Thesis

presented by

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It has been my good fortune during the past seven months to have been attached to the staff of a large hospital for the treatment of infectious diseases. The chief disease treated was scarlet fever and it is one of the most frequent complications of this disease that I have chosen to write. The title of my thesis is:

**Albuminuria as it occurs in Scarlet Fever.**

At the outset of this analysis of over one hundred cases of albuminuria as it occurs in scarlet fever either during the course or after an attack of scarlet fever, a sharp division has to be made between cases which show albumen only in the urine and cases which show albumen and blood. Of the cases which show albumen only we are at once struck with the large number in which a very slight trace of albumen occurs only for a
A few days as compared with the smaller number which give evidence of its presence in larger quantity. In these latter cases too we usually find that the albumen persists for a longer period of time. In the cases which show a smaller quantity of albumen we at once notice that the albumen makes its appearance at an earlier part of the disease than it does in the cases in which it occurs in larger quantity. It will then be most convenient to divide those cases which show albumen only into two groups. The first group includes those cases which give evidence of the presence of albumen only in small quantity, in which the albumen occurs at an earlier part of the disease and in which it lasts for a shorter period of time. The second group includes those cases which give evidence of the presence of albumen in larger
larger quantity, in which it occurs at a later part of the disease and in which it usually lasts for a longer period of time.

The third group includes those cases which give evidence of both albumen and blood in the urine.

The exact condition of the patient on admission was carefully noted in each case. It was the custom to examine the urine of each case on one side of a ward one day, taking the cases on the opposite side the next day. When albumen was found to be present in the urine that urine was examined every day until it disappeared for some time. Many of the urines were examined microscopically.

The tests employed for albumen were the boiling + addition of acetic acid one and the cold nitric test as given in Finlayson's Clinical Manual.
While the test employed for the discovery of blood was the tinture of Saiaicum and Agonic Ether only. The condition of the patient and of the urine were carefully noted each day.

Slight engorgement of glands on left side of neck. Tumour deeply congelated towards enlarged the left ear remarkably so, the surface is turred with follicular concretion and tumorous masses.

The fumes of Chloroform were ordered to be performed by suction in the evening of the 1st. The convulsion coming left. Tumour is quite disappear - the right tumour is perfect, free from suction.

11th. General condition has improved, left tumour is still partly.

12th. Tumour is clear, but there is still a good deal of congestion of the 1st. Urine albumin.
Cases illustrative of First Group.

3 B. aged 13 yrs. f. was admitted into City Hospital, Birmingham on Jan 3rd suffering from Scarlet Fever. There is a diffuse well marked rash over the body and limbs. Tongue is coated with a thick fur : papillae prominent. There is slight enlargement of glands on left side of neck. Throat deeply congested.

Tonsils enlarged the left one markedly so, the surface is covered with follicular exudation and tenacious mucus.

Two grains of Calomel were ordered to be followed by saline in the morning.

9th Jan. The exudation covering left tonsil is quite uniform - the right tonsil is perfectly free from exudation.

11th Jan. General condition has improved. Left tonsil is still dirty.

13th Jan. Tonsil is clear but there is still a good deal of congestion of throat.

18th Jan. Urine shows trace of Albumen.

20th Urine
26th Jan. Urine still shows trace of Albumen.
27th. No albumen.
29th. Patient ordered up.
Feb. 1. Again a faint trace of Albumen.
4th. Still a trace of Albumen.
8th. No Albumen.
10th. No Albumen.
13th. No Albumen.
25th. Patient was discharged cured on Feb. 5th.

Commentary. The throat on admission was a typical scarlet one. Although the mucus & exudation had cleared five days before the appearance of the Albumen still the congestion remained.

Liliana L., 15 yrs. admitted 3rd. 30th. 1895.
The notes state that on admission it is impossible to diagnose Scarlet Fever from the rash which can hardly be said to exist. Tongue is dirty and papillar are prominent. Throat is injected. Patient explains
explains that rash was only well seen
four days before admission
Dec. 31. No rash has yet appeared.
Jan. 2. It is very doubtful if patient
has had Scarlet fever.
The urine shows a heavy trace of Albumen.
Jan. 3. Faint trace of Albumen.
...5. Very faint trace of Albumen.
6. No Albumen.
This patient was discharged cured Feb. 12.

Commentary. At first it was doubtful
if patient ever had Scarlet fever
The tongue and throat pointed to
Scarlet fever but there was no rash.
The appearance of the albumen rather
strengthened the view that she had.

J.W. 4 yrs. 4. Admitted Nov. 29th 1896.
On admission the notes state that the rash was bright and general. Tongue coated. Throat injected. Tonsils enlarged.

Nov. 28. Throat very dirty. Patient wandering slightly during night.

Urine shows trace of albumen.

Nov. 29. Baggy swelling right side of neck; very tense.

Dec. 6. Urine trace of albumen.

10. No albumen.

12. Trace of albumen.

13. No albumen.

16. Faint trace of albumen.

19. No albumen.

27.

30.

Jan. 1. Patient was ordered up for a little.

2. Faint trace of albumen.

4. No albumen.

8.

10.

Discharged Feb. 5th. Cured.
Commentary. The throat in this again was a severe one and two days before albumen occurred the swelling on side of neck appeared. This swelling was probably the result of septic absorption from the throat.

A.H. 6 yrs. 4. admitted Nov. 12th 1895.

On admission the rash was general and bright. Tongue red. Throat dirty and tonsils enlarged.

Nov. 13. Small patch of herpes on cheek and lower lip.
Nov. 14. Throat cleaner
16. Trace of albumen
17.
18.
Throat clean though tonsils still enlarged.
Nov. 19. Seems dull and listless.
   No albumen.

Nov. 24. Throat angry looking & right
   Tonsil covered with thin coating of mucus
   No albumen.

Nov. 26. faint trace of albumen
   27.
   28. no albumen
   29

Decr 2
   6
   12
   20

Discharged January 8th, 1896.

Commentary: The throat here again
was the main feature & was only
obvious cause for the somewhat prolonged
elevation of temperature. It will be
seen that on Nov. 25th, one day before the
albumen made its reappearance, there
was a rise of temperature 100.4° and
that a day before this occurred the throat
is noted as looking angry and that
rt. Tonsil is coated with mucus.
W. W. 12 yrs. M. admitted Nov. 28th 1895.


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2. Urine shows trace of albumen.

6.

4.


10.

14. Trace of albumen.

16.

18. Left adenitis.

19. No albumen.

20. The glands in the neck are still swollen & tender. The mass is of a
Triangular shape is situated in front of sterno-mastoid.

21. No albumen.
22. There is fluctuation to be made out in the glandular mass.
23. Faint trace of albumen.
24. No albumen.
28. No albumen.
30. Faint trace of albumen.

Temp. 1.
2. No albumen
3. No albumen
5. Faint trace of albumen.
8. Very faint trace of albumen.
10. No albumen
11. No albumen
12. No albumen
23 Discharged cured Feb. 5th 1896.

Commentary. The throat in this case was a typical scarlet one. The glands were enlarged. It will be seen that a day before the albumen reappeared there was a rapid rise of temperature to 103.2°.
The albumen in this case lasted for a much longer time than is usual with cases in this group.

In this group forty five cases have been studied - 23 being females and 25 males. In the great majority of these the special feature was the condition of the throat which usually congested with enlarged tonsils. In many an extra rise in the temperature took place at the same time as the albumen appeared and in some as it reappeared. The albumen on an average appeared on the seventh day that is reckoning from the beginning of the illness not from the date of admission. The average number of days on which it occurred was six.

These six days are not often consecutive for often the albumen appeared one day was absent for one or more days and again appeared. Very rarely in fact do we get the urine in this first group containing albumen for six consecutive days.
Cases illustrative of Second Group.

H. W. aged 8 yrs. M. Admitted Nov. 20th. 1895.

On admission the rash, tongue and throat were those of a typical case of scarlet fever.

Nov. 21. No albumen

22. No albumen

23. No albumen

24. No albumen

25. No albumen

Dec. 3. No albumen

12. No albumen

17. No albumen

20. No albumen

24. No albumen

28. Faint trace of albumen.

Complained of sore throat yesterday.

On examination it is seen to be somewhat reddened.

Dec. 29. Faint trace of albumen.

30. Faint trace of albumen.

Jan. 3. No albumen

4. No albumen

6. Trace of albumen

7. "

8. "

9. "
Jan 11. No albumen.

Jan 12... No albumen.

Jan 13. faint trace of albumen.

Jan 14. No albumen.

Discharged Jan 16th 1896 cured.

Commentary: It will be seen that the day preceding the rise appearance of the albumen in the urine, the throat was complained of & on examination was found to be reddened. At the same time there was a rise of temperature to 101.4°.
J.C. aged 5 yrs. F. Admitted Oct. 14th. 1895.
On admission the rash was noted as being typical of scarlet fever, the throat as being inflamed.
Oct. 27. No albumen.
Nov. 1. 
5. 
9. 
13. 
17. 
22. 
27. Less albumen this morning. Headache.
29. Trace of albumen.
30. Trace of albumen.
Dec. 1. 
2. 
Trace of albumen.
5. 
10. 
11. Trouble of stools.
Trace of albumen.
12. 
14. No albumen.
Dec. 16. No albumen.

Dec. 18. No albumen.


Commentary. The throat is noted as being reddened when the albumen appeared. The temperature did not rise as the albumen appeared. The rise seen on chart was probably due to measles which the patient developed.


On admission the rash was noted as being typical and universal. Tongue furled in middle line posterior. Papillae enlarged. Frenoes congested. Throat enlarged but firm.
Jan. 2. No albumen.

3. Tonsils are very much swollen and congested and meet in middle line in front of uvula.

Jan. 4. No albumen.

7. Throat in much same condition as when last noted.


9. Throat are still congested. Tonsils are enormous and swollen with enlarged crypts in some of which are seen points of excoriation. The surface of each tonsil is flattened and pale in colour.

Jan. 10. No albumen.

13. Heavy cloud of albumen.


Jan. 15. Still about 2 ozs. albumen. Twenty six ounces urine passed in 24 hours.

Jan. 16. Rather less albumen. 16 ozs. urine.

17.

18. Cloud of albumen.

19.

20.

21.

23. No albumen.

25.

30.

Discharged cured Feb 12th 1896.

Commentary. The throat in this case was an exceptionally severe throat and the quantity of albumen was larger than usual. There was distinct decrease in the quantity of albumen passed. On the appearance of the albumen the temperature rose 1° above normal.
In this group we get on a stage further. The albumen occurs much later - on an average it appears on the thirty-third day - and lasts a little longer, on an average nine days.

Here again in a large proportion of the cases we have the throat complained of and in many the throat is noted as being congested with enlarged tonsils and often enlargement of the glands in anterior triangle of neck. In many of the cases too the temperature rises on the appearance of the albumen. This group includes cases which show severer symptoms than the cases in group one do. The kidney condition seems to be a more severe one for we find that in many a note has been made that the face looks puffy and that the patient is not making the normal quantity of water. The hunt for tube casts, however, rarely meets with success.
CASES ILLUSTRATIVE OF THIRD GROUP.

J.W., aged 10 yrs. F. Admitted Dec. 23rd, 1895.

On admission the rash, tongue, and throat are all noted as being typical.

Here is some slight left adenitis.


27. Congestion of throat has decreased.

Some mucus still adheres to right tonsil.

29. Case running a very normal course.

31. No albumen.

Jan. 2.

4

5

7

9. 102° F. Complains of pain in left cervical region—glands in posterior triangle enlarged & painful.

11. Heavy cloud of albumen. Face looks puffy but not pale.

12. Cloud of albumen.

13. Face more puffy but patient expresses herself as feeling better.

14. Glandular enlargement on both
both sides considerable.

Jan. 15. No further development. Still cloud of albumen. The apex is in 5th space in nipple line. Heart sounds are normal.

16. Cloud of albumen; 18 ozs. Urine passed in 24 hours. At 10 p.m. the T was 104° without any obvious cause. No pain except headache is complained of. The skin is acting well. Apex seems a little further out than it was yesterday but sounds are normal. The breath quiet and colour is good. She takes milk and daily water well.

17. Cat had slept well during night. Frontal headache still complained of. Slight epistaxis this morning. Apex bent about 1/4 of an inch beyond nipple line and covers a larger area than usual. She has not felt sick and has no abdominal pain. Glands under inferior maxilla, in the anterior and posterior triangles of neck are enlarged, very hard but not painful. Urine still contains about the same quantity of albumen but
no blood. 20 ozs. urine passed in 24 hrs.

June 18. Urine contains more albumen and blood. There is a trace of albumen this morning. 22 ozs in 24 hrs.

19. Cloud of albumen & a little blood. 18 ozs. urine passed in 24 hrs.

Patient looks pale but face is not so puffy. The upper lift is nearer the nipple & line does not occupy so large an area. Temperature is normal. She takes nourishment well and sleeps well and is brighter.

20. Slight improvement maintained.

Cloud of albumen. Blood still present. 28 ozs. passed in 24 hrs.

21. Albumen & blood as y' day. 14 ozs. urine.

22. Improving generally steadily.

23. Albumen decreasing. 30 ozs. urine.

24. Trace of albumen - no blood. 36 1/2 ozs. urine passed.

25. Trace of albumen. No blood. 28 ozs. urine passed.

26. faint trace of albumen. 13 1/2 ozs. urine.

27. 20

28. No albumen from this date onwards.
Patient was discharged cured Feb 15th 1896.

Commentary. This case is interesting as showing the severe symptoms which characterise this group as compared with the cases in the two other groups. The throat here was a severe one and there was much glandular enlargement with pain in the cervical region. The temperature rose as the albumin appeared and again when the blood first appeared.

E.T. aged 19, f. Admitted January 15th. 1896. On admission the rash is noted as being universal and very bright. On arms there are some large papules; rash here also
also somewhat patchy. Red strawberry tongue. Throat is very much congested.

Jan. 16. Both tonsils show some exudation.

17. Rash not nearly so bright. Throat as before. Right adenitis.

21. No albumen.

23.

24. Both tonsils especially left one very much enlarged. Complains of pain along anterior border of left sternomastoid.

25. No albumen.

30. Cloud of albumen. Face looks puffy. Apex in 5th interspace inside nipple line. 1st heart sound not sharp and clear but no murmur heard.

31. Cloud of albumen.

Feb. 1. Patient urinated twice last night. Once this morning. She does not complain of headache. Skin very dry. 30yo. cleanse.

3. Vta. once y'day. Passing more urine, but there is a little blood in it this morning. 70yo. urine passed in 24hrs.

4. Less albumen. 120yo. urine slight general improvement.
Feb. 6. Complained last night of pain down right side of neck. 9.100 a.m. Rent as before. Hands on both sides specially on right enlarged. More albumen. At 5 p.m. patient had a severe right - she complains of pain down right side of chest - pain is of a sharp character & catches her breath. Slight cough.

Breathing quiet. 22 yrs. urine passed.

Feb. 7. Pat has passed a very comfortable night. Slight rigor at 5 a.m. Still complains of pain in chest but much less severe. She vomited during night after everything that was given her. Pain is complained of on pressure being made over a localised area about 10" below costal margin in extension of nipple line (side). Bowels acting well. Resp. 25. Pulse 108 hard. Skin dry. Somewhat dryness of 10 p.m. fast asleep. T. normal.

Feb. 8. 7.1 p.m. Skin acting better. No headache. Passed about 3 oz. of urine.
The vomit consists of a greenish yellow fluid with undigested milk. Albumen & blood still present.
Complains of thirst - toasts much relished but elain. She looks brighter and exposes herself as feeling better.
Feb. 10. Patient has had a good night. Skin has been acting well but is again dry this morning. Has only vomited once since 9 p.m. Pain still complained of in left side. Passed about 12 oz. of urine.
Taking meals better.
Feb. 11. Slept greater part of night. 14 oz. urine passed. Less albumen & much less blood.
14. Patient is now passing peaf and is feeling stronger. Still large quantity of albumen & some blood.
16. Steadily improving. Has still twice during night but very little.
Blood still in considerable quantity.
Feb. 24. T. was 100° last night but is again down below normal. Vomited twice during night but not much at a time. Bowels act well as does the skin. The quantity of urine passed is quite satisfactory but the amount of albumen & blood is much too great.

Feb. 25. Pat. complains of pain in left hypochondriac region. T. 101° & pulse has increased to 120. She has again vomiting.

Feb. 26. Patient has had a good night & been resting peacefully. All. 47°.

Feb. 27. Patient feels better. She explains that pain felt in right hypochondriac region is worse immediately she takes nourishment.

Feb. 28. All. 47°. Blood.

Mch. 2. 27°. 26°

Mch. 3. 27°. 18°

Mch. 4. 27°

Mch. 5. 19°. 32°

For the first time for a month can it be said that the blood has decidedly decreased in quantity.
Patient looks very pale but is brighter than she has been for a month.

Mch. 6. Less albumen - less blood.

43 07c. Urine passed.

8. Much less albumen - little blood.

13.

14.

16.

20.

24.

27.

Ag. 7. No blood. Faint trace of blood.

At the time of writing there is still a little albumen but no blood. Pat. is detained in hospital.

Commentary. This case gave rise to much anxiety & was most closely watched. The rigor & pain in side are worthy of note for in another case which will be recorded - convulsions & pain & pneumonia occurred, and pneumonia supervened. No pleurisy or pneumonia supervened in this case. Here again we have severe
seven throat symptoms + pain in cervical region. As in the last case albumen appeared a few days before the blood made its appearance.


On admission patient was desquamating febr. The tongue was large + flabby but clean. Tonsils were enlarged but otherwise normal. There was some enlargement of cervical glands. Slight oedema of ankles. Ophthalmoscopic examination revealed Retinitis and some papillitis. The urine contained a heavy cloud of albumen but no blood. Temperature was normal. He remained fairly well until the 6th day when he vomited at noon
noon. It the afternoon of the same day he again vomited a greenish brown fluid. At 8:20 on the morning of the 4th he had a convolution, during the same day he had three more. During the night of the 6th no urine was passed. Late in the evening of the 7th he was in a very drowsy condition. On the 8th the urine for the first time contained blood. Examination of the chest revealed all the physical signs of apical pneumonia (right side). Quantity of urine passed was 44.07 oz., the largest quantity since admission. The pneumonia ran a severe course and he died on 14th Dee. Despite energetic treatment directed to both the lung and kidney condition.

Commentary. This case was remarkable from several points of view. 1. He was admitted with albuminuria, retinitis. It is not usual for retinitis to appear in scleratube nephritis. Probably
probably the Nephritis was not due to the Scarlet fever poison but was of old standing.

2. The blood made its appearance about the thirty-fifth day of the illness. He had all the primary symptoms of Scarlet fever a full month before admission. Now true Nephritis occurring in Scarlet fever comes on about this period of the illness, and I think we are justified in supposing that this patient had suffered for a considerable time from Albuminuria and that the appearance of blood marked an acute exacerbation due to the secalatinal poison.

3. The lung condition undoubtedly played a large part in causing death in this case. No doubt it told heavily on a heart already working at high pressure from increased arterial tension due to the inflammation going on in the kidney.
This group includes cases which show by far the most severe symptoms. Luckily it is the smallest group, sixteen cases in all. Here again in the great majority there are severe throat symptoms. If the throat is not specially complained of we rarely fail to note that patients complain of pain in the neck usually along the anterior border of the sterno-mastoid. The albumen in this group occurred on the twentieth day, and lasted on an average three days. The albumen has usually become well established before the blood makes its appearance. The blood as a rule does not remain for a much shorter period than the albumen. It is noteworthy that the albumen occurs in this group, for a considerable period, on consecutive days.
All are agreed that the albumen and blood occurring together in a case of scarlet fever are the results of an acute inflammation going on in the kidney. But although there are no two opinions about this, the cause of albumen in the urine occurring during the early part of a case of scarlet fever still awaits for final settlement. What then is the cause of this early albuminuria? To answer this we should consider the symptoms and clinical history of patients who undoubtedly suffer from acute nephritis. The clinical history of the first stage of stage of nephritis i.e. the inflammatory stage, as stated by Dr. Driguer Stewart in his well-known work on Bright's diseases - a work to which I acknowledge my indebtedness - is as follows: - "After exposure to cold or after some febrile affection an individual feels some lumbar pain has frequent calls to micturition but makes little water at a time..."
time and that of a dark bloody or smoky colour, containing a large amount of albumen and throwing down a deposit composed mostly of tube casts. The total quantity of urine is decreased. Cedema sets in. There is at the same time some degree of febrile disturbance the breathing may be interfered with and the patient may complain of headache and drowsiness. In the most favoured circumstances these conditions continue for a few days or a few weeks and then gradually disappear; the urine first improving; its quantity increasing; its colour becoming more pale; the albumen and tube casts diminishing; and the dropsey passing away by degrees. But in a large proportion of cases the symptoms first return to continue increase in intensity or after temporary improvement a relapse occurs, the dropsey becomes so severe as to prevent the free play of the lungs, and death
death from suffocation results; or the blood becoming poisoned with excrementitious matter, which the diseased kidneys are unable to eliminate, a series of nervous symptoms, varying in their character, though at present grouped under the name leucemia, results, under which the patient dies. Now the only point with which these mild forms of albuminuria agree with this history is in the cause after some severe febrile disturbance similar pain is in a few cases complained of but in the vast proportion it is absent. The frequency of micturation is not increased, and what is of great importance is that the quantity of urine passed in the day is not diminished, and moreover what is of paramount importance is that in my experience tuber casts never can be found in the deposit. Headache in a few cases is complained of. This group then of mild albuminuric cases
cases occurring during the same early
stages of scarlet fever can hardly be
said then, judging from the
clinical history of cases which un-
doubtedly are suffering from acute
nephritis, to partake of the nature of
an acute inflammation of the kidneys.
If then there be not a structural
change in the kidneys brought about
by an inflammation, what else can
it be? Dr. Goodale in a paper,
contained in Lübo Hospital Reports, on
The etiology and Clinical aspects of
Scarlatinal Nephritis states that because
nephritis in the vast majority of cases
gives rise to albumen in the urine,
we must not on the other hand
conclude that albumen always
indicates nephritis, for any one of
the causes of albumen in the urine
may be operating to produce
albumen in a scarlatinal patient,
in which case the abnormality of
the urine would be no evidence
of a specific nephritis. Pagge; any
säys:—In scarlet fever albuminuria may occur during the pyrexial stage and ought probably to be distinguished from that which appears later and is dependent upon nephritis. Thomas in Cyclopaedia of the practice of Medicine by H. von Ziemssen says: It is rarely that I am able to find any symptoms of renal cataract at the outset of the disease and when they do occur I see them generally diminish with the decline of the fever in the second week or disappear entirely; and finally without any connection with such symptoms at the beginning of the disease I see a new affection of the kidney breaking out with more or less oedema. Thomas is showing that cataract of the renal tubules does not always occur during the febrile stage of scarlet fever, and that it does not lead on to the parenchymatous nephritis which occasionally supervenes during the second or third week.
week. I do not agree in thinking that this mild albuminuria is not due to a form of nephritis for although we find no tube casts in the urine is it not possible to get a mild form of inflammation without destruction of the epithelium lining the tubules of the kidney. Unfortunately I have been unable to examine the kidneys in any of my cases of mild albuminuria, not having been able to find any literature on the post mortem appearances of the kidneys in cases where death has occurred. But although one has not been able to throw any light on the subject from post mortem appearances yet we can from the symptoms exhibited by these cases of mild albuminuria form some idea of the kidney condition. Dr. Stevenson Thompson in a paper contained in the Medico-Chirurgical Transactions vol.131 divides his cases into two groups: 4. Initial albuminuria during
during first week. B. Late albuminuria occurring from 9th to 48th day, and justifies this division on the ground that patients with scarlet fever often suffer from two attacks of albuminuria separated by a well marked interval. This he states would indicate a difference in pathology, but what the difference is in pathology is, is not stated. The difference in pathology to my mind is only of degree, the same process being at work in the different forms of albuminuria.

When we come to look closely into the symptoms exhibited by the different groups we are struck by the fact that one particular symptom is often present in patients showing albumen in the urine. This symptom we find in patients representative of all the groups. In the mild form of albuminuria i.e. group one, we frequently find that patients complain of the throat. In groups two and three
we find the same thing. When we examine the throats of those patients we usually find that the tonsils are congested and enlarged and many of them in addition to being congested and enlarged show some deposit. Frequently too we find that before albumen makes its appearance in the urine pain is complained of in the glands along the anterior border of the Sterno-mastoid and not infrequently those glands are enlarged, hard and to the touch. In many of the cases we find that when the glands in the neck are complained of, the temperature rises up one or two degrees sometimes more. The cases which have been recorded show this well. Now we know that at the onset of an attack of scarlet fever the throat is the first part that the patient complains of feeling sore, the probable reason of this being that the tonsils and adjacent
adjacent parts are specially selected by the micro-organisms of septic fever and become under their action inflamed and swollen just as in typhoid fever the jejuni patches are specially selected by the micro-organisms which produces that special fever. The throat and the cervical glands must be capable of holding and manufacturing a great quantity of septic material which is gradually absorbed by the lymphatics and blood vessels. This septic material after circulating in the blood must be given off largely by the kidneys and must consequently produce its irritating effect on the delicate lining of the tubules of that organ. In the Cases which show only albumen (group one) we usually find that the patient are actually ill for the first week or so when the albumen appears, and it seems to me to be quite legitimate reasoning to think that in those
cases the poison is at first externally
vile but soon plays itself out,
wheresoe in the cases which show
both albumen and blood in the
urine (group three) and which
show these at a much later part
of the illness, the poison at first
is not very vile but lies
dormant for a long time ready
to break out with greatly increased
vile when a favourable
opportunity — such as a chill — presents
itself. These latter cases are causing
very mild cases at the outset and
before the albumen or blood appears
the throat is often complained of
and the temperature rises up.
In the mild cases of albuminuria
one is certainly struck with the
mildness of the symptoms directly
traceable to the kidney condition.
Headache is absent, no oedema can
be discovered, the quantity of
urine passed keeps up to its
normal and contains no tube
When casts shed from the kidney. If then the symptoms being as trivial and albumen present, why should we say that it is due specially to the poison? for surely if the poison can so affect the kidney as to produce albumen, why does it not also produce severe general symptoms? This unfortunately cannot be answered positively but I would like to suggest that the poison in these mild cases of albuminuria as acts on the epithelium of the tubules of the kidney as to affect its selective quality. We know from recent physiological experiments that the epithelium allows the different constituents of the urine to pass through not by a process of osmosis but by the the selective quality or vital activity possessed by these cells. How is it not possible that the secreted free poison in these mild forms of albuminuria so acts on this epithelium so as to allow the albumen
Allenmen to pass through it? we are all agreed that the structural changes wrought in the kidney in the severe forms of albuminuria are the result of an acute inflammation going on in that organ, the result of the poison of scarlet fever acting on it. The clinical history of the cases given under group three bears this out and agrees more or less with the clinical history of the first stage of nephritis as given in Grainger Stewart's work. The throat in all the three groups is the seat of a morbid process whatever be its nature and it is arguing with this in mind that makes me think that the mild and severe forms of albuminuria occurring during an attack of scarlet fever are due to the one cause namely the poison of scarlet fever, and that the pathological process set up in the kidney, in the case of mild albuminuria
Albuminuria, but a simpler form of the pathological process set up in the severe cases of albuminuria.

The end.