

ON SCARLATINAL ALBUMINURIA: being the record  
of the examinations of the urines of 91 consecutive cases of Scarlatina admitted to the wards of the City of Glasgow Fever Hospital, Kennedy Street,

by

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A Thesis for the Degree of Doctor of Medicine.  
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\* I doubt if the author has used the  
paper ~~was~~ here.

He does not mean, I presume, to suggest  
that he entered on the inquiry in order  
to criticise only, but in order to  
discover truth. If so, the proper  
way of stating it would be to say  
that his paper was suggested by  
the previous ones of Thomson  
& Mahomed, & proceeded partly  
on the same line of inquiry.

1884

This piece of work was undertaken as a criticism upon the paper of Dr. R. S. Thomson, the result of whose investigations was published in Vol. IXIX of the Medico-Chirurgical Transactions, London, and of the paper by Dr. Mahomed entitled "The etiology of Bright's Disease, and the pre-albuminuric stage," published in Vol. LVII of the transactions of the same society. I had originally intended to extend the investigation over a period of one year but circumstances have prevented the original intention being carried out and only the result of six months continuous observation are available.

Altogether the urines of 91 consecutive cases of scarlatina admitted to the wards were examined. The patients were of all ages from  $1\frac{1}{6}$  to 50 years, the large majority being under 15 (84.6%) and 62.6% being under 10 years of age.

Albumen or blood colouring matter or both were detected at some period during the stay in Hospital in 48 (52.7%) of the cases examined and of these 29 (60.4%) were below 10 and 39 (81.2%) were below 15 years of age.

#### Method of Observation.

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The method adopted was as follows:- Specimens of the

urine of each patient were examined daily for both albumen and haemoglobin from the day of admission till the day of dismissal.

At first three daily specimens were examined but after about six weeks this course was abandoned on account of the excessive labour involved and thereafter only two daily specimens were examined: one taken about 6 a.m. the other about 6 p.m., but in cases in which it seemed called for, four or more daily specimens were tested.

In all over 10,000 specimens of urine were examined for albumen and for haemoglobin.

In a large number, though not in all the cases the urinary sediment was examined microscopically. Nitric acid in the cold was used as the standard test for albumen being chosen on account of its convenience: but in cases of doubt the heat and picric acid tests were also employed. In the case of the latter test the contact method was used, a saturated solution of the re-agent being carefully poured down the side of the tube held obliquely. The formation of a white ring at the contact surface in an acidulated urine not dissolved by heat, was regarded as proof of the presence of albumen, especially if other evidence pointed in the same direction: such as its former undoubted presence, or the presence of a trace of blood colouring matter. If no ring appeared at the contact surface the urine was held to be free from albumen. The

guaiacum test was employed for the detection of haemoglobin, the method adopted being the following:- About a drachm of the urine to be tested was taken by pipette from the bottom of the urine glass and placed in a test tube. To this two or three drops of simple tincture of guaiacum were added with about two drachms of ozonic ether and the whole shaken up. The mixture was then allowed to rest for a few minutes when the formation of a blue or greenish blue colour was regarded as evidence of the presence of haemoglobin.

## RESULTS OF CLINICAL OBSERVATION.

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### Classification of the cases.

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As already stated the proportion of cases in which some abnormal urinary constituent occurred was large, as many as 48 or 52.7% of the cases examined having been found to contain albumen or haemoglobin or both at some time during the period of detention in hospital, which in the majority of the cases extended to 56 days.

In most of these the quantity of albumen was small and could be detected only by careful testing. In some cases merely an occasional trace was detected, but in others the albumen persisted in the urine for weeks and was sometimes very considerable in amount. Occasionally the albumen

was accompanied by blood colouring matter, the amount being out of all proportion to the haemoglobin as it exists in normal blood. In other cases blood alone was detected, the albumen bearing as far as it was possible to judge a direct proportion to the haemoglobin.

It will thus be evident that the cases under consideration may with advantage be divided into three classes:-

- I Cases of true "Albuminuria" in which albumen only was present, in variable though as a rule in small amount. Vide Table pages 19, 20, 21, 22, cases 1 to 36 incl.
- II Cases of Haematuria in which apparently "blood" was present. Vide Table page 22, cases 37 & 38.
- III Cases in which the albumen was out of all proportion to the haemoglobin and greatly in excess of the amount ascribable to the presence of blood alone. In these cases the albumen was as a rule abundant. Vide Table pp 22 to 24 Cases 39 to 48 inclusive. The last four cases might at first sight appear to merit being placed in a class apart from the others as there seems to be no relation between the albumen and the haemoglobin detected in them. The probable explanation is that there was an excess of albumen present at first, and that the surplus albumen persisted after the blood had disappeared.

In the first class of cases the result of the examination of the sediment microscopically revealed the occasional

but by no means invariable presence of tube casts, (hyaline and granular). In the second class red blood corpuscles were seen, and occasionally, what might have been judging from its appearance, a blood cast or at times a hyaline cast. In the third class of cases numerous granular, hyaline, epithelial and blood casts were seen mixed with red blood corpuscles, the hyaline and epithelial casts being in excess or the others.

Period of Occurrence.

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Albumen or haemoglobin or both were found in the urine at various dates during the course of residence in hospital, there being however a larger relative number of cases that showed one or other symptom towards the end of the second and beginning of the fifth week than at other periods of the disease; but it is interesting to note in this connection that acute desquamative nephritis occurred very late in the course of the disease in three cases (Nos. 40, 41 & 42 in table) the first sign of albumen in the urine in these cases having appeared on the 45th. <sup>\* 5<sup>th</sup></sup> ~~5<sup>th</sup>~~ and 48th. days of illness respectively.

A considerable number of the cases (12 in all) shewed albumen early in the disease; and in 9 of these cases there was a variable interval, of several days as a rule, before it appeared a second time.

\* 5<sup>2nd</sup>



In the remainder of the cases albumen was not detected during the early days of the disease.

The cases thus naturally divide themselves into two classes.

1 Cases of "early" or "initial" albuminuria.

2 Cases of "late" or secondary albuminuria. "Early" albuminuria is not as a rule in itself a serious symptom, and judging from its usually short course and the absence or only occasional presence of tube casts in the sediment, one would be justified in ascribing it to a catarrhal condition of the kidney and not to an actual inflammation of the kidney substance. In some cases true nephritis commenced during the early days of the disease and ran a lengthy course without intermission lasting many weeks in one of the cases see table, pages 19, 20, & 22, cases 9, 13, & 34.

It should however be noted that it is extremely difficult, if not impossible, to draw a sharp line between "early" and "late" albuminuria, and to say definitely where the one ends and the other begins. The division of the cases therefore into those of "early" and "late" albuminuria is ~~thus~~ seen to be to a large extent merely arbitrary, but it was adopted partly for convenience and partly because in many of the cases it seemed to be justified by the observed facts. In some mild cases the "initial" albuminuria was not followed by "late" albuminuria, see table, pages 19 & 20, cases 7 & 21.

The facts described at length above may now be more clearly understood by means of the following series of tables.

Table 1. showing the interval in days between "early" and "late" albuminuria.

No. of Case in Table. Number.	Interval between "early" and "late" albuminuria in days. Days.			
2	20	(9th.	-	29th.
5	12	(9th.	-	21st.
14	22	(8th.	-	30th.
18	3	(9th.	-	12th.
20	24	(8th.	-	32nd.
27	48	(7th.	-	55th.
29	28	(4th.	-	32nd.
35	6	(7th.	-	13th.
45	3	(7th.	-	10th.

Table 2. Showing the date at which albumen was first detected in the cases which did not show "initial" albuminuria, but including cases 9, 13 & 34 in which the "initial" albuminuria ran on without interruption to "late" albuminuria.

Day of illness on which albumen first detected.	Number of cases which first shewed its presence on that date.
4th.	1
5th.	1
9th.	<del>4</del> 3
10th.	<del>4</del> 3
12th.	2
16th.	1
17th.	1
19th.	1
20th.	2
21st.	1
22nd.	1

Day of illness on  
which albumen  
first detected.  
Contd.

Number of cases which  
first shewed its  
presence on that date,  
Contd.

23rd.	1
25th.	1
26th.	1
27th.	1
30th.	1
31st.	<del>7</del> 5
45th.	2
48th.	1
51 <del>st</del> nd.	1
58th.	2
67th.	1

It will be seen from a reference to this table that a larger number of the cases occurred from 9th. to 12th. days and on the 31st. day than on any other particular day.

A third table may now be drawn up showing the date at which albumen first appeared in the urine of all the cases examined irrespective of whether it comes under the class of "early" or of "late" albuminuria.

Table 3. Shewing the dates at which albumen first appeared in all the cases examined.

Day of illness on  
which albumen  
first detected.

Number of cases in  
which albumen first  
detected on that day.

2nd.	1
3rd.	2
4th.	2
5th.	23
6th.	23
7th.	24
8th.	1

Day of illness on which albumen first detected Contd.	Number of cases in which albumen first detected on that day Contd.
9th.	3
10th.	3
12th.	2
16th.	1
17th.	1
19th.	1
20th.	2
21st.	1
22nd.	1
23rd.	1
25th.	1
26th.	1
27th.	1
30th.	1
31st.	5
45th.	2
48th.	1
51st.	1
58th.	2
67th.	1

From this table it is seen that more of the cases shewed albuminuria from 3rd. to 7th. from 9th. to 12th. and on 31st. days than at any other particular day of illness.

Dropsy or oedema of superficial parts such as eyelids or scrotum was observed only in three of the cases examined, and they all belonged to Class III. (Nos. 41, 43, & 44 in table.)

On the Pre-albuminuric stage of Dr. Mahomed.

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Dr. Mahomed first drew attention to the fact that in some cases of nephritis, notably in scarlet fever, one

57  
 sometimes observes a stage in which only blood colouring matter can be detected, not albumen. To this stage he gave the name of the "pre-albuminuric stage," and from the cases he recorded in vol. XLVII of the Medico-Chirurgical Transactions he drew certain conclusions.

To quote from the paper, page 198 he says:- "The observations I have now to bring before you are briefly these:-

"1stly. That previous to the commencement of any kidney change, or to the appearance of albumen in the urine, the first condition observable is high tension in the arterial system, due either to the presence of a noxious material in the blood, such as lead, alcohol, uric acid in gout, scarlatinal poison, or what not, which alters the relation between the blood and the tissues, and destroys their chemical affinity for each other; or else to a sudden chill causing contraction of the superficial vessels and congestion of the internal organs.

" 2ndly. If this condition of high tension be sufficiently severe, transudation of the characteristic crystalloids of the blood, notably haemoglobine, occurs before albumen appears in the urine, and they can be detected in that fluid by the guaiacum test for blood.

" 3rdly. If this condition be allowed to continue, albumen is subsequently found, and, if still unchecked

"or uncontrollable, Bright's disease in one of its forms ensues.

" 4thly. If checked before the albumen appears, or immediately after its appearance, by a brisk purge or other appropriate means, the condition is suddenly changed, the tension disappears from the pulse and the crystalloids from the urine."

It is outside the scope of this paper to discuss any theory as to the causation of nephritis and to that part of Dr. Mahomed's paper I shall not refer but shall confine my criticism to his facts, alluding only to the cases of scarlatina which he adduced in support of his theory.

The results of his investigations led him to the conclusion that in the early stages of some cases of nephritis blood crystalloids and "notably haemoglobine" were found in the blood<sup>x</sup>, such blood crystalloid not being due to the presence of actual blood corpuscles.

To settle whether this was a justifiable conclusion to come to, the following experiment was made; microscopic examination of the sediment not proving satisfactory, partly because the number of red blood corpuscles was small, and because those present became so altered in appearance after some hours as to be unrecognisable. A suspected urine (i.e. one which gave the guaiacum re-

\* I don't think "reverse" is the  
correct word here.  
I should suggest "converse"

action, but no reaction for albumen by the ordinary tests) was allowed to stand for four to six hours when it was tested for haemoglobin at various levels, with the result that the characteristic reaction was obtained only in a specimen taken from the lower parts of the column. After standing for some hours more, the characteristic reaction could be obtained in the upper portions of the column also. This observation was made not once but repeatedly and agrees in toto with the results of Dr. R. S. Thomson's experiments published in Vol. LXIX of the Medico-Chirurgical Transactions, London; and I agree with his explanation of the phenomenon viz:- that it is due to the presence of red blood corpuscles which gradually settling to the bottom of the urine glass, cause the reaction to be most marked there at first, afterwards when the haemoglobin has dissolved out of the corpuscles and been diffused throughout the column, the reaction is obtained in the upper layers of the fluid.

A similar but the reverse phenomenon is sometimes observed during the decline of a nephritis, the albumen disappearing first, the haemoglobin later; and to this stage Dr. Thomson suggested that the name of "post-albuminuric" stage might be given. In this stage also the urine gives similar reactions to those described above.



To make the proof of the presence of blood and not merely crystalloids in a urine of the nature in question complete, all that remained was to demonstrate the presence of albumen, and this was done as follows:-

Three to four ounces of the suspected urine were evaporated in vacuo to a small bulk, filtered, and the filtrate neutralised with carbonate of soda and then rendered faintly acid by the addition of a few drops of dilute acetic acid. It was then boiled and in every case the presence of albumen was demonstrated by the formation of minute flakes, or at least of a distinct haze. . The nitric acid test was not available for the detection of albumen in so highly concentrated a specimen from its tendency to precipitate Nitrate of Urea.

Dr. Mahomed found that a condition of constipation preceded the so-called pre-albuminuric stage in most of his cases of scarlatinal nephritis, and looking upon the extra quantity of effete material thereby thrown into the blood as the more immediate cause of the nephritis, treated his cases by purgation. In some of the cases thus treated, the tension of the pulse became lower (which was to be expected) and the haemoglobin disappeared from the urine, and Dr. Mahomed concluded that an attack of nephritis had been successfully aborted. Judging the cases from my own they

could be explained on the supposition that they were cases of transient haematuria, or at least of only slight and not of "aborted" nephritis.

Some of the pulse tracings also that he gave as examples of "high" tension do not I think warrant that name, but would be more correctly called pulses of well sustained tension. The "abortive" treatment was not successful in all the cases reported by him, albumen and blood continuing to appear in several after the purgation or "other" appropriate treatment was begun.

I now add a few pulse tracings obtained by myself during the course of some of the cases.

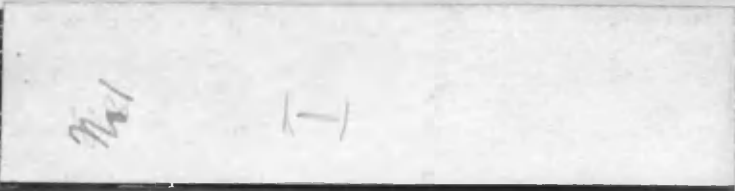
Nos. 1. to 5. are from case No. 44.

No. 1. taken on the 17th. day during what Dr. Mahomed would have called the "pre-albuminuric stage."

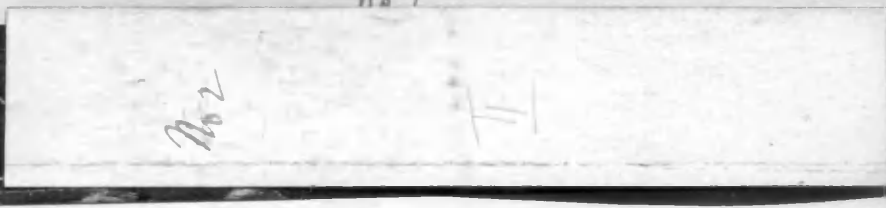
No. 2. taken on the next day is more markedly one of high tension, as are also Nos. 3 and 4 taken on the 20th. and 35th days of illness respectively.

No. 5. taken on the 96th. day of illness shows the pulse coming back to a more normal state though there was still slight albumen and blood present in the evening specimen of urine, and a faint trace of albumen only in the morning specimen.

No. 1



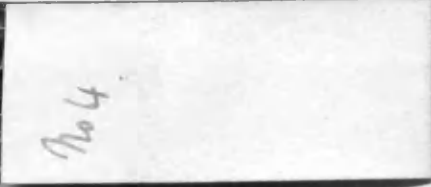
No. 2



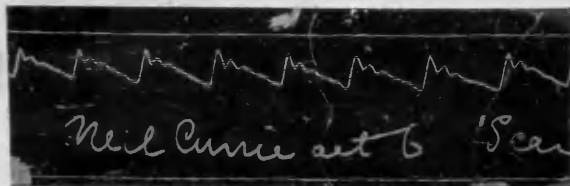
No. 3




No. 4



No. 5



No. 1



Neil Currie at 6 Sea 17<sup>th</sup> day 28-1-96 3:50 p.m.

No. 2



Neil Currie at 6 Sea 18<sup>th</sup> day 29-1-96 3:20 p.m.

No. 3




Neil Currie Sea 20<sup>th</sup> day Nepal 3<sup>rd</sup> day 31-1-96 11:30 a.m.

No. 4



Currie at 6 Feb 15<sup>th</sup> 1896 Sea 35<sup>th</sup> day

No. 5



Neil Currie at 6 Sea 9<sup>th</sup> day 15-1-96

No 6. is a tracing taken on the 52nd. day from case No. 41. and shows well marked high tension, there being both blood and albumen in the urine.

No. 6

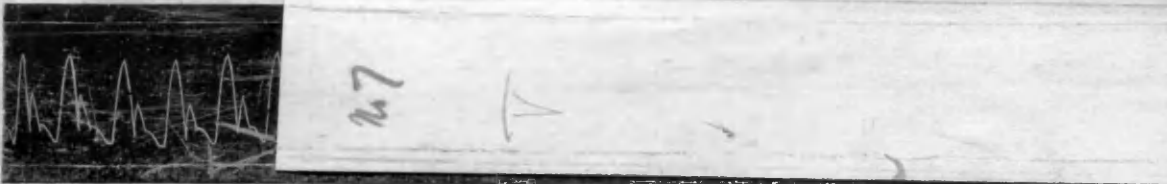


No. 7. is from case No 40. on 45th. day of illness when albumen and blood first detected in the urine, the sediment at the same time containing numerous tube casts.

I should not call it a pulse of "high" but of well sustained tension: certainly it does not merit the name of a "high" tension pulse more than No. 8. which was taken from a brother who had no sign of nephritis.

No. 9. is also from case No. 40 on the 161st. day of illness, and shows a pulse of slightly less tension.

No. 7

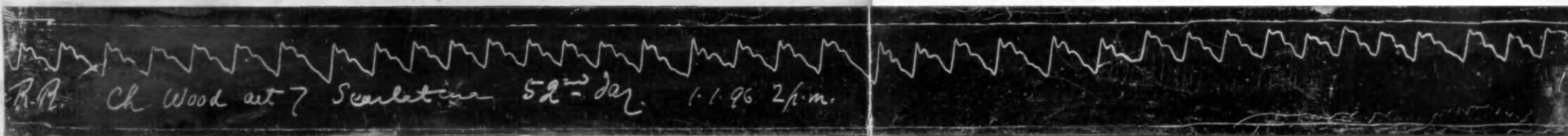


No. 8



No 6. is a tracing taken on the 52nd. day from case No. 41. and shows well marked high tension, there being both blood and albumen in the urine.

No. 6

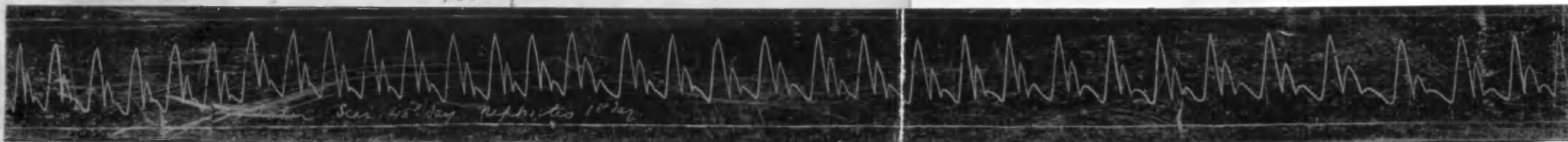


No. 7. is from case No 40. on 45th. day of illness when albumen and blood first detected in the urine, the sediment at the same time containing numerous tube casts.

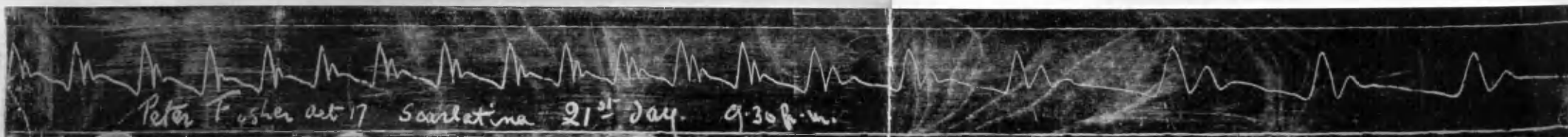
I should not call it a pulse of "high" but of well sustained tension: certainly it does not merit the name of a "high" tension pulse more than No. 8. which was taken from a brother who had no sign of nephritis.

No. 9. is also from case No. 40 on the 161st. day of illness, and shows a pulse of slightly less tension.

No. 7



No. 8







*[Handwritten notes and markings, including a circled '11']*

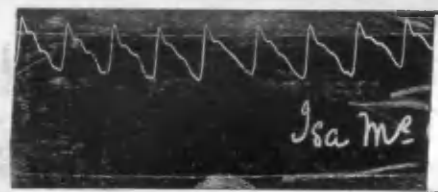
Nos. 10 to 12 are from case No. 38 and not one could be called a pulse of "high" tension

No. 10



*[Handwritten notes, including 'No 10']*

No. 11



*[Handwritten notes, including 'No 11']*

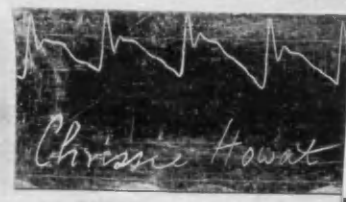
No. 12



*[Handwritten notes, including 'No 12']*

Nos. 13 and 14 are from case No. 46 on 15th. and 18th. days of illness respectively and they also shew no sign of "high" tension.

No. 13



*[Handwritten notes, including 'No 13']*

No. 14



*[Handwritten notes, including 'No 14']*

Summary.

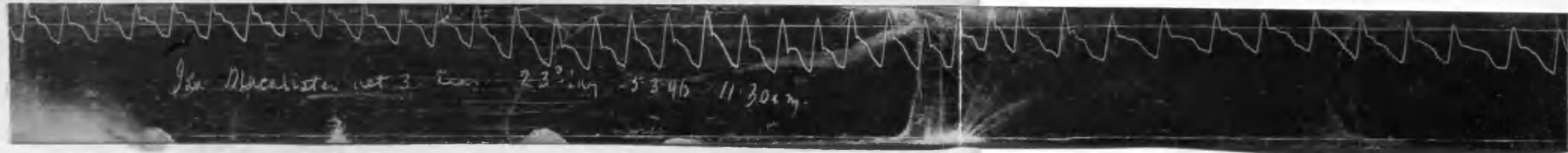
To make a short summary I would direct attention to



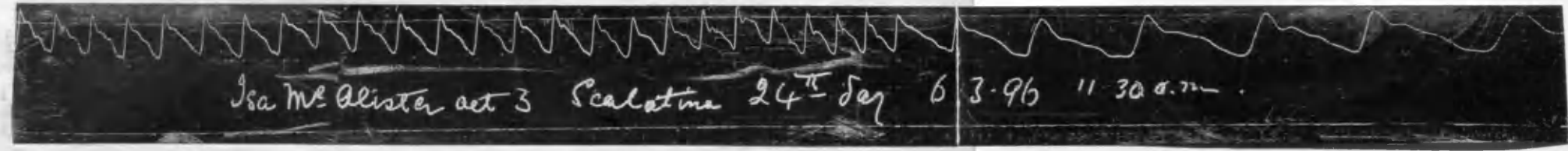
17

Nos. 10 to 12 are from case No. 38 and not one could be called a pulse of "high" tension

No. 10



No. 11



No. 12



Nos. 13 and 14 are from case No. 46 on 15th. and 18th. days of illness respectively and they also shew no sign of "high" tension.

No. 13



No. 14



Summary.

To make a short summary I would direct attention to



the main facts brought out in this paper which are:-

- I. That albuminuria or haematuria or both occurred in 52.7% of the cases observed.
  - II. That the cases seemed to divide themselves naturally into three classes.
    1. Those of pure albuminuria in which albumen only was detected.
    2. Those of haematuria, in which "blood" seemed to be present.
    3. Those of albuminuria and haematuria, the albumen being greatly in excess of the haemoglobin as found in blood.
  - III. That dropsy, or oedema of the superficial parts was observed unmistakably in only three of the cases.
  - IV. That a "pre-albuminuric" and also a "post-albuminuric stage" (if the word be allowed) do not exist in the proper sense of the terms.
  - V. That a pulse of "high" tension is apparently not an invariable accompaniment even of undoubted nephritis.
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Abbreviations:- ft. tr. - faint trace. tr. = trace. dist. = distinct. abdt. = abundant. The numbers refer to the day of illness. A stroke -- between two dates means that the abnormal constituent was present daily and uninterruptedly from the one date to the other. a.m. or p.m. after a number means that the abnormal constituent was detected only in the morning or evening specimen of that day, as the case might be.

## I. Cases of 'Albuminuria'

No. of case	Date of Admis- sion.	Age	Sex	Day of Ill- ness. Adm. Dism.	Period at which Al- bumen de- tected.	Period at which Hae- moglobin detected.	Duration of Neph- ritis.	'Pre-al- bumin- uric Stage'	'Post-al- bumin- uric Stage'	Dropsy	Microscopic Character of Sediment.	Result	Remarks
1	Nov. 16th 1895.	2 $\frac{1}{2}$	M	4th. 88th.	58th p.m. tr. 59th a.m. tr.			None	None	None	Not examined	Well	Albuminuria coincident with an at- tack of broncho-pneu- monia.
2	Nov. 16th 1895.	10	F	4th. 60th.	7th p.m. tr. 8th. & 9th a.m. tr. 29th a.m. tr.			None	None	None	Not examined	Well	
3	Nov. 19th 1895.	5	F	15th. 72nd.	20th -- 22nd tr. 23rd a.m. 24th tr.			"	"	"	"	"	
4	Nov. 25th 1895.	6 $\frac{1}{2}$	F	3rd. 57th.	31st. p.m. dist. 32nd a.m. tr.			"	"	"	"	"	Coincident with glandu- lar abscess in neck.
5	Nov. 28th 1895.	9	F	4th. 66th.	5th & 6th tr. 9th a.m. ft. tr. 21st ft. tr. 22nd -- 25th a.m. tr. 27th a. m. tr. 30th a.m. tr. 31st. tr. 32nd a.m. tr. 47th a.m. tr. 56th. a.m. tr.						Sediment fre- quently exam. 'Round' cells seen always & on one occasion a few structures like hyaline casts.	Well	
6	Dec. 1st 1895.	7	F	4th. 56th.	20th a.m. tr. 24th a.m. tr.						Not examined	Well	
7	Jan. 13th 1896.	5	F	4th. 62nd.	7th & 8th tr.			"	"	"	"	Well	
8	Jan. 22nd 1896.	7	F	4th. 74th.	26th p.m. tr. 27th a.m. tr.			"	"	"	"		
9	Nov. 7th 1895.	11	F	5th. 112th.	5th -- 100th abdt. -- ft. tr. 107th -- 110th ft. tr. 111th a. m. ft. tr.		Circa 100 dys.	"	"	"	"	Well	A very severe case with bright rash long continu- ed throat con- dition & doub- le otorrhoea resulting in almost com- plete deafness
10	Nov. 8th 1895.	8	F	2nd. 59th.	58th p.m. tr.			"	"	"	"	Well	
11	Nov. 29th 1895.	2	M	4th. 93rd.	67th p.m. dist.			"	"	"	"	"	
12	Dec. 15th 1895.	3	F	2nd. 61st.	10th p.m. dist. 11th. p.m. tr. 15th a.m. tr. 22nd p.m. tr.						'Round' cells granular de- bris & one or two doubtful hyaline casts.	Well	

## I. Cases of 'Albuminuria' Contd.

No. of case	Date of Admis- sion.	Age	Sex	Day of Ill- ness. Adm. Dism.	Period at which Al- bumen de- tected.	Period at which Hae- moglobin detected.	Duration of Neph- ritis.	'Pre-al- bumin- uric Stage'	'Post-al- bumin- uric Stage'	Dropsy	Microscopic Character of Sediment.	Result	Remarks
13	Dec. 17th 1895.	4	M	4th. 20th.	4th -- 18th dist. to ft. tr. 19th dist. 20th abdt.		16 dys.	None		None	Granular & hy-aline tube casts & 'round' cells.	Death	Dirty throat with double otorrhoea & in last few days signs of double pneumonia. No p.m.
14	Dec. 28rd 1895.	3	F	4th. 62nd.	8th a.m. tr. 30th a.m. tr.						Not examined.	Well	
15	Dec. 28rd 1895.	1 1/2	M	7th. 75th.	9th a.m. tr. 10th tr. 11th a.m. tr. 12th tr. 39th & 40th tr. 41st a.m. tr.						No tube casts found & nothing that could be called renal cells.	Well	Fairly severe case with <del>throat</del> <sup>throat</sup> and double otorrhoea.
16	Dec. 28rd 1895.	12	F	9th. 67th.	12th a.m. si. tr.						Not examined	Well	
17	Jan. 9th 1896.	5	F	6th. 24th.	12th p.m. ft. tr. 16th p.m. dist. 17th & 18th dist. 19th a.m. dist. 20th dist. 21st a.m. dist. 23rd a.m. tr.						"	Death	Severe case with ulceration of tonsils, double otorrhoea & capill. bronchitis.. No p.m.
18	Jan. 10th 1896.	4	M	3rd. 60th.	3rd p.m. tr. 4th a.m. tr. 7th p.m. tr. 8th a.m. & 9th a.m. tr. 12th tr. 14th a.m. 15th p.m. tr. 16th -- 23rd tr. 24th a.m. tr. 30th p.m. tr. 54th p.m. 55th a.m. 56th p.m. 57th 58th a.m. 59th p.m. ft. tr.			None	None	None	No tube casts found in urinary sediment.	Well	
19	Jan. 28th 1896.	15	F	3rd. 59th.	51st p.m. tr.						Not examined	Well	
20	Jan. 31st 1896.	13	F	3rd. 67th.	4th -- 8th tr. 32nd p.m. tr.						"	Well	
21	Feb. 15th 1896.	21	F	2nd. 58th.	3rd -- 5th tr. 6th p.m. tr.						"	"	
22	Nov. 14th 1895.	12	M	4th. 62nd.	21st a.m. tr. 26th & 28th a.m. ft. tr.			"	"	"	"	"	
23	Nov. 28rd 1895.	8 1/2	M	3rd. 59th.	30th dist. 34th p.m. & 35th a.m. dist. 35th p.m. tr. 37th a.m. tr. 48th p.m. tr.			"	"	"	Round granular & oval cells seen. In one specimen the oval cells collected in masses simulating the appearance of a tube cast.	"	
24	Nov. 27th 1895.	18	M	4th. 60th.	45th a.m. tr. 61st a.m. tr.			"	"	"	No tube casts found; round gran. cells seen.	"	
25	Nov. 29th 1895.	8	M	8th. 66th.	27th p.m. tr. 28th -- 32nd a.m. traces only.			"	"	"	Not examined.	"	
26	Dec. 4th 1895.	6	M	2nd. 99th.	22nd. a.m. dist. 27th tr. 29th p.m. tr.						A few round cells no casts seen.	"	

## I. Cases of 'Albuminuria' Contd.

No. of case	Date of Admis- sion.	Age	Sex	Day of Ill- ness. Adm. Dism.	Period at which Al- bumen de- tected.	Period at which Hae- moglobin detected.	Duration of Neph- ritis.	'Pre-al- bumin- uric Stage'	'Post-al- bumin- uric Stage'	Dropsy	Microscopic Character of Sediment.	Result	Remarks
27	Dec. 31st 1895.	26	M	6th. 63rd.	6th p.m. tr. 7th a.m. ft. tr. 55th p.m. tr.			None	None	None	Not examined.	Well	
28	Jan. 14th 1896.	7	M	2nd. 59th.	7th p.m. tr. 8th & 9th a.m. tr. 10th tr. 11th & 12th a.m. tr. 46th p.m. & 47th a.m. tr. 51st a.m. 52nd. a.m. 53rd a.m. & 54th a.m. ft. tr. 55th p.m. ft. tr.						"	"	
29	Jan. 20th 1896.	19	M	2nd. 54th.	2nd. p.m. tr. 3rd & 4th tr. 32nd p.m. tr. 33rd p.m. tr. 35th p.m. 36th p.m. 37th p.m. 38th p.m. tr. 40th p.m. ft. tr. 46th p.m. & 53rd p.m. ft. tr.						No tube casts seen.	"	
30	Jan. 21st 1896.	24	M	4th. 61st.	10th p.m. 11th a.m. tr.								
31	Jan. 22nd 1896.	30	M	6th. 55th.	6th p.m. dist. 7th -- 9th dist. 10th a.m. tr.						Not examined.	"	
32	Jan. 24th 1896.	16	M	2nd. 59th.	31st p.m. dist. 32nd p.m. tr. 33rd p.m. dist. 35th p.m. tr.						"	"	
33	Feb. 3rd 1896.	6 $\frac{1}{2}$	M	4th. 58th.	tr. 55th p.m. sl. tr. 57th a.m. sl. tr. 5th -- 14th tr. only once on eve. of 7th dist. 16th a.m. ft. tr. 18th & 19th ft. tr. 20th a.m. ft. tr. 21st -- 24th ft. tr. 25th p.m. ft. tr. 26th tr. 27th a.m. ft. tr. 35th p.m. 36th p.m. & 38th p.m. sl. tr. & faint traces after this till 3 dys. before dismissal, sometimes in morn. at others in eve. spec. & occas. in both.						"	"	

## I. Cases of 'Albuminuria' Contd.

No. of case	Date of Admis- sion.	Age	Sex	Day of Ill- ness. Adm. Dism.	Period at which Al- bumen de- tected.	Period at which Hae- moglobin detected.	Duration of Neph- ritis.	'Pre-al- bumin- uric Stage'	'Post-al- bumin- uric Stage'	Dropsy	Microscopic Character of Sediment.	Result	Remarks
34	Feb. 5th 1896.	7	M	8th. 12th.	9th a.m. tr. 10th & 11th tr. 12th p.m. abdt.		30	None	None	None	Not examined.	Death	Case of old pleurisy with signs of ef- fusion on ad- mission. Tuber- cular? No p.m.
35	Feb. 13th 1896.	10	M	3rd. 58th.	6th p.m. tr. 7th a.m. tr. 13th a.m. tr.			"	"	"	"	Well	
36	Feb. 15th 1896.	10	M	5th. 63rd.	10th ft. tr. 11th a.m. ft. tr. 17th p.m. ft. tr. 24th p.m. ft. tr. & 42nd p.m. ft. tr.			"	"	"	"		

## II. Cases of Haematuria.

37	Nov. 20th 1895.	50	F	5th. 61st.	16th a.m. tr. 26th a.m. tr.	16th a.m. & 26th a.m.		None	None	None	Not examined.	Well	
38	Feb. 13th 1896.	3	F	2nd. 57th.	23rd p.m. -- 33rd a.m. sl. to ft. tr.	22nd p.m. -- 33rd p.m. 35th ft. tr.	Circa 13 dys.	Marked	Marked	None	Sediment re- peatedly ex- amined. Shewed blood corpus- cles, & round gran. cells, of red blood corp. which looked like blood casts; & one or two struc- tures like granular casts seen in one specimen.	Well	

## III. Cases with both blood and albumen but in which the albumen is out of all proportion to the blood.

39	Nov. 7th 1895.	4	F	4th. 118th.	25th tr. 26th & 27th dist. 33rd tr. 38th p.m. tr. 39th - 67th dist. to ft. tr. thereafter only an oc- casional tr. till 76th then occas- ional traces till 89th.	42nd p.m. -- 89th with very occas- ionally no haemoglobin reaction. Thereafter occasional- ly present till 94th. Absent till 112th & ft. tr. once or twice till 116th.	Circa 30 dys.	None	Marked	None	Granular hy-aline & blood casts, blood corpuscles & round granu- lar cells.	Well	Severe case with double otorrhoea & left mastoid disease & super- ficial perios- titis over mas- toid. Beginning of albuminuria coincident with severe faucitis & swelling of glands in neck.
40	Nov. 13th 1895.	11	M	5th. 162nd.	45th -- 140 abdt. to ft. tr. There- after ft. tr. on 143rd p.m. & 144th a.m.	45th -- 139 p.m. There- after ft. tr. on 143rd p.m. & 144th a.m. 145th a.m.	Circa 85 dys.	None observed.	None	None	Granular and epithelial tube casts, red blood cells & round gran. cells.	Well	Cervical glands swollen & pain- ful on 42nd day.

## 111. Cases with both blood and albumen but in which the albumen is out of all proportion to the blood. Contd.

No. of case	Date of Admission.	Age	Sex	Day of Illness.	Adm. Dism.	Period at which Albumen detected.	Period at which Hæmoglobin detected.	Duration of Nephritis.	'Pre-albumin-uric Stage'	'Post-albumin-uric Stage'	Dropsy	Microscopic Character of Sediment.	Result	Remarks
40	Continued					after this ft. tr. some times a.m. at others p.m. at others both times till 158th since when ft. tr. daily.	148th p.m. 149th p.m. 151st a.m. occasional traces till 158th since then daily.							
41	Nov. 14th 1895.	7	M	4th. 111th.		52nd--76th a.m. Thereafter 84th p.m. ft. tr. 85th p.m. ft. tr.	52nd--77th a.m. Thereafter 80th ft. tr. 82nd p.m. ft. tr. 83rd a.m. 84th p.m. ft. tr. 90th p.m. ft. tr. 93rd p.m. ft. tr.		<i>case 24426</i>	<i>not observed</i>	<i>Present</i>	Oedema of Eye-lids.	Granular hyaline & blood casts, round cells.	<i>Well</i>
42	Nov. 20th 1895.	12	M	4th. 133rd.		48th p.m. -- 53rd a.m. 54th a.m. dist. to tr. 72--76th <sup>m</sup> p.m. specimens only tr. 77--89th <sup>m</sup> p.m. spec. only tr. 90 & 91st p.m. spec. only ft. tr.	50th p.m. -- 53rd a.m. 56th p.m. -- 59th p.m. 60 & 62nd p.m. 63rd a.m. 64, 66, 68, 72 & 73rd p.m. 74th a.m. 75, 77, 80, 90, 98, 106, 107, 112, 114, 115, 117, 122, & 124th p.m. spec. only & ft. 129th ft. tr. 130 & 131	?	None observed.	<i>None</i>	None	Blood corpuscles & hyaline casts.	<i>Well</i>	
43	Nov. 20th 1895.	6	M	4th. 88th.		19--31st a.m. dist. -- tr. Thereafter 32nd a.m. tr. 35 & 36th p.m. tr. 37th a.m. ft. tr. 38--41st tr. 47th p.m. dist. 81st a.m. ft. tr.	25--31st a.m. 32nd a.m. 37th a.m. ft. tr. 38--40th dist. 47th p.m. m. dist.	Circa 12 dys.	None	<i>None</i>	Oedema of eye-lids & scrotum.	Blood corp. & epithelial & gran. casts.	<i>Well</i>	Severe case with double otorrhoea. Glands enlarged on left side of neck on 34th day.
44	Jan. 14th 1896.	6	M	3rd. 109 <sup>2</sup>		17th p.m. -- 75 <sup>th</sup> p.m. from chest to tr. Hereafter till 109 <sup>2</sup> tr. & ft. tr. in p.m. specimens, always; and ft. tr. in a.m. specimens also except on 4 occasions when none detected, on which occasions also no hæmoglobin.	16th p.m. -- 75 <sup>th</sup> p.m. from dist. to tr. Hereafter always present in p.m. specimens. Absent on 20 occasions in a.m. specimens.		<i>Present</i>	<i>Absent</i>	Oedema of eye-lids.	Hyaline, granular, epithelial & blood casts & blood corp. & round gran. cells.		

~~IV. Cases which do not come under the first three classes.~~

No. of case	Date of Admis- sion.	Age	Sex	Day of Ill- ness. Adm. Dism.	Period at which Al- bumen de- tected.	Period at which Hae- moglobin detected.	Duration of Neph- ritis.	'Pre-al- bumin- uric Stage'	'Post-al- bumin- uric Stage'	Dropsy	Microscopic Character of Sediment.	Result	Remarks
45	Nov. 12th 1895.	8	M	6th. 59th.	7th & 10th a.m. dist. 27, 30, 31 & 33rd a.m. ft. tr.	7th & 10th a.m. dist.		None	None	None	Not examined.	Well	
46	Jan. 22nd 1896.	10	F	4th. 60th.	9th p.m. 10th tr. 15th a.m. 16th tr. 17, & 21st a.m. 24th p.m. 25th a.m. ft. tr. 26, & 27th tr. 28th a.m. ft. tr.	15th a.m. 16th p.m.		None	None	None	Red blood corp. & round granu- lar cells. In one spec. one or two struc- tures like hya- line casts seen.	Well	
47	Dec. 23rd 1895.	6	M	7th. 65th.	31, 33rd p. m. tr. 51st a.m. ft. tr.	31st.		"	"	"	Round granular cells, no casts.	Well	
48	Jan. 21st 1896.	6	M	6th. 63rd.	31st a.m. 31. tr.	17th p.m.		"	"	"	Not examined.	Well	