EIGHTY CASES OF CHOREA:

ANTECEDENTS, FAMILY HISTORY, STATE OF THE
HEART, AND SUBSEQUENT HISTORY.

BY

W. P. HERRINGHAM, M.D., F.R.C.P.,
PHYSICIAN TO THE WEST LONDON HOSPITAL, AND TO THE PADDINGTON
GREEN CHILDREN'S HOSPITAL.

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ABBREVIATIONS.

F. Father. M. Mother. B. Brother. S. Sister. rh. Rheumatism.
rh. f. Rheumatic fever. ch. Chorea. Ht. ap. n. l. Heart-apex in nipple
line. Ht. ap. ins. or outs. Heart-apex inside or outside nipple line. Imp. +
Heart impulse greater than natural. 3 w. + Three weeks after first visit.

THE following remarks are based upon the examination of eighty consecutive cases of chorea occurring in my practice at two general hospitals. The cases were nearly all out-patients, but eight of them were admitted to the wards for chorea, and in two it occurred while in hospital for rheumatism. I directed my attention to the personal history of the patients, to the history of disease in their families, and to the state of their hearts at the time of attendance. I have seen nearly half the total number at various intervals subsequently, and have been careful to note the state of the heart at the time of their subsequent attendance.

In examining the personal and family histories for the causes of the chorea, inquiries were made first for an *exciting* cause, such as fright, or shock, or injury ; next or in default of this for *predisposing* causes, rheumatism, other ill-health, or prolonged mental strain. The remaining cases, in which none of the above could be discovered, are divided into those with and those without previous attacks of chorea, the first group being again subdivided into those who alleged a cause for the first attack, and those who could not.

In writing out the cases, however, it has been more convenient to place the rheumatic cases by themselves. They have been subdivided into classes. The first contains four cases of patients in whom the chorea for which they were treated followed immediately upon rheumatic fever ; the second, three cases wherein, though the present attack was not, the first had been, immediately preceded by rheumatic fever. In the third are twelve cases in which the connection was not immediate, but the rheumatic fever had occurred at an interval varying from two weeks to four years before the first attack of chorea. The fourth class is formed of two cases in which there had been no previous rheumatism, but acute rheumatism came on during the attack of chorea. The evidence for the rheumatic fever is in most cases the statement of the patient's friends, but in Cases 1, 2, 9, 11, 19, 20, and 21 my own observation. I do not think, however, that doubt need be thrown upon the first kind of evidence in this matter for rheumatic fever is not likely to be confounded with other diseases occurring at this time of life ; they depend always, or nearly always, upon the statement of a medical man, and often upon the diagnosis of a hospital physician.

The fifth and sixth classes contain those cases in which a clear history could be obtained of occasional pains in the joints or of definite attacks of such pains, but in which no swelling or fever was noticed. These cases cannot be said with such certainty as the preceding to be of a rheumatic character, but the labours of others during recent

years have rendered it at least probable that such pains in early life are really rheumatism.

The first four classes contain twenty-one cases, more than a quarter. The addition of the fifth and sixth brings the total (including Case 40) to thirty-seven, very nearly half of the whole number.

In the seventh class are placed six cases in which a definite cause was alleged to have excited the disease. In the first, No. 37, that cause was physical injury to the head, fright being excluded, and it is interesting to compare this with other cases such as that of Dr. McLeod (No. 365 in the Collective Investigation Report¹), in which a woman aged forty immediately upon severe head injuries became choreic and maniacal. It appears at least possible that a visible injury to the brain or meninges may have occurred in these cases. The remaining five cases are all of mental origin, and these are the only five in which I could extract from child or parent a history of such an exciting cause. Many of them have said to me, in reference to this or a previous attack, "Well, sir, the doctor said it was caused by a fright," who have been quite unable to give such a history themselves. Seeing that the children are in almost every instance old enough to recollect and speak for themselves, we need only allow for those few cases in which, the fright having been caused by the parent, she was ashamed and the child afraid to mention it. There are four other cases, Nos. 25, 56, 57, 58, in which the first attack was ascribed to a definite exciting cause of a similar nature. While therefore the descriptions leave no doubt of the connection, the class formed by such cases remains small.

The eighth class is formed by four cases in which chorea was preceded by some definite ill-health, and although in two of them, Nos. 44, 46, this may be perhaps but a premonitory stage of chorea itself, the remaining two, Nos. 43, 45, were ill of catarrhs which can scarcely be thus explained.

¹ 'Brit. Med. Journ.,' 1887, i, 425.

With these must be considered Cases 22, 23, 24, 35, in all of which considerable ill-health existed previously to the chorea ; for predisposing causes do not exclude, but assist one another.

But another predisposing cause was found in the cases composing the ninth class. Some of these patients gave a history of worry, as No. 53, a servant under a harsh master, or No. 34, a young woman who was at strife with her family, or No. 39, a little girl who worked twelve hours a day at boot-finishing. Others had just returned to school after a long absence, as Nos. 5, 19 ; and the remainder, fifteen in all, were working hard at school, most of them preparing for an examination, and often giving evidence by sleep-talking that their lessons were too much for them. In Cases 31 and 55 two attacks had occurred, each just before an examination.

The remaining twenty-five cases afforded no clue to any definite predisposing or exciting cause beyond the fact, that Nos. 56 to 66 inclusive, forming the tenth class, had already had one or more attacks of chorea.

It was, however, of interest to carry the investigation yet further, and, like Dr. Isambard Owen, in the 'St. George's Hospital Reports,' to inquire what lesser ailments were to be found among patients affected with chorea. In four cases the history could not be obtained. In thirteen others the appearance was one of strength, or there was no history of any common ailments ; but of these No. 10, George Y—, though a strong, stout-built boy, was looking pale and weak when I saw him from his recent illness, and No. 34, Charlotte A—, looked of strong physique, but was of very unstable nervous system. There was only one patient, No. 74, James S—, whom I should have called very strong. He was when I first saw him a strong, stout lad, and he is now the picture of health and strength. No. 1 could not detail any ailments, but was a very delicate-looking girl.

In all the other sixty-two cases there was a common ailment to which the patient was often subject, and in

many there were several. Of these headaches were the most common, being noted in twenty-eight instances. There were seven of these patients in whom the headaches were combined with vomiting. In two they only came on after reading.

Indigestion of various sorts, chiefly an inability to eat rich food, is noted in fourteen, of which one was a boy, No. 47, who ate no meat, or very little.

Eczema squamosum was seen on the face in nine, blepharitis in two, and the scars of cervical abscesses in three cases. Another boy, No. 60, was said to have sores on the body, probably eczema, not infrequently.

Sore-throats were noted in six cases, colds and coughs in three, and bronchitis occurred in seven others, while one, No. 25, showed a well-marked rickety chest. Nervous disorders are not so frequently complained of. One child had chronic incontinence of urine, another was a bad sleeper, four had "faints," which may possibly have been epileptic, and four others, including all the grown-up girls, were hysterical. One of these was a pregnant married woman; another was married but not pregnant.

Twenty-six, including several of the preceding, were described by their mothers as "delicate," "never strong," "always ailing," or the like, and in two, Nos. 5 and 32, this delicacy is said only to have existed since an attack of acute rheumatism.

It may be noted that of the cases which were not delicate the larger number were not rheumatic. It could not therefore be said that general delicacy always took the place of rheumatism, where this latter was not present, as a predisposing cause.

At the same time that this examination of the personal history was made the family history of each patient was also investigated. Except in respect of rheumatism and chorea it is not worth while to examine these minutely, and the former must be confined to rheumatic fever, for rheumatism in the mouths of the laity means every pain but colic.

Rheumatic fever had occurred in twenty-five out of seventy-five families. In five the records were wanting. Two thirds of these, seventeen families, belonged to rheumatic patients. The remaining eight families are distributed among forty-one patients in whom no history of rheumatism could be obtained.

Chorea had occurred in twelve families.

Chorea and rheumatism had occurred in nine families.

In one case, No. 4, when the patient had chorea, a younger brother was reported to have had chorea, but no rheumatism. Two years later I attended this brother for rheumatism. In four cases chorea and rheumatic fever had occurred in the same member of the family.

Minor ailments.

Strong looking or with no minor ailments, 10, 13, 30, 34, 37, 38, 42, 62, 63, 65, 68, 72, 74.

Headaches, 2, 3, 5, 6, 7, 12, 14, 17, 20, 22, 28, 31, 32, 33, 34, 36, 40, 45, 52, 53, 55, 57, 62 A, 66, 67, 69, 76, 77.

Indigestion, 6, 7, 15, 21, 36, 45, 46, 47, 52, 60, 66, 67, 75, 76.

Eczema, 6, 14, 22, 26, 32, 34, 39, 60 (prob.), 66, 67.

Blepharitis, 56, 58.

Cervical abscess, 54, 66, 70.

Sore-throats, 16, 22, 26, 45, 47, 80.

Colds and coughs, 6, 28, 36.

Bronchitis, 23, 24, 26, 52, 57, 71, 80.

Rickety chest, 25.

Incontinence of urine, 51; bad sleeper, 22; "faints," 34, 48, 53, 69; hysteria, 18, 29, 34, 42.

Said to be delicate, 5, 6, 7, 8, 14, 16, 17, 22, 26, 28, 32, 35, 39, 40, 43, 52, 54, 55, 58, 60, 61, 71, 75, 77, 78, 79.

Family history.

Rheumatic fever, 1, 2, 4, 6, 7, 8, 12, 13, 15, 16, 17, 23, 24, 27, 30, 36, 39, 40, 55, 57, 58, 70, 71, 72, 77.

Chorea, 4, 7, 8, 15, 16, 35, 36, 52, 55, 57, 58, 64.

Chorea and rheumatic fever, 4, 7, 8, 15, 16, 36, 55, 57, 58.

The condition of the heart was noted in almost every instance at each visit, and the examination was made in a uniform manner:—first in the erect position; then if there was no murmur or the signs were equivocal, the patient was made to exert himself and re-examined; and if still without a result he was examined while lying down. The apex was noted as being at the furthest point downward and outward where the impulse could be distinctly felt. The patients were all written to subsequently, and as the result of this in thirty-seven cases they were examined after the disease had ceased. The interval at which this was done varied from a few months to four years after the original attack. It is stated both in the Tables and in the following summary.

A. The heart was natural in ten cases¹ (Nos. 15, 24, 26, 32, 34, 37, 42, 57, 59, 62).

No. 15.—2½ years later. No ch. or rh. since.² Heart natural.

No. 24.—3 years later. No ch. or rh. since. Heart natural.

No. 32.—1½ years later. Came for fresh chorea, no rh. since. Had a presystolic murmur.

B. There were uncertain signs of disease in the following:

1. *Heart-apex natural, first sound indistinct* in three cases (Nos. 8, 17, 70).

No. 17.—3 years later. Ch. thrice but no rh. since. Heart-apex outside nipple line, a systolic murmur, and accentuation of the second sound at the left base.

¹ If it be remembered that Cases 1 to 36 and Case 40 are rheumatic it is easy to see by each list how many rheumatic cases it contains.

² Here as in the subsequent Tables "no rh." means no rheumatism of any sort, either acute, or mere joint pains.

2. *Heart-apex natural at first, but going outwards, no murmur*, in four cases (Nos. 31, 48, 51, 65).

No. 31.— $2\frac{1}{4}$ years later. No ch. or rh. since. Heart-apex in nipple line.

No. 51.—1 year later. Came for fresh chorea. Heart-apex in nipple line.

3. *Heart-apex in nipple line at first, but going inwards, no murmur*, in four cases (Nos. 4, 9, 66, 77).

No. 4.— $2\frac{1}{2}$ years later. No ch. but rh. and purpura since. Heart-apex in nipple line.

No. 9.—3 years later. Ch. with slight rh. once since. Heart-apex just inside nipple line. Prolonged first sound, accentuated second sound, excessive impulse.

No. 66.—3 years later. No ch. or rh. since. Heart natural.

No. 77.— $2\frac{3}{4}$ years later. Slight choreic movements since. Heart-apex in nipple line.

4. *Heart-apex natural, murmur inconstant*; one case (No. 76).

5. *Heart-apex natural, murmur constant*, in five cases (Nos. 3, 10, 28, 29, 67).

No. 28.— $2\frac{3}{4}$ years later. No ch. or rh. since. Heart the same. No accentuation of second sound.

No. 29.— $2\frac{1}{4}$ years later. No ch. or rh. since. Heart-apex in nipple line, loud systolic apex murmur, second sound accentuated.

No. 67.—7 months later. No ch. or rh. since. Heart-apex in nipple line. No murmur.

6. *Heart-apex at first natural, going outwards, murmur throughout*, two cases (Nos. 14, 20).

No. 14.— $2\frac{1}{2}$ years later. Slight ch. now, rh. once since. Heart-apex in nipple line, first sound prolonged, occasional murmur after exertion, second sound accentuated at left base, and impulse rather increased.

No. 20.—2 years later. Slight rh. since, no ch. Heart-apex in nipple line, systolic murmur, second sound accentuated.

7. *Heart-apex in or outside nipple line, no murmur*,

sixteen cases (Nos. 7, 13, 22, 27, 38, 39, 45, 47, 49, 50, 60, 61, 69, 73, 75, 79).

No. 22.—6 months later. A systolic murmur. $3\frac{1}{4}$ years later. Apex the same. No murmur. Impulse increased, second sound accentuated.

No. 27.—Some months later in a fresh attack. A systolic murmur heard.

No. 39.— $3\frac{1}{2}$ years later. Ch. once, no rh. since. Apex outside nipple, no murmur, second sound accentuated.

No. 45.—4 months later. No ch. or rh. since. Heart same.

No. 50.—3 years later. Ch. once, no rh. since. Heart-apex outside nipple, a short systolic murmur.

No. 60.—5 months later. Heart natural.

No. 61.—3 years later. No ch. or rh. since. Heart-apex in nipple line.

c. There were sufficient signs to warrant a diagnosis of organic disease in twenty cases (Nos. 1, 2, 5, 6, 11, 12, 16, 18, 23, 35, 36, 53, 54, 56, 58, 63, 64, 71, 72, 80).

Eight cases were seen again. In all the diagnosis was confirmed (Nos. 5, 11, 12, 16, 23, 36, 58, 71). A few had had ch. since, attended for a fresh attack, none had had rh. since.

d. A murmur developed during observation in the following cases :

1. *With the apex starting as natural*, six cases (Nos. 19, 30, 40, 44, 46, 52).

No. 40.—6 months later. Every sign of organic disease. $2\frac{1}{2}$ years later. No murmur, but other signs remain. No rh. or ch. since. $3\frac{1}{2}$ years later apex returned within n. l., no murmur.

No. 52.—3 years later. No ch. or rh. since. Heart-apex outside nipple line; loud systolic murmur heard behind. Congested cheeks.

2. *With the apex in or outside nipple line at first examination*, five cases (Nos. 21, 43, 55, 74, 78). In No. 74 the murmur had the character of functional affections.

No. 43.—6 months later. Came for fresh ch. Heart natural.

No. 74.—3 years later. No ch. or rh. since. Heart natural.

No 78.—6 months later. No ch. or rh. since. Heart-apex in nipple line. Murmur remained.

E. In the following four cases a murmur was heard at first and vanished during attendance (Nos. 25, 33, 62A, 68).

No. 62A.— $3\frac{3}{4}$ years later. Came for fresh ch. No rh. since. Heart natural.

No. 68.—6 months later. No ch. or rh. since. Heart-apex in nipple line ; no murmur.

It appears therefore that of those hearts which were healthy then, one subsequently became diseased without fresh rheumatism ; that of those which clearly had organic disease, all who were seen later remain the same, or are in worse condition ; and that of the doubtful cases two (Nos. 60, 66) became healthy, while seven (Nos. 9, 17, 20, 22, 27, 29, 50) present sufficient evidence of organic disease, and ten (Nos. 4, 14, 28, 31, 39, 45, 51, 61, 67, 77) remain uncertain.

The chief interest, however, centres round the remaining groups D and E. Those murmurs which vanish during chorea appear, to judge from two examples, not to leave permanent effects behind them. Of eleven cases in which a murmur developed during observation, five were re-examined, and of these, three gave good evidence of organic disease, and two were natural.

Besides the cases above mentioned, another patient, Hester S—, æt. 13, came under my care for bronchitis, who had two years before been an in-patient under Dr. Gee for chorea. When admitted the heart was natural, but on the twenty-third day a soft systolic murmur was audible. When under my care the heart's apex was just inside the nipple line, and there was a faint but distinct systolic murmur.

These four cases appear to give clear evidence of the permanence of a cardiac murmur directly produced by chorea, and of its organic nature. Corroborative evidence is afforded by three cases, Nos. 5, 32, and 58. These had pre-

viciously attended for another attack of chorea, and the heart was at that time noted as natural. No rheumatism or other illness had occurred in the interval, and it seems a fair inference that in these cases also the murmur, which time has proved to be of organic origin, was due to chorea alone.

The post-mortem evidence is in accord with these inferences ; for, on the one hand, some few fatal cases have shown no signs of endocarditis, even though carefully examined upon that point, and, on the other, many of the cases with cardiac disease show changes so recent that they to all appearance followed rather than preceded the chorea.

Nor can it be said that it is only in rheumatic patients that chorea produces cardiac disease. No trace of rheumatism could be found in Nos. 52, 58, or 78, and in only one of these, No. 58, was there any rheumatism in the family.

It may well be that chorea had caused cardiac disease in other cases, but though they prove concurrence, they cannot from the first when morbid signs are present, prove causation, since the heart affection may have preceded the chorea. On the other hand, they cannot be used to prove that heart disease produces chorea, for hardly any cases come in the first week (only six of the eighty), and the murmur in one of the above-mentioned instances developed before the seventh day.

From these cases the following conclusions may be drawn :

1. That a large number of choreic patients are liable to rheumatism.
2. That choreic patients are nearly always of a delicate constitution.
3. That chorea is sometimes directly caused by emotion.
4. That chorea may cause permanent heart disease.
5. That it also gives rise to signs of cardiac disease which are not permanent.

CLASS I.—Cases in which present attack was immediately preceded by *Acute Rheumatism*.

Name, age, date.	History of rheumatism.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
1 Mary C., 10, Feb., 1885	Sore-throat, followed by illness confining her to bed, in which joints were inflamed; on getting up was found choreic	Delicate looking; no other illness or ailment	F. and 3 B. strong; M. rh. f.; 1 S. cor-neal scars, and now keratitis	Ht. ap. n. l.; syst. ap. mur.	—	—
2 Maud O., 16, March, 1885	Rh. f. twice; in-patient for 2nd attack; up a few days before onset of ch.	Delicate looking; no other illness; headaches	F. ?; M. delicate, indigestion and rh.; 1 S. (18) just had rh. f.; 5 B. and S. strong	Ht. ap. n. l.; syst. ap. mur. heard behind before ch., and so remained	Ang., 1885. — Heart same	—
3 Walter S., 11, May, 1885	Rh. f. 3 months ago; just got up when ch. began	No other illness; headaches	All strong	Ht. ap. ins.; syst. mur. loudest over pulm. va. throughout; pulse irregular at first	—	—
4 James S., 11, Dec., 1885	2 weeks ago laid up with pains in limbs; could not move legs because of pain	Scarlatina with droopy 6 years ago	F. rh.; M. and 6 B. strong; 1 B. seen ch. (this B. Feb., 1888, has had subacute rh. for 3 months, and has syst. ap. mur.)	Ht. ap. n. l.; first sound prolonged at ap.; 3 weeks + ht. natural	Feb., 1888. — Ht. ap. palp. in n. l., 5th sp., but most distinct in ins. n. l.; no mur. Was under treatment 2 months ago for swellings in many joints and "bruises" all over legs; doctor said it was "rheumatism"	Working hard for examination.

See also Case 9.—Subsequent history.

CLASS II.—Cases attended for a later attack, in which the first was immediately preceded by Acute Rheumatism.

5	Sophia M., 11, April, 1885	Rh. f. at 6 and 9; first ch. began while in bed with rh. f.	2nd attack of ch.; All strong delicate since rh. f.; sleeps badly; subject to pains in head; eczem. squam. on face	F. rh.; M. bronch.; 1 B. rh.; 2 S. weakly, 1 S. rh. f.	1 year ago under treatment for ch.; ht. then noted as natural in clerk's notes; no illness since; now ht. ap. n. l., syst. mur. (Dr. Garrod)	Feb., 1888.—Now at- tending for 3rd ch.; no rh. since 1885; ht. school after an absence of 18 months.	Just at onset she had returned to school after an absence of 18 months.
6	Eliza M., 11, Feb., 1885	Rh. f. 9 months ago; ch. during convalescence	2nd attack; al- ways delicate; sick headaches, indigest., colds, coughs; eczem. squam. on face	F. rh.; M. bronch.; 1 B. rh.; 2 S. weakly, 1 S. rh. f.	Ht. ap. † in. outside n. l.; syst. ap. mur.	May, 1885.—Ht. same	No warning or cause.
7	Elizabeth W., 8, Dec., 1885	Rh. f. 2 years ago; ch. during convalescence	2nd attack; al- ways very deli- cate; appetite bad, dainty; sore spots on tongue and sick headaches	F. much cough; rh. f. at 15, and ch. during conva- lence; 2 B. and S. no rh. or ch.	Ht. ap. n. l.; imp. natural; no mur.	—	Was studying hard for exami- nation, doing home lessons, and talking of them in her sleep at onset.

CLASS III.—Cases preceded by Acute Rheumatism, but not immediately.

8	George K., 16, Nov., 1884	4 months ago laid up 2 months with pain and swelling in knees	Not strong; no definite ailment	F. strong; M. rh. f.; 7 B. and S. all rheu- matic; 1 S. rh. f. and ch. during con- valescence	Ht. ap. natural; sound indistinct	1st May, 1885.—Ht. ap. n. l.; 1st sound indis- tinct, no mur.	No cause known.
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Name, age, date.	History of rheumatism.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
9 Minnie L., 10, Sept., 1884	6 months ago severe attack of rh. pains	2nd attack (first was soon after the rh.)	—	Ht. ap. n. l.; no mur. 8 weeks + ht. ap. just inside n. l.; no mur.	Sept., 1885.—Another attack, immediately preceded by swelling of finger-joints and right knee. Ht. ap. n. l., at first no mur., but 6 weeks + occasional syst. ap. mur. Aug., 1887.—Ht. ap. just inside n. l.; 1st sound prolonged, hardly long enough to call a mur.; 2nd sound + at left base; impulse + —	No cause known.
10 George Y., 15, Jan., 1885	Rh. f. Nov., 1884. Went to work at Christmas, looking pale and weak. Ch. began 2 weeks later	Stoutly built; no other illness or ailment	All strong	Ht. ap. inside n. l.; loud syst. ap. mur.; pulse small	—	No cause, unless work.
11 Arthur Q., 12, March, 1885	Rh., under me 3 months ago	—	F. died phthisis; rest strong	Ht. ap. n. l.; syst. ap. mur.	Aug., 1885.—Ht. ap. n. l.; loud syst. ap. mur.	No cause.
12 Jessie K., 6, April, 1885	Rh. f. Sept., 1883. 1st attack of ch. Nov., 1883	2nd attack; sick headaches; no other illness	F. rh. f.; M. delicate; 2 B. and S. strong	Ht. ap. outside; loud syst. ap. mur.	An attack of rh. supervened; 2 months later double apex murmur March, 1888.—No rh. or ch. since, but has been in Vict. Park Hosp. for heart; very loud murmurs at ap. and base	Worrying much with school work.
13 Anna S., 16, May, 1885	Rh. f. 4 years ago	No other illness or ailment	F., M., and 3 S. strong; 1 S. rh. f. twice	Ht. ap. n. l.; no mur.	—	No cause.

14 Ellen P., 10, Oct., 1885	6 months ago laid up with rh. in knees	Measles twice; All strong always ailing; headaches; ec- zem. squam.	Ht. ap. natural; faint syst. mur. on exer- tion; 3 weeks + ht. ap. n. 1.	March, 1888.—Ch. now slightly in left arm; rh. once in ankle since. Has to work very hard. Bronchitis. Ht. ap. in n. 1.; impulse +; 1st sound prolonged; oc- casional mur. after ex- ertion; 2nd sound + at left base March, 1888.—No rh. or ch. since. Ht. natural, except for re- duplication of 1st sound at apex	Working hard for examination at onset, but not complaining of work.
15 Joseph C., 13, Sept., 1885	Rh. f. 5 months ago; always pain in feet since	Very subject to bilious attacks	Ht. ap. $\frac{1}{2}$ in. inside; no mur.	March, 1888.—No rh. or ch. since. Ht. natural, except for re- duplication of 1st sound at apex	—
16 Annie T., 7, Sept., 1884	6 weeks an ill- ness in which throat sore, and in bed 2 weeks	Delicate look- ing; subject to sore-throats; never strong; no other illness	Ht. ap. $\frac{1}{2}$ in. outside n. 1.; syst. ap. mur.	May, 1885.—Ch. again; ht. a loud syst. ap. mur.	Previous illness thought to be rh. because of severity, state of heart, and family history. It was not, as far as could be found, scarlatina.
17 Charlotte G., 6, Jan., 1885	Rh. f. 3 months ago; ch. began 2 months later	"Low fever" 3 years ago; ail- ing some mos. lately; always delicate; head- aches	Ht. ap. inside n. 1.; 1st sound indistinct	Feb., 1888.—Ch. thrice since; no rh. since; still delicate, and very subject to headaches; ht. ap. just outside n. 1., 5th space; syst. mur. faintly audible at ap., but occasionally uncertain; 2nd sound + at left base	No cause known.

Name, age, date.	History of rheumatism.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
18 Maria H., 27, July, 1886	Rh. f. 8 years ago; often rh. pains	4th attack; hysterical	F., M., and 5 B. and S. have died in 2 years of lung disease	Ht. ap. n. l.; pre-syst. mur.	—	Pregnant; hysterical paralysis and anaesthesia.
19 Edith B., 10, Nov., 1887	Sept., 1887.—Swelling and pain in knees. Had been 2 wks. at school when in Nov. ch. began, and in 3rd week of ch. rh. returned in other joints	—	—	Ht. ap. $\frac{1}{2}$ in. inside; sounds clear. Admitted with rh., and while in bed a syst. mur. occasionally heard. 8 weeks + ht. ap. n. l.; soft syst. mur. at ap., louder on exertion	—	Had been 2 weeks at school.
CLASS IV.—Cases not preceded, but accompanied, by Acute Rheumatism.						
20 George W., 11, Jan., 1886	In 5th week of ch. acute rh. supervened	2nd attack of F. strong; ch. many head-aches; no other illness	F. strong; M. sick; 7 B. and S. no rh. or ch.	Ht. $\frac{1}{2}$ in. inside n. l.; syst. ap. mur.; the ht. ap. went out to just inside n. l. under observation	March, 1888.—No ch. since, but slight rh. in knees and ankles; none in family; ht. ap. palp. in n. l.; strongest $\frac{1}{2}$ in. inside n. l.; soft syst. ap. mur., increased on exertion, and then heard in axilla; 2nd sound + at left base	No cause known.
21 Anne W., 9, Sept., 1887	In 8th week of ch. acute rh. supervened	Always dainty, but no other illness	F. ?; M. dead; B. and S.	Ht. ap. in n. l.; a syst. mur. at first only after exertion, later constant	—	No cause known.

CLASS V.—Cases preceded, but not immediately, by pains in the Joints, though with no history of Acute Rheumatism.

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22	Emily H., 12, Nov., 1884	Occasional pains in joints	Always delicate; headaches, sore-throat; sleeps badly; eczem. squam.	All strong	Ht. ap. in n. l.; imp. +; no mur.; 1st sound became indistinct	May, 1885.—A syst. ap. since ulcerated throat.	Ailing 2 months
23	John L., 11, Feb., 1884	Occasional pains in joints	2nd attack; 1st year ago; bronchitis; had a fit in sleep during 1st attack of ch.	F. died phthisis, had rh. badly; M. and 3 S. strong; 1 S. anæmia; 1 S. rh. f.	Ht. ap. in n. l.; loud syst. ap. mur.; pulse irregular	Feb., 1885.—Another attack; ht. as before	All three attacks preceded by catarrh.
24	Jane J., 11, Feb., 1885	Occasional pains in joints	Bronchitis	F. rh. f.; 1 S. rh. f.; 1 S. fits; M. strong	Ht. natural	Feb., 1888.—No ch.; no rh. since then; headaches and bilious attacks; ht. natural	Poorly for some months previous.
25	John L., 16, March, 1885	Occasional pains in joints	2nd attack; 1st year ago; inflammation of lungs; rickety chest	F. ?; M. and 1 B. strong	Ht. ap. in n. l.; syst. ap. mur., but during observation the ap. retreated to natural, and the mur. disappeared	—	1st attack after fright by cab; left work 2 weeks after fright.
26	Margaret C., 10, May, 1885	Occasional pains in joints	Always delicate; bronchitis and sore-throats; eczem. squam.	F. strong; M. and 8 B. and S. weakly	Ht. ap. just inside n. l.; no mur.; pulse irregular	—	Ch. began just before an examination, about which much excitement and work.
27	Louisa R., 9, Nov., 1883	Occasional pains in joints	Ch. off and on ever since 6	F. and M. rh.; 1 S. rh. f.	Ht. ap. $\frac{1}{2}$ in. outside n. l.; no mur.	Some months later another attack, in which syst. mur. audible	No cause known.

Name, age, date.	History of rheumatism.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
28 Florence B., 14, July, 1885	Occasional pains in joints	Ch. yearly since 7; never strong; headaches, coughs; necrosis of sept. nasi and floor of orbit	F. rh. badly; M. strong; no B. and S.	Ht. ap. natural; syst. ap. mur. on exertion throughout	March, 1888.—Ch. once since; no rh.; ht. ap. normal; imp. not+, but a syst. ap. mur. constant though faint; louder after exertion; 2nd sound natural	No cause known.
29 Susan P., 21, Dec., 1885	Occasional pains in joints	Hysterical; no ailments	M. sick headaches; F. and all rest strong	Ht. ap. † in. inside n. l.; syst. ap. mur., which was strongly musical	March, 1888.—No rh. or ch. since; ht. ap. faintly palp. in n. l.; strongest imp. † in. inside n. l.; loud syst. ap. mur. heard outwards; 2nd sound + at left base	No cause known.
30 Clifford W., 15, Nov., 1885	Pains in joints, especially knees, for 6 months	Always strong; no ailments	F. dead, no rh.; M. rh. f. 4 times, mitral disease; 7 B. and S. strong	Ht. ap. just inside n. l.; 1st sound prolonged; later ht. ap. in n. l.; syst. ap. mur.	—	No cause known.
31 Rose L., 10, Dec., 1885	Occasional pains in joints	2nd attack; 1st 2 years ago; headaches	No rh. or ch. in F., M., or 8 B. and S.	Ht. ap. just inside n. l.; imp. +; 1st sound booming; 2nd sound + at left base; later ht. ap. went to n. l.; sounds clear	March, 1888.—No rh. or ch. in self or family since; ht. ap. in n. l.; no mur.; 2nd sound not+	Both attacks came on just before an examination.
32 Peter T., 10, Feb., 1886	Occasional pains in joints	2nd attack; 1st 1 year ago; strong and stout till then; headaches and eczema since	No rh. or ch. in F., M., or 6 B. and S.	Ht. ap. just inside n. l.; no mur.	Nov., 1887.—Presystolic mur. on exertion	No cause known.
33 Alice G., 9, Jan., 1886	Pains in knees a few months ago	Much headaches last 3 months; no ailment or illness till then	F. rh. badly; M. and 7 B. and S. strong	Ht. ap. in n. l.; syst. ap. mur., but later the mur. disappeared	—	No cause known.

34	Charlotte A., 18, May, 1886	Occasional pains in joints	Stout, strong; F. and M. rh.; no rh. Ht. natural hysterical; per-haps epileptic; ch. twice before; sick head-aches; eczem.	F. rh.; M. ch. when young; 2 B. and S. (younger) strong	Ht. ap. in n. l.; loud syst. ap. mur.	—	Domestic worry and quarrelling.
35	Minnie T., 8, April, 1887	Occasional pains in joints	2nd attack; 1st 4 months ago; always delicate and dainty	—	—	—	For a week before onset had a bad catarrh, which greatly weakened her.

See also Case 40.

CLASS VI.—Cases not preceded, but accompanied, by pains in Joints.

36	Annie A., 11, June, 1885	Ch. began with pains in knees; no previous rh.	No other illness; F. died ht. disease; often sick head-aches; appetite variable; colds and coughs	M. bad rh., never rh. f.; 1 S. ch. thrice; 1 S. eczem., delicate; 1 S. mitral disease and bronchitis, but no history of rh. or ch.	Ht. ap. n. l.; syst. ap. mur.	Sept., 1887.—Another attack; ht. ap. just inside n. l.; short syst. ap. mur. on exertion. Dec., 1887.—Ht. same	Ch. was left side only, but pains in both knees. Working very hard, and worrying about examination.
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See also Case 40.

CLASS VII.—Cases preceded by Injury, Shock, or Violent Emotion.

Case	Name, age, date.	History of exciting cause.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
37	William G., 10, May, 1885	While in usual health fell, cut his head; unconscious for a short time; vomited; 2 days later ch. began	No illness or ailment	F. and M. strong	Ht. ap. inside n. l.; no mur.	—	—

Name, age, date.	History of exciting cause.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
38 Sarah C., 14, Jan., 1884	2 days before onset B. taken by a lodger jumping out at her on stairs	No illness or ailment	No rh. or ch. in family	Ht. ap. 1 inch outside n. l.; no mur	—	—
39 Elizabeth B., 14, Sept., 1884	2 days before onset B. taken to hospital, at which "she cried and went on dreadful"	No illness or ailment, but not strong; eczem. squam.	F. delicate, rh. f.; 1 B. phthisis; 1 B. strong; 4 S. all delicate	Ht. ap. in n. l.; imp. +; no mur.; later ht. ap. outside n. l.	April, 1885.—Ht. ap. $\frac{1}{2}$ in. outside; no mur. Feb., 1888.—Ch. once since note; no rh.; ht. ap. $\frac{3}{4}$ in. outside n. l. in 5th sp., but most forcible $\frac{1}{2}$ in. outside n. l., 4th sp.; no mur.; 2nd sound + at left base	Working at boot-finish, 8 a.m. till 7 p.m.
40 Annie C., 16, June, 1885	At 2 p.m. suddenly told F. was dead (information quite unexpected and false), greatly frightened; at 4 p.m. vomited; at 7 p.m. twitching noticed	Scarlatina eight years ago; rh. occasionally in hands and feet; headaches; pains in belly; never strong	F. rh. f.; M. rh. f., mitral disease; no B. and S.	Ht. ap. natural; sounds clear; 7 days + a soft syst. mur. at ap. and outwards; 3 weeks + ap. just outside n. l.	Dec., 1885.—Ht. ap. n. l.; imp. +; syst. mur. at ap. and behind; 2nd sound + at left base. March, 1888.—No illness at all since; ht. ap. in n. l.; no mur.; 2nd sound much + at left base	—
41 William W., 15, Sept., 1887	Well in morning; during the day nearly killed by engine while crossing line; M. noticed twitching when he went home that evening	See Case 62A. No rh. since that note	—	Ht. ap. natural; no mur.	March, 1889.—Apex ins.; no mur. (Dr. Garrod)	—

42	Mary Ann J., 18, Dec., 1887	1 week ago a quarrel, followed by a hysterical fit; calft; noticed ever since.	Ch. at 8; hysterical fit; for 1 month had pain in heels and feet; strong looking	—	—
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See also Case 25.

CLASS VIII.—Cases without Rheumatism preceded by slight ill-health.

No.	Name, age, date.	History of ill-health.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
43	Phoebe H., 13, Oct., 1884	A bad cold, ver- tical headache, pale, languid, and peevish, just before on- set; is always thus before an attack	Ch. twice before; no rh.; hardly ever well	All strong	Ht. ap. in n. l.; no mur., but a syst. ap. mur. developed during observation	6 months later another attack, preceded by 2 weeks of griddiness and pain in vertex; ht. ap. inside n. l.; no mur.	No other cause known.
44	Florence B., 7, Sept., 1884	Pale and ailing 3 weeks	—	—	Ht. natural, but a faint syst. mur. de- veloped under ob- servation	—	—
45	Clara D., 13, Feb., 1885	Several bad colds late; out of health	Ch. once be- fore; no rh.; sore-throats; sick headaches; dainty; can't eat rich food	F. rh. and insane; M. and 3 B. weakly; 1 B. rh.; 7 S. strong	Ht. ap. in n. l.; sounds natural	4 months later ht. same	Working hard for examination.
46	Samuel B., 7, Feb., 1886	Appetite bad for some time	No rh. or ch.; bilious attacks	F., M., 5 B. and S., all strong	Ht. ap. natural; sounds natural; but during observation ht. ap. went to n. l., and a syst. ap. mur. developed, which was louder on exertion	—	No other cause known.

See also Cases 23, 24, 35.

CLASS IX.—Cases, without Rheumatism, preceded by hard mental work or worry.
Where not otherwise noted, first attacks.

Name, age, date.	History of mental strain.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
47 Albert S., 9, Nov., 1883	Studying hard	No rh.; sore-throats; eats hardly any meat	M. nervous; otherwise all strong	Ht. ap. in n. l.; imp. +; no mur.	—	No other cause known
48 Gertrude B., 12, Sept., 1884	Working for examination	No rh.; pale for 3 years; subject to "faints" for 2 years	All strong	Ht. ap. inside n. l.; imp. +; no mur.; the sp. beat varied to $\frac{1}{2}$ in. outside n. l., but was in n. l. at end of attack; no mur.	—	No other cause known.
49 Louisa B., 9, Nov., 1884	Working for examination	No rh.; scarlatina 3 years ago; fretful and peevish 2 months	—	Ht. ap. $\frac{1}{2}$ in. outside n. l.; 1st sound indistinct throughout, but no definite mur.	—	No other cause known.
50 Mary Anne S., 13, March, 1885	Studying hard to be a pupil-teacher	No rh.; scarlatina badly at 6	M. died cancer; strong	Ht. ap. $\frac{1}{2}$ in. outside at first, retreated to n. l. by end; pulse always very rapid; never any mur.	Feb., 1888.—Ch. once since; never otherwise unwell; strong and healthy; ht. ap. 1 in. outside n. l.; imp. rather +; a slight thrill; a short syst. ap. mur., constant when lying, only occasional when erect; 2nd sound very little +	No other cause known.

51	Maria P., 6, March, 1885	Working hard for examination	No rh.; always nocturnal in- continence of urine	All strong	Ht. nat. at first; ap. went out to n. l.	March, 1886. — A B. has had it, being "frit with elephants," she had it again when he was attacked; ht. ap. n. l.; no mur. March, 1888. — No rh. or ch. since; still head- aches and bilious at- tacks and bronchitis; ht. ap. outside n. l. in 5th space; loud syst. mur., loudest at ap., heard also behind	No other cause known.
52	Edith D., 11, April, 1885	Worries about lessons, talks of them in sleep	No rh.; bron- chitis; always delicate; head- aches; indiges- tion; much out of health last winter	F. and M. weakly; 2 other children, one of whom bronchitis	Ht. ap. inside n. l.; no mur.; a syst. ap. mur. gradually de- veloped under ob- servation	March, 1888. — No rh. or ch. since; still head- aches and bilious at- tacks and bronchitis; ht. ap. outside n. l. in 5th space; loud syst. mur., loudest at ap., heard also behind	No other cause known.
53	Sarah G., 14, June, 1885	A hard place; master harsh; she used to worry and be anxious about it; no definite fright	No rh.; small; pox mildly; "low fever," "faints" and headaches	F. strong; M. ch. when young; 7 B. and S.; 1 S. ch. and thrice	Ht. ap. n. l.; syst. ap. mur. heard be- hind; pulse irregu- lar throughout	—	No other cause known.
54	Louisa W., 10, July, 1887	Working for ex- amination at onset	No rh.; always delicate; scars of cervical ab- scesses	F. and M. rh.; B. and S. all strong	Ht. ap. in n. l.; syst. ap. mur.	—	No other cause known.
55	Jane W., 7, Jan., 1888	Working for ex- amination, and worrying about it	No rh.; ch. once before, also while working for an exami- nation; always delicate; head- aches lately	F. and M. strong; 1 S. (19) rh. f.; 1 B. (15) ch.	Ht. ap. $\frac{1}{2}$ in. outside n. l. in 5th sp.; no definite mur. at first, but during observa- tion a syst. ap. mur. developed, at first oc- casionally, then con- stant, when lying; pulse occasionally irregular	—	Paralytic variety.

See also Cases 4, 5, 7, 12, 14, 19, 26, 31, 34, 36, 39.

CLASS X.—Cases without Rheumatism or other cause in which there were previous attacks.

(A). With supposed cause.

Name, age, date.	History of previous chorea.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
56 Harry D., 17, Jan., 1884	Ch. twice before; 1st from fright by a man run- ning after him	No rh.; conjunc- tivities and ble- pharitis	—	Ht. ap. in n. l.; loud syst. ap. mur.	—	No cause for pre- sent attack.
57 Annie W., 14, Sept., 1884	Ch. thrice before; 1st at 10 from fright	No rh.; bron- chitis; head- aches; palpi- tation of ht.	F. not strong; M. bron- chitis; of 9 B. and S., lphthisis, 3 bron- chitis, 1 "faints," 1 rh. f. ch., and fits, rest strong	Ht. ap. inside n. l.; no mur.	—	No cause for pre- sent attack.
58 Hannah P., 11, June, 1885	Ch. once before, 2 weeks after fall downstairs	No rh.; not strong; blepha- ritis	F. and 5 B. and S. strong; M. rh. f., and ch. when young	Ht. ap. n. l.; imp. +; loud syst. ap. mur. heard behind	In previous attack, 18 months before, ht. is noted by clerk as natu- ral; no illness or ail- ment between that and this. March, 1888.—Ht. ap. outside n. l.; loud syst. ap. mur. heard behind	No cause for pre- sent attack.

(B). Without supposed cause.

59 Amelia S., 10, Nov., 1884	Ch. relapsing for 1 year, varying from side to side	No other illness	No rh. or ch.	Ht. natural	—	No cause for pre- sent attack.
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60	Harris W., 16, Feb., 1885	Ch. 4 times in last 5 years, generally in spring	No rh.; sores; is generally weak in winter, with large appetite and indigestion, well in summer, with small ap- petite and no indigestion	F. died paralysed; M. rh.; of 4 B., 1 phthisis, rest strong	Ht. ap. in n. l.; imp. +; 1st sound indis- tinct	July, 1885.—Ht. ap. No cause for pre- inside n. l.; sounds sent attack. clear
61	Mary Ann H., 14, Feb., 1885	Ch. once before	No rh.; always delicate	1 S. ch.; no other rh. or ch. in family	Ht. ap. $\frac{1}{2}$ in. outside n. l.; 1st sound in- distinct; pulse rapid	Feb., 1888.—No rh. or No cause for pre- ch. since, but not sent attack. strong; ht. ap. outside n. l. in 4th space, in n. l. 5th space; sounds natural
62	Emily C., 16, Feb., 1885	Ch. once before	No rh.; no ill- ness or ailment	All strong	Ht. ap. ? no mur.	No cause for pre- sent attack.
62	William W., 11, Nov., 1883	Ch. once before	No rh.; no ill- ness; headaches on reading late- ly	No rh. or ch.	Ht. ap. $\frac{1}{2}$ in. outside n. l.; syst. ap. mur., which disappeared during observation	See Case 41 No cause for pre- sent attack.
63	Louisa F., 13, Feb., 1885	Ch. once before	No rh.; no ill- ness or ailment	All strong	Ht. ap. in n. l.; loud syst. ap. mur.; apex went outside n. l. under observation	No cause for pre- sent attack.
64	Alice J., 13, March, 1885	Ch. off and on for 4 years	No rh.	1 B. ch.	Ht. ap. $\frac{1}{2}$ in. outside n. l.; imp. +; syst. ap. mur.; pulse ir- regular	No cause for pre- sent attack.
65	Edward W., 16, April, 1885	Ch. once before	No rh.; no ill- ness or ailment	M. dropsy; F. strong; no B. or S.	Ht. ap. inside n. l.; sounds clear; but later ap. in n. l.; sounds indistinct	No cause for pre- sent attack.
66	Frederick C., 11, April, 1885	Ch. once before	No rh.; cervical abscess; head- aches; indiges- tion; eczem. squam.	All strong	Ht. ap. in n. l.; no mur.; ap. went to inside n. l. during observation	March, 1888.—No rh. No cause for pre- or ch. since; ht. sent attack. natural

CLASS XI.—*Cases without Rheumatism or other cause. First attacks.*

Name, age, date.	Personal history.	Family history.	State of heart.	Subsequent history.	Remarks.
67 Emma T., 8, Nov., 1884	No illness; headaches; indigestion; eczem. squam.	F, M., and 2 B. and S. weakly; no rh. or ch.	Ht.: soft syst. ap. mur. on exertion	June, 1885.—Ht. ap. in n. l.; sounds natural	—
68 Annie B., 7, Dec., 1884	No illness or ailment	M. delicate; F. and 7 B. and S. strong; no rh. or ch.	Ht. ap. in n. l.; syst. mur. at ap. and b., dis- appearing under ob- servation	April, 1885.—No mur.	—
69 Minnie R., 12, Sept., 1884	No illness; faints; headaches; slight skin rashes	All strong	Ht. ap. in n. l.; no mur.	Jan., 1885.—Ht. same	—
70 Margaret S., 7, March, 1885	No illness; cervical ab- scesses	M. rh. f.; F. and 3 B. and S. strong	Ht. ap. natural; 1st sound indistinct	—	—
71 Harry G., Nov., 1883	Bronchitis; ? delicate	M. rh. f.	Ht. ap. in n. l.; syst. ap. mur. throughout; 2nd sound + at left base	March, 1885.—Ht. same. March, 1888.—No rh. or ch. since; loud syst. mur. heard in axilla	—
72 Emily D., 12, Feb., 1885	No illness or ailment	F. weak; M. rh. f.; 2 B. and S. strong	Ht. ap. in n. l.; syst. ap. mur. throughout	Aug., 1885.—Ht. ap. just inside n. l.; syst. ap. mur. on exertion	—
73 Eleanor W., 13, March, 1885	Typhoid f.; bronchitis	F. and M. died phthi- sis; 3 B. and S. de- licate	Ht. ap. $\frac{1}{2}$ in. outside n. l.; no mur.	—	—
74 James S., 16, April, 1885	Always very strong	All strong	Ht. ap. in n. l.; 1st sound murmurish; later a soft mur. at all orifices	March, 1888.—Quite well ever since; ht. natural; very strong looking	—
75 Amelia H., 18, May, 1885	Always pale and deli- cate; jaundice more than once; dainty	All strong	Ht. ap. just outside in 4th space; no mur.; pulse irregular	—	—

76	Amelia B., 7, May, 1885	No illness; always sick; headaches; can't eat rich food	All strong	Ht. ap. inside n. l.; an inconstant syst. mur.	—	In for an exami- nation at time of onset, but does not seem to have worried.
77	John W., 11, June, 1885	No illness; not strong; headaches after study- ing hard	F. rh. f.; 1 B. rh. f.; M. and 4 B. and S. strong	Ht. ap. at first in n. l.; retreated to natural; no mur.	No regular attack of ch. since, but subject to choreic movements on any worry or emotion, especially in right arm, so that he often can- not write properly; no rh.; ht. ap. in n. l.; imp. not +; 2nd sound not +; no mur.	—
78	Florence A., 13, June, 1887	No illness; always de- licate	F. ? M. died phthisis; 2 B. and S. strong	Ht. ap. in n. l.; 1st sound indistinct; a faint syst. mur. developed, only audible when lying	Nov., 1887.—Ht. ap. in n. l.; 1st sound indistinct; on lying down a distinct syst. mur., loudest at ap., not heard behind	—
79	Beatrice W., 10, Sept., 1887	Measles thrice; pertus- sis twice; always de- licate	No rh. or ch. in family	Ht. ap. ½ in. outside n. l.; 1st sound indistinct, though no mur.; 2nd sound + at left base	—	—
80	Mary G., 7, Oct., 1885	Measles; bronchitis; tonsillitis	M. and F. very strong; only a baby S.	Ht. ap. in n. l.; clear syst. ap. mur. heard behind	—	—

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. i, p. 48.)