

REPORTS
OF THE
COLLECTIVE INVESTIGATION
COMMITTEE

OF THE
BRITISH MEDICAL ASSOCIATION.

REPORT ON INQUIRY No. III.

ACUTE RHEUMATISM.

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THE invitation to the medical practitioners of the United Kingdom to furnish reports of cases of rheumatism which had come under their observation was issued by the Collective Investigation Committee of the British Medical Association on April 22nd, 1882, and the last report came to hand on June 5th, 1886. The result has been that observations on 655 cases have been sent to the Committee for comparison and analysis. It will be at once agreed that such a number of cases, recorded more or less in detail, is extremely creditable, when the arduous labours and the scanty leisure at the disposal of busy country practitioners (most of whom supply these records) are taken into consideration. It shows, moreover, how great is the interest which such men take in the advancement of the science of their profession.

The recorded cases have been considered for the most part in the order following:—1. Sex; 2. Age; 3. Occupation; 4. Habits; 5. Food; 6. Locality and Atmosphere; 7. Previous Illnesses; 8. Recent Antecedents; 9. Severity and Sweating; 10. Influence of Treatment on Duration of—*a.* Fever, *b.* Pain, *c.* the whole Attack; 11. Extent of the Joint-Affection; 12. Complications; 13. Relapsing Cases; 14. Deaths; 15. Skin Eruptions; 16. Subcutaneous Nodules; 17. Common Ailments; 18. Sequelæ.

SEX.

Of the 655 cases, 375, or 57.25 per cent., were males; 279, or 42.59 per cent., were females. In one case (133) the sex is not mentioned.

The difference in the numbers is not great, and it may be accounted for by the greater exposure to weather, etc., which the occupations of men entail upon them; added to which is the fact that men are, as a rule, more addicted to the consumption of beer and other forms of alcohol, which, though not perhaps an actual cause of rheumatism, certainly increases the liability to it in those who have once suffered from the disease.

AGE.

Of the whole number (655) of cases recorded, the ages of 6 males and 1 female are not mentioned, leaving a total of 647, or 369 males and 278 females, in which to calculate the average age in which the rheumatic attack occurred, including No. 133, in which the sex is omitted. The figures come out as follows:—In 369 males the average age of rheumatic attack, 26.55. In 278 females the average age of rheumatic attack, 23.82. Average age of the 647 cases, 25.38. Thus it is evident that the age difference between the two sexes, so far as the age of incidence is concerned, amounts practically to nothing.

Arranged in decades, the cases give the following result.

	Males.	Females.	Total.
Under 10	18	14	32
" 20	90	106	196
" 30	135	91	226
" 40	76	32	108
" 50	37	23	60
" 60	11	10	21
" 70	2	2	4
" 80	1	—	1
Age not mentioned.....	7		

655

It will be seen from the above that by far the greater number of cases occurred between the ages of 20 and 40—namely, 80.94 per cent.; that is, males 45.98 per cent., females 34.96 per cent.

[1417]

The greatest proportion in any one decade was between 20 and 30—namely, males 38.74 per cent., females 30.07 per cent. This is probably in accordance with general experience.

CASES OCCURRING AT EXCEPTIONAL AGES. 1.—IN PERSONS OF ADVANCED AGE.

Under this head five cases require especial notice, namely:

No. 14 (R. W. Barrow, Liverpool). Female, aged 66, married; third attack, the first occurred at the age of 33. Temperate habits and sufficiently fed. Locality, high, dry, and exposed; atmosphere wet and cold, with S.E. wind. Had previously suffered from sunstroke, glaucoma, and cardiac dropsy. The determining cause was attributed to over fatigue. Attack moderate in severity, with slight sweating: Duration of the fever and pain were 5 days and 8 days respectively; and the whole attack lasted 9 days. Many joints were affected; the pains migratory. Mitral systolic murmur of old standing; the apex being half an inch external to the nipple. The patient suffered frequently from urticaria and sick headaches. Recovery was complete.

No. 146 (J. W. Martin, M.D., Sheffield). Male, aged 63, a weighman, of temperate habits and sufficiently fed. Locality, low, dry and confined; atmosphere, wet and cold; wind N.E. He had had no previous illness, and the attack was attributed to exposure. It was a severe attack, with considerable sweating. Duration of fever and pain 20 days respectively, and the whole attack 26 days. Pains migratory, affecting many joints. No cardiac affection, and no previous rheumatic attacks. Recovery complete.

No. 153 (Thomas Fuller, M.D., New Shoreham). Male, aged 62, wheelwright, of temperate habits and sufficiently fed. Locality, high, dry and exposed; atmosphere, dry and mild, wind S.W. He had had no previous illness. The attack was a severe one, with considerable sweating. Duration of fever and pain 2 days respectively, and of the whole attack 21 days. Many joints affected; no record of any cardiac affection; third attack. Recovery complete. A relapse occurred 18 days after convalescence, and lasted 12 days, yielding to same treatment; namely, sodium salicylate.

No. 281 (E. A. Gibson, M.D., Edinburgh). Female, aged 68, widow, of temperate habits and sufficiently fed. Locality, high, dry and exposed; atmosphere, dry, cold, changeable; wind E. There had been no previous illness; the attack was ascribed to exposure to cold on the previous day. Attack severe, with considerable swelling. Duration of fever and pain 30 days and 5 days respectively, and of the whole attack 30 days. The muscles only were affected, and severely. She died of meningitis, there being no evidence of previous cardiac disease. No previous rheumatism. The case was complicated by pericarditis, and threatened pneumonia of the left lung.

No. 367 (T. H. Morehead, M.D., Cootehill, Cavan). Male, aged 80, farmer, of temperate habits and sufficiently fed. Locality, low, damp, confined; atmosphere, wet and cold; wind N.W. No previous illness. Tonsillitis was a recent antecedent, and the attack was attributed to exposure to wet and cold. It was a severe one, accompanied by night sweating. Duration of fever and pain 12 days respectively, and of the whole attack 42 days. Many joints were affected, and the pains were migratory. There was no cardiac affection; it was the first attack of rheumatism. Relapses occurred at intervals of 2 or 3 weeks. Recovery was complete.

The most remarkable of these five cases is the last, in which a first attack of rheumatic fever occurred at the age of 80, the attack being one of great severity. In this case recovery was complete. In a severe first attack, however, in another case (281), a woman of 68, death occurred after 30 days' illness. In a third case (143) a first attack occurred in a male aged 63.

2.—IN YOUNG CHILDREN. EIGHT CASES.

No. 13 (C. H. Hill, M.D., Islington). Male, aged 3; insufficiently fed. Locality, high, dry, and confined; atmosphere, wet and changeable; wind S.W. The attack was attributed to exposure to cold 3 days previously; it was mild, but attended by considerable sweating. Duration of the fever was 7 days; of pain 4 days; and of the whole attack 8 days. Few joints were affected; the pains were fixed; the child was liable to tonsillitis and bronchitis. Recovery was complete. A mitral murmur became audible during the attack, but afterwards was inaudible, the apex beating in the fifth space.

No. 109 (S. C. Smith, M.D., Halifax). Male, aged 6; sufficiently fed. Locality, low, damp, and confined; atmosphere, wet and cold. The patient had scarlatina just before. Attack a moderate one, with considerable sweating, lasting about 5 weeks. Many

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joints were affected; the pains were migratory. There was a systolic mitral murmur developed during the attack. No previous rheumatism. Recovery partial.

No. 245 (J. T. Collin, M.D., Lincoln). Male, aged 4; sufficiently fed. Locality, high, dry, and exposed; atmosphere, wet and cold; wind N.E. Had measles 2 years previously. Attack ascribed to exposure to cold 3 days before; it was a moderate one, but attended by considerable sweating. Duration of fever and pain 21 days and 14 days respectively; and of the whole attack 21 days. Few joints affected; pains migratory. No previous rheumatism. Death from pericardial effusion and exhaustion.

No. 450 (Edwin Jackson, Whalley Range, Manchester). Female, aged 5½; sufficiently fed. Locality, dry and flat; atmosphere, wet and cold; wind W. Whooping-cough at 4½. The attack was attributed to exposure to wet two days previously; it was a moderate one, attended by slight sweating. Duration of fever and pain 8 days and 6 days respectively, and of the whole attack 8 days. Many joints were involved. There was no cardiac complication, and no antecedent rheumatism. Recovery was complete.

No. 511 (D. J. Mackenzie, M.D., Glossop). Male, aged 5; sufficiently fed. Locality, low, damp, confined; atmosphere, dry, hot sun. Had measles six weeks before; attack attributed to exposure to wet and cold three days previously; it was a mild one, with slight sweating. Duration of fever and pain 6 days and 5 days respectively; and of the whole attack 6 days. Few joints were affected; the pains being fixed. Both pericarditis and endocarditis (mitral regurgitation) occurred during the attack, which was further complicated by bronchitis. No previous rheumatism. Recovery complete.

No. 587 (D. J. Mackenzie, M.D., Glossop). Male, aged 4; sufficiently fed. Locality, high, dry, exposed; atmosphere, wet and cold; wind W. Slight chorea 10 days previously. The attack was moderate, with very slight sweating. Duration of fever and pain 8 days and 12 days respectively, and of the whole attack 12 days. Few joints were affected; the pains were fixed. A systolic apical *bruit* was developed. The child was subject to catarrh and convulsions, but had had no previous rheumatism. A thread-worm was said to have been expelled by nantonin before the child came under observation. Recovery was complete.

No. 620 (J. Mackenzie Booth, M.D., Aberdeen). Male, aged 4; sufficiently fed. Locality, low, damp, confined; atmosphere, wet; wind E. There had been marked anæmia for some weeks. The attack was attributable to exposure to wet and cold, with over-fatigue 2 days previously; it was a severe one, with slight sweating. Duration of fever and pain 6 days respectively, and of the whole attack 6 days. Many joints were involved; the pains were fixed. There was an apical systolic murmur, and the disease was complicated by conjunctivitis and keratitis. No previous rheumatism. Bronchitis supervened 2 days after convalescence became established. Recovery was complete.

No. 627 (C. P. Coombs, M.D., Castle Cary). Male, aged 6; sufficiently fed. Locality, dry, confined; atmosphere, dry, cold, changeable; wind E. The attack was severe, with slight sweating. Duration of fever 17 days, and of the whole attack till death about 40 days. Pericarditis was developed, and the disease was complicated by chorea of one arm and aphasia; then by indications of spinal meningitis. Death was the result of embolism. The child had previously suffered from three or four attacks of subacute rheumatism; the first at the age of 5.

OCCUPATION.

The occupation of the patients who were the subjects of the record are varied, and are as follows.

Domestic servants	71	Colliers	9	Sempstresses	4
School children	63	Tailors	8	Bakers	4
Married women	46	Masons	8	Bricklayers	4
Labourers	24	Soldiers	7	Brickmakers	4
Clerks	21	Iron workers	7	Sailors	4
Agricultural labourers	16	Cotton hands	7	Carmen	3
Farmers	13	Engine drivers	6	Nailmakers	3
Shopmen	13	Carpenters	6	Furnace cokers	3
At home (females chiefly)	13	Waggoners	6	Navvies	3
Innkeepers	13	Nurses	6	Painters	3
Factory hands	11	Governesses	6	Weavers	3
Grocers	10	Coachmen	6	Druggists	3
Medical practitioners	9	Laundresses	5	Shoemakers	2
		Blacksmiths	5	Brewers, etc.	2
		Gardeners	5	Gamekeepers	2
		Dressmakers	4	Plumbers	2

Quarrymen	2	Mineral borer	1	Porter	1
Gasfitters	2	Bleacher	1	Circus tent maker	1
Fruiters	2	Weighman	1	Assistant warder	1
Dairymen	2	Wheelwright	1	Barmaid	1
Whitesmiths	2	Cabman	1	Open air	1
Charwomen	2	Gentleman	1	Purser's clerk	1
Maltsters	2	Undergraduate	1	Milk carrier	1
Warehousemen	2	Commission agent	1	Cabinet designer	1
Paper mill hands	2	Hay dealer	1	Printer	1
Coopers	2	Grinder	1	Fisherman	1
Various trades	2	Railway guard	1	Prostitute	1
Police constables	2	Signalman	1	Bookseller	1
Postmen	2	Canal boatman	1	Reformatory boy	1
Telegraph messengers	2	Higgler	1	Literary	1
Tube makers	2	Pilot	1	Pupil in colliery	1
Solicitor	1	Stationer	1	Vice maker	1
Oilman	1	Saddler	1	Builder	1
Railway porter	1	Drilling machine	1	Casting dresser	1
Screver	1	hand	1	Lace darning	1
Postmaster	1	Electric worker	1	Stone printer	1
Cutler	1	Mercantile	1	Boot tip stamper	1
Machine maker	1	Tin opener	1	Bookkeeper	1
Filler	1	Rope maker	1	Skin dresser	1
Brick carter	1	Dancing mistress	1	Potter	1
Traveller with steam engine	1	Fitter	1	Card room hand	1
Gunner	1	Fireman	1	Message boy	1
Infirmiry matron	1	Servant in asylum	1	Ship chandler	1
Pupil teacher	1	Vinegar maker	1	Upholsterer	1
		Bandsman	1	Analytical chemist	1
		Watchmaker	1		

Inspection of the above list at first sight appears to negative the explanation advanced above, of the difference between the numbers of males and females in the tables, namely, that the exposure necessarily entailed on men by the nature of their occupation is a cause of their being more frequently the subjects of rheumatism. It must, however, be remembered that the cases reported are simply those which different medical practitioners have been able to record during the time allowed them for furnishing the results of their experience. They are by no means to be received as a record of the prevalence of rheumatism in various trades or occupations. If it were, common experience would lead one rather to place such occupations as sailors, soldiers, brewers, bricklayers, coachmen, cabmen, police constables at the head of the list. It cannot be denied, however, that the number of domestic servants (71) is a remarkable occurrence. This may be partly accounted for by the inordinate consumption of alcoholic drinks—especially beer—and meat to which persons in that station of life are addicted. To this may be added want of proper exercise, with its consequent accumulation of nitrogenous compounds in the tissues.

One important omission must be noted in the tables, namely, an inquiry as to any hereditary tendency to rheumatism. Had this been available for analysis, it might have afforded an explanation of the great number of children (63) which comes second on the list.

CLASS IN SOCIETY.

Instead of grouping the cases in the different classes, namely, upper, middle, and lower, it has been deemed preferable to give the list in full, as showing more accurately the class to which the majority belong. It will be seen at a glance that the lower greatly preponderates over the middle and upper classes.

HABITS.

In calculating the numbers given in the tables under the three heads—temperate, intemperate, and total abstainers, it was thought well to group separately children under 14 years of age who were under close supervision either at home or at school. Such young persons who were engaged in any occupation which necessarily removed them from the supervision of the parents or school teachers, when not under 14 years of age, have been placed among the adults in the class to which they belong. There are, therefore, 647 cases to be dealt with under this head, excluding those in which no mention of the habit is made, namely:—

	Males.	Females.	Children under 14. Males.	Females.
Temperate	263	177	9	15
Intemperate	32	2	—	—
Total Abstainers	47	54	22	26
No mention made	5	3	—	—
Total	347	236	31	41

In order to trace the effects of habits in acute rheumatism, it will be necessary to make an analysis of the tables, and by so doing the following results come out:—

TOTAL ABSTAINERS (including Children).				
Males ...	...	69	or 10.53	per cent.
Females ...	...	80	„ 12.21	„
Total ...	...	149	„ 22.74	„
Average age of total abstainers:—				
Males ...	...	...	...	18.86
Females ...	...	...	...	18.98
Total average age ... 18.17				
Decade.				
Under 10 ...	Males. 13	Females. 11	...	Total. 24
„ 20 ...	33	42	...	75
„ 30 ...	11	19	...	30
„ 40 ...	9	2	...	11
„ 50 ...	2	3	...	5
„ 60 ...	1	3	...	4
69 80 149				

Previous attacks of rheumatism occurred in total abstainers in
 Males ... 19 or 27.53 per cent.
 Females ... 29 „ 36.25 „

Average age of previous attack:—
 Males ... 16.26
 Females ... 16.41

Average number of previous attacks:—
 Males (69 cases) ... 0.56 (exclusive of Nos. 353 and 469, in which no mention is made)
 Females (80 cases) ... 0.60 (exclusive of Nos. 53 and 205, in which no mention is made)

Average duration of fever:—
 Males (64 cases) ... 11.59 days (no data in 5 cases)
 Females (77 cases) ... 10.37 days (no data in 3 cases)

Average duration of pain:—
 Males (61 cases) ... 11.31 days (no data in 8 cases)
 Females (76 cases) ... 12.22 days (no data in 4 cases)

Average duration of whole attack:—
 Males (60 cases) ... 27.26 days (no data in 9 cases)
 Females (70 cases) ... 38.08 days (no data in 10 cases)

Deaths.

Males ... 4
 Females ... 3 (excluding No. 112, in which death occurred from enteric fever)
 Males ... 5.79 per cent.
 Females ... 3.75 „
 or a total death-rate of 4.69 per cent. in total abstainers.

Recovery.

Complete. Partial.
 Males ... 54 cases or 83.63 per cent. ... 10 cases or 15.15 per cent.
 Females ... 51 cases „ 63.75 „ ... 25 cases „ 31.25 „

(Excluding No. 255, female, in which the result is not stated.)
Occurrence of Heart Affection in Total Abstainers.

	Males.	Females.	Total.
Mitral regurgitation (during attack)	13	12	25
Pericarditis and mitral regurgitation	8	9	17
Mitral regurgitation (old)	7	7	14
Pericarditis	7	4	11
Aortic disease	3	2	5
Mitral and aortic (during attack)	3	1	4
Mitral stenosis	2	1	3
Mitral and aortic (old)	1	—	1
Mitral and pulmonary systolic	—	1	1
Old disease	—	2	2
Endocarditis	—	1	1
Pulmonary systolic murmur	—	1	1
Murmur	1	—	1
Not mentioned	—	—	4
	45	41	90

Percentage of recent heart disease, that is, occurring during the present attack:—

Males (68 cases) ... 54.41 per cent. (No. 259 not mentioned)
 Females (78 cases) ... 43.58 „ (Nos. 303, 337 not mentioned).

TEMPERATE (including Children).				
Males ...	...	272	or 41.52	per cent.
Females ...	...	192	„ 29.31	„
Total ...	...	464	„ 70.83	„
Average age:				
Males ...	...	...	...	27.40
Females ...	...	...	...	20.57
Average age of the whole number... 26.47				
Decade.				
Under 10 ...	Males. 5	Females. 4	...	Total. 9
„ 20 ...	58	61	...	119
„ 30 ...	111	68	...	179
„ 40 ...	54	31	...	85
„ 50 ...	33	17	...	50
„ 60 ...	8	8	...	16
„ 70 ...	2	2	...	4
„ 90 ...	1	—	...	1
272 191 463				

(Excluding No. 579, F., in which the age is not mentioned.)
 Previous attacks of rheumatism occurred in temperate persons in

Males ... 127 cases or 46.69 per cent.
 Females ... 83 „ 43.22 „

Average age of previous attack:
 Males (118 cases) ... 17.70 (age not stated in 9 cases)
 Females (83 cases) ... 17.59

Average number of previous attacks:
 Males (excluding Nos. 22, 83, and 373, in which the number is not stated) ... 2.19
 Females (excluding Nos. 202, 239, 254, 403 and 614, in which the number is not stated) ... 2.11

Average duration of fever:
 Males (253 cases) ... 11.37 days (no data in 19 cases)
 Females (184 cases) ... 12.10 „ „ 8 „

Average duration of pain
 Males (252 cases) ... 14.28 days (no data in 20 cases)
 Females (176 cases) ... 13.38 „ „ 16 „

Average duration of whole attack:
 Males (256 cases) ... 25.37 days (no data in 16 cases)
 Females (176 cases) ... 24.23 „ „ 16 „

Deaths.

Males ... 6 or 2.20 per cent.
 Females ... 4 „ 2.07 „
 or a total death-rate of 2.15 per cent. in temperate persons.

Recovery.

Complete. Partial.
 Males ... 201 cases or 73.89 per cent. 61 cases or 22.34 per cent.
 Females 133 „ 69.27 „ 51 „ 26.56 „

(Exclusive of Nos. 65, 151, 249, 579, males, in which the result is not mentioned.)
 (Exclusive of Nos. 81, 150, 322, 567, females, in which the result is not mentioned.)

Occurrence of Heart Affection in Temperate Persons.

	Males.	Females.	Total.
Mitral regurgitation	43	48	91
Pericarditis and mitral regurgitation	22	16	38
Pericarditis	10	—	10
Mitral regurgitation (old)	10	14	24
Murmur	8	3	11
Aortic obstructive	5	4	9
Aortic obstructive, mitral regurgitation	3	—	3
Pericarditis and murmur	3	3	6
“Aortic and mitral”	2	2	4
Presystolic murmur	2	2	4
Aortic diastolic (old)	2	—	2
Pericarditis and mitral obstructive	1	—	1
Pericarditis and presystolic murmur	1	1	2
Aortic and mitral systolic and presystolic...	1	—	1
Mitral diastolic...	1	—	1
Murmur diastolic	1	—	1
Aortic obstructive (old)	1	—	1
Pulmonary diastolic	1	—	1
Pericarditis (old)	1	—	1
Aortic regurgitant, mitral regurgitant	2	—	2
Aortic regurgitant, mitral regurgitant, and pericarditis...	1	1	2

Carried forward ... 121 94 215

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Brought forward	...	121	94	215
Murmur at base...	...	1	—	1
Aortic (old)	...	1	1	2
Murmur (old)	...	1	—	1
"Murmur and aortic systolic" (old)	...	1	—	1
Hæmic...	...	—	4	4
Pericarditis and aortic obstructive	...	—	4	4
Endocarditis (old)	...	—	3	3
Pericarditis and endocarditis	...	—	2	2
Presystolic and mitral systolic	...	—	1	1
Mitral stenosis (old)	...	—	1	1
Pericarditis and mitral systolic (old)	...	—	2	2
"Pericarditis, aortic and mitral" (old)	...	—	1	1
Pulmonary murmur	...	—	1	1
Pulmonary systolic	...	—	1	1
Aortic regurgitant	...	—	1	1
Endocarditis	...	—	1	1
		125	117	242
Percentage of recent heart disease, that is, occurring during present attack:				
Males (271 cases)	...	40.59	per cent.	(No. 579 not mentioned)
Females (192 cases)	...	49.47	per cent.	
INTEMPERATE.				
Males	...	32	or 4.76	per cent.
Females	...	2	„ 0.30	„
Total	...	34	„ 5.34	„
Average age of intemperate persons:				
Males	...	33.74		
Females	...	31		
Average age of the whole number... 33.60				
Decade.				
Under 20	...	1		
" 30	...	10		1
" 40	...	12		—
" 50	...	6		1
" 60	...	2		—
Total	...	31		2
Age not mentioned in No. 62 (male).				

Previous attacks of rheumatism occurred in intemperate persons in—	
Males	... 12 cases, or 37.5 per cent.
Females	... 1 " 50.0 "
Average age of previous attack:	
Males (12 cases)	... 21.85
Females (1 case)	... 21
Average number of previous attacks:	
Males (12 cases)	... 1.25
Females (1 case)	... 7
Average duration of fever:	
Males (30 cases)	... 11.6 days (no data in 2 cases).
Females (2 cases)	... 12.5 "
Average duration of pain:	
Males (30 cases)	... 14.46 days (no data in 2 cases).
Females (2 cases)	... 10 "
Average duration of whole attack:	
Males (30 cases)	... 23.6 days (no data in 2 cases).
Females (1 case)	... 7 " (no data in 1 case).
Deaths.	
Males	... 2 or 6.89 per cent.
Females	... 1 „ 50 "
or a total death rate of 8.82 per cent. in intemperate persons.	
Recovery.	
Complete. Partial.	
Males	... 17 or 53.12 per cent. 12 or 38.70 per cent.
Females	... 1 „ 50 " 0
Occurrence of Heart Affections in Intemperate Persons.	
	Males. Females. Total.
Mitral regurgitation	7 — 7
Pericarditis and murmur	3 — 3
Pericarditis	2 — 2
Pericarditis and mitral regurgitation	1 1 2
Pericarditis, mitral and aortic regurgitation	1 — 1
Aortic obstructive and mitral regurgitation	1 — 1
Murmur (old)	1 — 1
	16 1 17
Percentage of recent heart disease, that is, occurring during present attack:	
Males (32 cases)	... 46.87 per cent.
Females (no data)	...

	Percentage of		Average Age.		Percentage of Previous Attacks.		Average Age at which Previously Attacked.		Average Number of Persons Attacked.		Average Duration in days of			Percentage of Deaths.		Recovery per cent.		Percentage of Recent Heart Affections.						
	Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.	Fever.	Pain.	Whole Attack.	Males	Fem.	Complete.	Partial.	Males	Fem.					
Tototallers	19.53	12.24	18.86	18.77	27.53	36.25	16.26	16.21	0.56	0.60	11.59	10.37	11.31	12.23	27.26	38.08	5.79	3.54	83.63	63.75	15.15	31.25	54.41	43.58
Temperate	41.52	20.31	27.40	20.57	46.69	43.22	17.70	17.58	2.19	2.11	11.37	12.10	14.23	13.38	25.37	24.23	2.20	2.07	73.89	69.27	22.34	26.50	40.59	49.47
Intemperate	4.76	0.30	33.74	31.00	48.38	*	24.85	21.00	1.25	*	11.05	12.50	14.46	10.00	23.60	7.00	6.89	0.00	53.12	*	38.70	*	46.87	*

* No data. † No. 259; no data. ‡ Nos. 303, 337; no data. § No. 579; no data.

This table is drawn up in order that the course and complications of rheumatism, as set forth in the records, which occurred in teetotallers, temperate, and intemperate persons may be more easily compared. It must be borne in mind, however, that in intemperate females but two cases are given; no importance must therefore be attached to the figures under this heading. The table speaks for itself. On the whole, the figures are in favour of the teetotallers; but in three of the most important points it is distinctly the reverse, and it is somewhat surprising to find, first, that the average duration of the whole attack is 23.6 days in intemperate males, as against 25.27 days in temperate males and 27.26 days in teetotallers; secondly, that the percentage of deaths in teetotallers is more than double that of temperate persons; and, thirdly, that the percentage of heart affection is in teetotallers 54.41, as against 40.59 in temperate males and 46.87 in intemperate males.

It was thought advisable to make a brief analysis of the tables in children under 12 years of age with the view of eliciting any facts from the information given under the more important headings.

In the tables records are given of 51 cases of children under the above-mentioned age, namely: males, 25; females, 26.

Average age, males, 7.72; females, 9.15.

The attack was severe in: 8 (33 per cent.) 6 (23.07 per cent.)
 " moderate or mild: 16 (66 per cent.) 20 (76.92 per cent.)
 The joint affection was:

		Males.	Females.
Many affected; pains migratory	...	9	11
Few " " fixed	...	9	4
" " " migratory	...	4	4
Many " " fixed	...	2	3
Few " " "	...	1	2

Average duration (in days) of fever:
 Males ... 22 cases (72, 109, 121 no data) 10.72
 Females ... 25 " (337 ") 8.76

Average duration (in days) of pain:
 Males ... 21 cases (72, 109, 466, 627 no data) 11.09
 Females ... 25 " (337 ") 10.00

Average duration (in days) of the whole attack:
 Males ... 24 cases (121 no data) ... 22.12
 Females ... 25 " (205 ") ... 15.96

Recovery.

		Males.	Females.
Complete	... 19 or 76 per cent.	21	or 80.76 per cent.
Partial	... 4 " 16 " "	4	" 15.38 "
Deaths	... 2	1	

Heart affections:

	Males.	Females.
Mitral regurgitation	7	6
Pericarditis and mitral regurgitation ...	4	3
Pericarditis	2	3
Aortic obstruction	2	—
Aortic and mitral	1	—
Pericarditis and murmur	1	—
" " aortic obstruction	—	1
" " mitral regurgitation (old) ...	1	—
	18	13
Percentage of heart affections... ..	72	50

Inspection of the above figures brings out one fact, namely, that the percentage of children in whom the articular affection was severe and extensive is 36 per cent. in males and 42.30 per cent. in females. This is contrary to the received opinion, but the discrepancy may perhaps be accounted for by the small numbers here available. The duration of the fever, pain, and of the whole attack is about the same as in adults of the most approved habits; and this remark applies, generally speaking, to the percentage of complete recoveries. In the percentage of heart affection among males, the excessive liability of children is clearly shown by the figures, namely, 72 per cent. in children, against 54 per cent. in total abstainers, 40 per cent. in temperate males, and 46 per cent. in intemperate males. In the case of females the difference is much less.

FOOD.

Apparently but little information is to be gained under this head, the numbers being—

Food sufficient	626
" insufficient	27
" more than sufficient	1
Not stated	1
	655

It is unnecessary therefore to state the proportion of males to females.

LOCALITY.

The numbers come out as follows:—			
High, dry, exposed ...	161	High, damp, confined ...	9
Low, damp, confined ...	98	Low, confined ...	8
High, dry ...	52	Low, damp ...	6
Low, damp, exposed ...	46	Damp ...	5
Low, damp ...	35	Dry, confined ...	5
High, damp, exposed ...	31	Damp, exposed ...	5
High, exposed ...	31	Low ...	4
High, dry, confined ...	28	At sea ...	3
Low, dry, confined ...	26	Confined ...	2
Low, dry ...	19	Damp, confined ...	2
Low, dry, exposed ...	18	Exposed ...	2
High ...	14	Medium ...	1
High, damp ...	11	Travelling ...	1
Dry, exposed ...	10	Dry, flat ...	1
Dry ...	9	Flat, dry, confined ...	1
Not mentioned ...	9		

This is a somewhat remarkable list. It is a general opinion that rheumatism is more prevalent in low and damp localities, and it is certainly surprising that by far the greater number of cases (in 24.92 per cent.) occurred in a "high, dry, exposed" locality, and that, on the other hand, only two cases out of 646 in which data exist in the tables, occurred in a "damp, confined" locality. It is true that the next number (98 cases) occurs under the heading "low, damp, confined," but this is followed by 52 cases in a "high and dry" locality; the result of examination of the above list being that no facts of real value come out under this head.

ATMOSPHERE.

Wet or damp, cold, and cloudy	307
Wet, mild, and changeable	156
Dry, hot, sun for the most part	63
Dry and cold	57
Dry, mild, changeable	37
Wet	10
Damp	4
Not mentioned	21

Under this head the numbers come out in accordance with prevailing opinion. By far the greater number (307, or 47.66 per cent.), occurred in a wet, damp, cold, and cloudy atmosphere.

PREVIOUS ILLNESSES—TONSILLITIS.

In 158 cases, or 24.12 per cent., the patients were the subjects of tonsillitis, and it is worthy of remark that the numbers were the same in the two sexes, namely, 79, or 12.06 per cent. Again, sore-throat (the exact nature of which is not specified) occurred in 10 males and 10 females.

Of the 158 cases, 12 males and 15 females were the subject of tonsillitis as a common ailment, that is, the patients were liable to attacks of inflammation of the tonsil apart from any definite manifestation of rheumatism.

Of these cases—

No. 53. Female, aged 17, was attacked with tonsillitis three days after exposure to wet and cold.

No. 435. Male, aged 12. The tonsillitis lasted throughout the rheumatic attack (twenty-one days), and continued after convalescence was established.

No. 481. Female, aged 23. The attack commenced with tonsillitis.

No. 497. Female, aged 20. Tonsillitis supervened on the third day of the rheumatic attack.

No. 604. Male, aged 49. Tonsillitis preceded the rheumatism by six days, and recurred five days after recovery from the rheumatism.

No. 613. Female, aged 30. The patient had three attacks of tonsillitis each followed by acute rheumatism.

With the exception of the above cases specially mentioned, the tonsillitis preceded the rheumatism at variable intervals. Two cases (103, 494) as long as fourteen years previously; one case (11) five years previously; one case (638) four years previously; one case (517) tonsillitis and scarlet fever three years before; four cases (107, 189, 305, 516) two years before; seven cases (105, 317, 332, 438, 502, 635, 647) between one and two years. Of the remainder, tonsillitis occurred at periods varying between twelve months and the actual day of the onset of the rheumatism. In all those cases in which any cause for the tonsillitis or rheumatism is distinctly stated, exposure to wet, cold, or over-fatigue, or all three combined, is given. It is unnecessary therefore to print the exact numbers.

SCARLET FEVER AS AN ANTECEDENT.

Scarlet fever is mentioned as an antecedent in 88 cases only out of the total number, 655, or 13.43 per cent. It is probable, however, that this number does not represent the actual fact, and that the disease, as an antecedent of rheumatism, is not stated by many reporters, simply because no special inquiry was made as to particular fevers.

Of the 88 cases 43 or 6.41 per cent. were males

45 or 6.71 " " females.

It is not possible, by reason of the scanty data, to draw any conclusions as to the origin of valvular disease of the heart in specific fever other than rheumatism, but the following case may be noted as the only one having any special bearing upon this point.

No. 130 (James Barr, Bolton). Male aged 18; gasfitter. No previous rheumatic affection. Patient a total abstainer. He had measles 10 years and scarlet fever 8 years before the rheumatism, which was apparently induced by over-fatigue and exposure to wet on the day previous. When the patient came under observation a systolic aortic and a mitral murmur were heard, and on the termination of the rheumatism at the end of a fortnight, the heart's apex was 1 inch external to the nipple, showing clearly that the valve disease was of old standing.

In many of the cases of antecedent scarlet fever old valvular disease of the heart is recorded, but in them there had been at least one previous attack of rheumatism. The above-mentioned case forms the only exception. The incidence of the scarlet fever was, as common experience would show, in the earlier years of life, that is, before 20.

MEASLES AS AN ANTECEDENT.

Measles is recorded in 21 males or 63.63 per cent.

" " 13 females " 39.39 "

34 cases in all.

As in scarlet fever, the reports are insufficient for any definite conclusions, but the following cases are worthy of mention as bearing upon the question of the causation of heart disease.

No. 1 (Theophilus Trend, M.D., Southampton). Male, aged 32; solicitor. Had measles in childhood, followed by rheumatism.

He had an aortic murmur (systolic) when he came under observation, but at the termination of the attack it had diminished in intensity, and the apex beat was in its normal position.

No. 130 (James Barr, Bolton). Male, aged 18; gasfitter. Had scarlet fever 8 years and measles 10 years previously. He had an old systolic aortic and mitral murmur, and at the end of the rheumatic attack the apex was 1 inch external to the nipple. He had had no previous rheumatism.

No. 189 (C. Harrison, M.D., Lincoln). Female, aged 23, single, a cook. Had measles 21 years and scarlet fever 2 months previously. She had a systolic murmur observed during the attack of rheumatism, but it is not stated whether the murmur existed at the onset of the rheumatism, or whether it persisted after the convalescence was established. She had had no previous rheumatism.

As in the case of scarlet fever, the measles occurred in early life, and before 20 years of age.

Measles was associated with scarlet fever as an antecedent in 7 cases, of which Nos. 44, 103, 117, 130, 277, 365, 434 were males, and 1, No. 189, was a female. It was associated with varicella in 1 male (No. 309); with tonsillitis in 2 males (Nos. 1 and 11), and 1 female (Nos. 502); with tonsillitis and pertussis in 1 male (No. 103); with pertussis in 1 male (No. 420), and 3 females (Nos. 132, 392, 574); with tonsillitis and scarlet fever in 1 female (No. 229); with tonsillitis and chorea in 1 male (No. 433). In the remaining 15 cases measles was the only antecedent—namely, in 8 males and 7 females.

TYPHOID AS AN ANTECEDENT.

This occurred in 11 cases, of which 6 (295, 356, 389, 483, 518, 612) were males, and 5 (94, 139, 357, 360, 481) were females; of these, enteric and scarlet fever were antecedents in 5 cases.

No. 139. Female, aged 28, had enteric fever 25 years previously, and scarlet fever in childhood; 1 previous rheumatic attack at 19. No morbus cordis.

No. 357. Female, aged 8, recovered from enteric fever 2 months previously to the rheumatism, having had scarlet fever 14 months before. No previous rheumatism; no morbus cordis.

No. 389. Male, aged 17, had scarlet fever 8 years previously; the date of the enteric was uncertain. No previous rheumatism; no morbus cordis.

No. 360. Female, aged 22, had enteric fever, scarlet fever, small-pox, and whooping-cough as antecedents, but the dates of the fevers are not stated; 1 previous rheumatic attack at 19. No morbus cordis.

No. 431. Female, aged 28, had scarlet fever 19 years previously; the date of the enteric was unknown; 5 previous rheumatic attacks. Old morbus cordis.

No. 518. Male, aged 20, had enteric fever 6 years and tonsillitis 6 months previously; 1 previous rheumatic attack at 18. No morbus cordis.

Of the remaining 5 cases, enteric fever was the only antecedent, namely, in 2 males and 4 females.

TYPHUS AS AN ANTECEDENT

Occurred in—

No. 174 (W. Easby, M.D., March). Male, aged 18; 11 years previously. No previous rheumatism. No morbus cordis.

No. 372 (C. B. Richardson, M.D., Brighton). Female, aged 21; 5 years previously; this patient had scarlet fever when young; 1 previous rheumatic attack at 15. Old morbus cordis.

No. 441 (J. W. Miller, M.D., Dundee). Male, aged 47; twice previously; the patient had bronchitis 7 years, and otitis 5 years before; 3 previous rheumatic attacks, the first at 12. No morbus cordis.

VARIOLA AS AN ANTECEDENT

Occurred in 4 cases—3 males and 1 female, namely:

No. 136 (J. H. Jackson, M.B., Wigan). Male, aged 36, had variola 32 years, and pneumonia 20 years previously; 1 previous rheumatic attack at 19. No morbus cordis.

No. 370 (Thomas F. Raven, Broadstairs). Male, aged 40, had variola 7 years previously. No previous rheumatism. No morbus cordis.

No. 451 (John Reid, Rochdale). Female, aged 15, had variola 7 months previously. No previous rheumatism. No morbus cordis.

No. 645 (B. Roberts, M.D., Eastbourne). Male, aged 29; variola 18 years; scarlet fever 24 years previously; 1 previous rheumatic attack at 20. Old aortic disease.

(In No. 451 a mitral systolic murmur was heard during the

rheumatic attack, and in No. 645 an old aortic murmur, but in none of the others is any cardiac disease recorded.)

OTHER ACUTE SPECIFIC DISEASES AS ANTECEDENTS.

Whooping-cough occurred in 6 cases, namely, 3 males and 3 females.

Rötheln occurred in 2 cases, both females.

Mumps " 1 case, namely female.

Erysipelas " 1 " " "

Varicella " 1 " " "

" Fever " 1 " " "

In none of the above was there any heart affection unconnected with the rheumatism.

Syphilis is specially noted in 4 cases, namely, 1 male and 3 females.

No. 2 (Charles Ede, Guildford). Female, aged 40; syphilis was doubtful; the patient had suffered from eczema for 1 year previously.

No. 167 (T. Hyde Hills, Cambridge). Male, aged 32; cabman; the date of infection, etc., not stated.

No. 332 (W. Shaw, M.D., Maidstone). Female, aged 36, married; infected 4 years previously.

No. 424 (Thomas F. Raven, Broadstairs). Female, aged 35; infected 4 years previously by husband.

ANÆMIA AS AN ANTECEDENT.

Anæmia is recorded in 17 cases, or 2.59 per cent.; of which 3 or 0.45 per cent. were males, and 14, or 2.13 per cent., females.

No. 37. Male, aged 6; anæmic child; 1 previous attack of rheumatism at 3 years of age.

No. 47. Female, aged 14, single; errand girl; anæmia for two months previously.

No. 59. Female, aged 19, single; dressmaker; anæmia, no date given.

No. 78. Female, aged 28, married; anæmia, no date given. Phlebitis after parturition 38 days previous to rheumatism; 1 previous rheumatic attack at 14.

No. 94. Female, aged 15, single; house work; anæmia, no date given. Enteric fever 3 years previously.

No. 138. Female, aged 22, single; servant; anæmia, no date given.

No. 252. Male, aged 26; joiner; anæmia, no date given; neuralgia; 2 previous rheumatic attacks; first at 22.

No. 302. Female, aged 24; servant; anæmia, no date given; neuralgia, scarlet fever in childhood; 3 previous attacks of rheumatism, first at 13.

No. 340. Female, aged 24, married; anæmia, no date given; 2 previous attacks of rheumatism, first at 18.

No. 360. Female, aged 22, single; milliner; anæmia, no date given; 1 previous attack of rheumatism at 19. Scarlet fever, enteric fever, variola. Pertussis in former years.

No. 372. Female, aged 21, single; shopgirl; anæmia, no date given; 1 previous attack of rheumatism at 15. Typhus and bronchitis 5 years before second rheumatic attack. Scarlet fever in former years.

No. 423. Female, aged 20, single; at home; anæmia, no date given; migraine, debility, hysteria; insufficient diet; 1 previous rheumatic attack at 16.

No. 499. Female, aged 18, single; servant; anæmia, no date given; bronchitis, otitis in former years.

No. 549. Female, aged 24, single; servant; anæmia, no date given; 1 previous rheumatic attack at 15.

No. 520. Male, aged 4; anæmia some weeks previously; conjunctivitis, keratitis.

No. 622. Female, aged 27, married; anæmia, no date given; abortion and flooding 8 months previous to rheumatic attack; 5 previous rheumatic attacks, first at 8.

No. 647. Female, aged 17, single; servant; anæmia, no date given; scarlet fever at 5 years of age; tonsillitis 21 months before the last attack of rheumatism; old cardiac disease; no previous rheumatism.

In 5 of these cases cardiac complication existed, namely, in No. 37 a mitral systolic bruit was developed during the rheumatism, there having been one previous attack at the age of 3; 78, an old systolic mitral murmur, the patient having had an attack of acute rheumatism 14 years previously; 302, a mitral systolic murmur (probably of old-standing), there having been 3 previous attacks of acute rheumatism; 372, a mitral systolic murmur (but whether old or recent is not stated), with an attack of rheumatism 6 years previously; 647, a mitral systolic bruit (possibly of old standing),

with previous history of scarlet fever, but without any record of rheumatism.

It will be seen, therefore, that anæmia cannot, so far as these cases are concerned, be regarded as a cause of cardiac disease, but that in those instances in which it existed it must be attributed rather to rheumatism (4 cases), or to scarlet fever (1 case).

PULMONARY DISEASES AS ANTECEDENTS.

Bronchitis	occurred in 15 cases=	10 males,	5 females.
Pneumonia	" " 7	" = 3	" 4
Pleurisy	" " 2	" = 2	" "
Pleuropneumonia	" " 1	" = 1	" "

WHOOPING-COUGH AS AN ANTECEDENT

In 6 cases=3 males and 3 females.

Namely...	No. 199.	Male,	aged 31;	no date given.
"	392.	Female,	" 7	" "
"	420.	Male;	" 8	7 years previously
"	450.	Female,	" 5	4 1/2 " "
"	574.	" 10	5	" "
"	629.	Male,	" 14;	no date given.

CHOREA.

It is not a little remarkable, considering the recent observations of Dr. Stephen Mackenzie and others, that chorea is mentioned in this series of 655 cases as an antecedent or concomitant of rheumatism in 13 instances only, or 1.98 per cent., namely, males, 0.76 per cent.; females, 1.22 per cent. No apology is needed therefore for a statement of the chief particulars in each case.

No. 49 (F. Marsh, Stafford). Female, aged 24; single; housemaid; temperate; sufficiently fed. Locality, low, damp, exposed; 2 previous attacks of rheumatism, the first at 13. Scarlet fever 12 years previously; chorea at the same time. A mitral systolic murmur was heard at the commencement of the rheumatic attack, for which the patient was under treatment; but at the termination of the attack the apex was normal in position, although the murmur persisted.

No. 74 (S. Moritz, M.D., Manchester). Female, aged 25; single; factory hand; temperate; insufficient diet. Locality, low, damp, confined. Chorea 4 months previously, during pregnancy; no previous rheumatism or other illness; no cardiac affection.

No. 209 (G. W. Hoan, Lichfield). Male, aged 27; single; clerk; temperate; sufficient diet; 1 previous attack of rheumatism at 19; chorea in childhood. A systolic mitral murmur was heard at the commencement of the present attack, and remained during the attack; the apex beat being then half an inch internal to the nipple. The patient did well till the seventh day, when sweating ceased; and in the evening the temperature rose to 110° F., and he died in 5 hours, the temperature being then 106.9° F.

No. 238 (W. F. Brook, Fareham). Female, aged 11; sufficient diet. Locality, high, dry, exposed. No previous attack of rheumatism; chorea 2 years previously. The attack of rheumatism was severe; pericarditis complicated the attack, and death occurred on the seventh day, from asphyxia, the result of pericarditis and "great bronchial secretion."

No. 433 (F. Wachter, Canterbury). Male, aged 14; cabinet maker; sufficient diet. Locality high. No mention made of previous rheumatism. The patient had measles with enlarged tonsils, but the date is not given; 2 attacks of chorea 7 and 2 years ago. A mitral murmur was audible throughout the attack and at the termination of rheumatism after 21 days. The apex beat was normal in position. Recovery complete.

No. 469 (F. J. Allan, M.D., Dock Street, E.). Female, aged 24, single; temperate; sufficient diet. Locality, low, damp; 1 previous attack of rheumatism at 16; liable to bilious attacks; chorea in childhood. A mitral systolic murmur was audible throughout the attack, and at the termination of the rheumatism on the eleventh day. The apex beat was one inch to the left of the sternum; the murmur had been present since childhood, and was heard before the chorea attacked her. Recovery was complete.

No. 466 (H. S. Renshaw, M.D., Sale). Male, aged 9; temperate; sufficient diet. Locality, dry, exposed. No previous attack of rheumatism; aortic and mitral murmurs during the rheumatic attack; apex 1 inch below, and internal to nipple; murmurs disappeared 21 days after the onset of the rheumatism; "chorea remained." Recovery from rheumatism was complete.

No. 493 (W. Frew, M.D., Galston, Ayrshire). Female, aged 19;

single; lace darning; total abstainer; sufficient diet. Locality, low, damp. One previous attack of rheumatism at 16; chorea 9 years previously. A systolic mitral murmur audible throughout the attack (14 days' duration); at the termination the apex beat was in the sixth interspace, 1 inch external to the nipple line. Recovery was complete.

No. 524 (G. H. Mackay, M.B., Elgin). Female, aged 19; single; no occupation; temperate; sufficient diet. Locality, low, damp. No previous rheumatism; chorea 18 months previously; tonsillitis 4 days before. A mitral and aortic murmur was heard during the attack, and at its termination at the end of 3 weeks; the apex was just within the nipple. The patient had dropsy from heart disease.

No. 547 (W. H. Dobie, M.B., Chester). Female, aged 17; single; lady; temperate; sufficient diet. Locality, low, damp, confined. One previous attack of rheumatism at 12; chorea 5 years previously; systolic and presystolic mitral murmurs audible during the attack; no mention of position of apex. Chorea accompanied the previous attack of rheumatism, which was attended by violent delirium and severe pain; present attack mild, and terminating on the tenth day.

No. 587 (D. J. Mackenzie, M.D., Glossop). Male, aged 4; total abstainer; sufficient diet. Locality, high, dry, exposed. No previous rheumatism; chorea was slight, and occurred 10 days previous to the onset of rheumatism. There was a systolic mitral murmur from the third day of the attack, but the apex was normal. Recovery was complete.

No. 589 (D. J. Mackenzie, M.D., Glossop). Female, aged 14; temperate; sufficient diet. Locality, high, damp, exposed; 2 previous attacks of rheumatism (age of first not given); chorea is said to be "still present." A "murmur" was noticed when the patient came under observation; the apex was widely diffused. Recovery was complete.

No. 599 (C. H. Milburn, M.B., Durham). Male, aged 16; weaver; temperate; sufficient diet. Locality, low, damp, confined; 1 previous attack of rheumatism at 12. A mitral systolic murmur was noticed when the patient came under observation; the apex beat 1 inch below the nipple; chorea had occurred 3 years previously. Recovery was complete.

In 5 cases (74, 238, 466, 524, 587) there had been no previous rheumatism.

In 1 case (483) no mention is made of previous rheumatism.

In 2 cases (49 and 589) 2 previous attacks of rheumatism had occurred, while in the remainder, 1 previous attack had occurred in each case.

In Nos. 74 and 587 no cardiac disease existed after recovery from rheumatism; the patient having had an attack of chorea 4 months previously.

In No. 238 no cardiac disease was known until the rheumatic attack under which the patient succumbed; but chorea had occurred 2 years previously.

In No. 433 there had been no previous rheumatism, but there had been two previous attacks of chorea, and there had been no previous cardiac disease.

In No. 524 there had been no previous rheumatism. One attack of chorea 18 months previously; the patient suffered from cardiac dropsy; an evidence of old-standing valvular disease.

In these records, then, no valvular disease can be traced in connection with chorea alone, and, though in the majority of these cases in which chorea occurred valvular disease of the heart existed, it was presumably of rheumatic origin, and in all save one (524) the mitral valve alone was affected.

In one case (460) there had been one attack of rheumatism 8 years previously, and chorea in childhood, the date not given; it is specially noted that the mitral systolic murmur was heard "before the chorea attacked her."

In No. 49 chorea occurred at 12 years of age, the patient being aged 24, female.

In No. 74 chorea occurred 4 months previous, the patient being aged 25, female.

In No. 209 chorea occurred in childhood (no date given), the patient being aged 27, male.

In No. 238 chorea occurred at 9 years of age, the patient being aged 11, female.

In No. 433 chorea occurred at 7 and 9 years of age, the patient being aged 14, male.

In No. 460 chorea occurred in childhood (no date given), the patient being aged 24, female.

In No. 493 chorea occurred at 10 years of age, the patient being aged 19, female.

In No. 524 chorea occurred at 16 years of age, the patient being aged 19, female.

In No. 547 chorea occurred at 12 years of age, the patient being aged 17, female.

In No. 587 chorea occurred ten days previously, the patient being aged 4, male.

In No. 599 chorea occurred at 13 years of age, the patient being aged 16, male.

Various other "previous illnesses" are recorded in these tables, but the numbers in each case are so small that analysis of them would be useless.

RECENT ANTECEDENTS TO THE RHEUMATIC ATTACK.

Under this head are stated certain previously existing conditions to which the rheumatic attack might probably be attributed, or without which the patient might possibly have escaped.

Over-fatigue and exposure to wet and cold:

Males	...	61
Females	...	37
Not mentioned	...	1
Total	...	99 or 15.11 per cent.

Exposure to wet and cold:

Males	...	76
Females	...	30
Total	...	106 or 16.18 per cent.

Exposure to cold:

Males	...	55
Females	...	36
Total	...	91 or 13.89 per cent.

Over-fatigue—more or less prolonged:

Males	...	12
Females	...	18
Total	...	30 or 4.58 per cent.

Exposure to wet:

Males	...	38
Females	...	32
Total	...	70 or 10.68 per cent.

Over-fatigue—prolonged:

Males	...	12
Females	...	11
Total	...	23 or 3.51 per cent.

Over-fatigue—sudden:

Males	...	7
Females	...	4
Total	...	11 or 1.52 per cent.

Pharyngitis:

Males	...	10
Females	...	4
Total	...	14 or 2.13 per cent.

Parturition:

2 cases (125 and 406)	6 weeks previously.
1 " (305)	5 " "
1 " (391)	4 " "
1 " (264)	25 days "
1 " (606)	22 " "
1 " (428)	14 " "
1 " (515)	2 " "

Shock:

Males	...	4
Females	...	3
Total	...	7 or 1.06 per cent.

Of the other mentioned recent antecedent diseases, such as gout, gonorrhoea, of each one case; jaundice, catarrh, diphtheria, injury, parotitis (two cases), for example, the numbers are so small as to be valueless.

The expression "recent antecedents" here signifies a disease which occurred within six weeks previously to the rheumatic attack for which the patient came under observation.

The numbers in order stand as follows:

Exposure to wet and cold	...	106 cases.
Over-fatigue and exposure to wet and cold	...	99 "
Exposure to cold	...	91 "
Exposure to wet	...	70 "
Over-fatigue, more or less prolonged	...	30 "
Over-fatigue, prolonged	...	23 "
Pharyngitis	...	14 "
Over-fatigue, sudden	...	11 "
Parturition	...	8 "
Shock	...	7 "
No recent antecedent diseases (males, 39 females, 30)	...	79 "
No mention of antecedent diseases (males, 27; females, 18)	...	45 "

PHENOMENA CONNECTED WITH THE PRESENT ATTACK.

Under this head returns are made: 1, as to the severity of the attack and the sweating; 2, the duration of the fever, pain, and whole attack; 3, extent of joint affection; 4, result.

The figures come out as follows:

The rheumatism was severe in	...	178 males, or 27.17 per cent.
" " mild in	...	116 females, or 17.70 "
" " " "	...	191 males, or 29.15 "
" " " "	...	160 females, or 24.42 "

Cases in which no mention is made of astoseverity, namely, 133, 319, 320, 342, 377, 415, 420, 505, 539, 588	...	10
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Sweating was considerable in	...	255 males, or 38.93 per cent.
" " slight in	...	166 females, or 25.34 "
" " " "	...	116 males, or 17.70 "
" " " "	...	107 females, or 16.33 "

Cases in which no sweating occurred or no mention is made as to sweating, namely, 9, 46, 132, 133, 336, 407, 493, 520, 573, 606, 638	...	11
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Examination of the tables were then made with the view of ascertaining the influence of diaphoresis on recovery; the following is the result:

	Males.	Females.
Sweating, considerable	180, or 27.89 per cent.	105, or 16.25 per cent.
Recovery, complete	88 " 13.62 "	82 " 12.69 "
Sweating, slight	64 " 9.90 "	52 " 8.04 "
Recovery, complete	21 " 3.25 "	20 " 3.09 "
Sweating, slight	11 " 1.70 "	9 " 1.54 "
Recovery, partial	1 " "	1 " "
Sweating, considerable	1 " "	1 " "
Death	1 " "	1 " "
Sweating, slight	1 " "	1 " "
Death	1 " "	1 " "
Sweating, none	1 " "	1 " "
Recovery, complete	1 " "	1 " "

Of the 655 cases data were insufficient for the above calculation in 9 males (Nos. 46, 151, 249, 255, 325, 407, 578, 579, 606), and in 9 females (Nos. 9, 81, 132, 150, 322, 520, 567, 573, 638); in 1 case (133) the sex is not mentioned, leaving 646 cases to be dealt with.

The figures lend but partial support to the presumption that free diaphoresis produces a beneficial effect on the course and result of acute rheumatism, when the number of complete recoveries with slight sweating is compared with that when sweating was considerable.

Under "slight" sweating have been grouped cases in which diaphoresis is described as moderate; under "considerable" those in which it was profuse.

INFLUENCE OF TREATMENT ON THE DURATION OF THE RHEUMATIC ATTACK.

With only four exceptions, the cases recorded in the tables were under one or more of various remedies advocated for the relief of the disease, and it has been, therefore, thought advisable to calculate the average number of days' duration of the fever, pain, and of the whole attack (where a sufficient number of cases could be collected to strike an average), under some of the more usual methods of treatment. In a large number of cases the treatment

is different in each; no grouping of them, therefore, is either profitable or even possible.

Treatment.	Average duration (in days) of		
	Fever.	Pain.	Whole Attack.
Salicylates (sodium or potassium)	(173 cases) 8.65 days	(171 cases) 10.18 days	(167 cases) 19.03 days
Salicylic acid	(9 cases) 13.8 days	(9 cases) 10.7 days	(9 cases) 10.7 days
Salicin	(14 cases) 9.28 days	(14 cases) 15.07 days	(14 cases) 23.02 days
Alkalies	(26 cases) 13.23 days	(26 cases) 19.0 days	(26 cases) 36.30 days
Alkalies and then salicylates	(22 cases) 11.54 days	(22 cases) 13.90 days	(21 cases) 22.22 days
Salicylates and alkalies (combined)	(12 cases) 10.83 days	(11 cases) 15.54 days	(13 cases) 34.92 days
Salicylates and then alkalies	(19 cases) 10.78 days	(18 cases) 13.16 days	(17 cases) 30.64 days
Salicin and alkalies	(3 cases) 11.6 days	(3 cases) 9.3 days	(3 cases) 24.0 days
Salicylates and potass. iod.	(7 cases) 17.14 days	(6 cases) 24.16 days	(7 cases) 46 days
Salicylates and iron	(18 cases) 11.77 days	(19 cases) 10.89 days	(18 cases) 27.7 days
Salicylates and tonics	(16 cases) 8 days	(16 cases) 10.18 days	(16 cases) 18.68 days
Alkalies and opium	(8 cases) 10.75 days	(8 cases) 12.60 days	(8 cases) 18.75 days
Salicylates, then iron and quinine	(5 cases) 10 days	(5 cases) 13.8 days	(6 cases) 20.33 days
Salicylates and opium	(10 cases) 9.9 days	(11 cases) 8.45 days	(9 cases) 30.3 days
Salicylates and blisters...	(7 cases) 6.14 days	(7 cases) 12 days	(6 cases) 15.83 days
Alkalies and then quinine	(6 cases) 13.5 days	(6 cases) 21.6 days	(5 cases) 35 days
Salicylates and quinine...	(6 cases) 10.5 days	(6 cases) 17 days	(6 cases) 31.6 days

Case No. 655 has been excluded from the calculation under salicin as the data are insufficient. The patient was ill 7 days before she came under observation; the pain lasted 1 day, and the duration of the whole attack was 7 days.

In most of the cases treated the dose of salicin was 1 scruple, repeated in intervals of from 1 to 4 hours; and in once case (654) the drug was taken in 1-scruple doses every hour till the patient was well (about the 6th day).

In Case 444 the dose was grains xij, given every 2 hours till bedtime, and then repeated thrice daily. The patient was not seen until the 10th day, and on the 2nd day of treatment the temperature became normal.

CASES IN WHICH SALICIN, SALICYLIC ACID, OR ITS SALTS FAILED.

No. 19 (W. Bruce, M.D., Dingwall). Male, aged 42; shoemaker; temperate; sufficiently fed. Locality, low, damp, confined; atmosphere, changeable; wind W. No previous rheumatism. Present attack attributed to exposure and over-fatigue. The attack was severe, attended by considerable sweating, and many joints (fingers chiefly) were affected. Sodium salicylate was given, 10 grains every 2 hours, and then every 4 hours. Subsequently potassium bicarbonate was administered till the urine became alkaline. Recovery was partial, pain persisting in several joints. The reporter remarks: "Salicylate seemed to have no effect; treatment carefully carried out."

No. 22 (J. A. Erskine Stuart, Healy, Batley). Male, aged 23; single; blacksmith; temperate; sufficiently fed. Locality, high, dry, exposed; atmosphere, damp and cold; wind N. The patient had had several previous attacks of rheumatism, and had "congenital mitral disease inherited from mother." The present attack was ascribed to exposure to wet, and cold, and over-fatigue; it was severe, and the sweating considerable. The duration of the fever, pain, and whole attack was 7 days. The dose of sodium salicylate was 15 grains every 3 hours. The joint affection was relieved in 2 days. The salicylate caused gastro-enteritis and hæmatemesis, and the patient died.

No. 52 (J. Munro, M.D., Barnard Castle). Male, aged 21; single; labourer; temperate; sufficiently fed; locality, high, dry; atmosphere, mild and changeable; wind E. The patient had bronchitis 6 years previously, but no rheumatism. For the present attack no cause is assigned; the attack was severe, with profuse

sweating. The fever and pain lasted 6 days, and the whole attack 35 days; many joints were involved. During the attack a crop of sudamina appeared. Sodium salicylate, half a scruple to one scruple, was given every 3 hours. The reporter remarks that there was an absence of effect of the salicylate on either the fever or the pain. The patient made a complete recovery.

No. 79 (A. A. Cohen, M.B., Burwash). Female, aged 25; single; housemaid; temperate; sufficient food. Locality, high, damp, exposed; atmosphere, wet and cold. The patient had one previous attack at the age of 8. Present attack attributed to wet, cold, and over-fatigue; it was severe, and the sweating was considerable. The duration of the fever and pain were 12 and 14 days, and of the whole attack 14 days. Many joints were affected. Patient was chlorotic. Sodium salicylate was at first administered, and then potass. bicarb. and iod. The reporter remarks: "No benefit from treatment No. 1; rapid effect of No. 2." Recovery complete.

No. 105 (Edward Cureton, Shrewsbury). Male, aged 25; railway labourer; temperate; sufficient food. Locality, low, damp, confined; atmosphere, mild and damp; wind S. Patient had tonsillitis 1 year previously but no rheumatism. Present attack attributed to exposure to wet; it was severe, with considerable sweating. Duration of the whole attack was 49 days. Many joints were affected, and sudamina were present during the attack. Salicylates were administered for 3 days, and then potass. bicarb. Reporter remarks: "Salicylates failed; bruit appeared at the end of first week; case of a relapsing nature throughout. Recovery was complete."

No. 127 (F. B. Mallett, M.D., Bolton). Female, aged 22; single; sempstress; temperate; sufficient food. Locality, high and dry; atmosphere, changeable; wind S.W. Patient had scarlet fever 4 years previously but no rheumatism. Present attack attributed to prolonged over-fatigue; it was severe, with considerable sweating. Duration of fever and pain were 21 and 30 days respectively, and of the whole attack 42 days. Pericarditis and endocarditis supervened during the attack. Sodium salicylate, 2 drachms in 24 hours for several days was the first treatment; afterwards salines were substituted. The remark is: "No relief from treatment 1; good from No. 2." Recovery partial.

No. 143 (Henry Davy, M.D., Exeter). Male, aged 20; single; cutter; temperate; sufficient food. Locality, low, damp, confined; atmosphere, wet and mild. One previous rheumatic attack, at 19. Present attack moderate; slight sweating. Duration of fever and pain 7 and 5 days respectively, and of the whole attack 14 days. Salicylate was given at first in one-scruple doses, and afterwards iron and ammon. acet. Remarks: "Salicium produced no effect on temperature. Relief from treatment No. 2." Recovery was complete.

No. 201 (C. A. McMunn, M.D., Wolverhampton). Female, aged 15; single; schoolmistress; temperate; food sufficient; locality, low, damp, exposed; atmosphere, damp and cold; wind N.E. Patient had had no previous illness. Present attack attributed to exposure to cold and over-fatigue; it was a mild one, but attended by considerable sweating. Duration of fever and pain 14 and 10 days respectively, and of the whole attack 21 days. Few joints were affected. Pericarditis and pleurisy supervened during the attack. Salicin was first administered, and subsequently "sodium salicylate in one-scruple doses every four hours, with alkalies." The reporter observes, "No benefit from salicin." Recovery complete.

No. 212 (M. Messiter, Dudley). Male, aged 17, single; engine-driver; temperate; sufficient food. Locality, high, damp, exposed; atmosphere, wet and cold; wind N.E. No previous illness. Present attack was severe, with considerable sweating. Fever and pain lasted 28 and 20 days respectively; the whole attack 43 days. Few joints were affected. Sudamina appeared during the attack, and roseola afterwards. The dose of salicylate is not given, but the reporter remarks: "Salicylate produced so little relief and so much sweating that it was stopped. No other drug affected the rheumatism."

No. 244 (A. A. Cohen, M.B., Burwash). Male, aged 35; higgler; temperate; sufficient food. Locality, high, dry, exposed; atmosphere, dry, cold wind S.W. Patient had two previous rheumatic attacks, the first at 27. Present attack attributed to sudden over-fatigue and exposure; it was moderate, with slight sweating. The fever and pain lasted 7 and 8 days, the whole attack 21 days. Many joints were involved. Salicin (dose not stated) was first given; subsequently, two grains of quinine every four hours and a blister to knee. The patient was anæmic. "No benefit from

salicin. After the first dose of quinine, said, 'I felt it take all the fever out of me.' Recovery partial; pain persistent in one joint.

No. 290 (Jas. McNea, M.D., Inverness). Male, aged 18, single; grocer; temperate; sufficiently fed. Locality, low, damp, confined. No previous illness. Present attack attributed to exposure. Fever and pain lasted 20 and 2 days, and the whole attack 35 days. It was a moderate attack, but attended by considerable sweating. Sudamina appeared on the 9th, and lasted till the 24th day. A mitral systolic murmur came on during the attack. Sodium salicyl. was first given in doses of one scruple every two hours; then salicin in the same doses; and, thirdly, quinine with alkaline effervescents. The reporter remarks: "Temperature fell and murmur disappeared with the salicylate. With salicin in same doses, temperature rose and murmur returned."

No. 332 (W. Shaw, M.D., Maidstone). Female, aged 32, married; paper-mill hand; temperate; sufficiently fed. Locality, low, damp, exposed; atmosphere, wet. Patient had four previous attacks of rheumatism, the first at 8, and four years previously suffered from syphilis. Present attack preceded by prolonged over-fatigue; it was a severe attack, with considerable sweating. Duration of fever and pain was 5 and 21 days respectively, and of the whole attack 56 days. Many joints were involved. The treatment is stated to have been alkaline, but the remark of the reporter is, "Almost complete inutility of salicylic acid."

No. 372 (C. B. Richardson, M.D., Brighton). Female, aged 21, single; shop assistant; temperate. Locality, low, dry; atmosphere, wet, cold; wind E. Patient had had a previous rheumatic attack at 15; also scarlet fever when young, and typhus with bronchitis five years previously. Present attack followed exposure to cold; it was severe, and attended by considerable sweating. Duration of fever 40 days, and of the whole attack 280 days. Many joints were involved. During the attack the patient suffered from pleurisy, pericarditis, and double pneumonia. "Salicylates in large doses frequently repeated had no effect on the fever or pain," and recovery was eventually complete on quinine, digitalis, pot. iod., ammonia, and stimulants.

No. 390 (W. Brooks, Fareham). Male, aged 25, single; manservant; temperate; sufficiently fed. Locality, low, damp; atmosphere, dry, hot. No previous illness. Present attack followed prolonged over-fatigue on the previous day; it was moderate in severity, and attended with slight sweating. Fever and pain lasted 20 days respectively, and many joints were affected. Sodium salicylate for one week failed to relieve the symptoms, and recovery was eventually completed under potassium bicarb. and potass. iod.

No. 418 (H. G. Orlebar, M.D., Elizabeth Street, S.W.). Female, aged 18, single; servant; temperate; sufficiently fed. Locality, low, damp, confined; atmosphere, wet and cold. No previous illness. Present attack attributed to exposure to wet 8 days previously; it was severe, but accompanied by only slight sweating. Duration of fever and pain 21 days and 20 days respectively; of the whole attack 24 days. Many joints were affected. Patient suffered during the attack from pericarditis and intense pain in the cervical spine, and was usually dyspeptic. Sodium salicyl. in 15-grain doses every four hours failed to give relief; slight relief followed potass. acet. and bicarb., while quinine produced great benefit. Recovery was complete under iron and potass. iod.

No. 419 (H. G. Orlebar, M.D., Elizabeth Street, S.W.). Female, aged 25, single; dressmaker; temperate; sufficiently fed. Locality, low, dry, confined; atmosphere, dry, mild. No previous attacks. Present attack followed exposure to wet and over-fatigue just before; it was severe, with considerable sweating. Fever lasted 19 days, pain 17 days, and the whole attack 21 days; few joints were affected. Membranous pharyngitis supervened on the 18th day. Pericarditis during the attack; the patient was, moreover, subject to "bronchial catarrh and sluggish liver." Quinine was administered first, and then sodium salicyl., 15 grains every four hours, with no result. Recovery was finally completed under potass. iod., potass. bicarb., and digitalis.

No. 425 (T. F. Raven, Broadstairs). Female, aged 32, married; temperate; sufficiently fed. Locality, high, dry, confined; atmosphere, dry and hot; wind W. One previous attack of rheumatism at 12. Present attack attributed to exposure to cold and sudden fatigue 14 days previously; it was of moderate severity, but accompanied by considerable sweating. Fever lasted 40 days, pain 49 days, and the whole attack 84 days; many joints were involved. The patient was subject to migraine and was anemic. "Salicylic acid relieved the fever and pain from time to time, but failed eventually."

No. 448 (G. C. Dickson, M.D., Carnoustie). Female, aged 48, married; temperate; sufficiently fed. Locality, low, dry, confined; atmosphere, dry, cold, changeable; wind W. No previous illness recorded. Present attack followed prolonged over-fatigue and exposure to cold on the previous day; it was of moderate severity, but attended with considerable swelling. Duration of fever and pain 11 days and 21 days respectively, and of the whole attack 21 days; many joints were affected. The patient suffered from hæmorrhoids. The drugs employed were; (1) salicylates, (2) salicin, (3) citrate of iron, as to which the reporter remarks, "No benefit from No. 1; relief from No. 2."

No. 494 (W. F. Brook, Fareham). Female, aged 38, married; housekeeper; temperate, sufficiently fed. Locality, low, damp; atmosphere, wet, cold; wind N.W. No previous rheumatism. Patient had suffered from tonsillitis and pharyngitis 11 years previously, and from erysipelas 5 months before the present attack, for which no cause is assigned; it was a moderate one, with slight sweating. Fever and pain each lasted 25 days, and the whole attack 56 days. Many joints were affected. Sodium salicyl., 12 grains, with sod. bicarb. and ammon. carb., was administered every 4 hours, and Dover's powder at night. The reporter remarks, "No result from salicylate." Recovery was complete.

No. 530 (W. E. Green, Sandown, I.W.). Female, aged 14; nurse; temperate, sufficiently fed. Locality, low, dry, confined; atmosphere, dry, cold; wind N.E. One previous attack of rheumatism at 9. Present attack, not traced to any cause, was of moderate severity, with slight sweating. Duration of fever and pain 15 and 20 days respectively, of whole attack 28 days. Few joints were involved. Patient suffered from acne and dry bronchial cough. The disease was "persistent, notwithstanding salicin," but recovery was eventually complete.

No. 531 (W. E. Green, Sandown, I. W.). Male, aged 51; carter; temperate; sufficiently fed. Locality, low, damp, exposed; atmosphere, dry, hot. Three previous attacks, the first at 39. No cause could be traced for present attack, which was of moderate severity, with considerable sweating. Fever and pain lasted 7 and 5 days respectively, and the whole attack 10 days; many joints were affected. Salicin and *actæa racemosa* were at first administered, and then salicylic acid and *guaiaicum*. Reporter remarks: "No. 1 failed, No. 2 gave great relief. In the former attack salicin alone was of no service." The dose is not stated. Recovery was complete.

No. 538 (J. Neil Whitfield, Ebbw Vale). Female, aged 20; single; dressmaker; teetotaler; sufficiently fed. Locality, high, damp, exposed; atmosphere, damp and mild; wind S.W. No previous rheumatism. Patient had suffered from meneses. Present attack followed exposure to wet 2 days before; it was severe, with considerable sweating. Duration of fever and pain 12 days and 10 days respectively, and of the whole attack 14 days; few joints were involved. Treatment was (1) sodium salicyl.; (2) alkalies and blisters over the heart; (3) digitalis, ammon. carb. and strychn. Reporter remarks: "No good result from treatment 1. Patient died of asthenia from endocarditis."

No. 644 (G. Fisher, Aberdare). Female, aged 21; married; temperate; sufficiently fed. Locality, high, dry, exposed; atmosphere, wet, cold. No previous rheumatism. Present attack followed tonsillitis 12 days, and exposure to wet 2 days previously; it was severe, with considerable sweating; pain lasted two days, and the whole attack 28 days; many joints were involved. Treatment was (1) salicylates; (2) alkalies. Reporter remarks: "No effect from treatment 1; marked improvement under treatment 2."

646 (G. W. Stevens, M.D., Liverpool). Male, aged 29; single; clerk; temperate; sufficiently fed. Locality, high, damp; atmosphere, wet, cold; wind E. Patient had scarlet fever and meneses in childhood. Present attack followed exposure to wet and cold on the previous day; it was severe, with considerable sweating. Duration of fever and pain 8 days and 12 days respectively, of the whole attack 21 days; many joints were involved. Patient suffered from neuralgia and general debility. Treatment was (1) sodium salicyl., 15 grains every 3 hours for the first 2 days; (2) sodium salicyl. (dose reduced) and alkalies, blisters, etc. Reporter remarks: "Salicylate treatment had very little, if any, control over pain."

Of the total number, 655 cases, 536 were treated with salicin, salicylic acid, or its salts. In the majority of the cases other drugs were combined with the supposed specific, which failed in only 22 cases, or 4.10 per cent., namely, 10 males and 12 females. Of these, salicylates failed in 16 cases.

No. 22. Sod. salicyl., 15 grains every 3 hours caused gastro-enteritis and hæmatemesis.

No. 79. Salicylate failed, while rapid effect was obtained from alkalies and potass. iod.

No. 418. Salicylate failed, in doses of 15 grains every 4 hours, while quinine was successful.

No. 419. Quinine and salicylates (15 grains every 4 hours) failed, while alkalies and potass. iod. gave a good result.

No. 448. Salicylates failed, while salicin succeeded.

No. 644. Salicylates failed, while alkalies succeeded.

In 5 cases salicin failed. Of these:

No. 201. Salicin (dose not stated) failed, while salicylates (1 scruple) with alkalies every 4 hours gave good results.

No. 290. Salicylate (1 scruple every 2 hours) gave good results. With salicin in same doses the temperature rose, and the murmur, which had disappeared under salicylates, returned.

No. 531. Salicin and actæa racemosa failed, while salicylic acid and guaiacum gave great relief.

In 1 case (332) salicylic acid failed; dose not stated.

In 1 case (212) a failure was experienced, but the form of the drug, that is, whether salicin, salicylic acid, or its salts, is not stated.

From recent experience of the treatment of rheumatism by salicylic acid and its salts, the conclusion to be drawn from its failure in the above quoted cases is that the dose administered was far too small, or was not repeated at sufficiently short intervals.

SALICISM.

Untoward symptoms are noted in the report as resulting from the employment of salicin, salicylic acid, or its salts in 14 cases out of the 536, or in 2.59 per cent.

No. 10 (Basil G. Morrison, M.B., Canonbury). Male, aged 30, oilman, temperate. Had 1 previous rheumatic attack at 23, and an old regurgitant mitral murmur. Present attacks moderate, with considerable sweating. Patient was dyspeptic for a fortnight before the attack, which began with severe muscular pain in the neck and back, but with little or no fever at this stage. Sodium salicyl. 15 grains every hour produced "salicisim."

No. 22 (J. A. Erskine Stuart, Healey, Batley). Male, aged 23, blacksmith, temperate. Had had several previous attacks of rheumatism, and had "congenital mitral disease inherited from his mother." Present attack severe, with considerable sweating. Sodium salicyl., 15 grains every 3 hours, relieved the joint affection in 2 days, but produced gastro-enteritis and hæmatemesis. Patient died on the seventh day from "serious cardiac complication."

No. 61 (A. G. McKenzie, Much Wenlock). Female, aged 19, single, living at home, temperate. Had had one previous attack of rheumatism at 17, which had lasted 6 weeks under alkaline treatment. Present attack moderate, with considerable sweating. Sodium salicyl., 12 grains every 4 hours, was administered till salicisim supervened, and was then repeated thrice daily. The attack lasted 4 days only, and recovery was complete.

No. 87 (E. B. Mansell, Hastings). Male, aged 24, carpenter, temperate. No previous rheumatism. Patient had scarlet fever in childhood, and an ischio-rectal abscess 3 years previously; had been exposed to wet and cold a fortnight before. The attack was severe, and all ended with slight sweating. Sodium salicyl. was administered first, in one-scruple doses every 4 hours, and then salicin in the same doses. The salicylate caused great nervous disturbance and delirium, but did not ease the pain; salicin produced marked benefit. The attack lasted 16 days, and recovery was complete.

No. 116 (J. McEwan, M.B., Helensburgh). Female, aged 24, single, living at home, temperate. Had had 1 previous attack of rheumatism at 15; biliousness 1 month ago; unwell and shivery ever since; was liable to sore-throat and asthma (?). The attack was of moderate severity, with considerable sweating. Salicin was administered, half a drachm every 2 hours, from the fifth day; (2) sodium salicyl. (dose not stated) on the eleventh day; (3) salicin again. Patient became deaf, "probably due to salicisim; an acute attack of delirium about the time that sod. salicyl. was given, lasting about 2 days." The whole attack, inclusive of a relapse from slight exposure, lasted 28 days. Recovery was complete.

No. 187 (Edward Williams, M.D., Wrexham). Female, aged 29, married; temperate. Had had one previous attack of rheumatism at 25. Present attack moderate, with considerable sweating. Sodium salicyl. was first administered, and then potash in large

doses. The salicylate produced tinnitus, and was then dropped. The attack lasted 21 days. Recovery was partial.

No. 223 (A. S. Underhill, Tipton). Male, aged 41; innkeeper; temperate. No previous rheumatism, but had had peritonitis (date not given). The attack was severe, with considerable sweating. Sodium salicyl. was administered in half-drachm doses, and caused vomiting, diarrhoea, and headache; pain recurred when it was omitted. Under tonics recovery was complete in 56 days.

No. 229 (E. A. Laurent, M.B., Bedford). Female, aged 25, single; nursemaid; temperate. Two previous attacks of rheumatism, the first about 18. She had had 2 attacks of tonsillitis between 15 and 17; measles and whooping-cough as an infant. The attack was severe, with considerable sweating; many joints were affected. Treatment was (1) sod. salicyl.; potass. iod.; potass. bicarb. for 2 days only; (2) alkalies. Patient was "unable to take the salicylate;" the pains were aggravated at the menstrual period, which occurred on the sixth day of the attack. She was convalescent on the eighteenth day.

No. 297 (L. W. K. Phillips, Hove). Male, aged 13, schoolboy. Measles 11 years previously; no previous rheumatism. Tonsillitis 12 days before present attack, which was of moderate severity, with slight sweating. Many joints were affected, and pericarditis supervened during the attack. Sodium salicyl., half a scruple to 1 scruple, was administered every 2 hours at first, and produced delirium. It was therefore omitted for 1 day, and then recommenced, and gradually reduced for a month. Patient convalesced on the twenty-first day.

No. 428 (T. F. Raven, Broadstairs). Female, aged 35, married; lady; temperate. One previous attack of rheumatism at 23. Patient was anæmic; parturition 14 days previously; "over-fatigue from suckling." The attack was of moderate severity, but sweating was considerable; many joints were affected. Treatment was (1) salicylic acid; (2) quin., iron, arsenic, and alkalies. Salicylic acid was not tolerated; all drugs failed; and the case "gradually emerged into a condition resembling rheumatoid arthritis."

No. 508 (D. J. Mackenzie, M.D., Glossop). Male, aged 34; mason; intemperate; hitherto free from rheumatism. Present attack severe, with considerable sweating, and many joints were affected. Treatment was: (1) sod. salicyl., 15 grains, every 3 hours for 2 days; (2) potass. bromid. and bicarb.; (3) salicylate resumed. The salicylate produced deafness and delirium; no fall of temperature till No. 2 was commenced.

No. 566 (H. B. Pullen Burry, Liphook, Hants). Male, 31; carpenter; teetotaler. No previous rheumatism. Diarrhoea 12 days, and exposure to cold 6 days previously. Present attack severe, with considerable sweating. Few joints were affected. Treatment was: (1) alkalies for 36 hours; (2) potass. salicyl. was given when the temperature was 105.3° F., and 6 days later was 102.8°, when the patient was nearly poisoned, with blackish urine (the drug being presumably contaminated with phenol), and very dicrotous pulse. Delirium was absent. Recovery was complete.

No. 598 (G. Birt, M.B., Stourbridge). Male, aged 30; firebrick maker; intemperate. Patient had had 2 previous attacks of rheumatism; the first 5 years ago. Tonsillitis 9 days previously, and was liable to sore throats. He was fat. Present attack severe, with considerable sweating. On the second day sod. salicyl. was administered in 15-grain doses every 4 hours, but was omitted on account of distressing tinnitus. Pericarditis supervened during the attack. On the fifty-sixth day recovery was "nearly complete."

No. 642 (W. E. Green, Sandown, I.W.). Male, aged 24; soldier; temperate. No previous rheumatism. Present attack severe, with considerable sweating; many joints were affected. Treatment was: (1) sod. salicyl. for 2 days; (2) salicin for 1 day; (3) alkalies. Patient "unable to take either salicylate or salicin," "consequently the case ran the old-fashioned course," and recovery was complete after 40 days.

The toxic symptoms which occasionally follow the administration of the salicylates may doubtless often be accounted for by phenol contamination, as was the case in No. 566; but from the immunity of the great majority of the patients from such evil effects, it may be assumed that these drugs, as used in this country, are tolerably pure. In hospital practice it is by no means uncommon that a contaminated supply is sent in, and then toxic symptoms are the rule, even with small doses.

Of these 14 cases, 9 were males and 5 females. The most advanced age of the patients was 41 (No. 223); the youngest 13 (No. 297).

Two of the males (Nos. 508, 598) were intemperate; 1 (No. 566) was a total abstainer; the remainder were temperate.

The attack was severe in 7 males and 1 female.
 " moderate in 2 " 4 females
 " considerable in 7 " 5 "
 " slight in 2 " "

TOXIC SYMPTOMS.

Salicisism (definite symptoms not stated) in Nos. 10, 61, 229, 428, 643=2 males and 3 females.
 Deafness and delirium in Nos. 116, 508=1 male and 1 female.
 Tinnitus in Nos. 187, 598=1 male and 1 female.
 Delirium in No. 297=1 male.
 Nervous disturbance in No. 87=1 male.
 Vomiting, diarrhoea, headache, in No. 223=1 male.
 Delirium, dicrotic pulse, and blackish urine, in No. 566=1 male.
 Gastroenteritis and hæmatemesis in No. 22=1 male.

DOSE ADMINISTERED.

The dose of the drug is omitted, or it is not stated how often the drug was repeated in 6 of the cases, so that no conclusions can be drawn under this head; suffice it to say that the largest dose given was in No. 116, female, aged 24, namely, salicin half a drachm every two hours, followed on the fifth day by sod. salicyl., with a reversion to salicin (date not given); that the acute delirium supervened about the time the salicylate was commenced; that deafness probably existed before the patient took the salicylate.

The smallest recorded dose which produced toxic symptoms was (No. 61) gr. xij. of sodium salicylate, given every four hours, to a female, aged 19, with a moderate attack, but considerable sweating.

Examination of the 14 cases shows no relation between the amount of sweating or the severity of the attack and the toxic effects of the drug.

EXTENT OF JOINT AFFECTION.

The numbers under this head came out as follows;

	Cases.
Pains migratory—many joints affected	383
" " few " "	73
" " " " " "	1
Many joints affected	18
" " pains fixed	72
Few " " " "	85
" " " " " "	16
One joint affected	4
Not mentioned	3

A.—It was found that in cases where the pains were migratory, and many joints affected,

That the locality was :

Cases.	Cases.
High, dry, and exposed ... 100	High ... 6
Low, damp, and confined ... 56	Not mentioned ... 5
High and dry ... 36	Low and confined ... 4
Low, damp, and exposed ... 33	Damp and exposed ... 4
Low and damp ... 22	Damp ... 3
High and exposed ... 17	At sea ... 2
Low, dry, and confined ... 16	Low, dry, and exposed ... 2
High, damp, and exposed ... 16	Confined ... 1
Low and dry ... 12	Medium ... 1
High, dry, and confined ... 10	Travelling ... 1
High, damp, and confined ... 7	Damp and confined ... 1
Dry ... 6	Low ... 1
Low, dry, and exposed ... 6	
High and damp ... 6	
	383

That the atmosphere was :

Cases.	Cases.
Wet and cold ... 142	Dry, mild, and changeable ... 9
Damp, mild, and changeable ... 33	Dry ... 7
Damp and cold ... 31	Mild ... 7
Dry and hot ... 30	Dry, cold, and changeable ... 6
Dry and cold, with sunshine ... 28	Damp and mild ... 3
Changeable ... 20	Dry, cold, with snow ... 2
Wet, mild, and changeable ... 16	Cold ... 1
Not mentioned ... 14	Damp ... 1
Wet and changeable ... 13	
Cold and changeable ... 10	
	383

That the wind was :

Cases.	Cases.
E. ... 60	S.E. to S.W. ... 1
N.E. ... 41	N.W. to E. ... 1
S.W. ... 38	E. to N. ... 1
S.E. ... 34	W.S.W. to N.W. ... 1
W. ... 24	W. to E. ... 2
N.W. ... 22	Variable ... 2
N. ... 7	Not mentioned ... 146
N. to E. ... 2	
S. ... 2	
	383

Of the 237 cases out of the total of 383 in which the direction of wind was mentioned, it had an easterly direction in 141 cases, or 59.45 per cent.

B.—Where the pain was migratory and few joints affected, That the locality was :

Cases.	Cases.
High, dry, and exposed ... 18	No fixed abode ... 2
Low, damp, and confined ... 8	Dry and confined ... 2
Low and damp ... 7	Low, dry, and exposed ... 1
Low, damp, and exposed ... 7	Low ... 1
Low and dry ... 4	Low and confined ... 1
High and dry ... 4	High and damp ... 1
Low, dry, and confined ... 3	High, dry, and confined ... 1
High, damp, and exposed ... 3	Damp and changeable ... 1
Damp ... 2	Damp and cold ... 1
High ... 2	
High, damp, and confined ... 2	
	73

That the atmosphere was :

Cases.	Cases.
Wet and cold ... 20	Changeable ... 3
Dry ... 10	Damp and mild ... 2
Wet and mild ... 9	Damp, mild, and changeable ... 1
Damp and cold ... 8	No fixed abode ... 1
Dry, cold, with sunshine ... 6	Not mentioned ... 1
Dry and hot ... 5	
Wet ... 4	
Wet and changeable ... 3	
	73

That the wind was :

Cases.	Cases.
S.W. ... 13	N. ... 2
E. ... 11	S. ... 2
N.E. ... 10	N.E. to S.W. ... 1
W. ... 7	E.S.E. ... 1
N.W. ... 4	Not mentioned ... 18
S.E. ... 2	
E.N.E. ... 2	
	73

Of the 55 cases out of the total of 73, in which the direction of the wind was mentioned, it had an easterly direction in 27 or 49.09 per cent.

C.—Where the pain was fixed and many joints were affected, That the locality was :

Cases.	Cases.
High, dry, and exposed ... 18	Exposed ... 2
Low, damp, and confined ... 11	Dry ... 1
Low, damp, and exposed ... 8	Dry and exposed ... 1
High, dry, and confined ... 6	High ... 1
Low and damp ... 5	Low, dry, and exposed ... 1
High and dry ... 3	High and damp ... 1
Low, dry, and confined ... 3	Confined ... 1
Low and dry ... 2	High and dry ... 1
High and exposed ... 2	Not mentioned ... 1
High, damp, and exposed ... 2	
Low and confined ... 2	
	72

That the atmosphere was :

Cases.	Cases.
Wet and cold ... 21	Damp and cold ... 3
Changeable ... 12	Mild ... 2
Damp and cold ... 6	Dry ... 1
Damp and mild ... 6	Cold, with sunshine ... 1
Dry and hot ... 5	Cold and changeable ... 1
Wet and mild ... 5	Not mentioned ... 1
Dry and cold ... 4	
Wet ... 4	
	72

That the wind was:

Cases.			Cases.		
E. ... ..	...	19	N.W. ... ..	...	2
S.W. ... ..	...	8	N. ... ..	...	2
N.E. ... ..	...	7	Not mentioned ...	...	20
S.E. ... ..	...	5			
W. ... ..	...	5			72
S. ... ..	...	4			

Of the 52 cases out of the total of 72 in which the direction of wind was mentioned, it had an easterly direction in 31 cases, or 59.61 per cent.

D.—Where the pain was fixed and few joints affected,

That the locality was:

Cases.			Cases.		
Low, damp, and confined ...	16	Low, dry, and confined ...	3		
High, dry, and exposed ...	14	Low and dry ...	2		
High, dry, and confined ...	11	Low, damp, and exposed ...	2		
High and dry ...	8	Damp and confined ...	1		
High and exposed ...	6	Low and confined ...	1		
Low and damp ...	5	Damp ...	1		
High, damp, and exposed ...	4	At sea ...	1		
High and damp ...	3	Not mentioned ...	1		
Low, dry, and exposed ...	3				
High ...	3				85

That the atmosphere was:

Cases.			Cases.		
Wet and cold ...	27	Dry and cold ...	2		
Damp and cold ...	9	Changeable ...	2		
Dry and hot with sunshine ...	9	Dry and changeable ...	2		
Wet and mild ...	5	Cold and changeable ...	1		
Dry and mild ...	5	Mild and changeable ...	1		
Damp and mild ...	5	Damp and changeable ...	1		
Not mentioned ...	5	Cold ...	1		
Wet ...	4				
Dry and cold with sunshine ...	4				85
Damp ...	2				

That the wind was:

Cases.			Cases.		
E. ... ..	...	13	N.W. ... ..	...	4
S.W. ... ..	...	12	E. to W. ... ..	...	3
W. ... ..	...	7	Not mentioned ...	...	28
N.E. ... ..	...	6			
S.E. ... ..	...	6			85
N. ... ..	...	6			

Of the 57 cases, out of the total 85, in which the direction of the wind was mentioned, it had an easterly direction in 28, or 24 per cent.

E.—Where many joints were affected (no mention being made as to whether the pain was migratory or not),

That the locality was:

Cases.			Cases.		
High, dry, and exposed ...	4	High ...	1		
Low, dry, and confined ...	2	Low, dry, and exposed ...	1		
Low, damp, and exposed ...	2	High and exposed ...	1		
Low, damp, and confined ...	2	Dry and confined ...	1		
Dry ...	2				
High, damp, and exposed ...	2				18

That the atmosphere was:

Cases.			Cases.		
Wet and cold ...	7	Dry and hot ...	1		
Wet and mild ...	3	Dry and cold ...	1		
Changeable ...	3	Dry ...	1		
Dry and mild ...	1				
Wet ...	1				18

That the wind was:

Cases.			Cases.		
E. ... ..	...	5	Not mentioned ...	...	4
S.W. ... ..	...	5			
S.E. ... ..	...	2			18
W. ... ..	...	1			

Of the 14 cases, out of the total of 18, in which the direction of the wind was mentioned, it was easterly in 7 cases, or in 50 per cent.

F.—Where few joints were affected (no mention being made as to whether the pain was migratory or fixed),

That the locality was:

Cases.			Cases.		
High, dry, and exposed ...	4	High ...	...	
Low, damp, and confined ...	2	High, dry, and confined ...	...	
High and exposed ...	2	High, damp, and exposed ...	...	
Dry and confined ...	2				
High and dry ...	2				
Low and damp ...	1				

That the atmosphere was:

Cases.			Cases.		
Wet and cold ...	6	Wet and mild ...	...	
Wet ...	2	Damp and cold ...	...	
Dry and hot ...	2	Not mentioned ...	...	
Dry and cold ...	2				
Mild ...	1				

That the wind was:

Cases.			Cases.		
E. ... ..	...	4	Variable ...	...	1
S.W. ... ..	...	2	Not mentioned ...	...	1
S.E. ... ..	...	2			
N.E. ... ..	...	2			
N.W. ... ..	...	1			

Of the 15 cases, out of the total 16, in which the direction of the wind was mentioned, it was easterly in 8, or 53.3 per cent.

G.—Where the pain was fixed, one joint only being affected,

That the locality was:

Cases.		
Low and damp ...	...	1
High, damp, and exposed ...	...	1
Low, dry, and exposed ...	...	1
High and dry ...	...	1
		4

That the atmosphere was:

Changeable ...	...	1
Wet and cold ...	...	1
Dry and cold ...	...	1
Not mentioned ...	...	1
		4

That the wind was:

E. ...	...	1
W. ...	...	1
Not mentioned ...	...	2
		4

H.—Where pain was absent,

That the locality was:

Cases.		
High, dry, and exposed ...	...	1
High and exposed ...	...	1
		2

That the atmosphere was:

Dry and cold ...	...	1
Wet and cold ...	...	1
		2

That the wind was:

E. ...	...	1
N.E. ...	...	1
		2

(In 3 cases no mention was made as to pain or joint affection.) Further analysis of the above tables shows:

1. That the direction of the wind was mentioned in 432 cases, and that it was easterly in 244, or 56.48 per cent.

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Under locality, taking the first four headings under which the majority of the cases occurred, the following order is observed:—

	A.	B.	C.	D.	E.	F.	G.	H.
1	High, dry, exposed	High, dry, exposed	High, dry, exposed	Low, damp, confd.	High, dry, exposed	High, dry, exposed	Low, damp	High, dry, expl.
2	Low, damp, confd.	Low, damp, confd.	Low, damp, confd.	High, dry, exposed	Low, dry, confined	Low, damp, confd.	High, damp, expl.	High, exposed
3	High, dry	Low, damp	Low, damp, expl.	High, dry, confined	Low, damp, expl.	High, exposed	Low, damp, expl.	—
4	Low, damp, expl.	Low, damp, expl.	High, dry, confined	High, dry	Low, damp, confd.	Dry, confined	High, dry	—

Similarly under atmosphere the following is the result:—

	A.	B.	C.	D.	E.	F.	G.	H.
1	Wet and cold	Wet, cold	Wet, cold	Wet, cold	Wet, cold	Wet, cold	Wet, cold	Wet, cold
2	Dmp., mld., changeable	Dry	Changeable	Damp, cold	Wet, mild	Wet	Changeable	Dry, cold
3	Damp, cold	Wet, mild	Damp, cold	Dry, hot	Changeable	Dry, hot	Dry, cold	—
4	Dry, hot	Damp, cold	Damp, mild	Wet, mild	Dry, mild	Dry, cold	—	—

A. = many joints affected; pains migratory.
 B. = few " " " " fixed "
 C. = many " " " " " "
 D. = few " " " " " "

E. = many joints affected; no mention as to pain being migratory or fixed.
 F. = few " " " " " "
 G. = one joint " " " " " "
 H. = where pain was absent.

CARDIAC COMPLICATIONS.

1. Cases in which pericarditis and endocarditis were coexistent. Pericarditis and endocarditis occurred synchronously in 57 cases, or 8.70 per cent., namely, males 29, or 4.427 per cent.; females 28, or 4.274 per cent.

Of these, 2 deaths occurred, both females, aged 29 and 22, and both were treated with salicylic acid.

The following figures show the result under the various treatment employed:

	Males.	Females.
Recovery complete, from the rheumatism, etc.:—		
Salicylates	10	11
Salicylic acid	4	—
Salicylates and alkalies	3	1
Salicin and salicylates	—	2
Quinine and salicylates	1	1
Alkalies	1	2
Recovery partial:—		
Salicylates	6	6
Alkalies	—	1
Salicylic acid	—	1
Salicin	1	—
Alkalies and quinine	—	2
Salines	1	—
Every known remedy	—	1
	27	27

Deaths:—
 Salicylic acid 2
 No mention of result... .. 1

Table showing the period of life at which these affections occurred:—

Between	Males.	Females.
1 and 10	4	2
10 " 20	8	11
20 " 30	7	12
30 " 40	7	0
40 " 50	2	4
	28	29

The greater number in each case occurred between the second and third decades.

PERICARDITIS.

Pericarditis occurred alone in 54 cases, or 8.24 per cent., namely, in 27 males and 27 females.

If this number be added to that of the pericarditis and endocarditis combined, we have 57 + 54 = 111, or 16.94 per cent., of pericarditis in the whole of the recorded cases.

Among these cases 6 died, namely:

No. 12. Male, aged 34, of intemperate habits.

No. 238. Female, aged 11.

No. 245. Male, aged 4.

No. 281. Female, aged 68.

No. 463. Female, aged 16. Death in this case was from bronchitis.

No. 627. Male, aged 6. Death in this case was from embolism. These fatal cases will be considered more in detail under the head of deaths (see p. 401).

Forty of the cases, or 70.17 per cent., were treated, from the commencement of the attack or during its course, by salicin, salicylic acid, or its salts, but the information to be gathered from the tables is necessarily limited; no data are therefore available to show what is the effect of this drug on the serous membrane.

The greater number of cases occurred in males between the second and third decade, and in females between the first and second.

Between	Males.	Females.
1 and 10	2	0
10 " 20	5	14
20 " 30	10	6
30 " 40	8	1
40 " 50	1	5
60 " 70	—	1
	26	27
Age not stated	1	—
	27	—

The most advanced age at which pericarditis occurred was in (281) a female, aged 68; the youngest was (245) a male, aged 4.

Table showing the Different Recent Murmurs (that is, Murmurs which Supervened during the Present Attack). They are classed under two heads, namely, those which Recovered and those which were Persistent, and are grouped in columns according to the treatment of each case.

RECOVERY.

	Salicyl.	Alkal.	Alk., etc.	Salicin	Salic. A.	No ment.	Total.
Aortic systolic	7	2	—	—	—	—	9
Aortic diastolic	4	—	—	—	—	—	4
Mitral systolic	4	2	3	2	3	3	19
Mitral diastolic	—	—	—	—	—	—	—
Presystolic mitral	6	—	—	—	—	—	6
Pulmonary	3	—	—	—	—	—	3
Murmur	1	—	—	—	—	—	1
Endocarditis	—	—	—	1	—	—	1

PERSISTENT.

	Salicyl.	Alkal.	Alk., etc.	Salicin	Quin. op. aich.	Salic. A.	None.	Total.
Aortic systolic ...	13	3	1	2	1	—	—	20
Aortic diastolic ...	1	—	—	—	—	—	—	1
Mitral systolic ...	75	4	6	5	1	2	1	94
Mitral diastolic ...	1	—	—	—	—	—	—	1
Presystolic mitral ...	—	1	—	—	—	—	—	1
Pulmonary ...	3	—	—	—	—	2	—	4
Murmur ...	—	2	1	—	—	—	—	5
Endocarditis ...	1	—	—	—	—	1	—	2

In addition to these, 1 case of mitral regurgitation recovered, but the treatment is not stated; 5 cases recovered on salines, and 1 case on iron; 1 case of pericarditis recovered on saline treatment simply.

COMPLICATIONS.

The rheumatic attack was complicated by:

	Males.	Females.	
Pneumonia	in 7	4	= 11 cases, or 1.52 per cent.
Pleurisy	" 8	5	" 13 " 1.98 "
Epistaxis	" 4	3	" 7 " 1.06 "
Bronchitis	" 1	2	= 3
Pharyngitis	" 2	1	= 3
Erysipelas	" 1	2	= 3
Suppurative otitis	" —	1	
Hæmophilia	" —	1	
Meningitis	" —	1	
Pyelitis	" —	1	
Naso-pharyng. catarrh	" 1	—	
Laryngitis	" —	1	
Diphtheria	" 1	—	
Delirium tremens	" 1	—	
Parturition	" —	1	
Chancre	" 1	—	
Lactation	" —	1	
Gout	" 1	—	
Urethral discharge	" 1	—	
Thrush and tympanites	" 1	—	
Dysentery	" 1	—	
Epilepsy	" 1	—	
Diarrhœa	" 1	—	
Scarlet fever	" 1	—	
Rötheln	" —	1	
Angina	" —	1	
Enteric fever	" —	1	
Acute tuberculosis	" 1	—	

(Chorea is treated of in a separate section, see page 393.)

HYPERPYREXIA.

Four cases are included under this heading, in which the temperature at any time exceeded 107° F. Of the 4, three were fatal and 1 recovered.

No. 208 (G. W. Homan, Lichfield). Male, aged 47, baker, of temperate habits. Locality, high; atmosphere, dry but changeable; wind S.W. There had been four previous attacks of rheumatism. Present attack mild, but attended by considerable sweating. Patient had been exposed to cold, and shock of his son's death. Many joints were affected, and the pains were migratory. There was no cardiac disease. Treatment was: (1) potass. bicarb. and iod. sod. salicyl.; (2) quinine and opium. For the first 5 days there was wandering pain, but no fever or constitutional disturbance. On the sixth day temperature rose to 101.4° F., and remained between that and 102.2° F. until the nineteenth day. On the evening of the nineteenth day it rose suddenly to 107.4° F., and death ensued.

No. 209 (G. W. Homan, Lichfield). Male, aged 27. (This patient, in the preliminary report published by the Subcommittee in July, 1883, is said to have been a son of the above, 208). Single, a clerk, of temperate habits. No mention is made as to locality; atmosphere, mild and changeable; wind (?) N.W. There had been one previous attack of rheumatism at 19, and the patient had chorea in childhood. He had been exposed to cold 3 weeks previously. The attack was moderate in severity, attended by considerable sweating. Many joints were affected; the pains were fixed. An old regurgitant mitral murmur existed at the time of the present attack. Treatment was: sod. salicyl. 15 grains every 3 hours, and ice packing for the high fever. The case did well till the seventh

day, when sweating ceased, and in the evening the temperature rose to 110° F. He died in 5 hours, with a temperature of 106.9° F.

No. 531 (C. Boyce, M.B., Maidstone). Male, aged 43; intemperate; a vinegar maker. Locality, high and exposed; atmosphere, wet and cold. Patient had had a previous rheumatic attack at 35, and was constantly exposed to wet; the attack was severe, and attended by considerable sweating; many joints were affected; the pains migratory; there was an old mitral murmur (systolic). During the second day of the attack a miliary eruption appeared; the patient was, moreover, liable to dyspepsia and ulceration of the mouth. Treatment (1) sod. salicyl., 15 grains every 4 hours; (2) pot. bicarb.; (3) "cold sponging for hyperpyrexia." The temperature, which reached 107.2° on the fourteenth day, fell 5° in 3 hours under cold sponging. Duration of fever 23 days, of pain 11 days, of whole attack 105 days. Recovery was complete.

No. 560 (James Kaye, M.B., Bromsgrove). Male, aged 39; gardener; temperate. Locality, high and exposed; atmosphere, cold and changeable; wind E. He had been exposed habitually to sudden chills. The attack was a moderate one, with considerable sweating; many joints were involved; the pains were migratory; there was no cardiac complication; in the early part of the attack erythema made its appearance, and, later, sudamina. No previous rheumatic affection. Treatment: (1) pot. iod. and bicarb., with colchicum; (2) sod. salicyl., half a scruple every 2 hours, then 15 grains with sod. bicarb. half a drachm; (3) quinine, half a scruple dose; brandy; cold sponging. From the first to the fourth day the disease simulated gout; from the fourth to the seventh day pain and swelling nearly gone, when patient persisted in going out. On eighth day pain and swelling recurred, but the temperature was nearly normal. On twelfth day temperature 102°; rheumatic fever well developed. All went well till twenty-first day, when hyperpyrexia set in, which, though at first checked by treatment, proved fatal on twenty-third day. Temperature on twenty-first day 110°, on twenty-third 108.6°. The most important facts are shown in the subjoined table:—

Sex.	Age	Habits.	Previous Rheumatic Attacks.	Recent Antecedents.	Heart Disease.	Date of Onset of Hyperpyrexia.
Male	47	Temperate	4	Expd. to cold	None	6th day
"	27	"	1	"	Old mitral	7th "
"	43	Intemperate	1	" " wet	"	14th "
"	35	Temperate	None	" " chills	None	21st "

RELAPSING CASES.

Out of the whole number of recorded cases, instances of relapse of the rheumatic affection is noted in 70 patients, or 10.68 per cent., namely, males, 44; females, 26. Some had only one relapse, but in 6 males and in 2 females the relapses are stated to have been many. Among the 44 males occurred 63 relapses, and among the 26 females 30 relapses. Search among the tables was then made with the view of ascertaining whether or no treatment had any effect in preventing this recurrence of the rheumatism, but in vain. It was found that 97.18 per cent. of these relapsing cases were treated with salicin, salicylic acid, or its salts, chiefly sodium salicylate.

The only case requiring any special note is, perhaps, No. 155, a male, aged 15, who was immediately benefited by salicylic acid continued for 3 days; at the end of this time it "was omitted, as the patient loathed it." Potass. bicarb. and colchicum was substituted, with the result of an immediate relapse, and a rapid recovery on sodium salicylate. The duration of the fever was 30 days, of the pain 4 days, of the whole attack 10 days. The lad had suffered from two previous attacks of rheumatism, the first 5 years previously.

DEATHS.

In the 655 cases in the tables death occurred in 22, or 3.30 per cent., of which 12 were males and 10 females; 10 were temperate, 3 were intemperate, 8 were total abstainers, and in 1 case no mention is made as to drinking habits; 18 of the cases, or 81.81 per cent., were treated with salicin, salicylic acid, or its salts.

Percentage of deaths in

Total abstainers ...	5.36 per cent. (149 cases)
Temperate ...	3.74 " (264 ")
Intemperate ...	8.82 " (34 ")

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The following table, taken almost verbatim from the tabulated report, gives the more important facts connected with each case:—

Number.	Age.	Sex.	Heart Complications.	Previous Attacks of Rheumatism.	Treatment.	Recent Antecedents.	Day of Death.	—
12	34	M.	Pericarditis and mitral regurgitation	—	Quin., ammon., blister, opium, whisky	Exposure to cold and over-fatigue	7th	—
22	23	M.	Mitral regurgitation	Several	Sodium salicyl. and alkali	—	7th	—
47	14	F.	—	—	" " "	—	?	Salicylate caused gastro-enteritis and hæmatemesis.
112	47	F.	—	—	" " "	Exposure to cold and over-fatigue	14th	Death from enteric fever.
119	13	M.	—	—	" " "	" " "	13th	Dilatation of heart. Temperature, 105.6° F. on 12th day.
165	29	F.	Pericarditis	—	Salicylic acid, calom., op., blister	" " "	11th	—
181	40	F.	Presystolic murmur	Several	Sod. salicyl., calom. and opium, leeches to heart	" " "	8th	Apparently a case of primary endocarditis, followed by congestion of lungs.
208	47	M.	—	4	Sod. salicyl., alk., op., quinine	Exposure to cold and shock	19th	Temperature 107.4° F., sudden rise before death.
209	27	M.	Mitral regurgitation	1	" " ice pack	" " "	7th	Temperature 110° F.
238	11	F.	Pericarditis	—	" 1 salinus, 2 sod. salicyl.	" " "	7th	Death from bronchitis and asphyxia.
245	4	M.	"	—	Alkal., opium., blister over heart	Exposure to cold	21st	Death from pericardial effusion and exhaustion.
281	68	F.	"	—	Sodium salicyl.	" " "	30th	Death from meningitis.
455	22	F.	Pericarditis and mitral regurgitation	?	Salicylic acid, ammon., port wine	" " "	7th	Purpura, sloughs on buttocks.
483	16	F.	" " "	2	Sod. salicyl. and stimulants	" " "	14th	Death from acute bronchitis.
526	38	M.	Mitral stenosis	—	Sod. salicyl., alk.	Exposure to cold and over-fatigue	18th	temperature 105.8° F.
538	20	F.	Endocarditis	—	Sod. salicyl., alk., blister over heart, digit., ammon., strychn.	Exposure to cold and wet	14th	Death from asthenia.
544	18	M.	Pericarditis	1	Sod. salicyl.	?	25th	Death from cardiac complications.
550	18	F.	Aortic obstruction	—	Sod. salicyl., ammon., alesh.	—	—	Death from aortic pulmonary and mitral disease
560	35	M.	? Mitral regurgitation	—	Alk., pot. iod., colchic., quin., alesh., cold sponging	Habitual exposure to sudden chills	23rd	Temperature, on 21st day, 110.4° F.
583	24	M.	Murmur	—	Sod. salicyl., blister over heart	Exposure to cold and damp	6th	—
594	53	M.	—	—	Rest, stimulants, warmth to joints	Exposure to wet and cold	7th	Heart's action suddenly ceased.
627	6	M.	Pericarditis	3 or 4 subacute	Sod. salicyl., alk., quin., bromides and chloral for chorea	?	40th	Death from embolism.

SKIN ERUPTIONS.

Skin eruptions are recorded as shown in the following table:

Before (the attack).		During.		After.	
Cases.	Cases.	Cases.	Cases.	Cases.	Cases.
Eczema ...	22	Sudamina ...	46	Urticaria ...	2
Urticaria ...	11	Miliaria ...	13	Sudamina ...	1
Acne ...	5	Erythema ...	12	Miliaria ...	1
Erythema ...	1	Urticaria ...	10	Acne ...	1
Erythem. nodos. ...	1	Eczema ...	8	Erythema ...	1
Psoriasis ...	1	Purpura ...	5	Purpura ...	1
Seborrhœa ...	1	Erythem. nodos. ...	4	Herpes zoster ...	1
Papular ...	1	Acne ...	3	Papular ...	1
Lepra ...	1	Psoriasis ...	2	Lichen ...	1
Rashes ...	1	Lichen ...	2	Erysipelas ...	1
Acne rosacea ...	1	Vesicular ...	2		
Pustular (10 yrs.) ...	1	Herpes zoster ...	1		
Tinea tonsurans ...	1	Papular ...	1		
Sycosis ...	1	Peliosis rheumat. ...	1		
		Maculae ...	1		
		Herpes labialis ...	1		
		Syphilitic roseola ...	1		
		To which may be added:			
		Rose rash ...	2		
		Erysipelas ...	1		
		Typhus ...	1		

Sudamina being such a frequent concomitant of rheumatic fever, it was thought desirable to investigate the connection (if any) between the eruption and the severity of the attack and the extent of diaphoresis. The following table is drawn with the view of showing this:

Attack severe, sweating considerable;	males, 20;	females, 9 = 29
" moderate	"	" 8 " 6 = 14
" (?)	"	" 2 " = 2
" severe	" slight	" 1 " = 1
		46

SUBCUTANEOUS NODULES.

Of this affection 36 cases or 5.49 per cent. are mentioned—

namely: Males 20 " 3.05 " Females 16 " 2.44 "

They occurred at the following ages:

Age.	Male.	Female.	Age.	Male.	Female.
57	1	—	26	1	—
53	1	—	25	1	—
52	1	—	24	2	—
50	—	1	22	1	1
49	1	—	21	—	1
45	2	—	19	—	3
42	—	2	17	1	—
41	1	—	16	—	1
38	—	1	13	—	1
37	1	—	12	1	—
35	1	—	10	1	—
34	—	1	7	—	1
33	1	—			
32	—	1			
30	1	—			
			19		16

In one male the age is not given.

Nineteen or 52.7 per cent. of those who were affected with subcutaneous nodules had suffered from previous attacks of rheumatism.

The following table shows the number of previous attacks in each case, together with the date of the first.

Age.	Sex.	Previous Attacks.	Age at First Attack.	Age.	Sex.	Previous Attacks.	Age at First Attack.
57	M.	5 or 6	3 to 7	25	M.	3	Childhood
52	M.	1	20	24	M.	1	20
50	F.	1	39	24	F.	1	15
49	M.	1	15	22	F.	3	18
42	F.	3	39	19	F.	2	8
37	M.	Many	31	19	F.	2	13
34	F.	5	18	19	F.	1	14
32	F.	1	24	17	M.	2	13
30	M.	6	9	16	F.	2	8
26	M.	1	18				

Table showing the liability of those affected with Subcutaneous Nodules to Skin-Disease or other Ailments.

Age.	Sex.	Disease.
57	M.	Eczema for 15 years.
53	M.	Bronchitis.
52	M.	Prickly heat in India.
50	F.	Sciatica; erythema, left leg.
49	M.	Miliaria on tenth day of the rheumatism.
45	M.	Alcoholic dyspepsia; debility.
42	F.	Eczema on wrist and ankles second to twelfth day of rheumatism.
42	F.	Great debility.
38	F.	Debility.
37	M.	Sudamina during rheumatism; anæmia.
35	M.	Syphilitic roseola.
34	F.	Neuralgia.
33	M.	Lumbago.
33	F.	Urticaria often.
32	F.	Gout.
30	M.	Eczema on twenty-sixth day of rheumatism.
25	M.	Acne often; erythema and miliaria during rheumatism.
24	M.	Urticaria 7 days before rheumatism.
24	M.	Acne for years.
24	F.	Eczema.
22	M.	Erythema and miliaria during rheumatism.
22	F.	Dyspepsia.
21	F.	Erythema nodosum on ninth day of rheumatism.
19	F.	Anæmia.
19	F.	Eczema 7 years; herpes labialis and conjunctivitis during rheumatism.
19	F.	Eczema 5 years; dyspepsia.
12	M.	Urticaria on fifth day of rheumatism.
17	F.	Erythema nodosum in first week of rheumatism.
?	M.	Gout.

Of the above a tendency to skin disease is noted in 17 cases, or 47.2 per cent.

PREVIOUS ATTACKS OF RHEUMATISM.

Previous attacks of rheumatism are mentioned in 280 cases, or 42.74 per cent., namely:

Males	156, or 23.81 per cent.
Females	124, or 18.93 "

Of these:

The average age of previous attack of the whole number	=18.27.
" " " males	=18.58.
" " " females	=17.89.

COMMON AILMENTS.

Under this head are mentioned various diseases to which the patients were liable apart from the rheumatic attack for which they were under treatment.

The numbers are as follows:

Neuralgic headaches	55 cases, or 8.39 per cent.
Dyspepsia	36 " 5.49 "
Neuralgia	20 " 3.05 "
Biliousness	18 " 2.74 "
Bronchitis	15 " 2.29 "
Anæmia	13 " 1.98 "
Dyspepsia and constipation	9 " 1.37 "
Epilepsy	4 " 0.61 "
Hæmorrhoids	4 " 0.61 "
Dysmenorrhœa	3 " 0.45 "
Eczema	3 " 0.45 "
Urticaria	2 " 0.30 "
Epistaxis	2 " 0.30 "
Glandular abscesses	2 " 0.30 "
Herpes labialis	2 " 0.30 "
Syncopic attacks	2 " 0.30 "

And one case respectively of boils, ulceration of the cornea, gout and bronchitis, alcoholic dyspepsia, fever and ague, hæmoptysis, worms, dyspepsia and chronic Bright's disease, gout and headache, osteo-arthritis, chilblains, erythema nodosum, gonorrhœa, psoriasis, facial paralysis, periostitis, strumous, colic, convulsions, otorrhœa.

Although neuralgia occupies the first and third places in the above list, the total number of cases in which a "nervous element"

prevailed amounts only to 79 (neuralgic headaches 55, neuralgia 20, epilepsy 4) cases out of 655. No very strong support, therefore, is furnished by the tables to the theory of the nervous origin of rheumatism.

SEQUELÆ.

Under this head the following ailments occur in order of frequency.

	Males.	Females.	Total.
Anæmia and debility	11	9	20
Chorea	4	7	11
Stiff joints	6	5	11
Great debility	8	—	8
General debility	6	—	6
Bronchitis	3	3	6
Slight recurrence of rheumatism	4	1	5
Second attack	3	—	3
Increasing cardiac disease	1	2	3
Obstinate constipation	1	1	2
Dropsy	1	1	2
Desquamation of cuticle	—	2	2
Pains in joints	1	1	2
Boils	1	1	2
Phlebitis	1	—	1
Neuralgia and debility	1	—	1
Gout	—	1	1
Acute nephritis	1	—	1
Dyspepsia	—	1	1
Tonsillitis	1	—	1
Hæmoptysis, syncope, infarcts	—	1	1
Embolism	—	1	1
Rheumatic node in sacrum	1	—	1
Abscess in calf of leg	1	—	1
Enlarged finger joints	—	1	1
Pericardial effusion and adhesions	1	—	1
Sciatica, œdema, erythema (right leg and foot)	—	1	1
Syncope and loss of memory	—	1	1
Sciatica and melœna	1	—	1
Pneumonia (left)	1	—	1
Chronic rheumatism	—	1	1
Diarrhœa	—	1	1
Intense headache relieved by epistaxis	—	1	1
Urticaria	—	1	1
Subacute prostatitis	1	—	1
Irritation of soles of feet	1	—	1
Epistaxis	—	1	1
Functional disturbance of heart	1	—	1
Typhus	—	1	1
	62	46	108

Of the cases of chorea as a sequela the affection occurred:

No. 383, in a female aged 13, 6 months after recovery from the rheumatism.

No. 458, in a female aged about 30.

No. 466, in a male aged 9, both as an antecedent and a sequela.

No. 490, in a male aged 13, 14 days after recovery from the rheumatism.

CASES WHICH DESERVE SPECIAL NOTICE.

No 2 (Charles Ede, Guildford). A female, aged 40. The onset was very severe, and accompanied by delirium. During the attack slight pericarditis was developed.

No. 26 (Miles A. Wood, F.R.C.S., Ledbury). Male, aged 26; total abstainer. Had suffered 5 previous attacks, most of which, according to the report, occurred since his marriage 18 months previously, "as if nervous exhaustion had some effect." The other conditions are the same. "He is nervous and delicate."

No. 41 (P. Caldwell Smith, M.D., Motherwell, N.B.). Female, aged 34; total abstainer. Had had 5 previous attacks. She had old mitral disease, and suffered frequently from angina pectoris.

No. 57 (W. Carter, M.D., Liverpool). Female, aged 13. "The attacks came on immediately after a very severe fright, the child being up to the moment of the fright being apparently quite well, and never having had any rheumatic symptoms before."

No. 104 (Alfred Eddowes, M.D., Market Drayton). Male, aged 30, previously free from rheumatism. During the present attack developed pericarditis and mitral regurgitation. He had two relapses, and in the second "the pulse dropped to 40."

No. 118 (Dove McCalman, M.D., Ballchulish). Male, aged 24

quarrier; temperate; previously free from rheumatism. A double mitral murmur developed during the attack, and "rapid dilatation of the heart occurred between the second and eighth day, accompanied by a rapid rise of temperature to 105.4° F."

No. 119 (same reporter). Male, aged 13, previously free from rheumatism. Had "rapid dilatation of the heart from the seventh day till death on the thirteenth day. Before the ninth day the temperature was between 101° and 102° F.; from the ninth day it gradually rose to 105.6° F. on the twelfth day."

No. 273 (W. Macfie Campbell, M.D., Liverpool). Female, aged 17½; temperate. Had had one previous attack of rheumatism. In the present attack "fever was the sole primary symptom, followed by erysipelas. Diagnosis was, therefore, difficult."

No. 282 (J. Lardner Green, Salisbury). Male, aged 25; clerk; temperate; previously free from rheumatism. "Rapid consumption set in within a fortnight, of which the patient died (having made a partial recovery from the rheumatism). No obvious signs of phthisis were noticed at the onset of the rheumatism."

No. 296 (R. P. Ogleby, Leeds). Female, aged 25; temperate; free previously from rheumatism. Suffered from acute pyelitis during the attack.

No. 299 (A. W. Mayo Robson, F.R.C.S., Leeds). Male, aged 16; pork butcher; temperate. Had pericarditis and mitral regurgitation during the attack, with absence of joint affection.

No. 325 (T. F. Pearse, M.D., Haslemere). Male, aged 16; interperate; no fixed occupation. Pericarditis existed 6 days before the joint affection.

No. 336 (G. G. Whitwell, M.B., Shrewsbury). Male, aged 12; total abstainer; diet probably insufficient; previously free from rheumatism; subject to weekly epileptic fits before the onset of the rheumatism. During the attack he had no fits; since recovery the fits have recurred, often more severe than before.

No. 361 (H. R. Hadden, M.D., Dublin). Female, aged 42; temperate; subject to tonsillitis, but previously free from rheumatism. The rheumatic attack was accompanied by "tonsillitis and violent fever," which rapidly subsided under sodium salicylate. From the second to the thirteenth day the patient had eczema on the wrists and ankles, "the eruption being strictly confined to the joints, and attacking one after the other, just as rheumatism does."

No. 398 (G. H. Lilley, M.D., Portland). Male, aged 25; prison warder; temperate, and previously free from rheumatism. "The onset occurred while the patient was in bed for a fractured leg."

No. 419 (H. G. Orlebar, M.D., Elizabeth Street, S.W.). Female, aged 25; single; dressmaker; temperate. No previous rheumatism. Pericarditis and mitral regurgitation were developed during the attack. On the eighteenth day the patient had an attack of severe pharyngitis, with membranous exudation. Recovery complete on the twenty-first day.

Hæmorrhage occurred in three cases worthy of note; namely:

No. 337 (J. P. Willis, M.B., Bexhill). Female, aged 9; sufficiently fed; free from rheumatism hitherto. Patient had profuse epistaxis; slight vaginal discharge of blood.

No. 338 (same reporter). Male, aged 17, brother of the above. Had had one slight rheumatic attack previously. He suffered from profuse epistaxis before and after treatment commenced.

No. 557 (Harold Swale, M.B., Tavistock). Female, aged 20; nurse; total abstainer; previously free from rheumatism. She had severe epistaxis on the second, third, and fourth day (three-quarters of a pint each time). Mother and brother both hæmophilic.

These three patients were treated with sodium salicylate.

The tables were examined with the view of eliciting any facts as to—1, the effect of stimulants; 2, evidence of heredity of rheumatism; 3, the period at which cardiac complications occur; but, as no special inquiry was directed to these points in the formula submitted to the reporters, no information can be obtained from their reports.

THE will of Sir Joseph Ritchie Lyon Dickson, physician to the British Legation at the Court of Persia, has been proved; the personal estate valued at upwards of £7,000.

The senior medical students at the University of Pisa have agreed upon a strike of a novel kind. They have decided not to attend lectures until the five important chairs of clinical medicine, medicine, hygiene, general pathology, and materia medica, which have now been vacant for some time, have been filled up.

LECTURES

ON

SUPPURATION AND SEPTIC DISEASES.

Delivered at the Royal College of Surgeons, February, 1888.

By W. WATSON CHEYNE, F.R.C.S.,

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LECTURE I.

IN studying the effects of pathogenic bacteria on animals, we frequently see great differences between the effects of the same bacteria on different species of animals, and even on the same species under varying conditions. Inoculate guinea-pigs with tubercle bacilli and we constantly produce a rapid and general disease which has little or no tendency to remain localised, and no tendency to undergo spontaneous cure; we are naturally, therefore, tempted to look on the bacilli as the only noteworthy factor in the causation of the disease, and to think that with the discovery of the bacillus the etiology of the disease has been settled. On the other hand, if we turn our attention to man, we see that opportunities for infection with tubercle bacilli are frequently present without being followed by infection; that the disease assumes a variety of forms under a variety of external conditions; that it has comparatively little tendency to become generalised, and that it has a strong tendency to get well, either spontaneously or under the influence of treatment not directed against the parasites. It cannot be a matter of surprise if, under these circumstances, the clinical observer concludes that the etiology of the disease has not been solved by the discovery of the bacillus, or that he is inclined to regard the organism as a very small portion of the cause, or even as a secondary, and perhaps unnecessary accompaniment.

The fact is, however, that in these diseases we have two opposing forces before us—on the one side the bacteria, on the other the body, and these forces are by no means always equally matched, nor do they always bear the same relation to each other in different species of animals. In some animals the bacteria are more powerful than the body, the resistance on the part of the body being scarcely, if at all, evident; in other species of animals the same bacteria are much weaker than the body, and if they succeed in entering the animal organism at all, they only do so by the aid of other conditions, and when these conditions cease to act the bacteria again die out. In extreme cases these conditions, by determining the seat and the exact nature of the resulting disease, are apt to give rise to the erroneous belief that they are the essential ones.

This is well illustrated, not only by the example given, but also by the case of anthrax. Introduce a single anthrax bacillus into a guinea-pig, and the animal dies with certainty of a general disease, with only œdema at the seat of inoculation. On the other hand, introduce anthrax bacilli into rats, and we have a very different result, and one which varies according to the age of the animal and the other conditions of the experiment. The result of the injection into a young rat, for example, is that the animal becomes very ill—it may be, in some cases, even dies—while there is a production of sero-purulent fluid at the seat of inoculation. The older the rat, up to a certain point, the less are the general symptoms manifest, the purer is the pus which is formed at the seat of injection, and the sooner do the anthrax bacilli die out. In spite of these different results we must none the less admit that in each case the bacillus has been the essential cause of the disease, the difference in the characters of the disease being due to differences in the strength of the opposing forces. In the case of the guinea-pig infected with anthrax, the bacillus is so much more powerful than the body, that the symptoms of resistance on the part of the latter are completely obscured. In the case of the rats, on the other hand, the opposing forces are more or less equal in strength, and consequently other conditions, such as age, seat of inoculation, etc., come into play, and modify the character of the resulting disease.

In our surgical work we have to do with two diseases which