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T H E S I S

for the Degree of M.D., Edinburgh University,

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AN ANALYSIS of 296 CASES OF CHOREA with special  
REFERENCE to TREATMENT.

BY

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## I N T R O D U C T I O N .

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The earliest description of the disease Chorea Minor we owe to Sydenham's *Schedula Morborum* published in 1686. Since then Chorea Minor, or, as we now call it, Sydenham's Chorea, has been recognised as a distinct disease mainly attacking children from 5 years to puberty.

Chorea Minor, then is a disease of early life, and when we talk of Chorea in this paper, we exclude Chorea Major, the Chorea of pregnancy, and all the various motor tics and habit spasms which are common to child life.

The literature on the subject is immense and yet with all this observation and research the pathology of the disease is still very obscure, and the reports by different pathologists very conflicting.

One reason for this is the rarity of fatal cases of Chorea, as it is a disease, which, though it for the time being lays aside the child from all active participation in the daily routine of life, is almost always recovered from.

Where the Pathology of a disease is obscure/

obscure we have to fall back on theories, and there are several on chorea.

There are some who think that it is a functional disorder, among whom is Sturges, who regards it as a motor disturbance beyond the reach of anatomical demonstration, while McCarthy thinks it would be a mistake to consider emotional disturbances as a cause of a clinical syndrome running such a definite course as Sydenham's Chorea.

Dickinson is of the opinion that it is due, in the main, to arterial repletion caused by irritants in the blood. These he thinks may be either solid, as Emboli, or liquid such as the hypothetical fluent poisons. He suggests, however, that the vascular dilatation may be of nervous origin. These opinions are based on the results of 22 post-mortem examinations.

At one time the Embolic Theory was very popular. Kirkes was the first to bring forward this theory, and Hughlings Jackson and Stephen Mackenzie were strong supporters of it. They thought that, while the plugging of a large artery may cause hemiplegia, the plugging of a smaller artery or arteriole would bring about an impaired nutrition of the part and no necrosis.

This theory, however, has not borne investigation, as at post mortem examinations no trace of Emboli/

Emboli have been found by many observers, one of whom was Dickinson, who in 22 autopsies did not find the lesions in the Brain and cord consistent with embolism.

The association of Chorea with Rheumatism has been observed since the beginning of the 19th century. Many of the modern writers would place Rheumatism as the causal factor in every case, while others are inclined to look upon Chorea, not as a disease, but merely as a symptom, and divide their classification of Chorea into Rheumatic and Non-Rheumatic cases.

Henoch inclined to the view that Chorea was due to Rheumatism acting in some unexplained way on the co-ordinating centres, and Barlow was of the opinion that Chorea occurred so frequently with rheumatic symptoms that we are justified in regarding it as itself often a Rheumatic Symptom.

Duckworth maintained that it was a manifestation of the rheumatic habit or diathesis, precipitated often by some emotion such as fright, or sometimes without any such exciting cause. On the other hand Cheadle believed that Rheumatism is the most common and potent factor, but at the same time states that he thinks the commonly called rheumatic manifestations such as Tonsillitis, erythema, endo-carditis, pericarditis/



pericarditis and arthritis may be caused by other factors besides rheumatism.

Sachs and McCarthy both hold very similar views, namely it is due to the effect of an infectious agent or its toxin on the central nervous system.

Since the advent of the high power microscope many and varied reports have been published regarding organisms found both during life, and at post mortem examinations in cases of Chorea. From their researches some regard it as a general septic infection, while comparatively recently many continental observers stated that they had isolated a specific organism, the same organism being the causal factor in chorea and rheumatism.

At the beginning of this century Poynton & Paine, along with many others, were of the opinion that the remarkable constancy of the symptoms of rheumatic fever was against its being a condition that would result from many infections, and started their research which resulted in their discovery of the *Diplococcus Rheumaticus*, the same bacillus being isolated by them from cases of Chorea.

Beattie on injecting the *Diplococcus* into a rabbit found that it developed choreiform movements of/ .

of its limbs, a similar observation having previously been made by Poynton and Paine.

They regard Chorea as due to the presence of small focal lesions external to the capillaries, which are caused by the escape of the diplococci from the blood stream into these positions.

Still there are men who hold that Chorea and Rheumatism have nothing to do with each other and are distinct diseases, but I shall discuss this later when giving my observations on the relationship between Chorea and Rheumatism.

We find then, that as yet there is nothing very definitely known about the pathology of chorea, and, when the causal factor of a disease is unknown, the treatment must necessarily be carried out either by treating symptoms or else empirically.

Although most physicians have some line of treatment which they regard as being most successful, yet few are at all dogmatic in saying which treatment gives the best results. In the Royal Hospital for Sick Children, Edinburgh, the treatment has at least been/

been varied if not at all times successful, and I have classified all the cases, 296 in number, treated in this Hospital from October 1900, to January 1910, under their different treatments for the purpose of ascertaining whether any one mode of treatment gives more satisfactory results than another. By taking a large number of cases, and taking their average duration after treatment was begun, I have tried to eliminate fallacies as much as possible, and by taking the average duration of all the cases after treatment was begun, no matter what the treatment was, and comparing this result with the result of each separate group and sub-group of cases, I have been able to come to a conclusion as to the success of the different modes of treatment employed in this Hospital. While doing this I have at the same time analysed each case in regard to various facts, some of which I have tabulated and given in the tables of statistics, while others I have merely given as a whole, where I did not think it was of importance that they should be given in tabular form.

I have to thank Dr. Burn Murdoch, Dr. Melville Dunlop, Dr. John Thomson and Dr. Fowler for their kindness in giving me permission to use their cases, and especially Dr. John Thomson for his valuable advice, and the large number of references which he was good enough to put at my disposal.

STATISTICS OF 296 CASES OF CHOREA.

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THE FOLLOWING ARE ABBREVIATIONS AND SIGNS WHICH ARE MADE USE OF IN THE TABLES OF STATISTICS.

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SEX.

F = female. M = male.

AGE.

The decimal points equal the months.

FAMILY HISTORY.

M = Mother. F. = Father. B = Brother. S = Sister. Rheum = Rheumatism. H. = Heart disease. T.B. = Tuberculosis. B. = Bright's disease. E.G. = ex. goitre = Exophthalmie goitre. E.F. = Epileptic Fits.

PREVIOUS HEALTH.

M. = Measles. Who. = Whooping-cough. Chp. = Chickenpox. Sef. = Scarlet fever. D. = Diphtheria. C.S. = Congenital Syptulis. Flue = Influenza. H. = Tuberculous disease of hip. M. = Mastoid disease. T = Enlarged tonsils. B = Bright's disease. I.Sp.P. = Infantile Spinal Paralysis.

PREVIOUS/



PREVIOUS RHEUMATISM, CHOREAAND HEART TROUBLE.

Rh. = Rh. H. = Heart  
 disease ( ) = Number of  
 previous attacks of  
 Chorea. N = Rheumatic  
 Nodules.

PRESENT RHEUMATISM ANDHEART TROUBLE.

Rheum = Rheumatism.  
 M. = Mitial. N. = Rh-  
 eumatic Nodules. T. =  
 Sore throats.

SEVERITY OF ONSET.

+ = Severe attack.  
 Mod = Moderately Severe  
 attack.

- = Slight attack.

DURATION.

D. = day. W. = week.

M. = month. y. = year.

RECURRENCE.

Numbers equal the number  
 of recurrences.

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NUM- NAME SEX AGE AT ONSET FAMILY HIS- TORY PRE- VICIOUS HEALTH PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE PRESENT RHEUMA- TISM & HEART TROUBLE SEVER- ITY OF ATTACK DATE OF ONSET DURA- TION BEFORE TREAT- MENT DURA- TION AFTER TREAT- MENT RE- CURR- ENCE.

A R S E N I C .

1.	K.A.A.	F.	10:	4	M.H.&T.B	M.Who.C	Rhe.Fev.	Mit.Sys.	+	19:	1:00	8m.	1m.	no.
2.	W.C.C.	M.	8:11		Nll.	H.Who.F	Rheum	Nll.	+	27:	11:01	6wks	3wks.	no.
3.	E.L.L.	M.	7:	6	M.Rh.S.R	M.Who.P	Nll	Nll	Mod.	24:	12:02	14d.	17d.	no.
4.	M.M.M.	F.	10:12		Nll.	Who.P.CS	Nll	Nll	+	15:	1:03	2w.	19d.	no.
5.	A.M.M.	M.	9:10		Nll.	M.Sc.F.	Nll.	Nll	+	27:	10:02	2m.	5w.	no.
6.	A.G.C.	F.	7:10		Nll	M.Chp.	Chorea 2.	Nll	+	7:	2:03	2m.	1m.	no.
7.	A.B.	M.	5:	9	M.Rh.	M.Who.	Nll.	Nll	Mod.	10:	4:04	1m.	2m.	no.
8.	W.W.W.	M.	10:		Nll.	M.Who.	Nll	Nll	Mod.	28:	6:04	3w.	3w.	no.
9.	K.F.F.	F.	7:		Nll	M.Who.	Nll	Nll	Mod.	31:	3:04	2y.	10d.	no.
10.	V.P.P.	F.	8:	6	Nll	M.Who.	Nll	Nll	Mod.	14:	6:06	3w.	3w.	1.
11.	L.D.D.	F.	10:		Nll	M.Who.	G.Pains.	Nll	Mod.	8:	8:06	2w.	not crd.	no.
12.	W.T.T.	M.	5:11		F.Rh.	M.Chp.	Nll	M.Sys.	Mod.	27:	10:06	1m.	1w.	1.
13.	M.S.S.	F.	8:11		F.Rh.	M.Chp.	Rheum.	Nll	+	22:	10:08	8d.	3w.	no.
14.	J.P.P.	F.	7:		M.Rh.	M.W.C.B.	Nll	Nll	+	19:	3:09	2w.	2m.	no.
15.	J.A.A.	F.	8:	6	Nll.	M.	Nll	Nll	Mod.	6:	3:10	3d.	10d.	no.
16.	I.A.A.	M.	6:	2	Nll	M.Sf.Dp.	Nll	Rheum.	Mod.	14:	11:09	3d.	3d.	1.
17.	N.C.C.	F.	4:		Nll	M.Who.	Nll	Nll	+	9:	3:10	2w.	10d.	no.
18.	M.C.C.	F.	8:	3	M.Rh.	M.W.Chp.	Nll	M.Sys.	+	21:	5:10	6w.	1m.	no.
19.	E.C.C.	F.	6:		Nll	M.W.ScF.	Nll	Nll	+	21:	8:09	2w.	3w.	no.
20.	M.M.D.	F.	6:		M.Rh.	M.W.H.D.	S.Rh.	Nll	+	7:	9:09	3m.	4d.	no.
21.	J.F.F.	F.	10:	9	Nll.	M.Who.	Nll	Nll	Mod.	7:	2:09	3m.	2w.	no.
22.	J.G.G.	F.	9:	6	Nll	M.W.C.S.	Rheum.	M.Sys.	Mod.	21:	12:09	2w.	1m.	no.
23.	H.H.H.	F.	6:		Nll	M.	Chorea 1.	Nll	+	2:	9:08	3w.	1w.	no.
24.	H.H.H.	F.	11:		Nll	M.	Nll	Nll	Mod.	1:	1:10	2m.	1w.	no.
25.	J.L.L.	M.	7:	6	Nll	M.	G.Ps.Ts.	Nll	+	6:	7:10	1m.	6w.	1.
26.	M.A.L.	F.	9:	5	Nll	M.ScF.	Rh.Fev.	M.Sys.	Mod.	9:	5:09	1m.	3w.	no.
27.	M.R.R.	F.	6:11		Nll	M.ScF.	Nll	Nll	+	20:	9:09	10w.	17d.	no.
28.	B.S.S.	F.	11:		Nll	M.C.S.	Chorea 1.	Nll	Mod.	14:	2:08	1w.	16d.	no.

NUM-BER.	NAME	SEX	AGE AT ONSET	FAMILY HISTORY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURRENCE.
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A R S E N I C .

29.	M.S.	F.	8	M.Rh.	M.Whg.	Chorea(1)	Nll.	Mod.	8.4.08	3m.	2w.	no.
30.	E.S.	F.	9	Nll.	M.Whg.	"1.G.Ps.	Nll.	Mod.	17.12.07	6m.	3wks.	1.
31.	W.T.	M.	9	Nll.	M.Whg.	Rh.Fev.	Nll.	+	7.2.09	3d.	6wks.	no.
32.	M.C.	F.	5.11	Nll.	M.	Chorea (1)	Nll.	+	23.10.10	1m.	7w.	no.
33.	A.R.	F.	3	Nll.	Nll.	Nll.	Nll.	+	26.6.02	7d	not crd.	no.
34.	M.G.	F.	10	Nll.	M.Whg.C.	Pneum.	Nll.	+	29.4.02	3w.	"	no.
35.	J.R.	M.	8.11	Nll.	M.	Nll.	Nll.	+	16.8.02	7w.	6w.	no.
36.	L.M.	F.	7	F.Scl.	M."Chd.	Nll.	M.Sys.	+	29.11.03	4d.	not cd.	no.
37.	J.M.	F.	4	Nll.	Whg.	Nll.	Nll.	Mod.	1.1.03	18d.	5w.	no.
38.	D.W.	F.	6	Nll.	M.	Nll.	Nll.	Mod.	21.1.02	1m.	3w.	no.
39.	C.L.	F.	11	Nll.	M.W.C.D.	Rh.F.Ch.1.	Nll.	Mod.	23.6.01	6m.	1w.	no.
40.	B.S.	F.	9	Nll.	M.Whg.S.	Nll.	M.Sys.	+	9.1.06	8d.	3w.	no.
41.	S.M.	F.	4	M.T.B.	Nll.	Nll.	Nll.	+	2.12.05	1w.	14d.	1.
42.	F.P.	F.	8.11	M.R.F.R.	M.Whg.	Chorea (3)	M.Sys.	Mod.	23.3.06	1m.	3w.	no.
43.	M.H.	F.	10.11	Nll.	M.Whg.	Nll.	Nll.	Mod.	18.8.05	7w.	not cd.	no.
44.	D.T.	F.	10	Nll.	Whg.	Rheum.	Nll.	Mod.	17.3.04	1w.	5w.	no.
45.	J.L.	M.	6.11	F.Rh.	M.Whg.	Nll.	M.Sys.	-	13.3.00	2w.	19d.	no.
46.	M.D.	F.	9	Nll.	M.	Rheum	Nll.	+	3.11.01	5w.	33d.	no.
47.	M.F.	F.	11	M.Rh.	M.W.C.S.	Rh.Fev.	M.Sys.	+	15.9.01	1w.	24d.	no.
48.	A.A.	F.	8	F.Rh.	Nll.	Gr.Ps.Rh.	Nll.	+	5.6.00	2w.	1m.	no.
49.	J.M.	F.	9	Nll.	M.	Nll.	M.Sys.	+	20.2.00	2m.	1m.	no.
50.	M.A.	F.	8	Nll.	M.Whg.	Gr.Ps.R.F.	M.Sys.	+	13.3.00	2w.	3m.	no.
51.	S.L.	M.	9	F.H.S.	M.	E.Chorea(1)	M.Sys.	-	25.3.00	1m.	10d.	2.
52.	M.B.	F.	11	Nll.	Nll.	Chorea 1.H.	M.Sys.	Mod.	21.5.00	2w.	2w.	no.
53.	M.A.	F.	8	Nll.	Nll.	Chorea Rh.	M.Sys.	+	23.3.00	4m.	3w.	no.
54.	E.M.	F.	3.10	Nll.	Nll.	Nll.	M.Sys.	+	3.3.02	1m.	33d.	1.
55.	I.R.	F.	10	E.Rh.	M.Whg.C.	Throat	Nll.	Mod.	9.8.07	3w.	3w.	no.
56.	M.W.	F.	10.11	M.&F.Rh.	M.Whg.ChrThroat	Throat	Nll.	Mod.	24.12.09	1m.	1m.	no.

Self.



NUM-BER.	NAME	SEX	AGE AT ONSET	FAMILY HISTORY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURRENCE.
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A R S E N I C .

57	M.P.	F.	11.	Nil	M.Wnc.Chp	gr.pns.	Nil	+	5/12/03	6d	1m	1
58	L.M.	F	3.	Nil	M.	Nil	Nil	+	9/8/07	10d	1m	no
59	K.D.	F	7.	Nil	M.Wnc.Chp.S	Nil	Nil	Mod	5/8/07	1m	24d	no
60	H.H.	F	5.	Nil	M.	Nil	Nil	Mod	22/11/07	3d	23d	no
61	M.C.	F	6.	Nil	Whc.	Nil	Nil	Mod	23/11/07	2m	not crd.	no
62	J.W.	F	7.	Nil	Nil	Nil	Nil	+	4/9/03	46d	"	no
63	G.B.	M	6.	M.Rh	M.Wnc	Nil	M.Sys.Rh.	+	3/11/03	2w	6w	no
64	M.C.	F	4:11	S.Ch.	M.Chp.	Nil	Nil	+	22/2/05	1m	26d	no
65	B.H.	M	10.5	Nil	M.	Throats	Nil	-	26/9/06	6w	3w	no
66	J.S.	F	11.9	M.F.B.	Nil	Nil	Nil	-	5/4/04	3w	1w	no
67	C.T.	F	8.	F.Rh.	M.Wnc.	Throats	Nil	+	21/9/03	2d	5w	no
68	J.D.	F	8.11	Nil	Whc	Chorea 2	Rh.fev.	+	8/9/03	5w	6w	no
69	A.S.	F	10.	Nil	M.Scf.	Nil	Nil	+	28/5/03	5d	6w	no
70	A.B.	F	5.11	M.Rh.	Nil	Nil	Rh.fev.	+	9/10/03	1w	1m	no

A N T I P Y R I N E .

1	E.B.	F	6.9	Nil	M.	Nil	Nil	Mod	15/12/00	2w	12d	no
2	C.M.	F	10.11	Nil	M.Scf.	Chorea 6	M.Double	+	10/6/01	1m	12d	no
3	J.M.	F	9.8	F.M.R.	M.Wnc.Chp.	"1. Rh.	Nil	+	30/11/01	1m	19d	no
4	R.H.	F	8.3	S.Rh.H	M.	"1.G.Ps..M.Str.	Nil	+	7/1/02	1w	3w	2
5	H.R.	M	11.6	M.R.E.H.M.	M.	"1.F.Ps..M.Sys.	Mod	+	30/4/02	6m	13d	no
6	C.G.	F	9.6	M.F.Rh	M.Wnc.dip.	Rheum	Nil	+	4/4/03	4d	2w	no
7	C.H.	F	10.8	F.Rh.	M.Wnc.Pits	Chorea 1.	Nil	+	22/6/03	1m	10d	no
8	L.M.	F	5.6	Nil	M.Wnc.M.	Nil	Nil	+	22/9/05	6m	17d	no



NUM- NAME SEX AGE AT ONSET FAMILY HIS- TORY PRE- VIOUS HEALTH PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE PRESENT RHEUMA- TISM & HEART TROUBLE SEVER- ITY OF ATTACK DATE OF ONSET DURA- TION BEFORE TREAT- MENT DURA- TION AFTER TREAT- MENT RE- CUR- RENCE.

A N T I P Y R I N E .

9	J.W.	M	6.8	8	Nil	M.Whg.S.D.	G.pains	Nil	Nil	+	28	4/05	2w	5w	3
10	E.T.	F	7.9	9	F.Rh.	M.Chp.Scf.	Nil	Nil	Nil	+	7	12/06	3w	25d	no
11	H.D.	F	11.9	2	M.F.R.	M.Whg	Chorea 1.	Nil	Nil	+	3	4/07	3w	3w	no
12	N.L.	F	9.2	6	M.Rh	M.	Nil	Nil	Mod	+	10	9/07	1w	12d	no
13	C.M.	F	7.6	4	Nil	M.Whg.	Nil	Nil	+	29	9/08	3w	1m	no	
14	D.B.	F	8.4	6	B.R.C.	M.	Rh.Throats	Nil	Nil	+	10	11/08	2w	26d	no
15	M.S.	F	9.9	6	M.Rh.	Nil	Ch. 1. Rh.	Nil	Mod	-	18	11/08	3w	12d	no
16	F.F.	M	7.7	6	Nil	Nil	Nil	Nil	+	10	3/09	2w	2w	no	
17	W.M.	M	3.6	6	M.Bts.	M.	g.pains	Rheum	+	19	4/09	1m	16d	no	
18	A.W.	F	3.6	6	Nil	M.Chp.	Nil	M.Sys	+	3	2/09	6d	3w	no	
19	L.S.	F	10.10	6	Nil	M.Wch.C.S.	Rh.fav.	M.Sys.	+	20	4/10	6d	17d	no	
20	P.C.	M	8.11	9	S2B2Ch	M.	Ths.g.ps.	M.Sys.	+	14	12/09	6w	1m	no	
21	J.C.	M	7.9	4	Nil	M.Whg.	Nil	Nil	+	27	1/10	2w	15d	no	
22	I.F.	F	7.4	9	Nil	M.	Chorea 1.	Nil	Mod	+	18	12/09	2m	not crd.	no
23	E.J.	F	6.11	6	Nil	M.Whg.Chp.	Rh.M.Sys.	M.Sys	Mod	6	8/10	1m	11d	no	
24	N.D.	F	9.6	6	Nil	M.	Nil	Rheum	Mod	7	11/10	1w	3w	no	
25	E.G.	F	5.11	6	Nil	M.	Nil	Nil	Mod	6	10/07	1m	not crd	no	
26	L.M.	F	9.10	7	M.R.Bg	M.	Nil	Nil	+	5	2/08	3w	5w	no	
27	M.M.	F	7.7	9	Nil	M.Whg.ScF.	Whc.ScF.	M.Double	+	27	9/08	5m	1m	no	
28	J.F.	F	11.11	7	M.Rh.	M.Whg.Chp.	Ch. 1.g.ps.	Nil	Mod	+	28	12/00	1m	11d	no
29	G.S.	M	9.9	9	Nil	M.Whg.S.Fts.	Nil	M.Sys.	+	12	4/00	1m	6w	no	
30	J.M.	M	4.9	9	M.Rh.	ScF.	Nil	Nil	+	9	11/00	3d	10w	no	
31	S.C.	F	7.10	3	M.Bts.	M.Whg.C.ScF.	Nil	M.Sys.	+	24	3/02	2w	5w	no	
32	A.H.	F	10.3	3	Nil	M.	Nil	M.Sys.	+	19	2/10	10d	39d	1	
33	J.S.	M	10.7	6	Nil	M.Chp.	Nil	M.Sys.	Mod	21	5/08	18d	14d	3	
34	J.M.	M	7.7	6	Nil	M.Chp.	Nil	Nil	+	1	1/09	3w	3w	no	
35	R.R.	M	11.11	6	Nil	M.Whg.Chp	Nil	Nil	+	26	9/08	5w	1m	no	

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NUM-BER	NAME	SEX	AGE, AT ONSET	FAMILY HISTORY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURRENCE.
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A N T I P Y R I N E.

36	J.L.	M	10.	Nll	M.Who.	Rh. fev.	Nll	+	4/6/08	2w	1m	1
37	N.U.	F	9.11	Nll	M.	Nll	Nll	Mod	15/12/05	1m	17d	1
38	J.H.	F	5.	Nll	Who.	Chorea (2)	M.Svs.	+	8/2/09	2w	1m	no
39	B.R.	F	8.	Nll	M.Hbc.S	Nll	Nll	+	3/12/00	3w	6w	no

SODIUM SALICYLATE AND SODIUM BICARBONATE.

1	J.C.	F	7.11	F.Rh.	Et.	Nll	M.Svs.	+	3/5/03	2m	30d	no
2	J.L.	M	9.11	Nll	M.W.C.C.	Chorea (2)	M.Svs.	+	22/6/03	1m	3d	no
3	I.F.	F	11.6	M.S.R.	M.W.C.S	G.ps.Rheum	M.Svs	+	21.12.03	2w	2w	no
4	R.M.	M	7.9	Nll	M.	Nll	Nll	Mod	20/12/03	1m	16d	no
5	L.M.	F	9.5	F.Rh.	M.W.C.S.C.Ps.	Ch.2.gr.pains.	M.Svs.	Mod	1/1/04	1m	2w	no
6	E.A.	F	10.11	M.Rh.	M.Who.	G. pains	Nll	+	25/12.03	6w	not crd	no
7	J.P.	F	9.2	Nll	M.	Chorea (1)	Nll	+	10/12/03	4m	7w	no
8	A.M.	F	7.10	Nll	M.C.D.E.	Rheum	Nll	+	10/1/04	2m	18w	no
9	P.S.	F	4.4	Nll	M.	Rheum	M.Svs.	+	27/5/04	5w	6w	no
10	J.C.	M	8.10	S.RFTB	M.C.C.J.	gr.pains	M.double	-	23/4/04	2m	9d	no
11	C.A.	F	9.	F.R.H.	M.Scf.	Rheum.	Nll	+	8/6/04	2w	1m	no
12	M.S.	F	6.11	Nll	M.Who.	Chorea (1)	Nll	+	31/6/04	1m	not crd.	no
13	M.M.	F	7.	M.Rh.	M.	Rheum	Nll	+	22/12/04	2w	11d	no
14	J.M.	M	6.	Nll	M.	Nll	Nll	+	22/12/04	5w	2w	no
15	L.Y.	F	9.	M.Rh.	M.Who.	Rh. M.	Nll	+	10/1/05	3w	9w	no
16	J.S.	M	7.	M.T.B.	M.	Nll	Nll	Mod	6/4/05	1m	6w	no

NUM- NAME SEX AGE AT ONSET FAMILY HIS- TORY PRE- VIOUS HEALTH PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE PRESENT RHEUMA- TISM & HEART TROUBLE SEVER- ITY OF ATTACK DATE OF ONSET DURA- TION BEFORE TREAT- MENT DURA- TION AFTER TREAT- MENT RE- CURR- ENCE.

SODIUM SALICYLATE AND SODIUM BICARBONATE.

17	A.C.C.	M	9.	F. Malaria	M. Who.	Rheum.	M. Sys	+	13	3	05	3m	26d	no
18	A.S.	M	7.11	F. Rheum	M. Who. Pa.	Rheum.	M. Sys	Mod	14	13	05	1m	3w	1
19	D.R.	F	6.	F. T. of Br.	M. "Chp. S.	Nil	M. Sys Rh.	+	13	3	06	14d	not grd.	no
20	M.D.	F	10.	F. Brights	M. Who	Rh. fev.	Nil	+	20	5	06	km	2w	no
21	R.S.	M	9.	Nil	M. Who	Nil	M. Sys	Mod	27	9	06	14d	5w	no
22	D.H.	F	8.	Nil	M. Who	Nil	Rh. N.	+	27	10	06	14d	1m	1
23	S.R.	F	11.	F. Chorea	M. Who. Chp.	Ch. (1)	Nil	Mod	14	9	07	2w	not grd.	no
24	I.H.	F	7.	M. Heart	M. Who. Chp	Rheum	M. Sys	Mod	24	13	06	9m	not grd.	no
25	C.C.	M	8.	Nil	M.	Nil	M. Sys	Mod	20	4	07	3w	1m	1
26	L.C.	F	11.	Nil	M. W. G. F.	R. F. & N.	M. dbln.	+	1	9	07	3w	6w	no
27	M.A.	F	10.	Nil	Nil	Rh. fev	Nil	-	18	3	08	3d	2w	no
28	T.F.	M	11.	F. Brights	M. Who. Chp	Rh. fev	M. Sys	+	18	9	08	6w	6w	no
29	J.C.	F	9.10	F. M. B. R. S.	M. Who. Chp	Nil	M. Sys	-	18	6	08	2m	6d	no
30	A.H.	M	10.11	M. S. Rh.	M. Who. Filts	Rh. fev	Nil	+	27	4	09	6w	15d	1
31	E.A.	F	10.	Nil	Chp.	Ch. (1)	Rheum	+	7	1	07	2w	9d	1
32	A.B.	M	8.	Nil	M. Chp. Flu.	Nil	M. double	Mod	15	4	09	1w	16d	no
33	B.C.	F	6.	M. Rh.	M. Chp	Rheum	Nil	Mod	14	13	06	3w	not grd	no
34	F.D.	F	10.	Nil	M. H.	Rheum	Nil	+	27	5	09	3w	3w	1
35	D.F.	M	6.	Nil	Nil	gr. ps.	Nod.	+	9	7	07	3m	Death	no
36	J.C.	F	10.	M. & B. Rh.	Nil	C. I. S. P.	M. Sys. Rh.	+	21	11	06	2w	18d	1
37	J.H.	F	11.	Nil	M. Who.	gr. ps.	Nil	+	21	11	06	7w	16d	no
38	H.K.	F	7.	Nil	M.	Rh. fev	Nil	+	21	8	08	8d	not grd	no
39	G.L.	F	7.	M. R. T. S.	M. Who	gr. ps.	Nil	-	25	1	07	9d	12d	no
40	H.M.	M	6.10	M. Rh.	Scf.	Throats	M. Sys.	Mod	18	3	08	2m	1w	no
41	C.R.	M	6.	M. Rh.	M. Who.	Nil	M. Sys.	Mod	24	9	09	5d	3w	no
42	I.S.	F	5.	Nil	Chp.	Rheum	Nil	+	17	2	07	3w	1d	no
43	M.W.	F	4.11	Nil	M. Who	Nil	Nil	Mod	4	12	06	1d	15d	no
44	M.W.	F	11.	Nil	M. Brights	gr. ps.	Nil	Mod	3	11	08	2w	19d	no



NUM- BER	NAME	SEX	AGE AT ONSET	FAMILY HIS- TORY	PRE- VIOUS HEALTH	PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE	PRESENT RHEUMA- TISM & HEART TROUBLE	SEVER- ITY OF ATTACK	DATE OF ONSET	DURA- TION BEFORE TREAT- MENT	DURA- TION AFTER TREAT- MENT	RE- CUR- RENCE.
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SODIUM SALICYLATE AND SODIUM BICARBONATE.

45	A.H.	F	8.11	F. Rheum	M. Whe	Rh. fev.	Nil	+	31/3/03	1m	not ord.	no
46	R.D.	M	6.9	Nil	Scf.	Nil	Nil	+	31/3/03	5d	1m	no
47	J.C.	M	8.	Nil	M. Scf.	Rh. fev.	M. Sys	Mod	2/8/99	6d	11d	2
48	S.A.	F	9.5	M. Rheum	M.C.S.D.	Ch. l. R. fv.	M. Sys	-	8/3/10	6d	12d	no
49	E.M.	F	6.	Nil	M. Scf.	Nil	Rheum	+	26/11/06	6d	Death	no
50	J.K.	F	7.9	Nil	Nil	Ch. l. Thrs.	M. Sys.	+	26/12/06	14w	not ord	no
51	M.R.	F	5.	M. Rheum	M.W.B.H.	Nil	M. Sys	+	22/6/07	25d	2m	no
52	M.M.	F	10.	M. & F. R.	H. Wng	Nil	M. Sys	-	11/2/07	2w	12d	no
53	M.B.	F	11.	Nil	M. Wng	St. pains	Nil	-	22/3/07	1w	45d	no
54	O.H.	F	3.6	Nil	M.	Nil	M. Sys	-	4/6/04	3d	13d	no
55	V.R.	F	9.	Nil	M. Wng. D.	Nil	Nil	+	14/11/06	2w	1m	no

R E S T.

1	M.K.	F	6.2	Nil	M. Wng. Chp	Chorea (1)	M. Sys.	-	17/11/99	10m	1m	1
2	J.D.	F	8.	F. Scf.	M.W.C.C.S.	Gr. pains	M. Sys. R.T.	-	30/6/01	3w	11d	no
3	M.G.	F	8.	M. Rheum	M. Chp	Rheum	Nil	-	16/1/05	2w	5d	no
4	R.G.	F	9.5	B. Pits	M.E.	Nil	Nil	-	9/12/05	3w	not ord	no
5	G.L.	M	9.8	Nil	M.W.C.S.	Nil	M. Double	Mod	10/2/06	2m	6d	no
6	J.H.	M	10.9	F. Heart	M. Wng. chp	Nil	M. Sys	Mod	25/2/07	6w	9d	no
7	E.J.	F	6.4	F. Rheum	W. l. S. P.	Stiff neck	-	-	5/2/08	2m	9d	no
8	J.W.	F	5.5	M. Rheum	Nil	Rheum fev.	Nil	-	13/2/08	3m	8d	no
9	L.H.	F	6.2	M. Rheum	M. Wng. chp	Nil	M. Sys	-	9/6/08	1w	1w	no
10	M.N.	F	10.7	F. Rheum	M.W.S.C.	Ch. l. Rh.	M. Double	Mod	13/5/08	12d	2m	no
11	E.D.	F	9.	Nil	M. Chp	Nil	M. Sys	-	10/9/08	3w	13d	no
12	G.G.	F	7.5	M. Rheum	Chp	Ch. l. Rh.	M. Sys	+	8/11/08	1m	2w	no
13	I.B.	F	8	Nil	M. Wng.	Gr. ps.	Nil	-	27/9/08	4m	4d	no



NUM-BER	NAME	SEX	AGE AT ONSET	FAMILY HISTORY	PRESENT HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURR-ENCE.
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R E S U L T S

14	W.M.	M	7.10	Nil	M.Pneu.	Nil	Nil	-	29/18/09	2m	6d	no
15	J.C.	M	3.11	SgB <sub>9</sub> Ch.	M.Chp	Nil	Nil	+	5/1/10	1m	2w	no
16	J.M.	F	9.5	M.Rh.	M.whc.chp	Chorea(1).R.fev	M.double	-	3/1/10	5m	6d	no
17	M.H.	F	8.	M.E.Fs.	M.whc.Scf.	Nil	Nil	+	2/7/10	2w	3w	no
18	E.T.	F	7.5	F.Rh.	M.	Nil	M.Sys	-	27/11/10	2m	3w	no
19	D.L.	F	5.8	Nil	M.Chp	Nil	M.Double	+	31/7/10	3w	5w	no
20	C.C.	F	6.6	Nil	M.	gr.pains	M.Sys	+	29/12/06	2w	1w	no
21	D.H.	F	6.2	M.Rh.	M.whc.chp.	gr.pains	Nil	-	22/6/09	1y	2d	no
22	I.R.	F	11.	F.Rh.	M.whc.Chp	Chorea (1)	Nil	Mod	9/1/09	3w	18d	no
23	J.S.	M	5.11	Nil	M.whc.Chp	Nil	Nil	-	21/3/09	6w	6d	no
24	H.J.	M	7.10	M.Rh.	M.	Nil	Nil	Mod	25/12/03	2m	not crd.	no
25	L.A.	F	5.11	Nil	M.Chp	Nil	M.Sys	+	24/12/03	6w	1w	no
26	J.B.	F	7.10	S.Ch.	M.whc.	Throats	Nil	-	14/3/06	2m	3d	no
27	C.R.	F	11.10	F.Heart	M.	Ch.l.Rheum	Nil	+	30/1/00	2m	4d	no
28	N.C.	F	7.	Nil	M.	gr.pains	Nil	-	28/4/99	1y	1w	no
29	J.P.	M	5.	Nil	M.Chp	Nil	Throat	-	15/1/01	5w	5d	no
30	J.F.	M	4.5	Nil	M.	Nil	Nil	-	29/2/01	2m	1w	no
31	M.C.	F	7.11	F.M.Rh.	M.	Rh.fev.g.ps.	Rheum M.	+	6/5/01	2w	2w	no
32	R.C.	M	11.1	F.Rh.	M.whc.Chp.	Nil	Nil	+	17/5/01	3w	12d	no
33	T.K.	F	8.8	F.Rh.	M.	Rheum	Nil	+	8/5/01	2m	1m	no
34	E.H.	F	10.7	M.F.B.C.	M.W.C.S.	gr. pains	Nil	+	1/8/01	6w	5w	no
35	T.M.	M	10.4	F.Rh.	M.whc.Chp	Nil	Nil	-	20/9/01	4m	8d	no
36	J.M.	F	8.	F.T.B.	M.whc.	Rheum	Nil	Mod	18/12/10	3w	not crd.	no
37	R.M.	F	11.	F.Rh.	M.whc.	Throats	Nil	Mod	9/12/10	3m	not crd.	no
38	C.R.	M	7.	Nil	M.whc	Chorea (1)	Nil	Mod	22/10/10	5d	"	no
39	J.H.	F	5.	Nil	M.whc	Chorea (1)	Nil	Mod	2/2/09	13m	25d	no
40	N.P.	F	4.	Nil	M.whc	Nil	Nil	-	29/3/09	1y	1w	no
41	J.W.	M	11.6	F.M.Rh.	M.W.C.S.D.	Ch.l.Rh.fev.	M.Sys	-	21/2/10	2w	1w	no

NUM- BER	NAME	SEX	AGE AT ONSET	FAMILY HIS- TORY	PRE- VIOUS HEALTH	PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE	PRESENT RHEUMA- TISM & HEART TROUBLE	SEVER- ITY OF ATTACK	DATE OF ONSET	DURA- TION BEFORE TREAT- MENT	DURA- TION AFTER TREAT- MENT	RE- CUR- RENCE.
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R E S T .

42	M.A.N.	F	6.11	Nll	Nll	Rheum	Nll	Mod	15/10/09	1m	not	crd.	no
43	R.I.	M	6.9	M.Rh	K.Whg.Chp	Nll	M.Sys	-	12/8/09	2w	6d	no	
44	A.O.	M	8.	Nll	Wng.	Ch.2.Throats	M.Sys	+	21/9/09	1m	2m	no	
45	M.E.	F	5.11	F.Rh.	M.	Ch.1.Rheum	M.Sys	+	7/10/07	6w	2m	no	
46	F.G.	F	8.	Nll	M.Whg.Chp.	Nll	Nll	-	9/2/08	1w	1w	no	
47	J.K.	M	10.	Nll	M.Whg.	Nll	M.Sys	Mod	1/12/07	2w	5w	no	
48	H.S.	F	9.11	Nll	M.Whg.	Chorea (1)	Nll	-	1/11/05	1m	2w	no	
49	H.S.	F	9.10	Nll	M.Whg.	Nll	Nll	-	11/12/06	2m	10d	no	
50	A.M.	F	10.11	Nll	M.Whg.	Ch.1.ST.ps.	Nll	-	25/9/04	1m	4d	no	
51	B.M.	F	6.	S.Ch.	M.W.C.S.	ST. pains	M.Sys	Mod	6/12/04	3d	13d	no	
52	M.W.	F	10.	Nll	M.Whg.Chp	ST. pains	Nll	-	7/2/05	5d	6d	no	
53	A.F.	F	8.	Nll	M.	Nll	Nll	+	9/5/05	5w	3w	no	
54	A.H.	F	4.9	Nll	Nll	Rh.fev.	M.Sys	Mod	26/8/04	14w	26d	no	
55	A.B.	M	8.11	Nll	M.Whg	ST. pains	Nll	-	28/3/05	1m	6d	no	
56	W.C.	M	9.	S.Ch.	M.Whg.ScF.	Nll	Nll	+	21/10/04	3w	5w	no	
57	A.S.	F	11.7	Nll	M.Whg.ScF.	Nll	M.Sys	Mod	22/5/09	2m	10d	no	
58	A.M.	F	7.	F.M.Rh.	M.	Nll	Nll	Mod	22/5/09	5d	3w	no	
59	M.M.	F	7.	Nll	T.B.E.	Nll	Nll	-	28/5/09	1m	3w	no	
60	M.C.	F	11.6	Nll	Wng.ScF.	Chorea (1)	Nll	-	25/10/02	7w	13d	no	
61	H.L.	F	11.3	M.Rh.	M.Whg.	ST. pains	M.Sys	+	10/3/06	1m	1m	no	
62	E.A.	F	9.	Nll	M.	Ch.1.Worms	M.Sys	-	12/10/06	2w	10d	no	
63	I.M.	F	8.3	Nll	Nll	Nll	Nll	-	23/10/06	1w	not	crd.	no

M A S S A G E .

1.	J.M.	F	8.11	M.Fits	Nll	Nll	Nll	Mod	6/8/05	1m	7w	no
2	I.L.	F	6.	F.Rh.	M.Whg	Nll	Nll	+	21/10/04	1w	2w	no

NUM-BER	NAME	SEX	AGE AT ONSET	FAMILY HISTORY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURRANCE
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M A S S A G E

3	M.N.	F	6	Nil	M.Whc.ScF.	Rheum	M.Svs	-	23/4/06	2w	2w	1
4	E.O.	F	10	Nil	M.Whc.	Rheum	Nil	-	20/9/06	10d	1m	no
5	A.R.	F	6	F.Rh.	M.Whc.	Nil	Rheum	Mod	14/13/06	6w	3w	3
6	L.R.	F	9	Nil	Whc.	Ch.l.gt.ps.	M.double	Mod	28/2/07	5w	3w	no
7	R.E.	M	5.11	F.S.R.M.	M.	Nil	Nil	+	1/7/07	4d	10d	no
8	A.M.	F	5	Nil	M.	Nil	Nil	+	4/3/06	19m	1m	no
9	M.H.	F	9	Nil	M.ScF.	Nil	M.Svs	-	24/5/08	3w	1w	no
10	J.W.	M	9	F.Rh.	M.	gt. pains	Nil	-	21/11/08	4d	10d	no
11	W.H.	F	2	Nil	M.Whc	Ths.gt.ps.	Nil	-	28/3/07	2w	1m	1
12	A.R.	F	4	Nil	M.Whc	Ch. (1)	Nil	-	3/12/07	1m	6d	2
13	I.G.	F	9.11	F.R.3	M.Whc.ScF.	Nil	Nil	Mod	12/7/10	1m	12d	no
14	S.L.	F	10	Nil	M.Whc	Nil	Nil	+	27/4/10	12d	3w	no
15	J.B.	F	8	Nil	Tonsils	Nil	M.Svs	+	27/5/10	2w	7w	no
16	M.D.	F	9.11	Nil	M.Whc.	Ch.l.Rh.fv.	Nil	+	8/12/03	6w	18d	no
17	R.S.	F	8.10	Nil	M.	Ch.2.Rh.	M.Svs.	Mod	1/9/01	7w	7w	no
18	C.M.	F	7.1	Nil	M.Whc.Chp	Nil	Nil	+	12/9/05	5w	3w	1

HOT BATHS AND MASSAGE.

1	K.K.	F	7	F.Rh.	M.Whc.Chp	gt. pains	M.Svs	Mod	13/12/01	2w	not crd.	no
2	C.B.	F	8.10	Nil	M.Whc.Chp	Nil	Nil	Mod	13/12/01	2w	not crd.	no
3	A.W.	F	10.5	Nil	M.Whc	Rheum	Nil	+	13/11/01	2m	2w	no
4	C.H.	F	9	Nil	M.Whc	Nil	Nil	+	31/10/01	3m	5w	no
5	J.M.	M	5.11	Nil	M.ScF.	Ch.3.Ts.g.p	Nil	+	28/6/03	1m	1m	2

ARSENIC AND THEN ANTIPYRINE.



NUM-BER	NAME	SEX	AGE AT ONSET	FAMILY HISTORY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURR-ENCE
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ARSENIC AND THEN ANTIPIRYNE.

1	J.S.	M	9.11	M.Rh.	M.W.C.S.	Ch.3.gr.ps	Nil	-	5/12/00	1m	1m	no
2	I.L.	F	9.	Nil	M.	Chorea (2)	Nil	Mod	29/6/07	2w	1m	1
3	J.I.	M	9. 9	E.R.C.	M.Whc.chp.	Throats	Nil	+	16/12/09	4d	15w	1

ANTIPIRYNE AND THEN ARSENIC.

1	P.J.	F	7.	B R S	Nil	Nil	Nil	+	7/ 9/05	3w	2m	no
2	D.G.	F	5.	M.Rh	M.	Nil	Nil	+	19/1/09	1w	not ord.	no
3	C.D.	F	12. 5	Nil	Nil	Ch.2. Rh.	Nil	+	19/10/00	1m	6w	no

SODI. SAL. AND THEN ANTIPIRYNE.

1	I.S.	F	7. 8	Nil	Whc.	Ch.1.Rheum	M.Double	Mod	10/10/07	4d	2w	no
2	K.M.	F	9. 8	M.B.R.	M.Whc	Rheum	Modules	+	5/10/08	10w	3w	no
3	D.H.	F	10.11	F.Rh.	M.Whc.	Ch.(1) Rh.	M.die N.	+	18/ 9/09	1m	13w	no
4	J.M.	M	8.10	Nil	M.Whc.ScF.	Nil	M.&A.T.	+	8/10/10	2w	1m	no
5	J.M.	M	10.	Nil	M.Whc.	Nil	Nil	+	8/12/05	1w	1m	no

SOD. SAL. AND THEN ARSENIC.

1	I.B.	F	7.	F.T.B.	M.	Rheum	Rheum	+	2/ 9/03	1w	5w	no
2	E.C.	F	8. 6	Nil	M.D.Rh.	Nil	Nil	Mod	16/12/06	2w	not ord.	no
3	B.W.	F	10.11	Nil	M.C.S.D.	Rh.fev. (1)	M.Svs	Mod	1/ 6/07	3w	1m	no
4	V.P.	F	9.	Nil	M.Whc.Pine	Chorea (1)	Rheum	+	17/ 2/07	1w	1m	no
5	J.M.	M	8.	Nil	M.Whc.Chp.	Nil	Nil	Mod	29/ 3/04	1w	25d	no
6	E.C.	F	11. 4	F.Med.	M.	gr. pains	M.Svs.	+	26/ 6/99	8m	32d	no



NUM-BER	NAME	SEX	AGE AT ONSET	FAMILY HISTORY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURR-ENCE
7	B.M.	F	10.	Nil	M. Rh.fev.	Nil	Nil	Mod	14/7/04	6w	5w	no
8	A.T.	M	11.	Nil	gs. in neck	Nil	Nil	+	85/12/08	2w	6w	2
SOD. SAL. AND THEN ARSENIC.												
1	R.J.	M	12.	M.H.F.R.M.W.C.D.	Nil	M.Sys	M.Sys	+	13/2/00	9w	14w	no
2	E.L.	F	12.	Nil	gt.pains	M.Sys	M.Sys	+	5/2/00	2w	3m	no
3	J.M.	F	9.	F.T.B.	Nil	M.Sys	M.Sys	+	1/2/04	3w	7w	no
ARSENIC AND THEN ASPIRIN.												
1	T.M.	M	7.	M.Rh.	M.	Nil	Nil	+	21/4/04	6d	1m	no
ASPIRIN AND THEN SOD. SAL. AND ARSENIC.												
1	J.M.	M	8.	M.F.R.	M.W.S.	Ch.3.g.pains	Nil	+	24/4/04	3w	not crd.	no
E R G O T.												
1	A.B.	F	10.	Nil	M.	Rheum	Nil	+	9/2/03	6w	2w	no
2	C.C.	F	7.	M.Rh.	M.S.I.S.P.	Nil	M.Sys	Mod	28/5/08	1w	12d	no

NUM-BER	NAME	SEX	AGE	FAMILY	PREVIOUS HEALTH	PREVIOUS CHOREA, RHEUMATISM & HEART TROUBLE	PRESENT RHEUMATISM & HEART TROUBLE	SEVERITY OF ATTACK	DATE OF ONSET	DURATION BEFORE TREATMENT	DURATION AFTER TREATMENT	RE-CURRANCE
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1	J.H.	M	10.	NII	M.W.C.D.	Rheum Ch.(1)	M.Sys Rh	+	2/5/08	3w	5w	1
2	J.B.	M	3.10	M.R.Sc.	NII	NII	NII	Mod	28/12/06	2m	4d	no
3	M.B.	F	7.7	NII	NII	NII	NII	Mod	20/12/09	3w	6w	no

ERGOT, ARSENIC AND SOD. SAL.

ERGOT AND THEN ARSENIC.

20.

1	A.S.	F	7.	NII	M.Adenoids	NII	NII	Mod	28/3/03	3w	10w	no
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ERGOT AND THEN ANTIPYRINE.

1	M.W.	F	6.7	NII	M.W.C.S.	NII	Rheum	+	9/9/08	3w	9w	no
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ERGOT AND THEN SOD. SAL. AND CHLOROPONE AND THEN VACCINE.

1	W.T.	M	6.9	NII	NII	NII	NII	+	12/8/08	1w	11w	no
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ANTIPYRINE, SOD. SAL., SOD BROM., ARSENIC, CHLORAL AND BROMIDE, ERGOT.

1	S.B.	M	8.	F.T.B.	M.Whe.chp	NII	NII	Mod	1/7/08	5d	3m	no
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ARSENIC, THEN ANTIPYRINE AND THEN SOD. SAL.

1	A.F.	F	8.5	S.Rheum.	M.	Ch.1.Rh.	M.Sys	Mod	16/10/08	1m	5w	no
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NUM- BER	NAME	SEX	AGE	PRE- VIOUS HEALTH	PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE	PRESENT RHEUMA- TISM & HEART TROUBLE	SEVER- ITY OF ATTACK	DATE OF ONSET	DURA- TION BEFORE TREAT- MENT	DURA- TION AFTER TREAT- MENT	RE- CUR- RENCE
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ANTIPYRINE, THEN SOD. SAL. AND THEN ARSENIC.

1	H.M.	F	10.	S.Ch.	M.Wnc.Chp.	Chorea 1.	Nil	+	25/11/06	3w	6w	no
---	------	---	-----	-------	------------	-----------	-----	---	----------	----	----	----

ARSENIC AND BELLADONNA.

1	I.S.	F	5.1	Nil	Wnc.	Nil	Nil	Mod	5/6/03	5m	not ord.	no
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SOD. SAL., THEN CHLORAL AND BROMIDE AND THEN ARSENIC.

1 J.G. F 8.9 F.S.Rh. M.Wnc.P. Rheum Nil + 11/6/05 1d 3m 1  
 ANTIPYRINE, THEN ARSENIC, THEN HYPO OF HIG. SOD. ARSEN., THEN ANTIPYRINE, AND THEN ERGO

1	J.L.	M	4.5	Nil	M.Wnc.	Chorea (2)	Nil	+	3/4/01	1w	not ord.	3
---	------	---	-----	-----	--------	------------	-----	---	--------	----	----------	---

CHLORETONE AND THEN ARSENIC.

1	T.C.	F	8.9	Nil	M.Wnc.	Nil	M.Svs.	-	17/5/09	3m	10d	no
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CHLORETONE AND THEN ANTIPYRINE.

1	B.A.	F	11.4	M.Rheum	Wnc.	Rheum fav.	Nil	Mod	28/12/10	3w	1m	no
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NUM- ERR	NAME	SEX	AGE AT ONSET	FAMILY HIS- TORY	PRE- VIOUS HEALTH	PREVIOUS CHOREA, RHEUMA- TISM & HEART TROUBLE	PRESENT RHEUMA- TISM & HEART TROUBLE	SEVER- ITY OF ATTACK	DATE OF ONSET	DURA- TION BEFORE TREAT- MENT	DURA- TION AFTER TREAT- MENT	RE- CUR- RENCE
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ARSENIC AND POT. BROM. AND THEN ANTIPYRINE.

1	C.W.	M	5.2	F.R.&H.	Nil	Chorea 1. Nil	Nil	+	5/12/09	4m	not	grd	no
---	------	---	-----	---------	-----	---------------	-----	---	---------	----	-----	-----	----

TRIONAL AND THEN ANTIPYRINE.

1	K.K.	F	10.11	M.R.&H.	M.Who	Chorea 1. Rheum	FORMIC ACID.	+	28/10/08	5w	1m	no
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SOD. SAL., THEN FORMIC ACID AND THEN ARSENIC.

1	M.A.	F	9.10	Nil	Nil	Rheum Fav. Nil	-	20/6/08	2m	2m	6d	no
2	S.A.	F	7.9	Nil	M.C.S.D.	Ch.2.Rh. M.double	-	25/6/08	2m	2m	6d	no

ANTISTREPTOCOCCAL SERUM AND THEN ANTIPYRINE.

1	I.L.	F	10.9	Nil	M.Who	Nil	P. & F.	+	1/11/07	3w	6w	no
---	------	---	------	-----	-------	-----	---------	---	---------	----	----	----

1	I.F.	F	7.8	Nil	M.	Nil	Nil	+	21/10/08	5w	not	grd	1
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S T A T I S T I C S .

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SEX.	Males 78		
	Females 217		
AGE.	Females (1)	Under 5 = 11 cases	
	(2)	Between 5 & 10 = 146 cases	
	(3)	Over 10 = 60 "	
	Males. (1)	Under 5 = 5 "	
	(2)	Between 5 & 10 = 56 "	
	(3)	Over 10 = 17 "	

## FAMILY HISTORY:-

Rheumatism		in 92 Cases.
Maternal Rheumatism	" 58 "	
Paternal "	" 40 "	
Maternal & Paternal Rh.	" 11 "	
Brothers with Rheumatism	" 3 "	
Sisters with "	" 7 "	
Maternal chorea	" 0 "	
Paternal "	" 2 "	
Brothers with Chorea	" 4 "	
Sisters " "	" 12 "	
Tubercular Family History	in 9 "	

## PREVIOUS ILLNESSES.

Measles in	244 "
Whooping Cough	139 "
Chickenpox in	178 "
Scarlet Fever	50 "
Congenital Syphilis in	2 "
Pleurisy in	2 "
Pneumonia in	4 "
Jaundice in	1 "
Infantile spinal paralysis	2 "
Right-sided hemiplegia in	1 "
Enuresis in	2 "
Fits in	3 "
Influenza in	2 "
Bright's disease	1 "
Mastoid disease	1 "
Tubercular elbow	1 "
Tubercular hip	1 "
Psoriasis	1 "
Epistaxis	1 "
Herpes Zoster	1 "
Tubercular glands in neck	1 "

## PREVIOUS CHOREA, RHEUMATISM &amp; HEART TROUBLE.

More than one attack of chorea	101 cases
Previous chorea	61 "
Recurrence of chorea	51 "
Two attacks of chorea	71 "
Three " " "	17 "
Four " " "	10 "
Five " " "	0 "
Six " " "	2 "
Seven " " "	1 "
Previous Rheumatism	72 "
" growing pains	43 "
" rheumatism or growing pains	113 "
" liability to sore throat	14 "
" nodules	2 "
" erythema	1 "
" rheumatism, nodules, growing pains, sorethroats, & erythema =	127 "

## PRESENT RHEUMATISM &amp; HEART TROUBLE.

Present rheumatism & nodules	24 "
Rheumatic nodules	5 "
Bruits	101 "
Mitral systolic	82 "
Mitral stenosis	3 "
Double Mitral	13 "
Aortic incompetence & Mitral incompetence	1 "
Pericarditis & endocarditis	1 "
Previous rheumatism and growing pains in Heart cases =	46 "
Previous Chorea in Heart cases	28 "
Severe cases =	152
Moderate "	88
Slight "	56

## EXCITING CAUSE :-

Fright	= 39 Cases
Rheumatism	32 "
Scarlet Fever	4 "
Measles	1 "
Operation	2 "
Diphtheria/	



## EXCITING CAUSE:-

Diphtheria	= 1 Case
Chill	3 "
Injury	7 "
Worms	2 "
Grief	2 "
No cause	179 "

Mental impairment in 63 cases

Difficulty in walking 106 cases

Difficulty in speaking 101 "

DISTRIBUTION of CHOREA.

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Chorea started on Left side in	42 cases
" " " Right " "	57 "
" confined to Left side	19 "
" " " Right "	19 "
Chorea on both sides of Body "	257 "

NUMBER of CASES in the DIFFERENT MONTHS of the YEAR.

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January	= 20 Cases
February	27 "
March	26
April	21
May	23
June	23
July	8
August	17
September	28
October	24
November	24
December	46

Average duration before treatment	=	44 days
Cases not cured	=	33
Deaths	=	2
Average duration after treatment	=	25 days.

SEX/

S E X .

It is a well known fact that the number of girls affected by Chorea is greatly in excess over that of boys. This has been pointed out by many authorities, who give various reasons for the preponderance of the female sex incidence. The two chief reasons given are:- Firstly, that as the female temperament is more unstable than the male after the age of puberty, so it is in young children and, therefore, the exciting cause, be it what it may, will have a much greater chance of causing Chorea in the highly strung child than in the child with the more stable and steady disposition; and, Secondly, it has been proved by statistics that Rheumatism is more prone to attack the female child than the male, and those supporting the Rheumatic Theory of the causation of Chorea, are inclined to consider this fact enough in itself to account for the great excess of the females attacked by the disease.

Taking Chorea affecting people of all ages, See in 531 cases found that 393 females were affected, against 138 males. This gives a percentage of about 71 females. Hughes, Dickinson and Peacock's/

Peacock's reports give very similar figures, viz:- 73%, 70%, & 69% respectively. Sturge's results are even more remarkable as he found that females accounted for 78%.

Next let us consider the sex incidence in childhood. Sturges found that in children up to 12 years, his excess of females was not quite so great as in his statistics of those of all ages, it being 75% females, - and he points out that there is a somewhat less inequality in younger children than in older ones, but I find that of children under eight years old in his statistics, he still has a great preponderance of females, his proportion being 70% females to 30% males. Dickinson has a similar result, finding that of children below that age he had 62% females, as against his 70% in those of all ages.

From my own statistics I find that 217 of the cases were females and 78 were males, giving about 75% of females, and of my 120 cases below the age of eight, there is 71% of females. My statistics of the sex incidence of the disease compare then very closely with those of other recorders, which I have mentioned, and, although the difference in sex in children under eight is undoubtedly less, yet the difference is so slight that it is not of much importance. The following Table gives the percentage of females which were affected at different ages:-



T A B L E .

3 years	60%	females
4 "	73%	"
5 "	67%	"
6 "	67%	"
7 "	76%	"
8 "	72%	"
9 "	75%	"
10 "	73%	"
11 "	75%	"

The least inequality then is in the youngest children, and the greatest in those between the ages of 7 & 8, but I find the preponderance of the female sex is so very marked at all ages, and the percentage so variable in its relationship to age, that I cannot say that there is any age at which males are more prone to be affected than others.

As Sturges points out, this disorder, which now affects our children, still clings to the female sex, as did the old dancing epidemics of the middle ages; it prefaces the same temperament and is apt to be aroused by precisely the same causes.

## A G E

That Chorea is an affection of youth has been recognised since the time of Sydenham, who put the age incident down, at from ten years to puberty. Since/

Since then most authorities have agreed that one would be more accurate to say between 6 & 14 years. Of See's 191 cases, 151 were between six and fifteen years, only 11 being under 6, and 12 over 21. Pye Smith records that of his 136 cases, 106 were between six and fifteen, while Stephen McKenzie says that by far the largest proportion of his cases were in the third brain decade.

In Dickinson's record of 71 cases, 42 were under ten years or about 59% of his cases, and Sturges has very much the same result, 96 of his 177 cases being under that age, or about 54%. Only 47% of Osler's cases occurred under 10, and 319 of all his 554 cases occurred under twelve.

In my statistics I have taken the age, not on admission, but at the onset of the attack, and this should make the actual age incidence much more accurate, so many of the cases having quite a long duration before being brought to Hospital for treatment. Of my own 296 cases, I find 218 were under 10, or about 74%. This, on comparing it with other statistics, looks a very large proportion of cases, but, as the age limit of this Hospital is 12, and only a very few cases are ever admitted to it over that age, it is not so very striking, seeing that the other statistics/

statistics were taken from cases of all ages.

The oldest case which I include in my statistics was 12 years & 2 months, while the youngest was 3 years & 6 months. To show more clearly the number of cases at different ages, I have made a table, column I. of which includes both Males and Females, while columns 2 & 3 show the males and females considered separately.

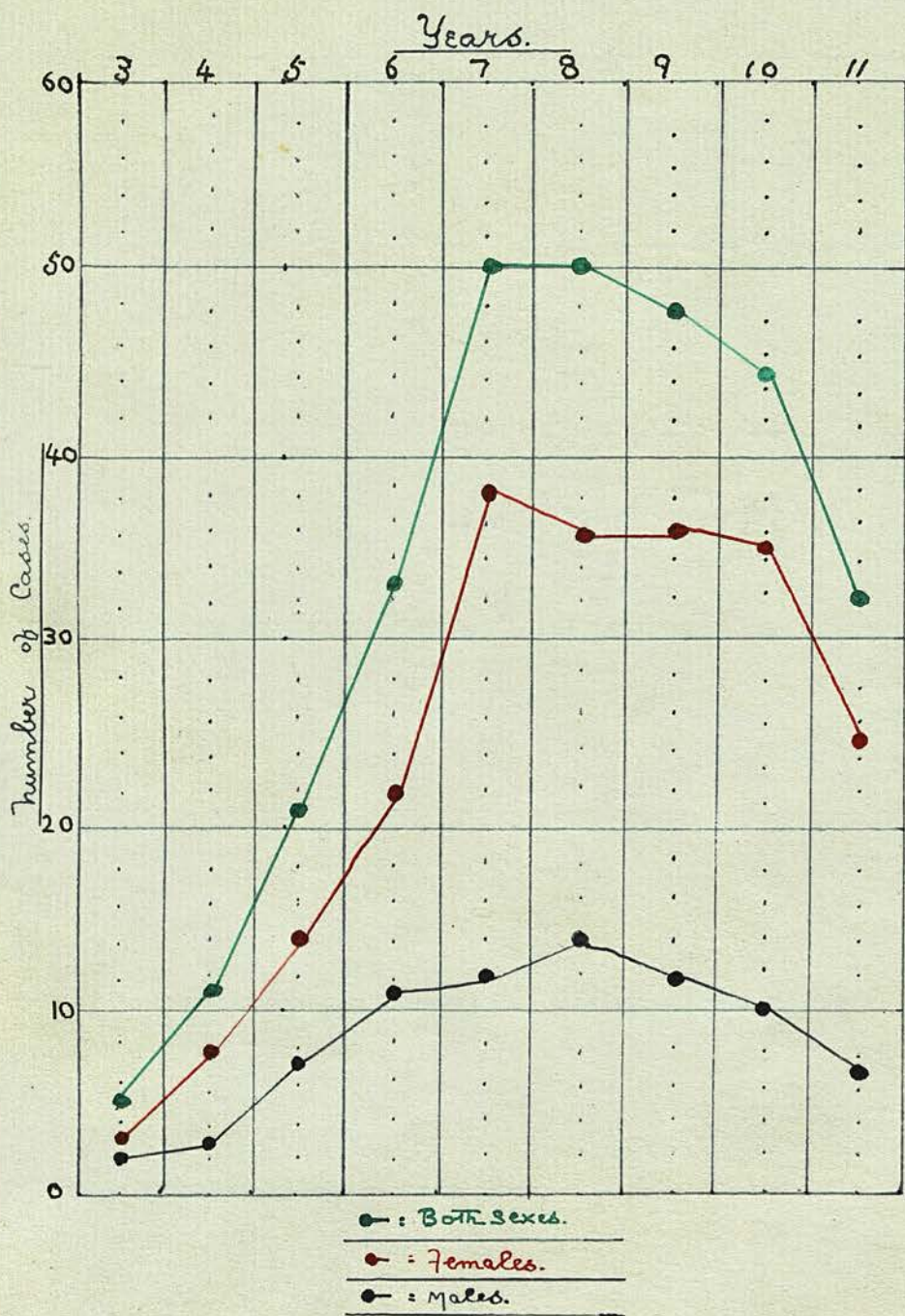
T A B L E .

Years	Males & Females	Males	Females
3	5 about 2%	2	3
4	11 " 4%	3	8
5	21 " 7%	7	14
6	33 " 11%	11	22
7	50 " 17%	12	38
8	50 " 17%	14	36
9	48 " 10%	12	36
10	45 " 15%	10	35
11	32 " 11%	7	25

To illustrate the age incidence more clearly, I have made out a Chart, the green line of which signifies both Males & Females, the red line the females, and the black line the males.

CHART/





This table and chart then show that from 7 years to eleven years is the time when the disease is most liable to affect the child, and also that the curves of Males & Females and of Males & Females considered separately, follow each other very closely. Considering the two sexes together, the curve rises steadily until seven, where it remains till eight, and then commences to steadily fall again. The Female curve is very much the same, the greatest number of cases being at 7, while the greatest number of male cases is at eight.

Chorea then is rare below the age of four, and what is sometimes called Chorea in children below the age of three, is not Chorea at all. As Osler points out, it is extremely difficult to distinguish between the jerky, irregular movements of an infant and those seen in an infant with meningeal haemorrhage, and the subsequent changes induced thereby. Hensch states that he has only seen one case at 3 years old and, as I have before mentioned, my youngest case was at 3 years 6 months, while I have only 5 cases which commenced under the age of four.

In conclusion, let me compare my age incidence with that of Osler. I have turned his figures into percentages of all his cases, occurring below/



below the age of twelve, 319 in number. His maximal number of cases occurred at 9 years, where he had about 19% of his cases.

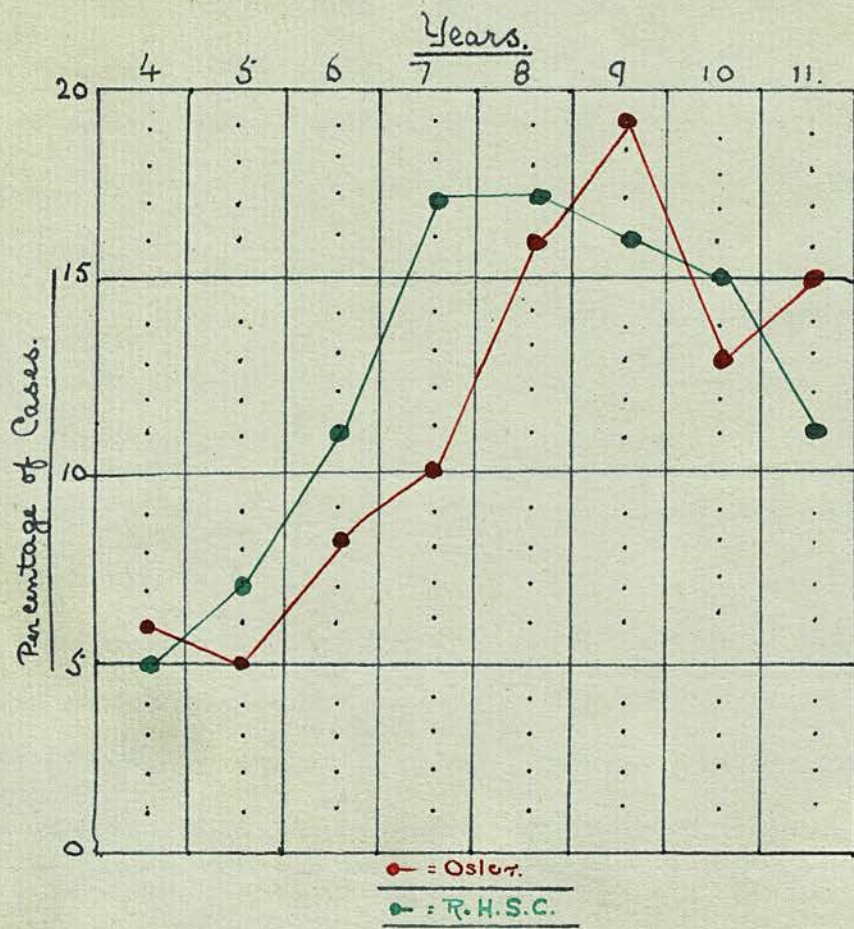
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Years	R.H.S.C.	OSLER.
4	5%	6%
5	7%	5%
6	11%	8%
7	17%	10%
8	17%	16%
9	16%	19%
10	15%	13%
11	11%	15%

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The difference in Osler's Statistics from mine is brought out more clearly in the following Chart. Osler in red, Royal Hospital for Sick Children, Edinburgh, in Green.

Chart/





LOCALITY.

That town children are more prone to the disease than country children has been observed by many authorities, and of my 296 cases, 256 occurred in Edinburgh, while 40 cases from neighbouring districts, and the great majority of those came from busy centres, such as Kirkcaldy, Bo'ness and the like, and very few from the regular country.

The cases which came from Edinburgh are pretty well distributed over the areas which supply all the different cases for this hospital, and no special locality can be said to send us more cases than another.

Chorea appears to be prevalent in most European countries, and the disease seems to occur among the whites in America in very nearly the same ratio as it does in this country. Negroes, American Indians and Indians, however, are evidently not at all subject to the disease, and very few cases of it have been reported.

It seems to be a disease of civilisation, and whereas most civilised countries appear to be equally affected, yet the severity of the disease seems to vary somewhat with the locality. I am told, for instance/

instance, on good authority, that we do not see nearly so many severe cases of Chorea here in Edinburgh as they do in the London Children's Hospitals.

#### SEASONAL RELATIONS.

In America they fully recognise the seasonal incidence of Chorea, and Lewis, who has done most work in this connection, gives November as the month when Chorea occurs least, and his highest point is reached in March.

From November, he says, there is a rapid rise to December; January and February remain very much the same as December, and then there is the sudden rise in March, when the maximal number of cases occur. Then in April a fall takes place, but in May there is another slight rise and from then there is a steady fall in the number of cases till November is reached, when the minimal number of cases is recorded.

Putman, however, failed to establish this seasonal variation on analysing the cases which occurred in the Boston district, and the same may be said of Sir William Gowers statistics of cases occurring in this country. He found that in the first quarter of the year he had 33 cases, in the second 25, in the third 20, and in the fourth quarter 27 cases./

cases.

I have taken the eleven years, 1900 to 1910 inclusive, and have separated the cases up into the months when the first symptoms of the disease were noticed.

I find that, taking all the years together, December has by far the greatest number of cases, while the month of July seems to be the time of year when Chorea is least likely to occur. March, which comes first in Lewis' Statistics, only comes 8th in mine, and November, in which month his minimal number of cases occurred, comes 4th in order of greatest frequency in mine.

The years vary a great deal of course as regards their seasonal incidence, but from my Table it would seem that July and August were the two months when Chorea was least likely to occur, while, with the exception of December, when so many of my cases have occurred, the other months of the year can be classified together, as there is a very slight difference in their number of cases. I was rather impressed by the marked increase in number of cases in the month of December, and I wondered whether the Christmas festivities might not have something to do with it. Accordingly I went over all my cases occurring/



T A B L E

number of cases per Month.

	MONTHS											
	1	2	3	4	5	6	7	8	9	10	11	12
1900	2	3	3	1	1	1	0	0	0	1	1	4
1901	1	1	0	1	4	2	1	0	3	1	4	2
1902	2	0	2	2	0	1	0	1	0	2	0	1
1903	2	2	1	1	2	3	0	2	3	1	2	8
1904	2	1	3	5	1	4	1	1	1	2	0	2
1905	2	2	1	2	2	1	0	2	3	1	1	5
1906	1	1	5	1	1	1	0	1	2	4	5	9
1907	2	5	1	2	0	3	2	3	3	3	3	3
1908	0	5	1	1	4	6	1	2	8	5	5	1
1909	3	5	3	3	6	1	0	4	5	1	1	8
1910	3	2	4	2	2	0	3	1	0	3	2	3
Total.	20	27	26	21	23	23	8	17	28	24	24	46.



occurring in that month, and separated them up into those occurring before the 20th, and those occurring after that date. I was surprised to find that only 18 of the 46 cases occurred after the 20th, so that the majority occur long before the Christmas excitement could have had anything to do with it.

One might be inclined to think that in Edinburgh the celebrity of the New Year would lay more strain on the children than the Christmas rejoicings, but the number of cases for the whole of January only comes tenth in the order of the greatest number of cases per month. Some writers have put the examination times at school as causal factors in the occurrence of Chorea, but, as I have ascertained, the School Board Examinations in Edinburgh, do not take place in December, but in the summer months, when the fewest number of my cases occur, so, although undoubtedly too much work at school is an exciting cause of Chorea, yet it can have little to do in causing the increased number of cases in December.

I am inclined to think that the meteorological conditions have more to do with this preponderance of cases than any other one factor.

TABLE/

EXCITING CAUSE.

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That Rheumatism in one of its various forms is an important factor in the causation of Chorea is certain.

Henoch says he has rarely seen Chorea coming on during the acute stage of polyarthrititis, and Sturges agrees with this, only  $4\frac{1}{2}\%$  of his cases springing directly from Rheumatism. Dickinson states that the causal factor in  $7\%$  of his cases was Rheumatism, and Peacock put his percentage down at between 7 & 8. Steiner of Prague gives even a smaller number of cases due to Rheumatism, namely  $1\frac{1}{2}\%$ . On the other hand Osler's percentage reaches as high as 17, and See mentions that in 61 out of his 128 cases Chorea and Rheumatism coincided.

Chorea, which came on during the convalescence from rheumatic fever, after all pain had left the joints, is, however, a fairly common occurrence, and Henoch, Sturges and Osler all mention this while dealing with the exciting cause of the disease.

That there is usually a distinct interval between the assigned cause and the first observations of the disease is well known, and the explanation of the occurrence of the Chorea most commonly some little time after the acute polyarthrititis may follow this rule/

rule of the interval of cause and effect, or, on the other hand, it may have nothing to do with the arthritis and be due to the rheumatic state of the child.

Of my cases 32 of the 296 started either with rheumatic fever or during its convalescence. That is about 11% of my cases. I shall discuss the relations of Rheumatism and Chorea more fully later, and merely mention these facts under the above heading.

Fright is assigned as the cause of Chorea in many cases, and its importance is fully recognised by all writers on the subject. Here again one usually gets the distinct interval between the fright and the commencement of the Chorea. To illustrate this, let me mention one of my cases, where a little girl saw two drunk men fighting. She went home and was very emotional, and then next day was noticed to be very restless and not to be in good spirits, and in about a week's time the Chorea began to make itself apparent.

Purves Stewart says that 20 to 30% of his cases had a history of fright and Osler found that his statistics gave a 15.5% with such a history.

The/

The cause assigned in 39 or 13% of my cases was fright of a varying nature.

I next consider some kind of injury as the given cause, as in all probability the injury will have much the same effect on the child's physical centres as fright. Here I find 7 cases, or about 2%, said to be caused by some accident to or bodily hurt of some kind. An interesting example of a case of this sort is, I think, worth recording. A little girl was playing with a rat trap when it went off and caught her right hand in it. Next day Chorea started in that hand, and was so severe that the arm was partially paralysed. The rest of the body was absolutely free from Chorea. Two cases, or a little less than 2/3% of the cases, were said to date from a few days after some minor operation.

All these causes are in all probability due to the mental shock and may be classified under Fright, which we originally put down as being the cause of 13% of the cases. Now with the addition of those due to personal injury and operations we raise the percentage to about 10%.

Some early authors, and not a few physicians to this day, lay great stress on the importance of reflex irritation as a cause of Chorea, and regard/



regard gastro-intestinal irritation as one of the most common causes.

Osler, however, states that he did not find a single instance in his records to justify the belief, and Purves Stewart had only one case, where a tape worm was discovered out of 41 consecutive cases.

In two of my cases, the presence of worms was blamed for the onset of the disease, and in both cases a tape worm was passed, while the child was being treated in the ward. In no instance do I find any mention of thread worms.

Many of the cases, which are instanced as cases illustrating this theory, are not true choreas but are more allied to the motor tics, and as Osler points out, Jacobi, who lays great stress on the importance of naso-pharyngeal irritation in the causation of the disease, is usually dealing with cases where the chorea is especially confined to the face, and are probably habit spasms, and not the chorea minor.

One must, however, remember Demme's case, where the chorea was brought on by the application of iodoform, and each subsequent application of the iodoform caused a relapse of the chorea.

Grief was put down for two cases, while three/

three of the cases were accounted for by chill.

The strain of working for examinations, and even the ordinary school work, was given as the causal factor in 23 cases, or a little over 8%, but in not a single instance can I find that the chorea was caused by punishment by the teacher, although several mothers blamed this for it, but in every case it was quite apparent that the child was affected by the chorea at the time when punished, as the reason of the punishment was either restlessness, dropping books or blotting copy books with ink, all of which would be due to the chorea.

Now let us consider the Infectious diseases as exciting causes. Henoeh states that he has seen on four occasions Chorea develop during the convalescence from Scarlet fever, while Osler mentions that in not a single case in his records was the occurrence of Scarlet fever in any way associated with the commencement of the Chorea. In my cases Chorea started in four cases which were recovering from Scarlet fever, and in no case did the Chorea begin when the child was severely ill with the fever.

In a record of 533 cases of Scarlet fever, reported by Carslaw, three developed Chorea.

Both in my own statistics, and in those  
of/

of Henoch, one case was said to be caused by Diphtheria, while Measles accounted for one of my cases, as against two of Henoch's.

In 179 of the 296 cases the causal factor was stated to be unknown. This is a very large proportion of the cases, being 60%.

Imitation, which formerly was looked upon as an important causal factor, is now thought very little of. All the epidemics of so called Chorea have not been true Chorea minor, but hysteria. One of course comes across cases where two children in one family are affected, the one after the other, such as one of my cases, where two brothers took Chorea, the one just a few days after the other, but, on inquiring into the family history, I found that some years previously, two sisters and two brothers had had Chorea at different times, so it was much more probable that the Chorea was due to the family predisposition, than to any imitation. I have very few cases where any mention is made of a child having developed Chorea after having seen and played with a Choreic patient, and though a ward in a sick childrens' hospital is hardly ever free from at least one case of Chorea, yet I have not a single instance of Chorea developing in a child while in the ward.

FAMILY/

FAMILY HISTORY.

In going into the Family Histories of my cases I have paid no attention to the Grandparents, nor Uncles and Aunts, as any report about these relatives is very inaccurate, some being mentioned fully, while others are omitted. In every case the family history as regards Mother and Father, Brothers and Sisters was fully taken so my statistics as regards those are quite accurate. Rheumatism occurs in the family histories much more frequently than any other disease, - 58 having a maternal history, while 40 have a paternal history. Three brothers had Rheumatism, and 7 sisters, while the mother and father were both affected in 11 cases.

Taken together Rheumatism occurs in the family history in 92 cases, or about 31% of the cases.

This is a larger percentage than that recorded by Sturges, who found that 26% of his cases had a family history of Rheumatism. Cheadle has pointed out that Rheumatism is transmitted from parents to children as much as gout, and found, that in taking the family history of 173 cases, 20% had developed undoubted Rheumatism of those with a Rheumatic/





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Rheumatic family history, while of those without a Rheumatic family history only 4% had developed Rheumatism.

This large percentage of cases of Chorea with a rheumatic family history is greatly in favour of the rheumatic theory of Chorea, and for an example let me mention one of my cases, where the eldest sister had had rheumatic fever twice, the second brother had had Chorea, followed the next year by rheumatic fever, the second sister had had Chorea and Erythema nodosum, and the third sister had had Chorea three times/

three times.

Chorea itself does not enter very largely into the family histories, and in only 17 cases was there any mention of it.

The mother had not been affected by it in a single instance, while the father had only suffered from it in two cases. Four brothers and 12 sisters however, were mentioned as having had it. This then gives a very small proportion of the cases with a Choreic family history, it only being about 6%.

Now, if one regards Chorea as Rheumatic, and the Heart cases in the family history as Rheumatic, which undoubtedly a great many of them are, then taken together with the Rheumatic cases, we find that there are 108 cases, in the family history of which there is a strong rheumatic taint, or about 37%.

In only nine of the cases was there a Tubercular family history.

#### PREVIOUS ILLNESS.

The connection that Scarlet fever has with arthritis, and therefore with Rheumatism, makes one inquire about previous Scarlet Fever. As already noted, only in 4 cases did the Chorea occur during the convalescence from the disease. A previous history of Scarlet fever was, however, found in 50 of/

of the cases, or about 17%. Osler states that 141 or about 27% of his cases had previously suffered from this complaint. Here again one must take into consideration the age incidence of the two statistics.

As regards Whooping cough, Sturges found that in an analysis of 120 cases of Chorea he had 100 cases which had previously had Whooping cough. This appeared to him to be a very large proportion of cases, so he analysed 394 cases taken consecutively irrespective of disease, the maximal age of which was twelve, and found that only 91 had previously been affected by Whooping cough.

Of course when analysing cases one must take into consideration their age when going into their previous illnesses, as it will appear obvious to any one that it is absurd to compare the previous health of a bottle baby with that of say a child of ten years old. Now in any childrens hospital the great majority of children admitted are much younger than the average age of Choreas, and therefore will have had less chance of taking such a disease as Whooping cough, and so in order to draw any definite conclusion Sturges should have taken, not consecutive cases, but cases of the age of from 5 to 12 years irrespective of disease.

However, even taking into consideration this/



this point, Sturges 80% of cases, which had previously suffered from Whooping-cough, is very large, and is very nearly double my number, as I only found 47% with such a previous record.

Measles figures very largely in the previous health of my cases, and I found that 244, or about 82% of the cases, had had Measles. Chicken-pox only occurred in 78 or 28% of the cases.

Measles then comes first with 82%, Whooping-cough second with 47%, while third and fourth places are taken by Chickenpox and Scarlet fever, with 26% and 17% respectively.

There were only two congenital specifics in all the cases. Of previous gross nervous manifestations, there were two cases of Infantile Spinal Paralysis, and one Right sided hemiplegia. I was rather surprised to find that only three cases had suffered from fits in infancy. As one would have thought that children with unstable nervous systems would have been very liable to suffer from the infantile nervous disturbances.

Two had suffered from Pleurisy, and four from Pneumonia at some previous date, while one child had been very ill with Jaundice, and one with nephritis, some considerable time before the commencement of the Chorea. Influenza and Enuresis occurred/

occurred in two cases each.

A history of Epistaxis was only found in one case. I was prepared to find a much larger number than this, as Epistaxis is looked upon by many authorities as one of the possible Rheumatic manifestations of childhood.

Of lesions of the skin, one had had Psoriasis, and one Herpes Zoster, while one developed Erythema nodosum while in the ward. Tuberculosis does not figure very largely amongst the previous illnesses, only two cases having had a tubercular hip, and elbow respectively. One had had some of the glands in its neck removed for tubercular disease some time previously, while one had had a radical Mastoid operation done, which possibly was Tubercular. In this list of previous illnesses I exclude Chorea, Rheumatism and Heart disease and, on looking over it, there is really nothing very striking, and nothing that throws any light on the causation of Chorea. The same, however, cannot be said of previous Rheumatism. Under this heading I bring the Subcutaneous nodules, growing pains, valvular disease of the heart with no previous arthritis, the headaches which many children suffer from, the recurrent sore-throats, stiff necks, and some of the erythematous eruptions/

eruptions seen in childhood, as I consider all these and many other slighter ailments are Rheumatic manifestations in childhood. The association of Chorea with Rheumatism has been recognised since the beginning of the 18th Century, and most of our modern writers fully recognise this connection. Yet every now and then men have tried to prove that that connection is not so great as was thought, and in order to do so they have brought forward statistics to verify their statements. Sturges, who though fully recognising the connection that Rheumatism has with Chorea, yet tries to prove that the relationship is slight. He says that the excess of Rheumatism in the previous health of Choreic children would seem to be represented at the utmost by something between 15 and 20%, he thinks this is too small for the importance laid upon it by various authorities. He deals purely with articular Rheumatism in his statistics, and takes no account of the childish manifestations at all.

Out of his 132 cases he could not ascertain whether they had previously suffered from Rheumatism in 11 cases, so of his 121 cases he had 21 with previous articular Rheumatism, or about 17%

He says, that while authorities are all trying/

trying to verify this connection, they leave the two most important facts in regard to the causation of Chorea alone, namely that alarm or mental disquiet is the commonest, and he even says its constant causation, and also that female children are by far the commonest affected. For the first of his statements I should like to say that, although I do not agree with the latter part of it, yet, even should that be true, I do not see that it is any argument against the Rheumatic connection. I do not see why a fright, or some emotional disturbance, should not cause Chorea in a Rheumatic child, just as a chill brings on an arthritis in an adult patient. In all probability each is only an exciting cause to a person already of the Rheumatic diathesis. To illustrate my point let me mention one of my cases. The child was just recovering from Rheumatic fever, when a mouse ran up her sleeve and got into the neck of her dress, and almost immediately after this she developed Chorea.

Of his argument about the great preponderance of females I may merely mention - firstly, that, as Cheadle has pointed out, there is a far greater number of females affected with Articular Rheumatism than males in the hemidecade of life.

He/



He says he finds from his statistics that there are nearly two girls to one boy. Now Chorea is an earlier manifestation of Rheumatism than arthritis, so I am inclined to think that the female preponderance is rather a point in favour of the Rheumatic causation of Chorea. Barlow, on the other hand, found that there was sufficient evidence of previous Rheumatism in 60% of his cases, and states that he has no doubt, that if a fuller investigation could have been carried out into the minor Rheumatic manifestations, a much larger percentage would have been found to have a Rheumatic previous history.

The Collective Investigation Committee, basing their statistics wholly on articular rheumatism, found that 32% had had Rheumatism, either previously, or else at the same time as the Chorea, while Stephen McKenzie gives about 45% of his Choreas as Rheumatic.

Osler states that, of his 554 cases, 15.8% had previous, present, or subsequent Articular Rheumatism, and, when he adds to these, those with a previous history of pains in various parts of the body, he raises his percentage to 21.

Whereas Townsend found 21% of his cases with previous Rheumatism, Crandall places his percentage/

percentage at 54. Allan Starr only found 18% with previous Rheumatism, but he did not include growing pains in his statistics.

To show the different results authors have got while working at this investigation, let me mention the percentages arrived at by Peacock, Owen, Burton Brown, and Piper, who give 23, 26, 85.5, and 46% respectively.

Purves Stewart states that, in a series of 41 consecutive cases, 12 had previous Rheumatism, and two developed Rheumatism after the Chorea had started. Of the other 27 cases 15 had a strong family history of Rheumatism, and in the remaining 12, there was no Rheumatic history, yet 5 of those 12 had Mitial regurgitation, one stenosis, and only 6 no valvular disease of the heart. This then gives 34% of his cases with undoubted Rheumatism.

It is a very difficult task to follow up ones cases after they have left hospital, but this was done by Batten.

Of his original 115 cases, 32.2% had a history of Rheumatism. Three years later, 43.5% had a history of Rheumatism, while 6 years later the percentage had increased to 52.2%, which increased the original percentage by 21%. 38 cases could not be traced, /

traced, so, taking the same percentage for those 38, it brings the total percentage of previous, and subsequent Rheumatism up to 65%

Of my own cases, 72 had a history of previous articular rheumatism, or about 24%, while those having previously suffered from growing pains numbered 43, or 14 $\frac{1}{2}$ %.

Considering these two together my percentage is now raised to 33%.

Fourteen were susceptible to sorethroats, while only two had previously been known to have had nodules, and I could only find one case where previous Erythema was made mention of.

Now, taking all these as manifestations of Rheumatism, I now find that 127 of my cases come under these headings, or about 43%.

On looking over my column of present Rheumatism I find that 24 cases had either nodules or Rheumatism, which now makes my Rheumatic percentage 51.

I can give no statistics as to future Rheumatism, as I found it impossible to follow out the cases. I may merely mention a few cases which illustrate the fact that, although a child with Chorea may show absolutely no manifestations of Rheumatism, /



Rheumatism, yet at some future date be attacked by the disease, showing that many cases, which some authorities would classify as non Rheumatic, yet have the Rheumatic diathesis. Three cases which developed Rheumatic nodules while in the ward, and which before this had no symptoms of Rheumatism. Another case which developed Rheumatic fever while in the ward, and two others which at subsequent dates came back with Rheumatic fever, although at the time of first admission none of these cases had any symptoms of Rheumatism.

I can then state that more than half of my cases have a definite Rheumatic tendency, and that some of my cases, which one would classify as non-Rheumatic, have, by these subsequent admissions, proved that they were Rheumatic. While discussing the relationships of Chorea to Rheumatism one cannot ignore the important work done of late years by Gordon Holmes, Beattie, and especially Poynton and Paine.

These men have isolated, in several instances a diplococcus from the Blood, Cerebro-spinal fluid, and Brain tissues of cases of Chorea, and by their subsequent injection into rabbits, not only have they produced an arthritis, but in some cases even twitching/

twitching choreiform movements.

They maintain that the causal factor in Chorea and Rheumatism is a specific organism, and that the two conditions are produced by the same organism, and they have named it the *Diplococcus Rheumaticus*.

This, however, is by no means the final word on the subject, as McAlister, working on the principle of H.R. Ross, found that leucocytes from health patients died sooner in Choreic blood plasma than in Rheumatic plasma. He next investigated whether Choreic plasma was toxic to Rheumatic leucocytes, and found that the lives of the leucocytes were invariably shortened, thus proving that the plasma of the two diseases is distinct.

He also supports Cabot's statement that in Chorea there is an Eosinophilia, while in Rheumatic fever there is not.

In closing let me mention that Dr. Dingwall Fordyce found that, whereas the opsonic index to *Diplococcus Rheumaticus* in cases of Chorea on admission was invariably below one, yet on discharge it was always found to be above one, showing that as the patient got better from the disease so did his power of resistance to the diplococcus increase.

HEART/

## HEART CONDITION.

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I next deal with the heart condition which is so frequently an accompaniment of Chorea.

Of the irregularity of the heart's action, the acceleration of the pulse, and the cardiac dilatation, I have taken no statistics, as I found it was impossible to draw any accurate conclusions from the notes of the cases.

That these three phenomena are very common symptoms of heart affection in Chorea all observers are agreed.

As to the functional or Organic origin of the Bruits, so commonly heard over the heart in Chorea, I am not in a position to draw any conclusions.

From reports of autopsies on Choreas, however, the tendency would be to regard many murmurs as organic, as in every case I have seen reported, when there was a bruit heard over the heart, at the post-mortem examination the valves were found to be diseased, and Barlow reports a case, there, although no murmur could be heard, yet at the autopsy there were vegetations along the Mitial valve.

Dickinson found that in 21 children of eight and under who were suffering from Chorea, only four/



four were free from heart symptoms, and of 48 children above 8 years old, up to 13, there were 17 free from heart trouble. That is, that of 69 children, only 21 were free from heart symptoms.

Sturges states that, of his 132 children up to 12 years, 45 had heart trouble (irregularity and bruits.)

Of my 296 cases, 101 of them had bruits. A systolic murmur at the apex was by far the most common one, and 82 were thus affected. There were only three which had Mitial stenosis, while 13 had a double bruit at the Mitial area, and only one had an aortic requigitation. One developed pericarditis.

Taking these statistics collectively, 101 cases had a cardiac murmur, or about 34% of the cases.

I cannot say whether these bruits were functional or organic, and I can give no statistics as to their future behaviour. Several cases, however, have come back at some future date still a bruit, while, not a few cases which, while in the ward, had no murmur, have come back, at varying times afterwards, suffering from definite valvular disease, although no Rheumatism had occurred since their former admission to hospital and the time of their return.

Osler followed up 140 cases of Chorea from two/

two to ten years after their attack, and found that  $51\frac{3}{7}\%$  had some definite permanent damage to the heart.

In my own statistics I find that those who have previously suffered from Chorea give a 46% of heart bruits, while all my cases give a 34% and those which have no history of previous Chorea only a 24%. Those cases then with a history of previous Chorea have 22% more heart cases than those which have never suffered from Chorea before the present attack. In favour of the Rheumatic theory of the heart lesion let me mention that 46 of my heart cases had a previous history of Rheumatism and growing pains. This gives a 45% of my heart cases with a previous history of Rheumatism, and only an 18% of heart trouble out of all the cases which have had no previous Rheumatism, as against 34% of cases with, and without an antecedent Rheumatic history

#### RECURRENCE.

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That Chorea is liable to recur has been appreciated since the time of Sydenham, who was of the opinion that the recurrence was usually about the same time each year, and in order to prevent it advised/

advised the child to be purged a short time previous to the expected time.

In Sturge's statistics he does not record the recurrence of the Chorea, but merely mentions the previous attacks. He had, out of 45 boys and girls, 12 with previous histories of Chorea. In eleven the present attack was the second attack, and in only one was there a history of several attacks. This gives  $26\frac{3}{5}\%$  of cases with previous Chorea.

Osler, who was of the opinion that the spring months was the time of year when Chorea was most prone to recur, states that of his 410 cases, 240 had a single attack, 110 had two attacks, while three attacks were found in 35 cases, four attacks in ten, five in twelve, and six attacks in three cases. He thinks it is very doubtful if Rheumatism has anything to do with the recurrence. Dickinson found that in 71 cases recorded by him he had 18 second attacks, only 4 third, and 1 fourth attacks, while Sturges states that of his 177 cases, the Chorea occurred twice in 38 cases, three times in 10 cases, four times in 3 cases, and in one case the number of attacks was uncertain. In my cases I found that 61 had previously been affected by Chorea, while 51 came/



came back at a future date with a recurrence of the disease.

195 cases had one attack, while 101 had more than one attack. Of this 101, 71 were affected twice; 17 three times; 10 four times; 2 six times, and one had 7 attacks, which was the greatest number of times any of my cases was affected by the disease.

Sir William Gowers, who states that  $\frac{1}{3}$  of his cases had more than one attack of Chorea, reports one case, where the child was affected nine different times. I cannot find any case recorded being attacked a greater number of times than this. When discussing treatment I give my statistics as regards the effects of different drugs on the recurrence of the disease. One of the strangest things about Chorea is, that despite the severe motor symptoms, the intellectual functions seem to be affected, in the majority of cases very slightly.

The fact that in many cases the mothers have noticed that of late the child's disposition seems to have changed as in accordance with Dr. Reginald Miller's observations on "Latent Chorea", as he calls it, and in several of my cases have I come across this statement, but in the majority of my cases there is no mention made of any mental impairment./

impairment.

I can only find 63 cases, out of the 296, where there was noted some fact about the impairment of the mental condition. Loss of memory, which was present in one case, was the most severe phenomenon while the majority of the 63 were either emotional, or excitable. Some few were dull and stupid.

Although cases have been recorded where progressive dementia occurred, yet this must be very rare in children, as I find no record of such a case in this hospital.

In 101 of my cases, was there difficulty in speaking, and in a few cases this was so severe as to cause complete aphasia, but the majority of them had merely difficulty in controlling their organs of speech. Osler found that  $\frac{1}{4}$  of his cases had speech difficulties.

106 were noted as having difficulty in walking, and in one or two of these the Choreic movements were so severe that the patient could not walk at all, but most of them had merely some difficulty owing to the Chorea making their gait unsteady.

In the majority of cases the hands are the first part of the body which are noticed to be affected/

affected by the Chorea, the face is usually the next, and lastly the legs.

The almost mechanical action of walking in all probability is the reason why Chorea usually affects the legs to a slighter degree than the arms, whereas all the movements carried out by the arms and hands are much finer, and require more control from the ordinating centres.

That the right side is more frequently affected than the left has been pointed out by several writers. Osler says that in 52.7% of his cases it began on the right side.

Of my own cases 57 started on the right side, or about 19%, while in 42 cases, or about 14%, the Chorea first made itself apparent on the left side of the body.

Some supporters of the Embolic theory of Chorea have taken this fact as a strong argument in their favour, as hemiplegia is more common on the right side also. I think a more probable reason is that as the majority of people are right handed, so is the right hand first noticed to be affected by the Chorea, and when we come to look at what parts of the body the Chorea ultimately affects, we find that Right and Left sided Choreas have equal numbers, /



numbers, namely 19 each, so that the ultimate distribution of the Chorea does not affect the Right side more than the left. Seeé states, that in 97 of his 154 cases, the Chorea was confined to, or more marked on, one side, while Pye Smith found it confined to one side of the body in 33 of his 150 cases. I found in 38 cases only one side was affected, or a little less than 13%, while the Chorea was general in 258 cases, or a little more than 36%.

#### TREATMENT.

That rest and quietness are imperative in the treatment of Chorea cannot escape the observation of any person working in the outpatient department of a childrens hospital. One may go on treating a case with drugs for weeks as an outpatient, without any good result, while the cases often clear up in a remarkably short time after admission to the wards, where they are treated medicinally in the same way as they were before being taken in.

In several of my cases the Chorea had been going on for a very long time before admission, and in many cases their doctors had been treating them with drugs in much the same manner as the physicians of/

of this hospital do.

I found that the average duration before admission was 44 days, while the average duration after treatment in hospital was 25 days.

Rest then is imperative, and all cases should be kept in bed until all movements cease. This may seem hard, but should the child be permitted to get up before the Chorea has disappeared, and allowed to play with the other children, the bad effect is soon apparent.

Some physicians maintain that the child should be kept behind screens, and the fact, that this procedure keeps all excitement away, is undoubtedly beneficial. Some cases are treated here with screens round their beds, while others are not, and on the whole I cannot find any difference in the results.

That any excitement is very bad for a child with Chorea is well illustrated during the time of year when clinics are held in hospital, as invariably the child is much more restless for several days after the clinique, than it had been before it.

Next let us consider the question of Diet.

Osler recommends an abundant and nourishing diet, /

diet, and puts no restrictions on anything. Sturges is of much the same opinion but considers one meat meal a day sufficient, and that the diet should be liberal but not unrestricted.

Duckworth, on the other hand, says solid foods are inadvisable as they are always bolted. He advises milk diet with plenty of milk. Winters of New York, however, has very strong views on the subject of dieting in Rheumatism and Chorea. He is of the opinion that these diseases are caused by the acidity of the blood, and believes that Sodium Salicylate acts as a specific in Rheumatism by its supplying a base to combine with the extra amount of acid in the blood. This, however, does not reach the tissues fluid which still remains acid.

He believes that food bases are liberated at the spot where the acids of metabolism are set free, and states that vegetable foods contain three to four times as much basic material as animal foods do, and by feeding the patient on vegetable foods, he says one gets at the tissue fluids and thus neutralises them and cures the Rheumatism or Chorea. Vegetable acids in their oxidation yield alkaline carbonates. Fresh vegetables and fruits are especially/



especially rich in vegetable acids, and under oxidation are converted into corresponding Carbonates to render tissue fluids and blood alkaline. He recommends cereals, potatoes, bread, vegetables and raw fruits as the diet in Chorea.

I could not take any full statistics about the dieting of my cases, as in many instances no mention was made of diet, but the greater number of them were fed on milk and milk foods while the disease was acute, and then when the movements began to grow quieter they were put on the ordinary ward diet, which includes one meat meal a day.

Careful attention to the Bowels is a very important factor towards the general well being of the patient, but beyond that I cannot convince myself that the System of frequent purging gives any better results than the ordinary ward treatment where the bowels are kept regular.

As I mentioned before my main object in writing this Thesis was to try and arrive at a definite conclusion as to which line of treatment gave the most satisfactory results. I have classified my cases according to the treatment that was employed, whether medicinal, or otherwise, and have again subdivided those cases treated with drugs into different/

different groups, with the view of determining which method of giving the drug is most successful.

As arsenic is the classical drug for the treatment of Chorea let me first consider it. Arsenic has been used as a remedy for Chorea since the beginning of the 19th Century, and Martin in 1813 advocated its use. Since then it has been the Standard remedy.

Henoch recommends tonic doses of about M. T. Tid., and states that he has never seen any bad effects from its use in the way of toxic symptoms. Koplik holds very much the same views as to the method of administration, while Osler on the other hand pushes the drug, and holds that, although cases of toxic action upon the nerves have been reported, yet they are excessively rare and may be considered as cases of idiosyncrasy,

Martin began with M and T.W., and increased his dose by M.T. per diem until it began to disagree with the stomach and bowels, usually at MXIV., when he gradually diminished the dose till MX was being given, at which dose he continued for 6 weeks.

Dr. Begbie stated that he had never known arsenic fail to cure the malady in an experience of 30 years, but Sturges did not have at all the same results, and was inclined to place more faith in the amount of/  
of/

of confidence given to the patients by their medical advisers, than in the drug itself.

I find that 70 of my cases were treated with arsenic alone, while 29 were either treated with arsenic in the first instance, and did not recover under its action, or else some other drug having failed to cure the Chorea, the physicians fell back upon the use of arsenic. Arsenic was unsuccessful in 19·7% of the cases. While the average duration for all my cases after treatment was begun 25 days, that for those treated with arsenic, no matter what the dose was, was 24·1 days. When considering the results of a remedy one must take into consideration the number of cases not cured, besides the length of time taken by those cases which were cured after the commencement of treatment.

Arsenic proved most successful when given in large doses of the liquor, and I find that those cases treated, either with, or above M.X.Tid give an average duration of 23·3 days, and only a little over 6% not cured.

Although those cases treated with from . . . . . M.I.X. Tid. give a very short duration; namely 15 days, yet 40% of the cases were not cured, and therefore this mode of treatment cannot be said to have/



have been very successful.

The method of gradually increasing the dose of arsenic from quite a small dose up to a dose when toxic symptoms were observed did not give very good results, as the duration was 24.9 days, and 21% of the cases not cured.

Although, as I have mentioned, some observers recommend the small tonic doses of arsenic, yet my cases which were treated on this line, that is of, and below M.IV. of *Liquor arsenicalis* Tid. proved to be the least satisfactory of all the cases treated with arsenic, giving an average duration of 29.5 days, and 30% uncured.

Some continental physicians are in the habit of giving their arsenic hypodermically, and although I have only one case which was treated in this manner, yet it at least proves that this method is not at all times successful.

The arsenic was given in the form of 1% solution of *Liquor Sodii Arsenatis* and was given in M.X. doses once a day for a week, then the dose was doubled for the next 5 days, and then M.XXX was given once per diem for 7 days. For the last 5 days of treatment it was being given in M.XL doses, but absolutely failed to cure the Chorea.

Belladonna was combined with Arsenic in one/

one case, but this addition did not seem to do much good, as the Chorea did not improve at all although it was treated in this way for a fortnight.

For the first 5 days M.V. of the Tincture of Belladonna was combined with M.III. of Liquid Arsenicalis Tjd., then the dose was increased by M.II in each case, and kept at this for 4 days, after which M.X. of the Belladonna and M.VI. of Arsenic was given for 5 days with the aforementioned result.

I next consider the results given by those cases which were treated with Antipyrine.

This drug has been strongly advocated by McCall Anderson of Glasgow, who gave gr. V. Tjd for one week, and then gr. X. Tjd next week, while in the third week he gave gr. XV Tjd and then stopped the drug. This was given to a child of 7 years.

I have 39 cases treated with Antipyrine alone, and 19 cases where the Antipyrine was unsuccessful and the child was put on to other drugs or else other drugs proving ineffectual, the ultimate cure was brought about by Antipyrine.

The average duration after treatment of the cases treated with Antipyrine was 23.5 days as against the total average of 25 days, while 23.9% of/

of cases treated in this way were not cured.

The best results were found in those cases which were given gr.X. 4 hourly, where the duration was 18.5 days, while the second place is taken by the cases which were treated with gr.I  $\frac{1}{2}$ . to each year of life, the drug being given on the first day twice, on the second day three times, on the third day four times, while on the fourth and subsequent days five times per diem. It was continued at this for 14 days, or until an Antipyrine rash had developed, when it was stopped. These cases give an average duration of 19.5 days, with 15% uncured. The cases which were treated with small doses of Antipyrine proved to be very unsatisfactory, as also did those cases where the Antipyrine, being started at small doses, was daily increased till Gr.XII. or gr. XIV. Tid was reached and then gradually diminished.

Sodium Salicylate, which is of such immense service in the treatment of Rheumatism, has rather disappointing results when applied to Chorea.

Dr. Lees, however, is a strong advocate for its use in large doses. He says he always gives double the dose of bicarbonate of soda as a guarding agent and has never had any bad results from toxicity.

He/



He gives for a child of from 6 to 10 years Gr X of the Salicylate and gr.XX. of the bicarbonate for two days and then for about three days gr. XV. and gr. XXX, and if necessary he increases his dose to gr XX and gr. XL. He gives this twice hourly during the day and four hourly at night. At first then he gives gr.100 per diem, and ultimately gr. 200.

Although in all my cases double the dose of Sodium bicarbonate was given, yet the only two deaths which occurred were in those treated with large doses of Sodium Salicylate and bicarbonate, and they were undoubtedly caused by the Salicylate and not by the Chorea, nor heart affection. The first case got gr. LX of Sodium Salicylate along with the bicarbonate on the first day of treatment; the next day the dose was increased to gr. 80 per diem, and for the following 4 days the child was taking gr. 120 per diem. The Chorea was worse than ever on the day of death. There was a distinct odour of acetone in the breath, while there was acetone and diacetic acid in the urine, and the child had sighing respirations. Subcutaneous Salines were given but proved of no avail.

The second case was put on gr 135 per diem along with bicarbonate, and after one day of this became delirious, and was given Chloral and bromide to try and quieten her, but with no good effect.

Respirations/

Respirations became very prolonged with occasional sighs; pulse rapid and feeble. There was a slight improvement after intravenous infusion but in a short time the child collapsed and died.

Langmead reports eight such cases of acid intoxication from Sodium Salicylate, and states that in four of them no bicarbonate was given.

The average duration of all cases treated with Sodium Salicylate was 24.6 days, while 36.5% of the cases were not cured.

In the first place let me consider the cases treated with small doses.

The best result is given by the case treated with Gr. V. thrice hourly which gives 13 days as its duration, but then there is only one case of this kind. The same dose given Tid. was not at all successful, as the duration was 30 days, while none of the cases treated 4 hourly were cured, and, although those in which the drug was given twice hourly give a 25.5 days duration, yet there are 33.3% not cured. The two cases treated by gr. XXX 4 hourly were not at all satisfactory, as neither of them were cured.

Gr XX. Tid gives a pretty good result of 14.6 days, but has a 30% of not cured.

We next come to those cases treated by gr./

gr. X to gr. XIX. First of all let us consider the cases in which the drug was given T.i.d., and we find that the duration is 19.2 days with about a 43% not cured, while four hourly gives 27.4 days with 41.6% not cured. Three hourly gives 29 days with about a 29% of not cured and two hourly 33 days with 55% not cured. The two cases treated with very large doses died.

The cases which were merely kept quietly in bed and got no active treatment give a very good average duration, namely 15.8 days. At first sight this looks as if rest alone would be one of the best methods of treatment, but we must consider that a great many of these cases were very slight and were found to clear up without the assistance of any drugs, and also that the majority of cases treated in this hospital are given the chance of improving without any drugs being given and are only put on to drugs when rest alone does not seem to be doing much good. Also all cases treated with drugs are at the same time having rest and quietness, so it would be hard to imagine that the administration of the drug was prolonging the illness.

Rest, and once per diem massage, gives an average duration of 21.3 days but again this only includes/



includes slight cases, or else cases which began to improve immediately on admission.

Massage once per diem, and hot baths, does not give a very satisfactory result the cases lasting on an average 26.3 days.

It will be noticed that these last three classifications have no cases not cured, the reason being that when they were not progressing favourably they were put on to some drug.

Ergot, which Dr. Eustace Smith advocates so strongly, has not proved at all successful in this hospital, in spite of the enormous doses used.

The average duration of all the cases treated with Ergot gives 13 days, with an 80% of not cured.

The most frequent mode of administering it was ZI. 3 hourly, which gives 13 days as its duration, but a 66.6% not cured. When given 2 hourly it did not cure in the only case that was so treated. With larger doses than this, namely ZI. gr 2 hourly it proved to be incapable of checking the disease while with smaller doses, namely M.XV. Tid., no good results were obtained.

Dr. Eustace Smith has of late been employing Ergotine, instead of Ergot, but I have at present under my care a child with Chorea, who has been/

been well under the influence of this drug for over three weeks, and although he is somewhat better, yet he is by no means cured.

For the first 10 days he got gr. V. 3 hourly, then for a week gr. VII  $\frac{1}{2}$ . 3 hourly, and for the next 6 days gr. X. 3 hourly when it was stopped, as he was beginning to look white, and was not taking his food so well as on admission.

My results with Choretone have been very disappointing, although Winter says that he regards it as much of a specific in Chorea, as Sodium Salicylate is in Rheumatism, while McCarthy thinks it has a decidedly quieting influence, but says it must be carefully watched.

I have one case which was given gr. V. 3 hourly, but the drug caused intense giddiness and nausea and had to be stopped in a little over a week with no apparent mitigation of the Chorea. Those cases which were treated with similar doses *Tid.* did not recover. Winter states that since he began using Chloretone his average duration for Chorea is 7 to 8 days.

Trional, given in gr V. doses *Tid.* proved of no avail.

Bromides did not seem to have any quieting influence/

influence at all while Chloral and Bromide were also no good, although they were given a fair trial. Russel on the other hand regards Chloral as the most useful drug of the sedative class, while Purves Stewart mentions that some physicians keep their patients under its influence for weeks, but one must remember that the Chloral sleep is sometimes followed by Maniacal excitement.

Formic acid was only tried in two cases, which are mentioned as being very slight, and, although the average duration of 6 days looks very encouraging, yet there is a 33% not cured.

While Aspirin given in small doses of gr.III Tid. cured a case in 14 days, yet it is hard to believe that the drug, given in this manner, should be more efficacious as a cure for Chorea, than larger doses given in gr.V. doses Tid. did not do at all well.

Antistreptococcic Serum was given in one case but failed to influence the Chorea at all.

I can only find one case treated with a vaccine of the diplococcus Rheumaticus. The diplococci were obtained from Professor Beattie, and the vaccine made by Dr. Dingwall Fordyce. The Chorea cleared up in 3 weeks after the first injection/



injection of the vaccine.

Dr. Fordyce, however, informs me, that he treated two other cases in the same manner, and failed to cure them, so the vaccine treatment of Chorea is evidently not so successful even as the one case I have mentioned would lead one to believe.

The recurrence of the disease does not seem to be influenced by the former mode of treatment as I find that:-

Arsenic	gives a 15.7%
Antipyrine	" " 25.6%
Sodium Salicylate	" " 14.5%
Rest	" " 14.3%
Massage	" " 28.9%
Hot baths and massage.	" " 20.%

In the following table I give the number of cases treated by each different method, and also the number of cases not cured, and the average duration after the treatment was started, of each subsection.

T A B L E /

## T A B L E.

## AVERAGE DURATION AFTER TREATMENT OF ALL CLASSES.

Arsenic. LIQUOR ARSENICALIS.	Days.
Average of all the cases treated with Arsenic.	= 24.1
Doses of and above M.X. T.i.d. 31 cases two not cured.	= 23.03
Doses of and above M. $\frac{T.i.d.}{V}$ to M.IX. 5 cases. 2 not cured.	= 15.
Doses below M. $\frac{T.i.d.}{V}$ 20 cases. 6 not cured.	= 29.57
Increasing doses from small doses upwards. 26 cases 6 not cured	= 24.94
<u>ANTIPYRINE.</u>	
Average of all the cases treated with Antipyrine.	= 23.5
Doses of gr XV. 6 hourly 1 case.	= 30.
Doses of gr X. and above 4 hourly 2 cases.	= 18.5
Doses of gr X. and above T.i.d. 12 cases 7 not cured.	= 23.31
Dose of gr VII. T.i.d. 1 case	= 35.
Dose of gr VI. T.i.d. 2 cases	= 31.5
Dose of gr V. T.i.d. 1 case. 1 not cured.	not cured.
Dose of gr III. T.i.d. 1 case	= 75.
Increasing doses from gr V. to $\frac{1}{2}$ XII. then reduced. 1 case	= 35.
Increasing doses from $\frac{1}{2}$ V. to $\frac{1}{2}$ XIX. then reduced 1 case	= 30.
Dose of gr I. $\frac{1}{2}$ to each year of life 2,3,4,5,55 etc. times 20 cases 3 not cured.	= 19.5

SODIUM/

SODIUM SALICYLATE.

	Days.
Average of all the cases treated with Sod.	= 24.6
Dose of gr XXX. 4 hourly. 2 case. 2 not cured.	= not cured
Dose of gr XX. 3, 4, 6, 6, 6, 6, 3 times daily. 1 case. 1 not cured.	= Death
Dose of gr XX. T.I.D. 10 cases 3 not crd.	= 14.6
Dose of gr X - XIX. 2 hourly. 6 cases 3 not cured	= 33.
Dose of gr " " 3 hourly 21 cases 6 " cured.	= 29.
" " " " 4 hourly 17 cases 7 " cured.	= 27.4
" " " " T.I.D. 7 cases 3 " cured	= 19.2
Dose of gr V. 2 hourly, then $\frac{1}{2}$ X. 2 hourly, then $\frac{1}{2}$ XX. 2 hourly 1 case.	= Death
Dose of gr V. 2 hourly 3 cases 1 not cured.	= 25.5
Dose of gr V. 3 hourly 1 case	= 13.
" " " " 4 hourly 3 cases 3 not crd.	= not cured
" " " " T.I.D. 1 case	= 30.

R E S T.

Average of all the cases treated with rest alone. = 15.8

M A S S A G E.

Average of all the cases treated with Rest and Massage. = 21.3

H O T B A T H S A N D M A S S A G E.

Average of all the cases treated with Hot baths and massage = 26.3

ERGOT/



ERGOT.

Days.

Average of all the cases treated with Ergot = 13.

Dose of ZI. 3 hourly. 6 cases. 4 not cured = 13.

Dose of ZI. 2 hourly 1 case not cured = not cured

Dose of ZI  $\frac{1}{2}$ . 2 hourly 1 case " cured = " "

Dose of M.XV. T.I.D. 2 case 2 not cured = " "

FORMIC ACID. 25% Solution.

Average of all the cases treated with Formic acid. = 6.

Dose of MV. T.I.D. 3 cases 1 not cured = 6.

CHLORETONE.

Dose grV. 3 hourly. 1 case = not cured

Dose grV. T.I.D. 2 cases. 2 not cured = " "

TRIONAL.

Dose grV. T.I.D. 1 case. 1 not cured = not crd.

HYPODERMIC INJECTION OF LIQUOR SODII ARSENATIS 1%

Dose MX. once daily for 7 days, then )  
 MXX. once daily for 5 days, then ) 1 case = not crd.  
 then MXXX. once daily for 7 days, )  
 then M-XL. once daily for 5 days. ) 1 not crd

ANTISTREPTOCOCCIC SERUM.

Dose 8 c.c. once. 1 in 2 days 8 c.c.)  
 once. 1 case. = not crd.  
 In 3 days 8 c.c. once. ) 1 not  
 cured.

ARSENIC AND BELLADONNA.

Liq. Arsen. MII. and Tinct. Bella- )  
 donna. MV. T.I.D. for 5 days. )  
 " " M.IV and Tinct. Bella- ) 1 case. = not crd.  
 donna M.VII. T.I.D. for 4 days. ) 1 not crd.

Liq. ./

Liq. Arsen. M.VI. and Tinct. Bella-) 1 case. 1  
 donna MX. T.I.D. for 14 days. ) not crd. = not crd.

BROMIDE AND CHLORAL.

Pot. brom. gr V. and Chloral Hy- )  
 drate  $\frac{1}{2}$  V. T.I.D. for 7 days ) 1 case. not  
 then. ) cured. = " "

Pot. brom.  $\frac{1}{2}$  X. and chloral )  
 Hydrate  $\frac{1}{2}$  V. T.I.D. for 7 )  
 days. )

BROMIDE.

POTASSIUM BROMIDE.

Dose of gr V. T.I.D. for 10 days. = " "  
 1 case. 1 not cured.

SODIUM BROMIDE.

Dose of gr X. T.I.D. for 5 days 1 = " "  
 case. 1 not cured

ASPIRIN.

Dose gr. V. T.I.D. for 7 days. 1 = " "  
 case. 1 not cured.

Dose gr. III. T.I.D. for 14 days 14.  
 1 case.

VACCINE OF DIPLOCOCCUS RHEUMATICUS OF POYNTON AND PAYNE.

Dose  $1\frac{3}{4}$  million, then in 5 days same dose,  
 then in 4 days same dose, then on the  
 2 following days same doses and in  
 4 days 2 million. Cured in 3 weeks  
 1 case. 21.

PERCENTAGE OF CASES NOT CURED AND PERCENTAGE OF RECURRENCES.

Per cent. of cases  
 not cured.

Percentage/

	Per cent. of cases not cured.	Recurr- ence.
Percentage of cases which left hospital not cured.	= 12. 5%	= 17. 3%
Where arsenic failed to cure.	= 19. 7%	= 15. 7%
Where antipyrine " " cure.	= 23. 9%	= 25. 6%
Where Sod. Sal. " " cure.	= 36. 5%	= 14. 5%
Where Ergot " " cure.	= 80. %	= -
Where Formic acid " " cure.	= 33. 3%	= -
Where Chlorotone " " cure.	= 100. %	= -
Where Trional " " cure.	= 100. %	= -
Where Lig. Sodii Ars. " cure.	= 100. %	= -
Where Antistreptococcic Serum failed to cure.	= 100. %	= -
Where Arsenic and Bella- donna failed to cure.	= 100. %	= -
Where Bromide and Chloral failed to cure.	= 100. %	= -
Where Bromide failed to cure.	= 100. %	= -
Where Aspirin " " cure.	= 100. %	= -
Where Rest " " cure	= 0. %	= 14. 3%
Where Massage " " or cure	= 0. %	= 28. 9%
Where Hot baths and massage failed to cure.	= 0. %	= 20. %
Drattis ?		= . 2.



Taking all things into consideration then no drug can be said to give very much better results than any other, the difference in average duration only being a day or two at the most.

I am inclined to favour the Antipyrine results, when given in gr.  $I \frac{1}{2}$  doses to each year of life and gradually increasing the number of times of administration per diem till it is being given 5 times, at which it is kept for a fortnight, or until an Antipyrine rash appears. By gradually increasing the number of doses one can observe any indication that the drug is disagreeing with the patient, and stop it before going any further. Although this seems to be an enormous dose yet in no case have there been any symptoms of toxæmia. The heart is not affected by it and the children are cheery, enjoy their food, and put on weight. The kidneys are not harmed by it. Arsenic, on the other hand, which has evidently also to be given in large doses, is very apt to cause toxic symptoms. Of my 51 cases treated with large doses of Arsenic, 28 of them had severe vomiting, and the drug had to be stopped on account of it, while several had diarrhoea, and painful conditions of the eyes.

There/

There was no case of peripheral neuritis. The results of the cases treated with even large doses of sodium salicylate, are not good, and the two deaths which occurred while the patients were being treated thus, are very much against it.

As for the other remedies, all I can say is that, although many of them are advocated by well known authorities, yet they have proved very unsuccessful in this hospital.

There still has to be found a specific for Chorea, and, if I have done nothing more in this statistical work, I have at least proved that none of the drugs used in this hospital can be regarded in that light.

#### CONCLUSIONS.

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From the results of my Statistics I am of the opinion that:-

- (1). Chorea occurs in females more frequently than in males.
- (2). The age at which the child is most liable to be affected by Chorea is from 7 to 10 years.
- (3). Chorea occurs most frequently in the month of December.
- (4). In the majority of cases there is no cause assigned.
- (5)./

- (5). There is very frequently a Rheumatic Family History.
- (6). Previous illnesses, except those connected with Rheumatism, have only an occasional association with the disease.
- (7). Chorea occurs most frequently in children who have at some previous date suffered from Rheumatism in one of its many forms.
- (8). A Mitial systolic is the commonest bruit and in many cases there is organic valvular disease of the Heart.
- (9). Chorea starts more frequently on the right side of the body than on the left, but ultimately affects the left side as much as the right.
- (10). There is no drug which can be regarded as a specific for Chorea.
- (11). Antipyrine gr. I.  $\frac{1}{2}$  to each year of life, given twice on the first day three times on the second day, four times on the third day and five times on the fourth and subsequent days is the most satisfactory treatment.



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