THE PROGNOSIS and TREATMENT IN SCARLATINA

From a record of 797 cases treated in Hospital,

by

E. W A T T, M.B.

September, 1901.

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A Prognosis:-

There is probably no acute illness where, from a study of its symptoms and course, we find it so difficult and in many instances so impossible to foretell the ultimate issue.

A child may develop after the mildest possible attack such a serious complication that death ensues within a few days, or the symptoms of onset may at first sight give no apprehension and the condition of the throat seem not unusually severe yet towards the end of the second week the local condition makes such rapid strides followed by purulent Rhinitis etc. that the patient is placed in a most precarious condition and the chances of recovery be very remote.

I am convinced, however, that when we have the opportunity of observing cases of Scarlet fever from the first few/

few days of illness, we can glean much information which enables us to give at least a presumptive prognosis.

In the following pages I will indicate such features as I have found of most value in forming such an estimate.

(a) SYMPTOMS OF ONSET:-

A consideration of the symptoms of onset gives us a fairly accurate idea as to whether the patient will have a mild or severe attack.

(1) VOMITING:- This symptom we find among the most constant as occuring at the onset of Scarlatina. In the mild cases it is nothing unusual to find that the patient has vomited once or twice.

However, it is only in severe cases that I have obtained any record of vomiting having persisted for more than a few hours. In only four cases have I seen vomiting persist for more than twelve hours from the commencement, and I think this occurence must be looked upon as an indication of a lethal attack. In such cases this symptom becomes the outstanding feature, and in all of the cases given below emesis was more or less persistent until a few hours before death. It can easily be perceived that this indicates most extreme constitutional disturbance and so/

so hampers our treatment that we find little can be done for the patient.

Mrs. Dickson, Aet. 36. Patient was well until the beginning of 5/12/1899 when she complained of a sore throat, sickness, and in a few hours she vomited several times. During the 6th. she was continuously "sick" and vomited frequently. The same afternoon patient complained of "pains in her stomach", shortness of breath, and the bowels moved several times. There was no abatement of these symptoms until the 4th. day of illness when she thought she was rather improved - her husband, however, thought she looked very ill, and called a Dr. who noticed a slight rash on her "body and arms". She was immediately thereafter sent into Hospital. On admission the radial pulse could hardly be felt, and the rate was about 150 beats per minute. There was pallor of skin generally. Her mental activity was normal. Dyspnoea was so extreme that she could only with much difficulty answer a few questions. After about an hour in Hospital she rallied somewhat, and a faint rash was now seen on skin. The throat could now be examined and was decidedly congested. Temperature was 101°.9. Everything given by the mouth, including stimulant, was almost immediately ejected. Unfortunately she/

she again collapsed and died 3½ hours after admission.

M. Kemp, Aet. 6 years. Admitted on 4th. day of illness. Temperature on admission 104°.4. Pulse 156 per minute. There was a history here of persistent vomiting and diarrhœa since onset of illness, her mother remarking that she had "taken nothing" since then. For 18 hours after admission she ejected nearly everything that was swallowed almost immediately after its administration. She lay in a semi-conscious state; rash was very dusky, pulse 180 p.m. From this time she quickly collapsed, and died on the 6th. day of illness. The diarrhœa had stopped for 2¼ hours before death.

J. M., Aet. 14 years. Admitted on 3rd. day of illness. History was that he had taken suddenly ill with sore throat, sickness, vomiting and weakness. During the first 36 hours of illness he had been able to retain a little fluid nourishment per mouth, and had vomited only 5 or 6 times during that period. After this, however, he retained nothing given by the mouth, and even without the introduction of food there was frequent emesis. The throat symptoms were now practically nil. Rash was seen early on the 3rd. day of illness when he was sent to Hospital. On admission there was a scant dusky red rash over/

over trunk and extremities, conjunctivae injected, tongue somewhat dry and coated with a thick brownish white fur. Fauces and tonsils showed a livid congestion. Hands and feet tended to be cold. Temperature 104°.2, pulse 148. He was dull and answered questions somewhat indirectly and stupidly. He ejected everything given by the mouth almost as soon as it had been swallowed, but there was no emesis apart from this. Per rectum some stimulant and nourishment were retained. On the 5th. day of illness the vomiting returned and was continuous; his pulse became markedly worse, and he died late the same evening.

M. McCartney, Aet. 8. Admitted on 4th. day of illness. History was that she had taken suddenly ill with severe sickness, headache, and slight sore throat. During the first 36 hours of illness, the vomiting occurred so frequently that she had been unable to retain "anything by the mouth". Thereafter the emesis was less frequent according to history, but she became "delirious","tossing about"more or less continuously and complained occasionally of a "dry throat". On the 3rd. day a "good rash" was noticed on her skin, and she seems to have just continued in much the same condition so far as could be gauged from history.

On/

On admission Temp was 105°.5. Pulse 148 per minute. Hands livid and cold. Eyes suffused, and on speaking loudly she seemed intelligent for the moment, almost immediately falling into her former stuporous condition. Tongue was coated with a brown fur, dry down the centre. Fauces and tonsils much congested and of a livid colour: the latter showed a good deal of thin and easily separable whitish exudate. Skin showed a profuse dark red eruption on trunk and proximal parts of extremities. Almost immediately after administering stimulant or nourishment by the mouth vomiting was induced, and only occurred in this way. She rapidly became more collapsed, pulse rising to 160-170 per minute, and she died within 24 hours after admission.

These four cases indicate a somewhat extreme type of Scarlatina and are all notable for severe and prolonged emesis. In fact, it was the principal feature of the cases from the commencement.

Refer: Trousseau Vol. II, syd. soc. p. 68, cites a case of Scarlatina where death ensued in 24 hours after onset, and where incessant vomiting was a marked feature from the commencement.

Gibson Sys. of Med. Vol. I, p.177, Persistent vomiting as unfavourable.

(2) Diarrhœa:- Early and pronounced diarrhoea occuring as a symptom of Scarlet fever I have only found in very severe and fatal cases. In the first few days of illness this symptom is often associated with emesis and like it, its import in enabling one to form an idea as to the probable type of case depends not only upon the number of motions in the 24 hours, but also upon the duration of the symptom.

Occuring in mild cases of Scarlatina I have almost invariably been able to trace its origin to some dietetic indiscretion, and as soon as this was rectified, the condition improved markedly and gave little further trouble.

I do not wish to discuss here the diarrhœa we so frequently see in late anginose cases with purulent nasal discharge and marked throat ulceration and where it is obviously traceable in great measure to the introduction into the gastro-intestinal tract of purulent material from the throat and nasopharynx. Of 5 cases where diarrhœa was pronounced at the onset of illness and persisted with 5 - 8 motions in the 24 hours until the 3rd. or 4th. days of illness, 3 died: one on the 8th. day, and the other two on the 5th. day of illness.

In two of these vomiting was also a troublesome symptom/

symptom - see M. Kemp, p. 4, and Mrs. Dickson, p. 3.

The 3rd. case ending fatally was:-

J. Kennedy, Aet. 7 years. History of illness commencing on 5th. November with sore throat, headache, and refusal to take food. Early next day diarrhoea began, and he had 5 motions in the next 24 hours. His complaint about his throat was very great and slight discharge was noticed coming from his nose. He had vomited several times during that night. On the 3rd. day of illness the diarrhoea became more pronounced, and he was said to have been delirious. A slight rash was seen on the trunk on the 4th. day and he came to Hospital the same evening.

On admission patient was much collapsed, his pulse registering 160 per minute, Temperature 101°.8. Tongue dry, coated with a thin brownish fur. Tonsils both showed much dirty white exudate, slight purulent discharge from both anterior nares. His extremities tended to be cold, and he lay in bed tossing about more or less constantly. He refused nourishment in any form. There was frequent and what seemed involuntary movement of the bowels to the extent of one motion every 2 to 3 hours. Many of these were greenish. Patient gradually sank, became delirious, and there was no abatement in the diarrhoea until the 6th. day/

day when there was a slight improvement. There was now extensive sloughy ulceration of the tonsils, soft palate and posterior wall of the pharynx, and the nasal discharge had become more profuse. Patient lingered on until the 8th. day when he died.

In the case of the two patients who recovered in neither was the diarrhoea so extreme as in those above cited, and it improved markedly after the 3rd. day of illness.

Writers lay more stress upon diarrhoea, when not amenable to treatment, and persistent than vomiting as an unfavorable indication in Scarlatina.

Refer:Thus West (Diseases of Infancy and Childhood) p. 783 mentions uncontrollable diarrhoea as occurring in malignant cases.

Henoch (Children's Diseases) Vol. II, Syd. Soc. states that diarrhoea although somewhat unusual in Scarlet fever occurs often in malignant cases of this disease.

Caiger (Clifford Allbutt Sys. of Med. Vol.) points out that diarrhoea occurs in severe cases and that towards the end of Anginose cases it also is not unusual.

(3) DYSPNOEA:- From personal observation I cannot speak with any degree of accuracy as to the prognostic importance of this/

this symptom, as I have only seen two cases which showed it where there was obviously no cardiac, pulmonary laryngeal or other organic lesion. Of these two cases one died on the 5th. day of illness - A woman Aet. 38, who only lived 4 hours after admission to Hospital, and had very distressing dyspnoea on admission and lasting up to the time of death. At first I was inclined to look upon this as being due to removal to Hospital, but on careful enquiry found that it had been one of her chief symptoms when at home having begun at the very commencement of her illness.

The other, also a woman, Aet. 34 years, from the commencement of illness had very marked and painful dyspnoea lasting for 24 hours. It was the symptom of which she most complained. This patient had a very severe though favorably ending attack of Scarlet. In neither of these cases was there cardiac or pulmonary or other organic lesion.

We find this symptom referred to by many authors as occurring in the most severe type of case.

Refer: Thus Graves Clin. Med. Vol. I, Syd. Soc. mentions a case of a boy Aet. 10 years - who recovered - and who presented this symptom in a marked degree. Tronssean Vol./

Vol. II, p. 176, Syd. Soc. remarks that "Dyspnoea unassociated with any pulmonary or other organic lesion as being of sinister presage."

Osler, 2nd. Ed. p. mentions "urgent dyspnoea as a symptom which may occur in malignant cases."

My experience is thus quite in accordance with these authors, and I should look with much concern upon a case presenting such marked dyspnoea as I have described in these cases above.

We must be careful to eliminate cases presenting this symptom as the result not of the Scarlet poison, but concurrent pulmonary or cardiac lesion.

(4) NERVOUS SYMPTOMS:- It is of common occurrence to get a history of "convulsions" at the onset of Scarlet fever in children, but on cross questioning the informant I have been able to satisfy myself that in many of these cases it was some manifestation of irritability or unusual behaviour of the child which to those previously familiar to him had warranted the term "convulsion."

I have had the opportunity of personally observing 19 cases from the first few hours of illness and in only two - both ending fatally - were there early nervous manifestations. In one of these there was in the first few/

few hours of illness clonic twitchings of the facial muscles and arms, in the other, in the first few hours of illness, a passing rigidity of one - right - leg.

Consciousness although not perfect was not much affected at first, but later they both became stuporose.

In one aet. 3 yrs. death occurred 36 hours after the temperature first rose: the other 62 hours thereafter. They were thus both of a most malignant type.

I am convinced that where, at the outset of an attack of Scarlet Fever we get such manifestations as I have cited in the two cases above, the case will prove to be of a very severe type if not probably fatal.

Refer: Trousseau Vol. II, Syd. Soc. p.175 supports this contention.

Whittaker, Pepper System of Medicine.

On the other hand many authors place "convulsions" among the commoner initial symptoms especially in children but I am not able to altogether agree with them in this matter.

See Osler 2nd. Ed. p. 75.

Fagge, Prin. & Prac. of Med: quoting Trousseau states that convulsions occurring on the 2nd. or 3rd. days always signify danger.

Keating Encyclopaedia of dis. of children, Vol. I, part II, p.570.

(B) RASH.-

(B) RASH.-

We find most frequently that the intensity of eruption when fully developed is in direct proportion to the severity of attack, and that the higher the temperature the more profuse the eruption. On the other hand, especially in malignant cases the eruption sometimes never attains any degree of brilliancy and in some recorded cases no rash was seen. (Trousseau Syd. Soc. Vol. II).

From the character and behaviour of the eruption so long as it is present, in a case of Scarlatina we can often glean much information concerning not only the severity of attack, but also the progress of the case.

The eruption in the milder cases - or the more severe cases running a favourable course - we find following the stages of appearance of the eruption; increase in its intensity and disappearance, without interruption.

In a large proportion of the more severe cases and in those ending fatally within the first week of illness this sequence is considerably modified and the eruption formerly of a bright red hue becomes livid or bluish, and on pressure being applied to the skin we find the eruption return more slowly, when this is removed, than formerly. The more suddenly these alterations supervene, and the longer they persist after treatment has been applied, the more critical is the patient's condition.

In/

In malignant cases this becomes very striking and in the later stages all that may remain of what was at first a bright, profuse eruption is an irregular, dusky staining of the skin of the trunk and extremities and on applying pressure with the fingers the colour returns very slowly when they are removed. This indicates a most extreme state of collapse and I have not seen any case which presented these features recover where this persisted after treatment was begun.

I have seen 5 cases where the eruption showed these qualities in a very striking manner. 3 of these died on the 5th. day of illness, one on the 6th. and the other on the 8th. day. Two being malignant cases and the remaining 3 very rapid Anginose cases.

Refer: Watson, p.975, Prin. & Prac. of Med.
Aitken, Vol. 1. p.332, Sc. & prac. of Med.

There is another class of case described in which following severe symptoms of onset we find, after a varying interval, a fairly well marked eruption. Suddenly within one or two days after its first appearance the rash fades markedly if not completely, coincidently with symptoms of collapse. This must be looked upon as a most unfavourable omen..

Mrs. D. quoted on p. 3 is the only instance I have seen of this.

I/

I wish to draw attention to the haemorrhagic form of eruption (the not uncommon cases where we find minute petechiae in the flexures of the joints etc. are not included). This seems to indicate a very severe type of Scarlatina. I have only seen one case, which terminated fatally on the 9th. day of illness:-

Sarah F. aet. 12 yrs. Admit. on 3rd. day of illness.- There was an eruption present on admission in the form of large irregular partly coalescent areas on the trunk and a slight Erythema over the extensor surfaces of the elbows and knees. For two days after admission she showed signs of improvement, the eruption preserving the same characters as formerly. On the 6th. day of illness the eruption on the trunk was decidedly more livid. Patient now looked much worse. In the evening there was slight oozing of blood from the lips and gums. Next day the bleeding had become more marked and there were several small purpuric areas over the front of the right Tibia and what seemed to be a number commencing over the trunk. By the following morning these last had spread over a large part of the abdomen and extended to a less degree over the back of the trunk. The haemorrhage from the lips and mouth by this time had become much more pronounced. There was now considerable swelling of the cervical glands on both sides of the neck although the ulceration of the throat had not greatly/

greatly advanced. She died as already indicated on the 9th. day of illness.

Refer:- Osler 2nd. ed. p.75.

A consideration of the day of illness on which the rash was first noticed does not give us nearly as much guidance from a prognostic point of view as a consideration of its character.

From a total of 105 cases, in which the day of illness that the eruption appeared, was noted there were on:

1st. day.	Mild cases	17	
	Severe "	6	
	Fatal "	0	
2nd. day.	Mild "	41	
	Severe "	15.	
	Fatal "	1	Anginose
		2	Malignant.
3rd. day.	Mild "	14	
	Severe "	6	
	Fatal "	1	(Anginose)
4th. day.	Mild "	2	
	Severe "	1	
	Fatal "	1	(Malignant).

Thus we find that by far the largest proportion of mild cases/

cases show eruption on the 2nd. day. Still on the same day we find an almost equally large proportion of severe and fatal cases.

(C) AGE.-

From statistics we find that age plays a very important part in the mortality in Scarlet Fever, and that under 5 yrs of age there is a rapidly increasing percentage of deaths over those above that age.

Thus of 797 cases under my care:-

	No. of cases	Died.	Mortal. per cent.
Under 1 year	5	2	40
1 - 3 yrs.	85	16	18.82
3 - 5 "	210	19	9.04
5 - 10 "	279	13	4.6
10 - 15 "	149	4	2.6
15 - 25 "	53	1	1.08

Of the remaining 16 one died aet. 38 and another aet. 46 yrs

These figures compare fairly closely with those given in the Reports of the City of Glasgow Fever and Smallpox Hospital for 1896-97-98 & 99, in which there is shown from the total admissions to both Kennedy Street and Belvidere Hospitals for these periods

A mortality per cent in Scarlet Fever at the different ages.

A Summary of these tables for the 4 years shows:-

Mort. p.cent.	under 1 year	19.38
	1 - 2 years	21.92
	2 - 3 "	13.9
	3 - 4 "	7.85
	4 - 5 "	6.55
	5 - 10 "	3.1
	10 - 15 "	1.3
	15 - 20 "	1.07

Thereafter the total figures for admissions are smaller and show a slight rise in mortality:-

From	20 - 25 years	2.38
	25 - 30 "	6.27
	30 - 35 "	6.97

Over 35 years of age in the report for 1899 there were 2 deaths out of 30 cases, and for 1896 1 death out of 22 cases.

Compare Tables in Caiger (Table III Clif. Albut p.131), where a much higher mortality is given at the different age periods, and in Gibson's Text book of Med. Vol. I from Asylum's Board Hosp. London.

These tables are interesting when we consider cases of Scarlatina in the aggregate but when we come to deal especially with Malignant Scarlet we find that this is no respecter/

respecter for ages.

Thus of the 5 cases of such that I have had under my care:-

1	aet.	2	yrs.	Died	on	2nd. day.
1	"	5	"	"	"	5th. day.
1	"	8	"	"	"	5th. "
1	"	14	"	"	"	4th. "
1	"	38	"	"	"	5th. "

On the other hand in the Anginose type of case where we get much ulceration of the throat with nasal discharge and a tendency to also involve the Eustachian Tubes and posterior wall of the Pharynx, the older the patient the greater his chances of recovery - if complications be excluded.

Thus of 45 cases where there was considerable purulent nasal discharge starting early in the illness - 2nd. to 5th. day - and extensive sloughy ulceration of the Tonsils with extension to the pillars of the fauces, soft palate etc. and no complications otherwise, 19 died at the following ages:-

7	cases	under	2	yrs.	of	age	5 died
8	"	from	2 - 3	yrs.	of	age	5 "
11	"	"	3 - 5	"		"	6 "
10	"	"	5 - 10	"		"	3 "
6	"	over	10	years.			0 "

There is here seen a striking improvement in the number of recoveries/

recoveries among the older patients and although the figures are small they represent an increasing resistance to the phagaedenic and Toxic processes the older the patient.

It is a well recognised fact that as a rule in the case of the older patients with Anginose attack the local condition can be much more easily treated than in young children, and nurses are agreed that the less resistance the child offers to local treatment the more enhanced is the chance of their recovery. Certainly I have seen many such cases where owing to the struggles of the child leading to much exhaustion, the local treatment had to be greatly modified and thus there was more liability for the ulcerative process to advance rapidly and much septic material was introduced into the gastro-intestinal tract inducing diarrhoea etc.

(D) SEPTIC RASH.-

The occurrence of a "Septic Rash" during the course of an attacj of Scarlet Fever I have found to be of decidedly unfavourable omen and the more extensive this eruption the worse seems to be the prognosis.

I have a record of 4 cases and 3 ended fatally:-

(1) S. Stevenson/

(1) S. Stevenson, aet. 2 yrs.

On admission there was extensive ulceration of both Tonsils and soft palate: considerable purulent nasal discharge and Temp. was 103.5, pulse 145 per min. She was very restless: Scarlatinal eruption was very profuse and bright. Next day there was discharge of pus from the right ear and she remained in the same unsatisfactory state. On the 5th. day of illness the Scarlatinal eruption had faded slightly and a morbilliform eruption appeared over the face and forehead and in the evening was seen on the extremities. This eruption was present for several days extending to the flanks and during this period the condition of patient became much worse. On the 11th. day of illness eruption had practically completely faded leaving an irregular reddish yellow staining but owing to the rapid advance in the local condition and the extreme constitutional disturbance patient's condition was hopeless. She died on the 14th. day of illness.

(2) Jas. Kelso, aet. 2.

Sharp initial illness with considerable ulceration of both tonsils. Slight thin discharge from the ant. nares on the 4th. day of illness which however did not last more than two days. Temp. came down to 99^{o} on the 6th. day remaining/

remaining 99° - 100° for several days.
Otitis media of right on 8th. day of illness.
Throat condition did not at first give rise to anxiety but after the 10th. day there seemed to be no further sign of improvement although his general condition remained satisfactory. On the evening of the 15th. day of illness a mobilliform eruption made its appearance on the face spreading in a few hours to the forehead and by next morning had reached the extremities, extensor surfaces of feet, wrists and front of thighs. At first this was regarded as probably measles but from the subsequent course of events this diagnosis was discarded. Patient's temperature rose to 102° swinging between that and 100.5 and pulse rate had also increased markedly. From this time patient gradually went down hill. Ulceration extended over whole of soft palate and purulent discharge from anterior nares became profuse. This "Septic" eruption faded on the 19th. day of illness and patient died 3 days later.

(3) Mary McK. aet. 3½ yrs.

Admitted without history on what was probably the 5th. day of her illness. Tongue was dry; mouth and fauces very dirty. There was much sloughy ulceration of both but especially the left Tonsil. She was much collapsed/

collapsed on admission but improved somewhat with treatment. There was evidence of a fading Scarlatiniform eruption on trunk and extremities. In addition in irregular areas over the shoulders, neck, forehead and trunk a morbilliform eruption. This as in case 2 was looked upon with suspicion but next day was clearly a "Septic" eruption. Patient lingered on and died 4 days after admission. Desquamation was commencing at the tips of the fingers.

(4) Wm. Taylor, aet. 3 years.

Patient had a severe anginose attack of Scarlatina. By the 6th. day of illness ulceration had involved not only both Tonsils but there was purulent discharge from both Anterior Nares. Temp. was 103° - 103.5 and pulse about 145 per min. On the 8th. day of illness a few small irregular slightly raised red areas appeared on the back of both wrists and in a few hours a number appeared on the face. He still looked so ill that I considered his recovery improbable. Within the next two days however, his Temp. began to show marked remissions and he rested rather better. By the 12th. day the Septic Eruption had disappeared but from this until the 17th. day he had to be fed by the nasal tube. Thereafter although his temperature still swung 99° - 101.5 he gradually improved and from the 35th. day of illness his temperature remained normal

and/

and he was dismissed well 5 or 6 weeks later.

Caiger (Clifford Albutt Sys. of Med.) p.150, Vol. II, mentions the occurrence of a septic rash in Scarlet Fever as unfavourable giving 80% as fatal.

(E) PULSE & TEMPERATURE:-

(1) Pulse.-

Scarlatina is a disease where even in the most favourable cases we may get a considerably elevated pulse rate. Thus in adults it is common if the attack be at all sharp to get a pulse rate even of 125 per minute and similarly in children 130 - 140 per minute. This level is maintained during the height of the pyrexia and falls in favourable cases pari passu with it. A higher pulse rate than this during the period of pyrexia and where in adults we have the pulse registering more than 140 and over 160 beats per minute in children must be looked upon as distinctly unfavourable especially if it be maintained for more than a few hours. We only find a pulse of this rapidity in the most severe type of case or where some serious complication has ensued. In Malignant cases of Scarlet the quality of the pulse may at first be good but within a limited number of hours in those terminating rapidly or after the 2nd. or 3rd. day of illness in those dying later we find the pulse become decidedly thinner and losing the volume it formerly possessed/

possessed. This alteration in the quality of the pulse will be found also to occur especially frequently in unfavourable Anginose Cases often several days before death and when I find it occur in such cases I consider the chances of recovery poor. A consideration of this alteration in pulse is invaluable from the point of view of treatment as well as helping us to estimate the progress of the case.

(2) Temperature:-

It is only in the most severe cases of Scarlet that I have seen Temperatures of 104° - 105° where this has been maintained for more than a few hours and when we have a case running a pyrexia over 104° we must consider him as being seriously ill so long as it is at this level.

In 4 of my cases which recovered the temperature was 105° - 105.6° but this was only maintained in 3 cases for 6 - 10 hours and in the other for 13 hours when it fell below 104.5°.

I have only seen higher temperatures than 105.5° in Scarlet as a terminal feature in fatal cases, and in one such the Thermometer recorded 110° F. a few hours before death.

Refer: Trousseau Vol. II.

Gibson Sys. of Med. Vol. I.

Clifford Albutt Syc. of Med. Vol. II, p.150.

(F) In the preceding pages I have attempted to indicate some of the leading indications which in uncomplcated cases of Scarlet Fever may guide us in estimating the probable issue. We find, however, that if we consider our case from this stand point only a part of our work is done and that the dangers both immediate and remote accruing from complications and sequelae are of equal importance.

In the following pages I will indicate from a total of 791 Hospital treated cases the numbers seized with the commoner complications along with the result.

(1) NEPHRITIS:-

Total cases.	Developed Nephritis.	Cured	Dismissed with Chronic disease	Died.
791	46	41	2	3

We thus find a percentage mortality of 6.5 in those who developed nephritis but in one of these cases death resulted from Cardiac failure following Diphtheria which had ensued when the urine was nearly free from albumen.

Nephritis developing in cases which have been under careful supervision during the whole period of illness - as in Hospital treated cases - is thus seen to present a comparatively low mortality. This is in marked contrast to what we meet with in patients admitted with nephritis and where presumably they have been getting about until they are seized with this sequela.

Thus/

Thus of 18 patients admitted to Hospital with Post Scarlatinal Nephritis 3 died and one was dismissed with Chronic Kidney disease, being a percentage mortality of 16.6.

See Table in Caiger (Clif. Albutt Vol. II) on the Case occurrence of Post Scarlatinal Nephritis and the Comparison of the case mortality in that developing in Hospital treated cases and those admitted with Post-Scarlatinal Nephritis.

See also Figures taken from the total admissions to the Glasgow Fever Hospital for the past 5 years.

Thus out of 13,593 cases, 50 died from Nephritis.

(2) Post-Scarlatinal Rheumatism.-

Like ordinary Rheumatism "Post-Scarlatinal Rheumatism" is not "per se" of much moment. We find, however, that it may lead to cardiac involvement and that occasionally the effusion into the joints becomes purulent in both instances opening up many serious possibilities for the patient.

Total Cases 791: Developed Post-Scarlatinal Rheumatism 26: Percentage incidence 3.29. Of these 26 cases, results were as follows:-

In 4 there was cardiac involvement.

1 died with both Peri and Endocarditis.

1 there had been a former cardiac lesion which was

intensified on dismissal.

2 dismissed with only very slight evidence of valvular lesion.

In 3 cases the Arthritic condition remained for from 3 to 5 weeks but ultimately completely disappeared.

2 cases developed a purulent arthritis, of these:

1 recovered

1 died with Pyaemic symptoms.

(3) Broncho-pneumonia.-

Out of my total cases I had 12 who developed Broncho-pneumonia.

These were at the following age periods.

Total:

12.

Ages.	No.	Cured.	Died.
Under 1 yr.	1		1
1 - 2 yrs.	3	3	
2 - 3 "	3	2	1
3 - 4 "	1	1	
4 - 5 "	1	1	
5 - 7 "	3	3	
Total	12	10	2

In this table it is seen that the only fatal cases occurred under/

under 3 yrs. of age, and in one of these the case was further complicated by considerable effusion into the left pleural sac and pericardium; both which became purulent. This tendency for serous effusions both pleural and pericardial to early become purulent is well-known although fortunately unusual.

We thus find that though Broncho-pneumonia is a somewhat uncommon complication in Scarlet Fever nevertheless when complicated in this manner with pleuritic or pericardial effusion our patient's chances of recovery are very remote.

(4) CELLULITIS of NECK.-

There is no complication occurring in a case of Anginose Scarlet Fever, where the patient is under the age of 3 yrs. that I look upon with more concern than extensive periadenitis of the nexk. The earlier this condition ensues the more tendency there is for the patient to rapidly lose ground and we find the temperature and pulse possibly verging on a more hopeless level than formerly.

In those cases, on the other hand, where this complication ensues in older patients and in those where the local condition of the Tonsils etc. is fairly satisfactory, its onset can be looked upon with very much less concern.

Thus of 13 cases of Cellulitis of the Neck, 3 died.

Case.	Type of Scarlatina.	Age.	Day of illness when began.	Recover: :ed.	Died.
H. Kennedy	Anginose	3½ yrs.	45th.	1	
F. Mahen	do.	3 "	14th.	1	
M. Miller	Mild.	2 "	6th.	1	
J. McLean	Anginose	4 "	5th.		1
M. McLauchlan	do.	4 "	8th. wk.	1	
	This patient had nephritis as well.				
G. McGilvray	do.	10 "	23rd.	1	
M. Gray	do.	13 "	16th.	1	
G. Deighan	Mild	6 mos.	7th.	1	
J. Johnston	Mild	2½ yrs.	8th.	1	
E. Ferguson	Anginose	2 "	8th.		1
G. Brown	Mild	3 "	7th.	1	
F. Simpson	Anginose	3½ "	9th. (both sides)		1
Wm. Currie	do.	4 "	6th.	1	

In this table we find that all the fatal cases occurred in those in which the severity of attack and of the local symptoms warranted its being classed as Anginose.

Also in all the fatal cases the condition began one on the 5th. one on the 8th. and the third on the 9th. day of illness. In one, F. Simpson, the cellulitis affected both sides ("Collar Neck")of older writers.

(5) MASTOID SUPPURATION (Acute) 14 Cases.-

In by far the large majority of these cases the condition pursued a very satisfactory course not requiring

any further treatment than simple incision. In 4 cases however the middle ear as well as the mastoid required clearing out and in one of these death resulted from Septic Sinus Thrombosis.

In another case the child, who was obviously dying from an anginose attack of Scarlet developed manifestations of Mastoid disease the day before death.

Total:	requiring simple incision.		Requiring Major operation.		In the remaining case the Mastoid was only a terminal feature.
14	9		4		
	recovered	Died.	Recovered	Died	
	9	0	3	1	

This, excluding the last case, gives us a mortality of nearly 7.6%.

In most we find the mastoid condition give rise to comparatively little constitutional disturbance. In all cases there was an acute otitis media either preceding or arising
/concurrently with the Mastoid condition.

(6) FAMILY ASSOCIATION:

We occasionally meet with a family where the ravages of Scarlatina play much havoc and we have few, if any, of those attacked, survive; or all seem to develop a mild or a severe attack. If we have cases of Scarlet Fever/

Fever following on a previous member of the family we can often fairly correctly infer that the attack will probably be of a similar type to the first case in many instances.

Thus I have a list where this was strikingly seen.

Mild Attack.		Severe Attack.	
Name.	Result.	Name.	Result.
McGraw (Jas.)	Well.	Ferguson (Sarah).	Died harmorrhagic.
" (Wm.)	"	" (Thos.)	Died Anginose.
" (Sarah)	"	" (Wm.)	Recovered.
Baxter (Wm.)	This man (the father aet. 45, died later from Nephritis.	McCartney (Margt.)	do.
		" (Jeanie)	Died Malignant.
" (Thos.)	"	Nugent (Kate)	Recovered but had very severe attack.
" (Maggie)	"	" (Wm.)	Died Anginose.
" (George)	"	Stewart (Kate)	Do. do.
Ewing, (Jno.)	"	" (Edward)	Recovered but had very severe attack.
" (Peter)	"	Stewart	
Thomson, (Elsie)	"	" (Jno.)	Mild attack.
" (John)	"	" (Netta)	Died Anginose.
Hendry, (Wm.)	"	" (Robt.)	Do. do.
" (Jas.)	"	" (Jno.)	Recovered sharp attack.
Watson (Jessie)	"	" (Arthur)	Mild attack.
" (George)	"		
McGuire (Jno.)	Developed Nephritis later from which he recovered.		
" (Hugh)	"		
" (Sarah)	"		

separate family

These cases show the predisposition, if it might be so termed, of some families to a comparatively favourable type of Scarlatina, and in others to a very severe, and in many, a fatal type.

This family predisposition to different types of attack is referred to by Trousseau Vol. II, Syd. Soc.

(7) BY A NUMERICAL ESTIMATION OF THE WHITE BLOOD CORPUSCLES,

I wish to show my results as obtained from a numerical estimate of the leucocytes in 8 cases.

Each case is accompanied by a chart in which,-

the leucocyte count is shewn in Red.

the temperature " " " Black.

the Pulse " " " Blue.

Case (1). J. Lindsay, aet. 6 yrs. (Female).

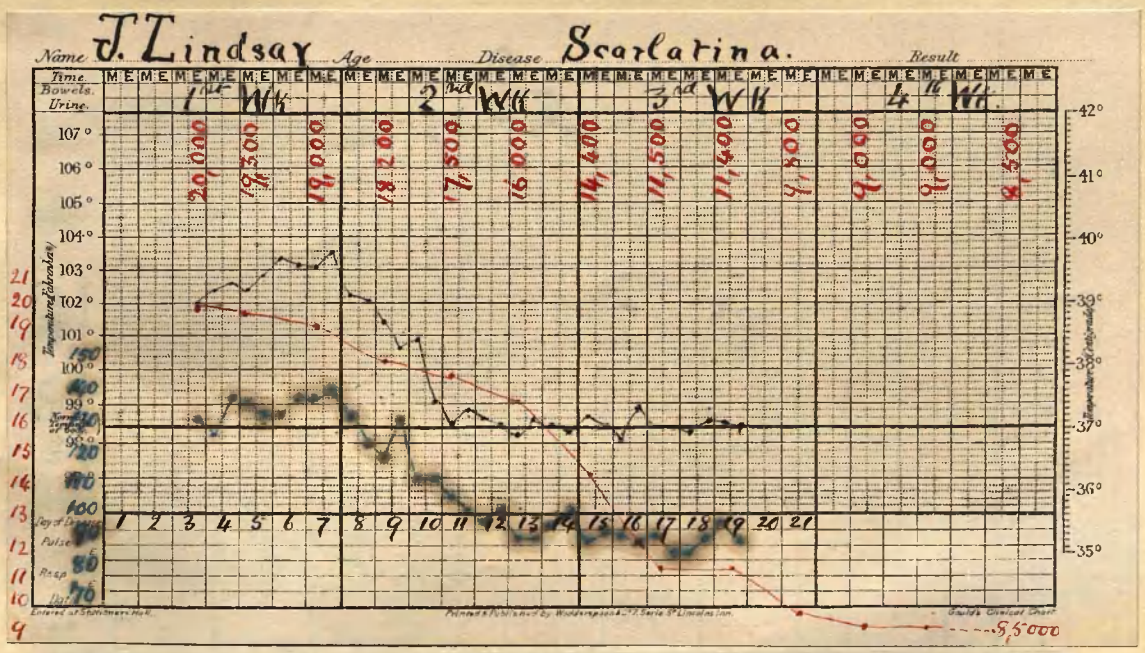
Well marked attack of Scarlet but no unfavourable indications.

First Leucocyte count done on 3rd. day of illness.

In this case there was only slight superficial ulceration of both tonsils. No nasal discharge.

Slight cervical adenitis on 6th. day of illness lasting for 4 or 5 days.

Convalescence uninterrupted.



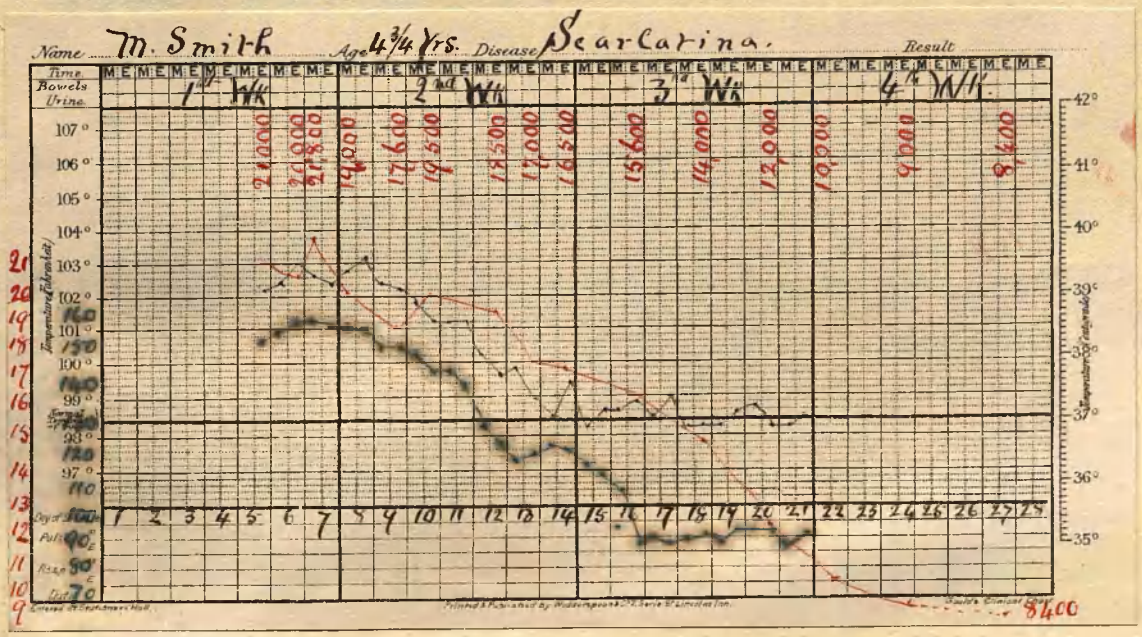
Case (2) M. Smith, aet. 4¾ yrs. (Female).

Well marked attack of Scarlet. Blood first examined on the 5th. day of illness.

On the 8th. day otitis media of right developed and next day slight Rheumatic pains in wrists lasting for 3 days.

Thereafter convalescence was uninterrupted.

This case shows a moderate leucocytosis falling with the temperature, but with the onset of the otitis media and Arthritic pains, we get a rise again in their numbers persisting several days when they again fall.



Case (3) L. Hamilton, aet. 3 yrs. (Female)

Anginose attack.

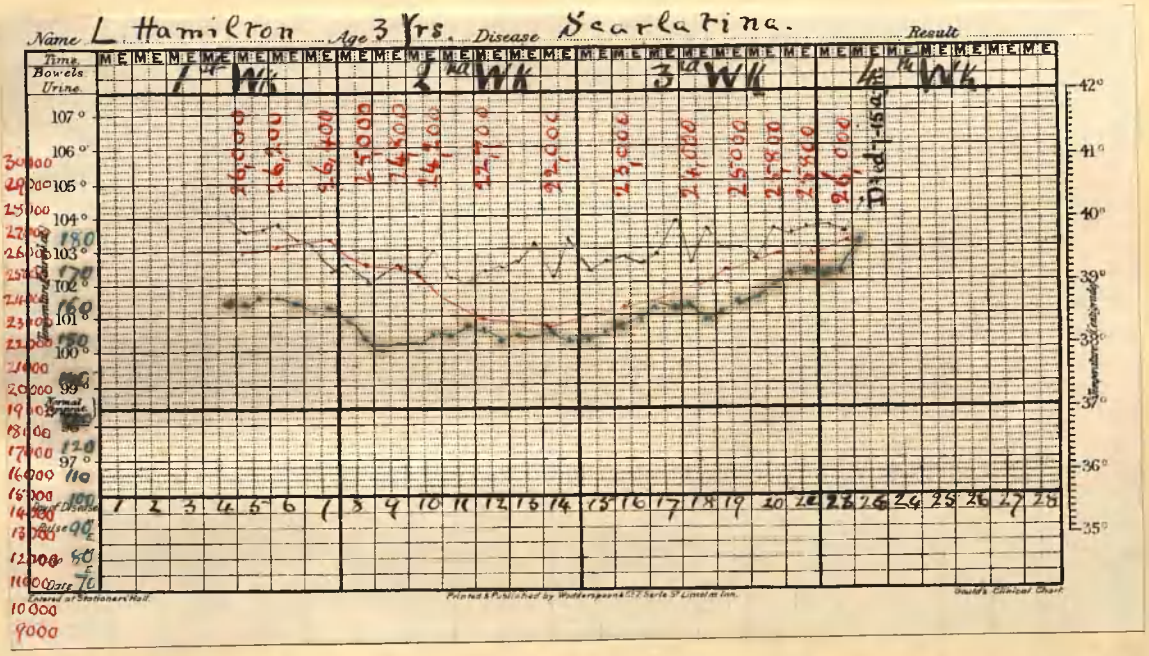
Admitted on 4th. day of illness. On admission she presented such severe symptoms that the term semi-malignant was applicable.

Patient rested well however and next day the pulse was rather improved.

Both Tonsils presented extensive superficial sloughing with a tendency to also involve the soft palate. There was purulent discharge from both Anterior nares.

Blood first examined day after admission.

Toward the 8th. and 9th. day of illness patient's general condition seemed much improved, and this continued for several days. Early in the 3rd. week, however, the pulse began to increase in rapidity; temperature to show a higher maximum, and although there was no increase in the throat ulceration she emaciated markedly, and it seemed as though she would probably gradually sink. Meantime the leucocytes preserved a high ratio. Patient died on the 23rd. day of illness.



Case (4) Lucy Baxter, aet. 11 yrs.

Sharp attack of Scarlet with, however, only slight throat mischief at commencement.

On 3rd. day there was slight enlargement of the cervical lymphatic glands.

On the 6th. day she complained of pains in joints, followed by swelling of wrists. This persisted for several days.

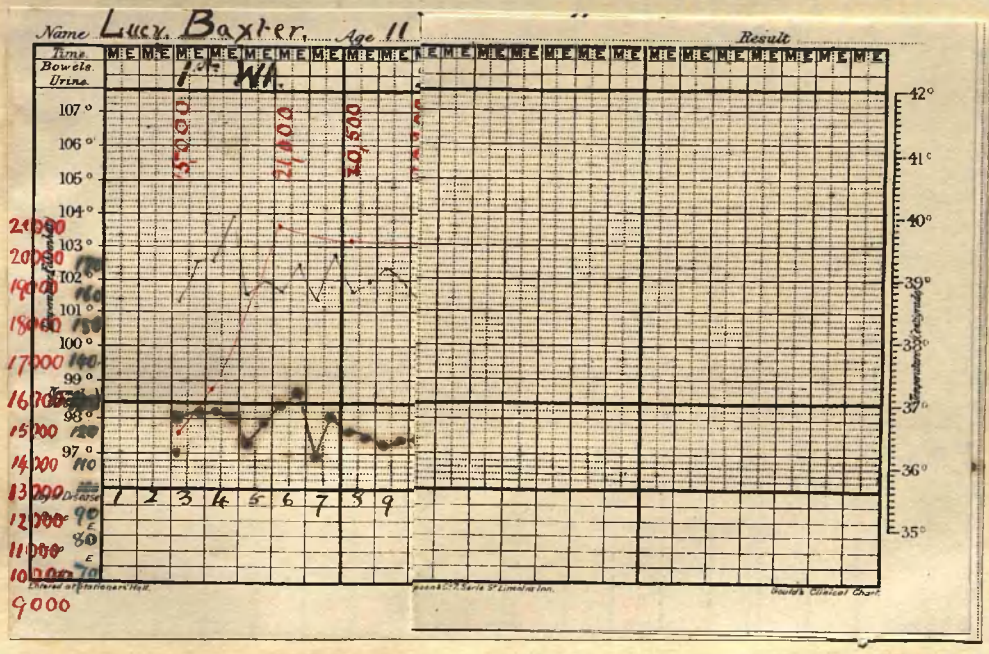
Leucocytes had by this time risen considerably higher, 21,000.

They continued at this height falling gradually towards the end of the 2nd. week to 15,000 about which level they remained until the 4th. week when they permanently fell.

From/

From about the middle of the 2nd. week of illness patient remained in a most unsatisfactory state becoming much emaciated and Temperature continuing about 102 - 103, and it was not until the end of the 4th. week that it remained normal.

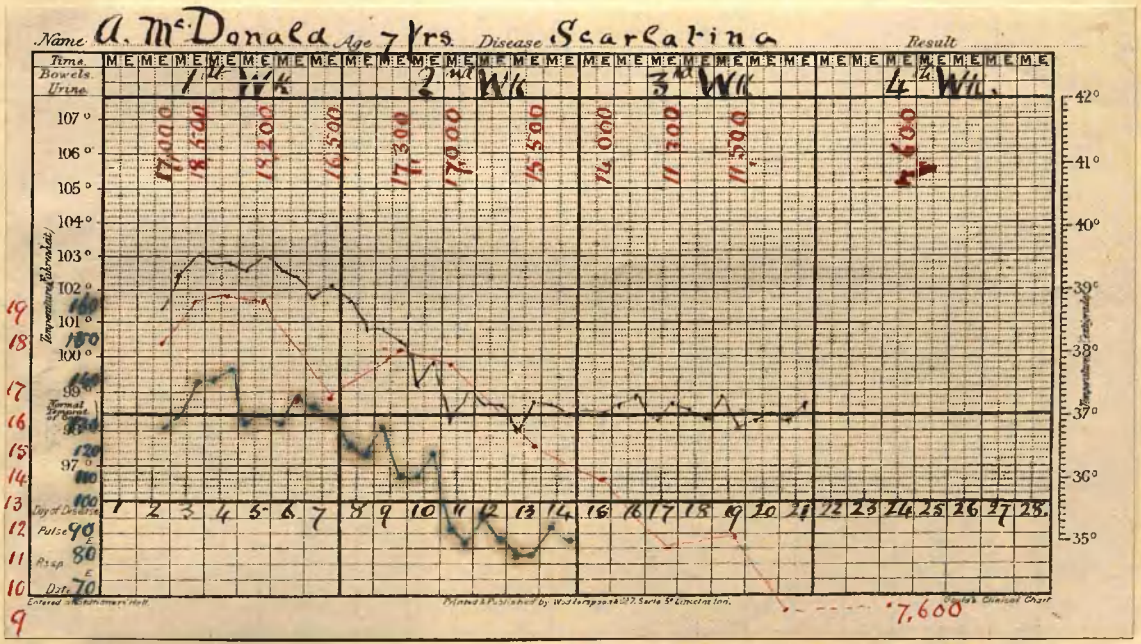
On the 18th. day of illness otitis media of right and two days later of the left developed. At this stage of the illness there were several small sloughy ulcers on both Tonsils, which were practically healed by the 24th. day of illness.



Case (5) A. McDonald, aet. 7 yrs. (Female).

A well marked, though favourable attack of Scarlet Fever, followed by no complications.

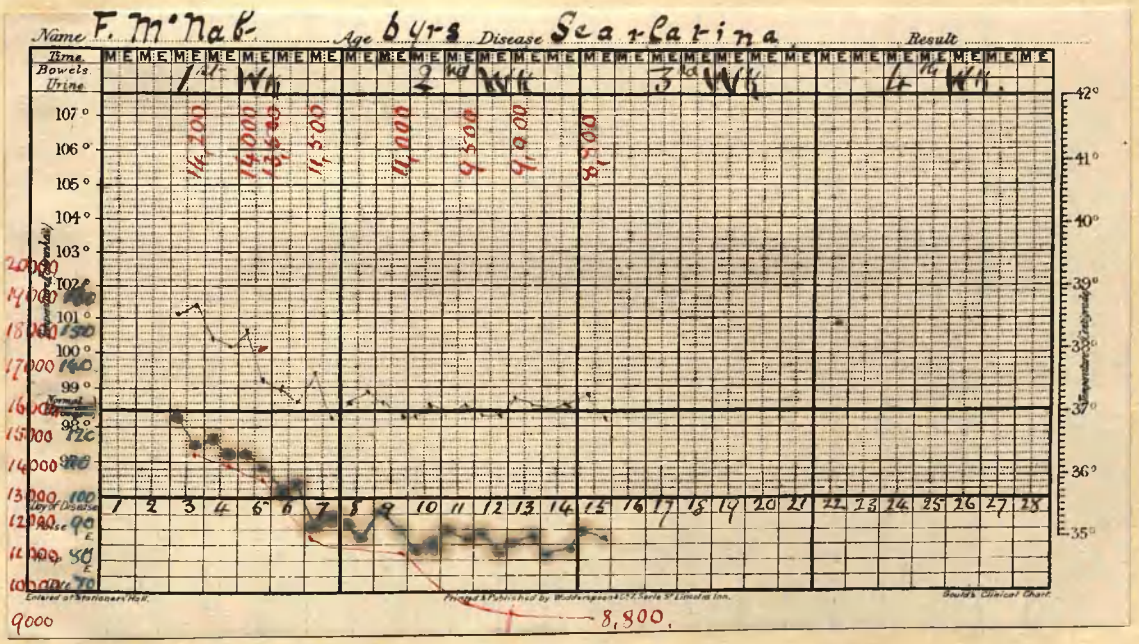
Blood count began on 2nd. day of illness.



Case 6: F. McNab , aet. 6. (Male).

Mild attack of Scarlet.

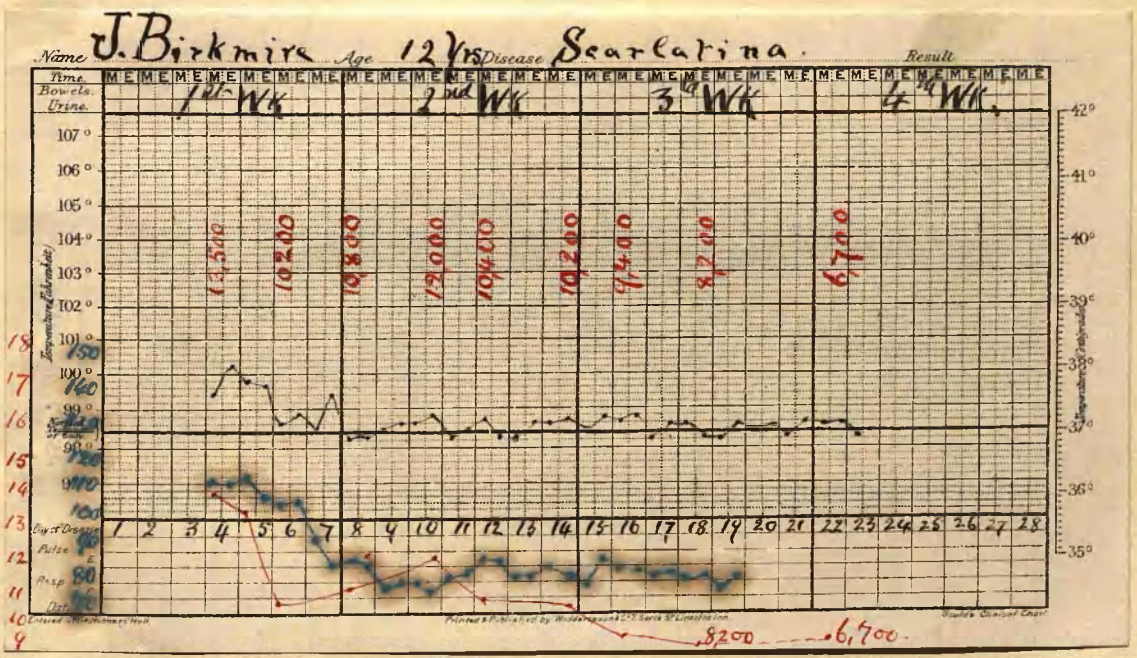
No complications ensuing.



Case 7. J. Birkmire (Female) aet. 12 yrs.

Mild attack of Scarlet Fever.

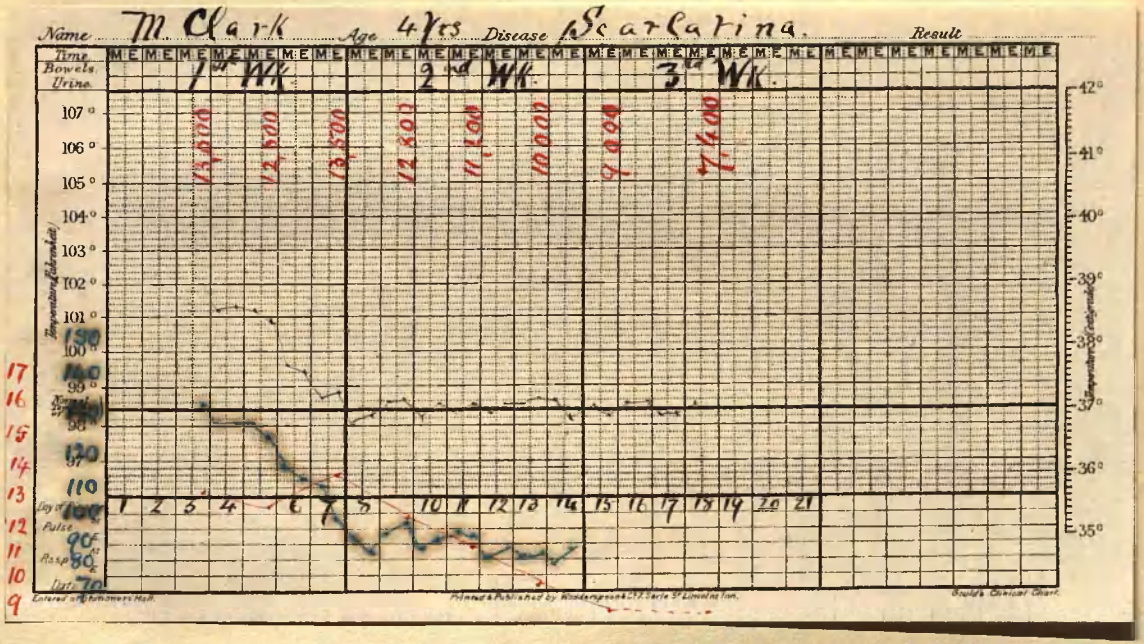
No complications ensuing.



Case 8: M. Clark, aet. 4 yrs. (Female)

Mild Case.

no complications following.



From a consideration of the above cases it is seen that in the mild cases the Leucocytosis is comparatively small and that where no complications ensue we only get a very slight increase in the number of Leucocytes.

In the severe cases on the other hand we get a very marked Leucocytosis - 18,000 to 29,000 per cubic millemeter. This tends to fall gradually but where complications ensue we get a secondary rise in their number, continuing until such time as the patient shows signs of improvement when they gradually declined.

In cases such as L. Baxter (No. 4) therevwas a uniform high Leucocytosis from the commencement and we did not see any appreciable difference in their numbers until the 4th. week when they dropped considerably, but still remained slightly above normal until convalescence was established. In this case also there was a striking increase in the leucocytes at the period when Arthritic pains were felt.

The case which showed the highest count was Case (3), 26,000 - 27,500, Anginose type.

In the severe cases we get a Leucocytosis of 15,000 to 21,000. The mild 10,500 - 14,000.

From this we are led to the conclusion that by an estimation of the Leucocytes in a case of Scarlet we can class our patients among either the severe or the mild.

Thus in the Fatal case the leucocyte count was never

below 24,000 - Anginose Case. In the severe cases 18,000 to 22,000, and in the mild cases as low as 9,800 - a little over 13,000.

Refer: Kotschetkoff - quoted on p.289 Türk Blut bei infections - Krankheiten,
gives: in slight cases 10 - 20,000,
in the more severe 20 - 30,000,
over 30,000 usually in those terminating fatally.

See also cases in Türk Blut bei
Infections - Krankheiten,
p.p.280, 282 and 286.

B. TREATMENT of SCARLATINA.-

In the following pages I will not enter upon the treatment of complications, but will limit my remarks to the treatment I have found most efficient in the different types of the disease.

In the large majority of cases ordinary "Fever treatment" is all that is necessary during the acute stage of the illness but owing to the tendency, during convalescence, for serious sequelae ensuing we cannot dispense with a strict supervision of our patient until several weeks - 6 - 8 usually - have elapsed from the onset. In fact in "Mild" Scarlet an equal amount, if not more, care is required during convalescence than during the febrile stage.

In all cases of Scarlet Fever the patient should be placed in a room or ward well ventilated, temperature kept as nearly as possible and uniformly at 62° F. Absolute confinement to bed for at least 21 days from the onset in mild cases, and a longer period varying with the condition of the patient, in the more severe cases.

The diet, during the period of pyrexia, will be found to give greatest satisfaction when entirely fluid - principally milk, beef tea, thin soups and any of the meat extracts. Of course, in those cases where, from the mildness of the attack, the patient has little, or a very short/

short-lived constitutional disturbance, a much more liberal diet can be instituted; sometimes as early as the 3rd. day of illness.

No. II diet which consists of

8 a.m. Breakfast: Porridge and milk.

8 a.m. Milk or Tea and bread and butter or Toast

12 noon: Dinner: Soups - chicken soup or Beef tea. Chicken or Fish (preferably boiled) and bread. Some form of milk pudding - milk.

4 p.m. Tea: Weak tea or Milk with bread and butter or Toast.

7.30 p.m. Supper: Porridge - if preferred - and milk. Milk; or tea occasionally to adults. Bread and butter.

In the intervals the patient is given as much milk as he desires to drink.

In the 2nd. week, if there be no contra-indication the patient is given a No. III diet, which consists in the addition of Fish or an egg to Breakfast: making the dinner more substantial by the addition of Meat and Potatoes to the No. II Diet, and eggs added to the Milk pudding. Tea the same as No. II except that an occasional egg is given to adults.

Supper is also supplemented by an occasional egg or portion of Fowl.

This is the dietary as adopted in the City of Glasgow Fever Hospitals in Scarlatina and gives every satisfaction.

In Hospital the urine of each patient is tested once daily for albumen during such time as he is confined to bed; thereafter twice in the week.

This should be carried out in all cases of Scarlet Fever as the early recognition of Nephritis sometimes means much to our patient.

LOCAL TREATMENT:-

(a) In 60 to 70 per cent of my cases any treatment of the throat was unnecessary apart from simple cleansing of the mouth and Tonsils with simple mouth washes. I found Glycerin Acid Carbolic 1 - 20 of greatest value for such. If there were any tendency to dryness of the mouth swabbing with Sod. Bicarb. (Sat. aqueous Sol.) I found beneficial or if this failed Borax and Honey. Should the mouth tend to become dirty the application of Potas Chlorat. (Sat. Aq. Sol.) is very effective although its prolonged use tends to induce a disagreeable "dryness" of the mouth, which contingency must be guarded against.

When any discharge from the anterior nares exists and especially if it tend to become purulent syringing the nose with Sod. Bicarb. (Sat. Aq. Sol.) or a weak solution of/

of Potas. Permanganate is generally sufficient and may be done once or oftener if necessary in the 24 hours.

For adults and children who are old enough to gargle some simple mouth wash used in this way is generally sufficient.

(b) Severe cases with much ulceration of Tonsils etc. or with purulent discharge from the nares in addition:-

In these cases our local treatment, for the first two or it may be three days depending on the rapidity with which the ulceration makes its appearance resolves itself into that mentioned under (a). In those cases in which the ulcers remain isolated there is no treatment so efficient as touching the base of each with solid Silver Nitrate once or twice daily, and continuing the same to any fresh ulcers as they appear. This application is attended with great difficulty at times in younger children but by restraint in the form of a blanket fixing the arms to the sides of the body and the head held by a nurse it can usually be properly carried out even in those resisting the treatment. As soon as there is evidence that the local condition is becoming quiescent and there is any tendency towards healing the application of the Silver Nitrate to such parts must be stopped in lieu of some milder measure such as simply swabbing with Glycerin. Acid. Carbolic/

Carbolic. 1 - 20. In those cases which present a thick white exudate more or less uniformly over the Tonsils, soft palate etc. the best method of treatment is to "paint" the parts which show this appearance with Silver Nitrate gr. 40 - the ounceof water or a 10% sol. of Nitric Acid, or any of the other numerous drugs recommended for throat work. This may be required twice daily but generally once in the 24 hours proves to be sufficient. I consider this method - silver Nitrat. gr. 40 the ounceto serve best where the condition of the affected parts stops short of sloughy ulceration.

In Anginose cases there is often considerable difficulty in deciding how much local treatment we dare employ at the risk of inducing collapse. In not a few cases the children have a very rapid and small pulse even while at rest and there is more or less intense pyrexia: Immediately we attempt to adopt any local treatment the child becomes much more collapsed, extremities cold and livid, pulse more feeble and altogether in such a case the probable benefit resulting from local treatment has to be carefully weighed against a possible immediate harm resulting to the child. In such cases as I have found it impossible for the reasons stated to employ strictly local measures I have found the following procedure keep the parts fairly clean:/

clean: The child is wrapped in a warm blanket and, giving a due allowance of stimulant, laid across the bed with the head depressed. Being held in this position we can without much difficulty and in a very short space of time syringe out the mouth and nares in succession. This has the effect of almost completely removing separable sloughs, and if the child should not be too much exhausted may be repeated as often as two hourly if necessary.

The best solution to employ for this purpose is one part of a Saturated Sol. of Sod. Bicarb. and three of water. If there be any odour about the discharge either from the nose or the mouth I employ a sol. of Sulphurous Acid, two drachms to the pint diluted with equal parts of water when used. This latter if employed alternately with the Sod. Bicarb. will be found to succeed admirably in some cases not only in diminishing foetor but the Acid Sulphurous seems to also act as a fairly strong antiseptic. Should the discharge become more copious from the nares and of that thin ichorous quality which we see in the worst type of Anginose case, the Sulphurous Acid in the above strength should be used every 2 or 3 hours if the patient be not too collapsed, the whole naso-pharynx being thoroughly irrigated.

I have a record of 8 cases where this method was employed from the commencement. In 5 of these no further treatment/

treatment was required and they recovered. Of the remaining 3 one developed laryngeal Diphtheria and died. The other two who both had extreme constitutional disturbance warranting the term semi-malignant died one on the 8th. and the other on the 9th. day of illness.

J.M., Aet. 4½ yrs.

Admitted to Hosp. on 3rd. day of illness.

Temp. 103°, pulse 135 per min.

There was considerable purulent discharge from both anterior nares. Both Tonsils much congested as well as palate. Tonsils enlarged, much congested and both showed a good deal of superficial sloughing as well as the pillars of the fauces.

In this case patient was amenable to treatment.

Local Treatment.-

The nose was syringed every 4 hours with Sol. Acid. Sulphurosi 3ī pint and the throat swabbed with the same, as frequently. This was continued for 4 days when there was so much local improvement that the treatment was reduced to twice daily for other 3 days and then stopped.

His improvement from this time was assured and he was up and about at beginning of the 5th. week.

M. McD. aet 2 yrs. Very severe attack.

Admitted on 2nd. day of illness. Temp. 104.

Pulse/

Pulse 150 per minute.

Very restless, refusing nourishment. Much thin ichorous discharge from both anterior nares. Tonsils and palate much congested: former very dirty.

Local Treatment.-

Nose and mouth syringed with Sulphurous Acid 3i pint. This owing to the collapse induced by struggling could only be done once every 6 hours for the first 3 days, later - the pyrexia now being lower and the pulse improved it was done every 3 hours for other two days when so considerable an improvement had occurred that the treatment was only required twice or thrice in the day. Within the next few days this local treatment was stopped there being only slight purulent discharge from the Anterior nares. The Tonsils were now much less in size and hardly presenting any ulceration. Simple swabbing was now employed for the mouth and fauces. Temp. was now only 100°, pulse 125 per min. Unfortunately this child now took a laryngeal Diphtheria, and in spite of copious serum treatment etc. died 6 days later.

H. McG. aet. 3 yrs.

Admitted on 4th. day of illness.

Temp. 103.5°, pulse 150.

On admission it was clear that patient had a very severe attack/

attack of Scarlet. Rash was very profuse and on the extremities possessed that livid hue, which indicates a failing circulation.

Considerable thin discharge from Anterior nares, fauces, palate and Tonsils covered by a dirty secretion and foetid odour from mouth. He was very restless and resisted treatment much.

Local Treatment.-

Mouth cleaned as well as possible with chlorine water.

Nose and mouth douched with Acid Sulph. 3i pint, as often as could be done without inducing too great collapse - about every 6 - 8 hours. Next day the patient's condition remained unchanged and also the day following. On the 7th. day of illness his Temp. was 103° but pulse had risen to 160 per min. and he did not look as if he would rally.

The rigour of our local treatment had to be relaxed somewhat owing to his extreme tendency to collapse. However he still took nourishment and stimulant satisfactorily.

Patient continued in much the same condition until the 9th. day when he died.

N.S. Aet. Admitted on 2nd. day of illness with severe attack.

Temp. 104.2. Pulse 145 per min.

On admission rash was very profuse and circulation seemed fairly satisfactory.

Both Tonsils, palate and fauces were extremely congested. Both Tonsils showed a thin white exudate over the surface.

2 days later a thin purulent discharge started from both Anterior Nares.

Patient had now become more restless and pulse rate had risen.

Local treatment was now begun in the form of syringing the nose with Acid Sulph. 3i pint 3 hourly and swabbing the Throat with the same equally often. This was continued until next day, when, owing to increased resistance on part of the child to the treatment it had to be abandoned and Iodoform Bougies, inserted into the Anterior nares, substituted. Tonsils which now showed considerable ulceration and sloughing, were touched twice daily with Solid Silver Nitrate.

There was no improvement, however, either in the local or the general condition of the patient and she gradually sank dying on the 8th. day of illness.

E.B., aet. 3½ yrs.

This patient developed Scarlet Fever in Hosp. having been admitted with what was thought to be Scarlet.

At the commencement of attack Temp. rose almost immediately to 104° and she had other severe constitutional disturbance. Rash was well "out" next morning.

Tonsils and Fauces, although greatly congested, were so far free from any evidence of ulceration. On the 3rd. day, however, a purulent discharge started from both anterior nares, and both Tonsils showed some dirty white "exudate" over the surface.

Local Treatment:-

Syringing the nose with Acid Sulph. 3ʃ pint water was now begun and continued 3 hourly for the first two days. The Tonsils were meantime swabbed with the same solution. On the 5th. day of illness otitis media of left began. On the 6th. day as there was rather less discharge the syringing was only done every 6 hours: this proved sufficient although up until the 17th. day there was still purulent discharge from the nares but this was diminishing daily. Treatment of the Tonsils had been continued as formerly and the general condition was much more satisfactory. After the 17th. day of illness the only local treatment required was occasional swabbing with Glycerin. Acid Carbolic. Temp. was normal on the 19th. day and she made an uninterrupted convalescence.

F.J., aet. 5 yrs.

Admitted on 5th. day of illness.

Temp. 103°, pulse 138 per min.

On admission there was a profuse though obviously fading scarlet rash on skin.

Much purulent discharge from both ant. nares, mouth and Fauces were very dirty and exhaled much foetar.

Local Treatment:-

Nose syringed 4 hourly for the first 24 hours after admission with Acid Sulph. 3i pint. Mouth etc. cleaned with Sod. Bicarb. Sol. Thereafter syringing was only required 6 hourly as the foetor had much diminished. Tonsils were painted once daily with Silver Nitrat. gr. 40 - the ounce

This treatment was continued until the 13th. day when the local condition had improved so much that only a simple mouth wash was required.

On the 24th. day patient developed Nephritis - blood persisting for 2 weeks and albumen alone for another 10 days. Patient ultimately recovered and was dismissed well at the 10th. week.

P. McK. Aet. 4 yrs.

Admitted on 3rd. day of illness.

Temp. on admission 103°. Pulse 140 per min.

On admission there was profuse purulent discharge from the/

the anterior nares. Tonsils both markedly enlarged congested and right showed considerable superficial ulceration.

Local Treatment.-

Nose douched 8 hourly with Acid Sulph. 3i pint, and ulcers on right Tonsil treated once daily with solid Argent Nitrat. For several days discharge from nose was profuse, mouth was dry and there was no improvement in the condition of the Tonsils. There was never however any foetid odour from the mouth - which was kept clean by Sod. Bicarb. Sol. However the Temp. never registered more than 103° and swung between that and 101.8°. Pulse kept about 140 - 150 per min.

From the middle of the 2nd. week of illness the nasal discharge began to get distinctly less purulent. Temperature fell lower each day and general condition improved slowly. Otitis media of right developed at this time.

Patient although much emaciated and anaemic was gradually restored and was dismissed in the 11th. week having been detained in Hospital owing to discharge from the ear.

B.S., Aet. 3½ yrs.

Admitted on 2nd. day of illness.

Sharp initial symptoms.

Evidence/

Evidence of much congestion of Fauces, Tonsils etc.

On 4th. day of illness purulent discharge from ant. nares and by the 5th. day there was a considerable amount of superficial ulceration of both tonsils and slightly of right side of soft palate.

Local Treatment:-

At first simple swabbing was deemed enough. On the 5th. day however douching with SO_2 Sol. was begun - every 4 hours, To the Tonsils Argent. Nitrat. gr. 40 - the ounce.

In spite of this the ulceration continued active and by the 8th. day of illness there was a small sloughy perforation of the right side of the soft palate. This was touched once daily with solid Silver Nitrate.

Otitis Media of both occurred, left on 10th. day and right on 12th. By this time patient had become very emaciated but Temp. kept swinging between 101° and 102.2° and her pulse was always fairly good. Nourishment was well retained. Douche from 9th. day 8 hourly.

From the 13th. day of illness patient's condition became more satisfactory, discharge from the Anterior nares was much less than formerly. Douche still 8 hourly.

This improvement continued for several days when there was again more profuse nasal discharge and a tendency for the Faucial ulceration to become more active, and Temperature and pulse rate rose considerably. Within a

few/

few days these untoward symptoms gradually began to disappear, patient ultimately making a good recovery.

In two cases I have used the pure Tincture of Iodine locally to the Tonsils, with striking benefit in one case.

(a) Wm. Taylor, aet. 3½.

Severe constitutional disturbance, Temp. for first few days 103° - 103.5, pulse 145 per minute.

On 4th. day of illness a thin purulent discharge from both Anterior nares. Both Tonsils showed considerable commencing ulceration. Both Tonsils swabbed once daily with TK. of Iodine and nose douched with Sod. Bicarb. saturated Aq. Solution several times daily. For 3 days patient seemed to improve but on the 9th. day of illness he became very irritable, pulse rose to 150 - 160 per minute Temp. 102.5 - 103.5°. Discharge from nose became more profuse and the ulceration of the Tonsils seemed to be proceeding apace. On the 13th. day of illness as patient refused all nourishment and stimulant he was fed by nasal tube. This had to be continued until the 17th. day during which time his Temp. had shown greater remissions and his pulse had improved somewhat. Patient was now greatly emaciated. From this time however he gradually improved and the Throat condition to become clean although it was other 3 weeks before his Temperature remained normal.

The/

The TK. of Iodine was stopped on the 18th. day of illness and Glycerin. Acid Carbolic substituted 1 - 20. Dismissed well in the 11th. week of illness.

John Glen, aet. $2\frac{1}{2}$.

Admitted on 5th. day of illness with a severe Anginose attack of Scarlet Fever.

There was profuse discharge from the nose (purulent) Tonsils both showed much sloughy ulceration and the soft palate was also becoming involved. Temp. ranged about 103° for the first few days and then reached 104° frequently.

Pulse 150 occasionally 165 per minute. Tk. of Iodine was applied to the Tonsils and palate (such part as was ulcerated) once daily. Nose was douched 4 hourly with Acid Sulphurosi 3ⁱ pint. This was continued but as patient's general condition became worse this had to be done less frequently. The application to the throat was continued. On the 9th. day he developed Otitis Media of right. Patient was now obviously gradually collapsing, and he died on the 14th. day of illness. His Tongue and mouth had become very dry during the last few days of life although the throat never presented that extreme degree of ulceration which we so often see.

In the first case the Tk. Iodine appeared to act satisfactorily and in the second case the patient had too severe an Anginose attack to hope for much benefit from local treatment.

Refer: Article on Treatment of Ulcerated Throat, British Medical Journal Nov. 10th., 1900, p. 13 7 5.

(3) Treatment by excision of the Tonsils where we get them much enlarged and extensively ulcerated. I have tried this in two cases both ending fatally.

D.R. aet. 5½ years.

Admitted on 2nd. day of illness.

There was already on admission a profuse eruption over the skin and patient had severe constitutional symptoms.

Tonsils were greatly enlarged showing much follicular exudate. They and the adjoining parts were much congested.

Temp. that evening was 104°, pulse 140 per min. Next day patient was restless, had slight dyspnoea, due in great measure to the size of the Tonsils which were now showing signs of commencing and extensive ulceration. On the following day as the dyspnoea was becoming worse, I excised the right Tonsil swabbing the raw surface with pure Nitric Acid and also applying this agent to the other tonsil. Patient now had decidedly less dyspnoea, and rested better that night. Next day, however, there was obviously a commencing laryngitis and he had considerable stridor which within the next 24 hours became so extreme that I did Tracheotomy. In spite of vigorous local treatment fresh ulceration had begun on the site of the Tonsil which had been removed and the whole fauces and soft palate were most extensively ulcerated. Patient,

although/

although greatly relieved by the Tracheotomy, gradually sank, dying two days later - 9th. day.

E.B., aet. 3½ yrs.

Admitted on 3rd. day of illness.

On admission patient had all the features of an early Anginose case.

Temp. was 104.2 and pulse 154 per min. There was extreme enlargement of both Tonsils, the left being the larger. This gave rise to considerable respiration difficulty, as the patient was unable to breath through the nose owing to the presence of adenoids and a profuse nasal discharge - purulent.

Both Tonsils showed much superficial ulceration. On the day following admission the respiratory difficulty continued with increasing intensity, and as the patient was in much distress I excised the larger Tonsil, treating the fresh surface with pure Nitric Acid. This gave the patient much temporary relief, but the intensity of the illness continuing she gradually sank, and died about 36 hours later - 6th. day.

In both of these cases we had extreme constitutional disturbance; in fact they both were well marked Anginose or "Septic" cases. Any operation was perhaps inadvisable

as/

as the chances of recovery, especially in Case II were remote. However in both, the relief of Dyspnoea was marked although temporary. Of course we cannot but anticipate a re-infection of the cut surface and although I have not myself tried it the actual cautery applied immediately after removal might be more successful, or first scraping the whole ulcerated surfaces with a sharp spoon, and then applying the actual cautery, under a general anaesthetic.

In those cases where we get purulent nasal discharge which does not warrant that annoyance to the patient accruing from frequent douching, I have found some form of antiseptic bougie of service. Thus Iodoform bougies inserted one into each nostril on gradually being melted and if the head be extended slightly will be found to act fairly thoroughly upon the nasal mucous membrane. One of these bougies can be placed in each nostril thrice daily and allowed to act until ¼ to ½ an inch has been melted.

Out of 18 cases in which I employed this remedy, I have only seen one case where an Iodoform rash was induced.

Discharge from the nose, with its use in this way, soon shows signs of improvement, and if used in appropriate cases, further treatment will be found to be unnecessary.

(C) DELIRIUM.-

The treatment of delirium occurring during the first few days of illness is best carried out by the judicious application of cold to the skin. Thus we commence in the slighter degrees, where the patient is occasionally tossing about in bed, by the tepid sponging repeated every half hour if necessary. Should this fail, asit seldom does in such cases, we must have recourse to the cold pack or cold sponging. By this means we generally succeed in gaining some hours quiet sleep for the patient. In the more severe type of delirium as we meet it in Anginose cases we must apply the cold pack from the commencement - provided the condition of the patient offers no contra-indication as well as iced cloths to the head or the ice-bag.

In the delirium of Malignant and so-called semi-malignant cases, each case must be treated upon its own merits. Thus, so long as the circulation seems to be fairly good we may apply cold to the surface as frequently as necessary, carefully observing the effect of each application. Soon, however, in these cases the impossibility of applying such treatment arises owing to evidence of failure of circulation and we are here face to face with a difficult problem, should the patient still continue to

be/

be "noisy" or exhausting himself by sitting up in bed or tossing about in bed.

In such cases I have had recourse to chloral hydrate where it could be swallowed in doses of gr. 15 - gr. 25 for adults and smaller dosss for children in proportion. Chloral Hydrate I have found the most useful hypnotic in these cases.

Whenever we find our application of cold or tepid water to the skin prove insufficient, we must have recourse to medicinal means, but we too often find that our patient is already beyond our assistance, although we may have the satisfaction of seeing him quieted for a time.

However in many cases with severe throat ulceration and with a temperature not greatly elevated, the patient seems much distressed, is extremely irritable, obtains no sleep and often sits up in bed somewhat dazed. In these cases opium in the Form of the Tincture or combined with Syr. Chloral Hydrat. soothes the patient very markedly and its administration is almost always indicated in such cases.

Refer: Osler p. 80, advocates cold pack for delirium and pronounced nervous symptoms.

(D) SLEEPLESSNESS:-

This in adults with severe throat complaint occasionally forms a troublesome symptom.

In two instances I have seen it lasting in one case until the 4th. night of illness and in the other with barely 3 hours sleep until the 5th. day.

In the first case Mrs. A. aet. 34 yrs. Chloral Hydrate was tried on the 2nd. night of illness gr. 25 with no apparent effect, and on the following night Trional gr. 30 was given, but she only secured about one hour's sleep. On the evening of the 4th. day of illness there was much less throat complaint, the Temperature had fallen slightly, and she slept quietly for 4 hours without receiving hypnotic. Thereafter she progressed favourably.

The other case, A.L., aet 24 yrs. (Male).
Temp. 102.5, pulse 120 per minute.
Throat - Both Tonsils greatly enlarged, congested, Fauces congested and also palate. This was not a very severe attack but the distress from the throat was extreme.

First night, no sleep.
Second do, do. do. received Tk. opii m. 30
Third do. 1 hour's sleep, " " " " 40
Fourth do. 1¾ " " " " " " 60

On the fifth day of illness throat condition was much less troublesome/

troublesome and patient was thereafter able to rest comfortably. He made an uninterrupted recovery.

MEDICINAL TREATMENT:-

In the milder types of this disease, the use, so long as complications do not ensue, of remedial agents is unnecessary.

However, in the more severe cases we occasionally must have recourse to drugs.

(a) Antipyretics:- The most satisfactory antipyretic I have found in the case of children to be Quinine. This may be given in the form of the Sulphate or preferably the hydrochlorate in doses of gr. II two hourly for children under 2½ years old, and increasingly larger doses to older children. This is valuable in those cases where we have hyperpyrexia and where it is considered inadvisable to apply cold externally. We sometimes get a drop of 1° or it may be 1.5° in Temperature after 2 or 3 doses: when the drug can be withheld, and repeated when necessary with great caution. If the child cannot be persuaded to take this form of Quinine it may be given as the Tannate of Quinine with gr. 1 more added to each dose. This form, although not so efficient is comparatively tasteless.

For adults the necessity seldom arises for giving an Antipyretic. The safest is Phenacetin given in a dose gr. X or combined with Antipyrin.

R. Phenacetin
Antipyrin aa gr. V.

Medicinal Antipyretics either in children or adults are seldom called for and should only be used where the external application of cold is negatived or used as an adjunct to it.

Refer: Boston Hospital reports 99 - McCallom -

The routine use of Antipyretics in severe cases of Scarlatina is to be depreciated.

Medicinal Antipyretics are not of much service as compared with cold water, Osler p.80.

A. External Application of Cold.-

This is without doubt our sheet anchor for hyper-pyrexia especially in Scarlet Fever.

When Temp. not above	103° - 103.5°	- Tepid Sponging.
up to	104°	Tepid Pack.
from	104° - 104.5°	Cold sponging.
above	104.5°	Try frequent cold sponging and if insufficient use the cold pack.

This I have found satisfactory as a working basis but as much depends upon the immediate effect of the treatment upon each patient as upon the behaviour of the Temperature.

Thus there are many instances where it will be found that even with a Temp. of 104.2 and patient is easily quieted tepid sponging may be enough to induce sleep. In fact there is no realm of therapeutics where we can be so easily guided by result. We must always be on the look-out for untoward effects and be prepared to increase or decrease the rigour of our application from time to time and in Hospital I always direct the nurses to vary the treatment according to result. In this way the patient can be continuously kept under the best possible circumstances and his every change treated at once.

One/

One great indication that the treatment is sufficiently rigorous is whether the patient rests quietly or sleeps. Should he continue to be restless then from Tepid sponging we must use the tepid pack or if that do not improve matters cold sponging - water as it comes from the cold tap in this Country is suitable. Should there still be hyperpyrexia and the patient continue to be restless our choice now lies between a cold pack or cold bath provided the patient is ~~able to stand either~~ sufficiently vigorous to withstand such interference, and here we must be on the look-out for failing circulation and coldness of the extremities. Should these arise as the result of our treatment, we must, pro tem substitute the less vigorous tepid pack, or we may employ a cold douche to the vertex. In certain cases this last comforts the patient very markedly and may, of itself, induce sleep for a time.

In a very small proportion have I found the cold bath applicable - 2% of all cases requiring hydrotherapy - owing to the tendency to failure of the circulation and too great chilling of the extremities.

A much larger number of patients derive marked benefit from the cold pack, where it is confined to only one half of the trunk at one time. This method I was able to employ in 15%. Of the remaining cases cold sponging was required in 10%, and the tepid pack or tepid sponging in

the others.

Refer: The application of cold to the skin for hyperpyrexia is much lauded by Trousseau, Vol. II, Syd. Soc.

Fagge, Vol. I, Prin. & Practice of Med. p.212 states that cold affusion or bathing is the best method to combat hyperpyrexia in Scarlatina.

I cannot do better than quote Osler 2nd. Ed. p.p. 79 & 80 on this form of treatment in Scarlet Fever:- "When the temperature is above 103° the extremities may be sponged with tepid water. In severe caseswith the temperature rising rapidly this will not suffice, and more thorough means of hydrotherapy should be practiced. With pronounced delirium and nervous symptoms the cold pack should be used. When the temperature is rising rapidly, but the child is not delirious, he should be placed in a warm bath the temperature of which can be gradually lowered, The bath at a temperature of 80° F. is beneficial. In giving the cold pack. . . . . The good effects which follow the administration of the cold pack are often striking particularly in allaying the delirium and jactitation, and procuring quiet and refreshing sleep.

The ice cap is very useful and may be kept constantly applied in cases where there is high fever".

See also Keating Encyclopaedia of dis. of Ch. Vol. I, pt. II.

ADMINISTRATION of STIMULANT in SCARLET FEVER.

In Scarlet Fever it is of the utmost importance that we step in at the right time with our atimulant, especially as in those in which it is most often indicated the disease is running a very rapid course and a few hours may make all the difference between tiding our patient over a critical period or perhaps allowing him to lapse into so collapsed a state that there is much greater difficulty in improving his condition if this can now be done.

Two of the principal indications for the administration of stimulant are an increasing rapidity and loss of volume in the pulse, and any tendency for the rash to return more slowly than formerly when pressure is applied to the skin. When such circumstances arise the immediate administration of stimulant is called for. At each visit to a sharp case of Scarlet I invariably examine not only the condition of pulse but also of the eruption. When we suddenly get a diminished intensity in the eruption or lividity accompanied possibly by coldness of the extremities we have a group which might be called "late indications" for stimulant. No patient who has been under observation from the commencement of illness should present such without already having received stimulant.

Other/

Other less direct indications for the administration of stimulant exist such as a tendency to failure of the pulse when treatment of the throat is being carried out or it may be induced by sponging or "packing". In these cases if stimulant be given when such symptoms manifest themselves we may prevent their occurrence, but unfortunately however this is generally a precursor of more untoward manifestations.

Of course in those Malignant cases where little or no eruption appears we are easily guided by the pulse and other severe constitutional disturbance, but owing to the extreme gastro-intestinal symptoms we see in these cases it is seldom possible to give much if any stimulant.

In 5 cases I have been forced to the expedient of administering it per rectum. All occurred in cases where from severe and continued emesis nothing could be given by the mouth.

In two it was given in this way for only 24 hours when the patients were able to swallow the stimulant. Both recovered.

In a third case, malignant, whiskey was given per rectum for 3 days; when the patient died.

In the other remaining two cases Stimulation per rectum was kept up for 4 days in one and 5 days in the other before the stomach would retain stimulant in any

form.

These enemata are best given 3 to 4 hourly along with some nutrient such as peptonised milk or meat extract.

As to which form of stimulant to give our patient there is seldom much difficulty and Brandy or a good Whiskey is generally satisfactory. Occasionally, however, the patient refuses this or the stomach will not retain it, and in such we must fall back upon Champagne which is best given iced or in some form of meat extract. Given in this form I have seldom seen it refused even by young children. The champagne should be "dry".

In a limited proportion of cases I have found sherry taken where the others had failed.

As regards quantities:-

This must be carefully regulated in each case from day to day.

We may begin with m.20 of whiskey 3 hourly for a child under 2 years, gradually increasing if necessary up to m. 20 hourly. For older children 3 to 4 years m. 30 3 hourly, increasing if necessary to m. 30 about every 1½ to 2 hours.

And for those over 4 years 3ĵ whiskey 3 hourly is an average amount to begin with, up to 3ȷ for adults.

When the patient is under circumstances where he can be/

be carefully observed, stimulant canbe given only as required, and in such this proves quite as satisfactory and in some better than a regular administration of stimulant.

The effect of each dose of stimulant must be observed and more or less given when the necessity arises.

We must remember the dictum of Todd "that it is safer to give too much than too little stimulant and to begin too early rather than to leave off too soon", and I think that to the severer forms of Scarlet it is specially applicable.

Refer: R. Hutchison - Food & prin. of Dietetics 1900 p.464 and p. 465.

Clinical Lectures on Certain Acute Diseases Lec. XIV Todd. London 1860.

Fothergill Handbook of Treatment.

Murchison, Continued Fevers 1884, p.292.- Indications for and Contraindications to the Administration of Stimulant.

Cardiac stimulants in the form of Digitalin, Strychnine and Ammonium Carbonate are at times of great service as adjuncts to alcohol. Especially in those cases where, owing to persistent vomiting, nothing can be retained if Strychnine and Digitalin be given hypodermically we may perhaps rally him until this condition improves. I have never satisfied myself from observation that apart from such circumstances either Strychnine or Digitalin was in any way so efficient or that Ammonium Carbonate was so permanent in action as alcohol.

However I invariably seek their assistance when for any reason Alcohol does not act satisfactorily., of where for any reason it cannotbe "pushed" to the desired degree.

ADMINISTRATIVE TREATMENT of SCARLET FEVER.-

There is a unanimous verdict that the only method of preventing the spread of Scarlatina in a community is isolation of the patient from the first day on which it is diagnosed until he is dismissed "well". It is only in this way that we can attempt to diminish its tendency to appear in epidemic form in "hatching grounds" such as we find in a town of any size.

I wish however, in the following pages to limit my remarks as to how best to house and restrict our Scarlet patient./

patient.

There is a unanimous verdict in favour of treating Scarlet Fever by isolation, and this in so far as it applies to Hospital treatment I will discuss in the following pages.

It is interesting to look back upon tables as shewing the death rate before Hospital or any definite isolation system was adopted.

Thus in "The Evolution of the Function of Public Health Administration in Glasgow" by Dr. J. B. Russell 1895 we find the following figures:-

Period.	Total No. of Deaths.	Death rate per million from Scarlet.	
1855-59	2427	1301	
1860-64	2343	1141	
1865-69	3210	1429	
1870-74	3397	1379	- 1870 Isolation
1875-79	1622	645	compulsory.
1880-84	1862	725	
1885-89	1161	435	
1890-94	1108	347	

This Table shows a remarkable diminution in the death rate per million inhabitants especially striking from 1875 4 years after compulsory isolation was brought into force.

By his removal to Hospital a patient should not only cease to be a menace to the community, but should be thus placed under the best circumstances for his ultimate recovery./

recovery. However, there are some points upon which I would beg to lay especial stress as by their presence much harm may accrue to the patients when aggregated. I have had the privilege of experiencing two epidemics of Scarlatina in two different Hospitals. Kennedy Street, Glasgow 1899-1900 and Belvidere Hospital, Glasgow 1900-1901. The following I found as having a distinctly deleterious effect upon the patients:-

1. over-crowding - giving each patient less than 2,000 cub, feet and at times only 1000 cu.ft. air space.

(2) The treatment of severe and mild cases in the same ward.

(3) The retention of convalescents in the acute ward.

(1) The results of over-crowding soon manifests itself in the form of retarded convalescence, anaemia etc. especially marked in patients admitted after the ward has been running for some weeks at excessive numbers. Thus, both in Kennedy Street and Belvidere Hospitals a large proportion of the patients treated in these overcrowded Wards even though they had had only a mild attack were dismissed in a much more unsatisfactory condition as regards robustness than one should have wished.

Also, where there is overcrowding the separation of the patients from one another is not so complete, and we have/

have greater risk of "secondary throats" troublesome eczema as the nursing is not so perfect and if cross infection arise its chances of infecting a large number is increased.

Return Cases.- We usually find that our largest number of return cases comes from patients who have been dismissed from an over-crowded ward. Thus, seven out of 12 return cases were from patients who had been dismissed from wards which had been overdrowded.

(2) The treatment of severe and mild cases in the same ward frequently leads to"secondary throat" in the latter or a reinfection of the nasal mucous membrane and we may have a purulent Rhinitis - as I have seen in 3 instances. In all of these the patients had no nasal discharge until well on in convalescence. In this manner otitis media may arise with all its attendant dangers;or stomathitis etc.

(3) By retaining our convalescent in the acute ward he is liable to the dangers mentioned under (1) and (2).
He may develop a "late" albuminuria 5th. - 9th. week.

Thus in one ward which had been running about 1200 cu. ft./for 4 months there were 6 cases of albuminuria for each patient developed from the 5th. to the 9th. week. These all developed/

developed within a month of one another and shortly after the ward stopped receiving no cases occurred.

To efficiently treat cases of Scarlatina a Hospital should fulfil the following conditions:-

(1) Each patient should have a cubic air space of at least 2000 feet and in the case of Anginose patients 2500 or if possible 3000 feet.

(2) Acute Wards:- These should be constructed for from 10 - 12 patients each having 2000 cubic feet air space or if constructed for more cases a greater number of isolation rooms must be provided so as to diminish the chances of cross-infection.

(3) Convalescent Wards:- Cubic air space per bed the same but the ward may be large enough to receive cases from several acute wards. These wards should be separated from the acute wards as far as is compatible with transference of patients and convenience to the nursing staff. Patients removed here on the 21st. or 22nd. day of illness unless some contra-indications such as the onset of complications exist.

(4) A sufficient number of Isolation rooms to accommodate one or not more than two patients. These can be used for any case where there is suspicion of cross infection aroused; or for the treatment of such as have some serious

complication or for the reception of the following:-

(a) Anginose Cases.

(b) doubtful cases of Scarlet.

(c) a room which could be extemporised for operating.

(5) A suitable reception room where all cases can be examined on admission and despatched to the appropriate ward.

(6) An efficient dismissal block where the patients could be admitted in their hospital clothes and bathed, the dressing being carried out by another attendant. Thus the patient comes in contact with nothing which might convey infection.

The patients are admitted by one entrance and are dismissed from the opposite.

In this way I feel justified in stating that our patients would not only be more quickly restored to their former vigor but that they would more uniformly be dismissed at the end of 7 weeks from the commencement of illness than has been my experience. Also the chances of "Return Cases" would be very slight if existent at all.

In the Metropolitan Asylums Board Hospitals cases of Scarlet if uncomplicated and otherwise well areonly kept for 3 weeks in the Acute Wards, being then removed, unless

there be some contra-indication, to the convalescent wards. From the latter they are dismissed in the 7th. week if "free from infection," Each convalescent should be ~~case being~~ carefully examined for any evidence of the primary desquamation remaining, Eczema of alae nasi and ear, discharge from ear, sores on fingers, feet etc., congestion of throat, stomatitis, albuminuria, discharge from anterior nares, and if there be any suspicion of the preceding existing the convalescent must be retained in Hospital until cured; or if dismissed he must be carefully isolated at home, a system which very frequently leads to unsatisfactory results.