherwise for choreics to develop carditis depends on the type of treatment which has been adopted. Various are the methods currently recommended for the treatment of chorea, and in the cases under review most of the usual methods had been employed. Salicylates were administered in all cases who had recently suffered from arthritis. In the absence of any such history the patients were treated by arsenic, sedatives, or merely rest in bed without drugs. Rest in bed without drugs was reserved for the very mild cases, while sedatives were given in those examples characterized by violent jerkings.

The relative values of the different methods in preventing cardiac disease are shown in Table VII, which details the

TABLE VII.—Relative Values of Different Methods of Hospital Treatment of Choreia.

Treatment.	No. of Cases Dismissed without Carditis.	No. who Subsequently developed Carditis.
Arsenic alone	5	0 = 0 %
Arsenic + sodium salicylate	3	1 = 33 %
Arsenic + sedatives	1	1 = 100 %
Arsenic + sedatives + sodium salicylate ...	1	0 = 0 %
Sodium salicylate alone	4	0 = 0 %
Sodium salicylate + sedatives	1	0 = 0 %
Sedatives	3	2 = 67 %
Rest alone	5	3 = 60 %
Totals	23	7 = 30 %

subsequent cardiac history of all the cases of chorea treated in hospital and dismissed without any cardiac lesion. The cases of chorea who came under observation with carditis or developed carditis during the course of the illness have been purposely omitted from this analysis as being outside the point under discussion. Cases dismissed irregularly are also excluded.

The results appear more striking when summarized thus and render further comment unnecessary:

Of non-cardiac cases—

9	received salicylates and 11% subsequently developed carditis.
10	“ arsenic “ 20% “ “ “
6	“ sedatives “ 50% “ “ “
5	“ rest only “ 60% “ “ “

It might, of course, be argued that as sedatives were given in the cases with the most violent choreiform movements they had been employed in the most severe examples of the infection, but a review of all the cases of chorea did not disclose any relationship between the severity of the movements and the incidence of cardiac involvement. Another possible fallacy in the above results seemed to be the use of rest alone in the very mild cases. It might be suggested that the milder examples of chorea came under observation at a later stage of the disease, and thus there had been greater opportunities for the development of cardiac complications, but from a careful scrutiny of the histories it did not appear that the mild cases had been admitted to hospital any later in the course of the disease than those severely affected.

One feels justified, therefore, in concluding that it was the difference in the methods of treatment adopted that was responsible for the variation in the above results. Other drugs may be equally or even more effective in temporarily checking the choreiform movements and in overcoming the emotional disturbances; but if we regard every case of Sydenham's chorea as a manifestation of “the rheumatic infection,” and thus a potential cardiac case, treatment by any other method than by the administration of salicylates seems wholly unjustifiable.

SUMMARY.

1. The records of 141 cases of rheumatic infection are analysed.
2. The patients were examined one to eleven years after the first attack.
3. No case occurred during infancy; 60 per cent. were from 6 to 10 years of age at the onset of rheumatism.
4. Girls were affected more frequently than boys. The disproportion was most marked in the case of chorea (3 : 1).
5. Arthritis was most prevalent in October and November (32 per cent.), chorea in February and November (32 per cent.).
6. As regards the lesions considered in this paper, 76 per cent. had carditis, 73 per cent. arthritis, 47 per cent. chorea, 28 per cent. tonsillitis, 7 per cent. subcutaneous nodules, 6 per cent. skin lesions.
7. With regard to cardiac involvement—6 per cent. had marked cardiac disability, 41 per cent. slight disability, 9 per cent. carditis without disability, 24 per cent. had no cardiac involvement.
8. Of the total cases 20 per cent. died; 25 per cent. of the fatalities were within three months, 57 per cent. within one year, 75 per cent. within two years from the onset of rheumatism.
9. Pericarditis and subcutaneous nodules were the lesions indicating most severe infection.
10. Early hospital treatment diminished the incidence and severity of carditis.
11. Treatment was more effective in preventing carditis in arthritis than in chorea.
12. Cases of chorea treated by sodium salicylate had a lower incidence of subsequent carditis than cases treated by arsenic, sedatives, or rest without drugs.

In concluding I have pleasure in expressing my thanks to Dr. Leonard Findlay for placing the material for this work at my disposal, and for his helpful criticism and encouragement.

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OVARIAN TUMOURS COMPLICATING PREGNANCY, LABOUR, AND THE PUERPERIUM.

(Additional Cases.)

BY

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In the Lettsomian Lectures¹ delivered before the Medical Society of London in 1920 I published the whole of my experience of ovarian tumours complicating pregnancy, labour, and the puerperium. The following cases have occurred since, and I now publish them in order to complete the series up to date.

The first series of cases, 55 in number, was attended by the death of one mother (from intestinal obstruction); the present series, 8 in number, was also attended by one death (from pulmonary embolism on the twenty-fourth day). The mortality for the 63 ovariectomies was 3.1 per cent.

CASE 56.

Mrs. M., aged 27, pregnant for the first time (married on August 27th, 1919), was sent to me by Dr. Faris on February 7th, 1920. She had been last "unwell" three weeks previously, when she only had a pink discharge. She had never gone over her time. The pelvis was large (iliac spines 11 in., iliac crests 11½ in., external conjugate 8½ in.). The breasts resembled those of pregnancy. The uterus could be felt

at a height of 3 inches above the pubes. A tumour larger than a hen's egg could be felt behind and to the left of the cervix, which had the characteristic consistence of pregnancy. On March 19th the uterus had increased to the size of the organ at the fourth month, reaching up 4½ inches above the pubes. On May 19th the pelvic tumour had increased in size, being nearly as large as an orange, and was deep in Douglas's pouch; it felt hard like a fibroid and could not be pushed up.

On August 11th, 1920, I performed Caesarean section through an incision to the right of the middle line. The placenta was in front. The child (a boy weighing 7½ lb.) was delivered by the feet, and cried at once. The uterine wound was sewn up with silk sutures. The tumour was found to be a parovarian cyst of the right side. It measured 4 by 3 by 2½ inches and was removed (without the ovary and tube) by enucleation, after carefully tying all the vessels running in the cut peritoneum with fine silk, as also the small sheaf of vessels running towards its base, and then closing the peritoneum with fine silk. The cyst contained clear fluid of lower specific gravity than 1000, no solid growth or papilloma.

The patient made a simple recovery for a fortnight after the operation, when thrombosis of the right femoral vein occurred, which kept her in bed for a month. She made a good final recovery, and with her child was quite well three years later.

CASE 57.

E. D., aged 39, mother of seven children, was admitted to University College Hospital on December 6th, 1920, complaining of increase in the size of the abdomen since her last childbirth three and a half months before, when the tumour was present but caused no difficulty; she felt a dragging pain in the tumour, and suffered from a winter cough with expectoration in which no tubercle bacilli were found. A multilocular ovarian tumour was felt in the abdomen reaching up to a height of 4½ inches above the pubes. It was removed through a median abdominal incision on December 11th, 1920. The tumour weighed 6 lb. and measured 5 by 6 by

4½ inches. Under the microscope it was a pseudo-mucinous cyst with many microscopic papillae, and some of the smaller cysts were packed with papilloma, the epithelium of which was lowly proliferated. The operation lasted twenty-eight minutes. The bronchitis was aggravated by the operation; the temperature reached 102° on the third day. The patient left the hospital well on January 8th, 1921.

CASE 58.

M. M., aged 34, who had had three children (no miscarriage), was admitted to University College Hospital on February 13th, 1922, complaining of pain in the right side of the abdomen since a week before her last child was born (two years and four months before). She was in the ninth week of pregnancy, having last menstruated on December 20th, 1921. A small cyst could be felt on the right side of the lower abdomen, and bimanually the uterus, nine weeks pregnant, could be felt, pushed over to the left side.

On February 18th, 1922, the tumour was removed through a Pfannenstiel incision. The wound healed by first intention and the recovery was simple, the highest temperature being 99.4° on the second day. The patient was delivered naturally of a living boy, after two hours' labour, on September 26th, 1922. In January, 1925, the abdominal wall was strong and the scar scarcely visible. The tumour measured 2½ by 2½ by 2½ inches; it was a lutein cyst of the right ovary.

CASE 59.

N. A., aged 18, a primigravida, was admitted to University College Hospital on May 15th, 1922, as she had been found (on her previous admission in April) to have a dermoid tumour in the pelvis which could not be pushed up. The pelvic measurements were: iliac spines 10 in., iliac crests 11½ in., external conjugate 8½ in., diagonal conjugate 4½ in.; the outlet was contracted.

Caesarean section was performed on May 20th, 1922, two days before term. The child was delivered in fifty-three seconds; it weighed 7 lb. 6 oz., and cried at once. The ovarian tumour (of the right side) was then removed and the pedicle tied with silk, the tube being left behind. The operation lasted fifty-eight minutes. The patient made a good recovery, the highest temperature being 100° on the seventh day, afterwards normal. The tumour was a dermoid weighing 6½ oz., and measured 4 by 2-3/5 by 2 in. It contained cartilage, fat, muscle, spaces lined with epithelium, sebaceous glands, and hair follicles, and was lined with a thin squamous epithelium.

CASE 60.

R. B., aged 34, mother of seven children (no miscarriage), was admitted to University College Hospital on May 25th, 1922. Her doctor had found a tumour in the abdomen during her last pregnancy, and while she was being prepared for admission to the hospital labour came on and she was delivered of a living child, which presented by the breech, on January 29th, 1921. She had steadily increased in size, and was again about five and a half months pregnant, having last menstruated on November 22nd. There was very extensive pigmentation of the arms and face. The uterus reached up to the umbilicus, and above it was a flaccid cyst extending up to the ensiform cartilage.

Ovariectomy was performed on May 27th, and a multilocular cyst of the right ovary containing blood-stained fluid was removed.

It was mainly unilocular with a few daughter cysts, and contained no solid growth except one or two small masses of papilloma showing under the microscope no tendency to malignancy. After the operation the pigmentation became less intense. A good recovery ensued; the highest

temperature during her stay in hospital was 99.4°. She left the hospital on June 6th. The pregnancy continued, and the patient was delivered of a living girl on September 12th, 1922, and of a living boy in October, 1924.

CASE 61.

L. T., aged 30, mother of two children, was admitted on June 2nd, 1922, complaining of dragging pain in the left iliac fossa and of a yellow discharge since her last confinement five months before. She had had a flooding nine weeks before admission and had "seen nothing" since. The uterus was felt at a height of 2½ inches above the pubes, of the size, shape, and consistence of the pregnant organ at the ninth week. Behind the uterus could be felt a cystic swelling larger than a hen's egg; it could be moved but not easily pushed out of the pelvis.

Ovariectomy was performed by a median abdominal incision on June 4th, 1922. A good recovery was made; the highest temperature was 100°, on the seventh day. The tumour consisted of a cyst measuring 2½ by 2½ in., with two small cysts in its wall, and of a more solid part containing a few small cysts and a corpus luteum of pregnancy. The patient went to term and was delivered of a living boy at the end of January, 1923.

CASE 62.

M. K., aged 33, who had had two children and one miscarriage, was admitted on July 29th, 1922, complaining of flooding for nine days. The patient was two months pregnant. An ovarian tumour was found reaching up to within 1½ inches of the umbilicus. Next day the temperature reached 102.2°, and the patient passed a two-months ovum; the temperature then fell to normal. On August 1st the uterus was felt at a height of

CASE 56.—A=Operation. B=Deep stitches removed. C=Superficial stitches removed. D=Vomited. E=Death from pulmonary embolism, 7 p.m.