FREQUENCY of ALBUMINURIA

With the Compliments of
Geo R Shepherd

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— IN —

HEALTHY PEOPLE.

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FROM PROCEEDINGS OF CONNECTICUT MEDICAL SOCIETY, 1888.

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1889.

Frequency of Albuminuria in Healthy People.

For more than a hundred years the fact has been recognized that albumen is occasionally present in the urine, and since Dr. Bright connected it with renal disease its occurrence has been looked upon with serious apprehension. Within a few years, however, the causes and frequency of its appearance have been investigated by many competent observers both in Europe and in this country, and reading the now somewhat voluminous literature of this subject impresses one with the conviction that the opinion is gaining ground that in a large number, if not in a majority of cases, albuminuria is a temporary symptom of comparatively little account, dependent upon transient causes; and, more than this, we even have such high authority as the late Prof. Austin Flint, and Prof. Grainger Stewart for the statement that albuminuria associated with tube casts is not always of serious import.

The causes of albuminuria are almost as numerous as the cases. Ellis, in the *Boston Medical and Surgical Journal*, 1880, publishes a long catalogue of them, and almost every week has witnessed some additions to it from the labors of an army of investigators.

In the matter of frequency, Posner, Kleudgen, Senator, and some others find albumen in all or nearly all people; while Capitan, Van Noorden, Leube, and Leroux vary in their estimates from 84 per cent. to 5 per cent. Munn in his life insurance examinations in New York detected it in 11 per cent. of the applicants. One of the most thorough and complete reports on this subject is that of Prof. Grainger Stewart of Edinburg. He examined the urine of 505 individuals, finding albumen present in 166 of them or 32.8 per cent.

In the case of 205 soldiers, 77, or 37.5 per cent., had albumen, while of 74 civilians examined only 18.8 per cent. had albumen. Of 100 children in the Craiglockhart Poor House 17 per cent.

showed albuminuria, while of 100 male inmates of the same institution, aged about sixty, the percentage was 62. Illustrating the influence of diet on albuminuria his investigations on different classes of people were as follows: In soldiers 15.6 per cent. showed albuminuria before breakfast and 40.6 per cent. after breakfast; old men 37.5 per cent. before and 67.5 per cent. after breakfast; children 12.5 per cent. before and 17.5 per cent. after; and in another class of children 14.6 per cent. showed it before breakfast and 20.8 per cent. after. The effects of exercise he found as follows: a party of soldiers before breakfast showed 15.6 per cent. having albuminuria, after breakfast the number increased to 40.6 per cent., but after a march it had diminished to 28.1 per cent. Before going on fatigue duty 44 per cent. showed albumen, but after the fatigue duty there were 64 per cent. having albumen. Of a band of boys playing on wind instruments he found the percentage having albumen 20,8, while it was only in 8.3 of the other boys, but after the band boys had been playing an hour the percentage of those showing albumen was reduced to 12.5 per cent.

The conclusions which he draws from these, and other examinations, are as follows, viz.:

"1. That there is no sufficient proof that albumen is normally discharged from the human kidneys.

"2. That albuminuria is much more common in the healthy people than was formerly supposed, [his statistics having demonstrated its presence in nearly one-third of the population.]

"3. That the frequency increases with age.

"4. That it is more common among those whose occupation involves arduous bodily exertion than among those who lead easy lives.

"5. That albuminuria frequently follows the taking of food, especially breakfast.

"6. That moderate muscular effort rather diminishes this condition, but

"7. That it is increased by violent and prolonged bodily efforts.

"8. That cold bathing produces or increases it in some cases.

"9. That the existence of albuminuria of itself is not a sufficient ground for rejection in life iusurance."

The source from which these statistics emanate obliges us to be-

lieve them accurate and the opinions expressed demand consideration, but the thoughtful American practitioner feels almost instinctively that such facts as these cannot be duplicated in this country, and since the subject is one of great importance, not only to our profession, but as well to the community at large, particularly so to our life insurance companies, your committee on matters of professional interest in the State decided to investigate it on a larger scale than had hitherto been undertaken. That is, instead of tabulating a few hundred examinations to secure thousands of them.

Three avenues opened before us for the collection of statistics. First, the records of our large life insurance companies. Second, the examination of soldiers in our army, and third, original examinations by physicians of ability in civil practice.

Several of our large life insurance companies responded cheerfully to our request for the record of their experience, yielding a total of 31,125 examinations of urine in applicants for insurance with 185 cases in which albuminuria was detected or .59 (fifty-nine one hundredths of one) per cent. One company not included in the above, reported 2,395 examinations, 5 per cent. of which showed albumen.

A certain amount of doubt arises in connection with the acceptance of conclusions based upon the returns made to life insurance companies. First, the ability of the examiner to detect albumen when present only in small amounts may in a large number of cases be fairly questioned, since agents frequently employ physicians of inferior attainments in places where no regularly appointed examiner is located, and, too, in many small places it is well nigh impossible to find a suitable man. Second, many companies do not require their medical examiners to report to them confidentially all declinations, and as applicants who have been declined by the local examiner frequently withhold their application papers from the company to avoid being placed upon the declined list, it is apparent that a certain percentage of albuminurias may escape notice at the home office. Selecting, therefore, three of our large companies who appoint their medical examiners with great care and only accept examinations by their own regularly appointed examiners, and who also require all their examiners to report to them the name, address, and cause of declination of every applicant rejected, thus making it pretty certain that but few cases

escape their notice, and also that competent men have made the investigations, we have 27,132 examinations showing 0.71 (seventy-one one hundredths of one per cent.) of albuminuria. Still further, taking one of these companies which in addition to these precautions, also requires all bills for medical examinations to be paid from the home office, the name of applicant always being given and whether accepted or rejected, and we have 5,948 examinations with 47 declined for albumen or 0.79 (seventy-nine one hundredth of one) per cent. Now if we add to this a liberal allowance for errors and failure of notice the number must still fall very far short of the 11 per cent. of Dr. Munn and the 31 per cent. of Professor Stewart, and if we marvel at this discrepancy, what shall we say to the investigations of De la Celle de Chateaubourg, who reports 84 to 100 per cent. as the results of his analysis of the urine of the healthy?

For the purpose of confirming the above your committee had blanks prepared* and distributed them among physicians known to be interested in this subject, men of ability, and known to us personally as competent and accurate in their professional undertakings.

In addition to this your committee addressed letters to Surgeon General John Moore and Surgeon John S. Billings of the United States Army, requesting their co-operation in securing the examination of soldiers in the regular army. This request was

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*RECORD OF URINALYSIS.

Name?.....No.?.....
Residence?.....Married?.....
Sex?.....Age?.....Occupation?.....
Amount secreted in 24 hours?.....
Hour of voiding sample?.....How long after food?.....
Character of last meal?.....
How long since active exercise?.....
Reaction?.....Spec. Grav.?.....Color?.....
Albumen?.....Character of sediment?.....
If albumen is present, use microscope, and state whether any
Blood?.....Pus?.....Epithelium?.....
Crystals?.....Casts?.....
Other elements?.....

REMARKS.

.....

Date .....188 .....M. D.
P. O. Address.....

Where albumen is found, please investigate the cause, frequency and persistency of its presence, and state under Remarks. When more than one examination is made of the same person, number each slip. Return these blanks properly filled out to Geo. R. Shepherd, M. D., Hartford, Conn., by March 1, 1888.

endorsed and advocated by the medical directors of the life insurance companies located in Hartford and was courteously received and acceded to by the surgeon-general. Circulars* and blanks were forwarded to Washington and by General Moore distributed among the medical officers of the army. Unfortunately this request was made at a late day, giving but little time for the statistics to be collected at the different posts and resulted in but a small number of returns from this source.

Tests were made with heat and nitric acid and ferrocyanide of potassium when there was doubt. The more sensitive reagents were not employed in consequence of our belief that, *in the absence of other symptoms* an amount of albumen that could not be detected by heat and nitric acid was too insignificant to be of clinical value.

From these sources we received the following number of returns, viz.: Army, 40; civilians, 1,821; a total of 1,861 examinations, which together with the 33,520 previously mentioned, makes a grand total of 35,421.

Of the 1,861 civilians and soldiers 1,677 were males and 184 females, and out of these 20 males and 3 females are reported as

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* HARTFORD, CONN., March 20, 1888.

TO THE SURGEONS OF THE U. S. A.:

GENTLEMEN: — It is desired to ascertain how frequently albumen is found in the urine of healthy people, whether there is any such thing as "physiological albuminuria," and whether the temporary albuminuria claimed, by some, to be of quite frequent occurrence is often found in healthy people, and, if so, to what causes is it due and how serious is its import? To this end we suggest that the morning urine of our soldiers be tested with heat and nitric acid, that later in the day, after breakfast or dinner, the urina cibi be similarly analyzed, and, to illustrate the influence of exercise in this connection, another examination be made after drill or other prolonged exercise. The accompanying blanks are duplicates of those now being used for this purpose among civilians, and we should be glad if residence, age, hour of voiding sample, how long after food, character of last meal, how long after exercise, and albumen could be filled out in each case; the name being replaced by figures, if preferred, and the separate blanks for the *same individuals* being numbered 1, 2, 3, etc., in the upper right hand corner. Whenever albumen is found the secretion of twenty-four hours should be collected, measured, the reaction and specific gravity noted and a careful analysis and microscopical examination made to determine the presence of blood, pus, casts, crystals, epithelium or other accompaniments or evidences of organic kidney disease, and, by repetition, to demonstrate whether albumen is a temporary or permanent factor and its source.

In the army unusual facilities exist for examining the same individual under varying conditions and various individuals under similar conditions, and your co-operation is invoked with the belief that the results obtained will possess positive scientific value, and with the hope that it may not entail upon you an undue amount of incongenial labor.

It is desired to incorporate the data secured in a report to be made to the Connecticut State Medical Society in May next, and therefore it is important that returns be made on or before April 15th to Your very obedient servant,

GEO. R. SHEPHERD, M.D., HARTFORD, CONN.

showing albumen, *i. e.*, a percentage of 1.19 for the males and 1.63 for the females.

TABLE I.

Showing amount of albuminuria in all the cases examined.

Parties Examined.	No. Examined.	No. showing Albumen.	Per Cent.
1st Life Insurance Company, - -	5,243	37	.71
2d " " - -	15,941	87	.55
3d " " - -	5,948	47	.79
4th " " - -	3,900	14	.36
5th " " - -	93	0	.0
6th " " - -	2,395	119	5.0
Soldiers U. S. A., - - - -	40	1	2.5
Civilians, Males, - - - -	1,677	20	1.19
" Females, - - -	184	3	1.63
Totals, - - - - -	35,421	328	.93

The individuals examined were the men and women actively engaged in daily life such as soldiers, physicians, lawyers, clergymen, merchant, bankers, students, book keepers, clerks, machinists, mechanics of all kinds, farmers, day laborers, dressmakers, housekeepers, and domestics.

Regarding the question of exercise, we have 254 examinations of members of our State military companies examined immediately after an hour or two of active drill, with only one showing albumen, and that one being afflicted with gonorrhoea. The albumen was evidently attributable to the disease rather than exercise. (No. 2 of Table VII.)

38 Soldiers of our regular army showed no albumen before drill. After drill and active exercise, one had albumen in his urine, and he was a hard drinker. (No. 6 of Table VII.)

127 Employees of a large manufacturing establishment examined before exercise: 2 showed albumen in the morning urine, and after six hours of hard labor, 5 had albumen, but this latter number only included one of those showing albumen in the morning urine, in the other one it being absent.

17 Clerks were examined for albumen an hour after a light lunch with negative results. After an hour of very active exercise in the gymnasium, followed by a bath ending with a cold shower

bath, 3 had albumen in the urine which was otherwise normal, with the exception that 1 showed oxalate of lime crystals, and 2 urates in excess.

12 Students examined as the last mentioned had neither albumen before nor after exercise and bathing; 3 had excess of urates, however.

15 Musicians examined just after exercise, not one had albumen.

TABLE II.

Showing the effects of Exercise in producing albuminuria.

Parties Examined.	Albumen before Exercise.	Per Cent.	Albumen after Exercise.	Per Cent.
254 Conn. Militia, -	0	.0	1	.39
38 U. S. A. Soldiers,	0	.0	1	2.63
127 Mill Operatives,	2	1.57	5	3.94
17 Clerks, - -	0	.0	3	17.65
15 Musicians, -	0	.0	0	.0
12 Students, - -	0	.0	0	.0
463 Total, -	2	.43	10	2.16

Regarding the influence of food and digestion in causing albuminuria in healthy people, 478 examinations of urini cibi showed but 6 instances of albuminuria.

37 Men, including professional, business, and laboring men, had no albumen in the urine passed on rising. After eating breakfast, 1 had albumen without casts or symptoms of kidney disease, though he had suffered from dyspepsia more or less.

5 Patients who had suffered from dyspepsia with oxaluria, and occasional traces of albumen without evidence of any kidney disease, were examined before eating, and no albumen found; after eating eggs and farinaceous food they all had albumen in the urine.

4 Children aged from five to thirteen years, whose father had deserted them and whose mother was but poorly able to care for them, scantily clothed and living under poor sanitary conditions, had no albumen in the morning urine They were given a good meal of eggs and bread and milk, and in two hours the urine of the eldest three had albumen in it, while the youngest had none.

TABLE III.

Showing the influence of Food and Digestion in producing albuminuria.

Parties Examined.	Before Food.	After Food.	Per Cent.
37 Professional and laboring men, -	0	1	2.7
5 Patients (dyspeptics), - -	0	5	100.0
4 Destitute children, - - -	0	3	75.0
46 Totals, - - - - - -	0	9	19.57

Regarding cold bathing, 43 men were examined and had no albumen in the morning urine passed on rising; after taking a cold bath and exercising a little, but before eating, the urine was examined again and 2 had albumen. One of these two had suffered a good deal from dyspepsia and oxaluria. He is a lawyer, a hard worker, and an inveterate smoker of tobacco, has frequent bilious attacks from irregular and improper eating. Many years ago he had syphilis. A few granular and hyaline casts were found with the albumen in his case.

The five patients above referred to, who had suffered from dyspepsia, had no albumen in their urine before bathing, as shown by nitric acid and heat, but potassio-mercuric iodide gave a very faint cloud in one. After a cold bath, they all had a considerable amount, and in one hyaline casts appeared as well, though this was not the case showing a trace of albumen before the bath.

Dr. Edward W. Lambert, Medical Director of the Equitable Life Assurance Society of New York, writes that he has found the temperature has much to do with increasing the percentage of albuminuria. A sudden fall of the thermometer, particularly when it ranges near zero, or a notable rise reaching 90° in the shade and continuing there, always increases the number of cases.

TABLE IV.

Showing the influence of Cold Bathing in producing albuminuria.

Parties Examined.	Before Bathing.	After Bathing.	Per Cent.
43 Men, - - - - - - -	0	2	4.65
5 Dyspeptics, - - - - -	1 (trace.)	5	100.0

As to occupation, we found that of 575 machinists only 4 had albumen. Out of 711 men of easy muscular occupation, 1 student, 1 banker, 1 R. R. conductor, 1 trader, 2 clerks, 1 time-keeper, had albumen, and 3 had casts or other evidence of disease of the kidney.

TABLE V.

Showing the influence of Occupation in producing albuminuria.

Parties Examined.	Having Albumen.	Per Cent.
575 Machinists, and other Muscle workers, -	4	.7
711 Bankers, Book-keepers, Students, and other Brain workers, - - - - - - -	7	.98

In the matter of age, we examined persons of all ages from five to eighty-nine, but the albuminuria was only detected in those of middle age or youth. The proportion of men examined above fifty was too small, however, to base any conclusions upon, and ought not to be accepted as indicating any less liability in the aged, nor as militating the usual opinion on this point.

Special attention is called to the facts elicited by the examination of dyspeptics suffering from oxaluria. In their cases albumen was found after cold bathing and exercise in every instance, and during active digestion also. In two of these cases casts accompanied the albumen, and in one instance (No. 10 of Table VII) evidences of kidney disease appeared after the lapse of several years. This point should be kept in mind by examiners for life insurance.

Of the 23 cases in whom albumen was detected 7 show accom-

panying casts, 1 has pyelitis, and 3 others some renal derivatives, these latter, including one (No. 3 of Table VII), where the report is simply "blood, epithelium, and crystals." Of the 12 in whom no kidney lesion is definitely determined, 3 have cystitis, 3 gonorrhœa or stricture, 1 oxalate of lime in excess, 1 chills and fever, 1 cardiac hypertrophy, 1 had been a hard drinker, and 2 are wholly negative.

It is difficult to reconcile the wide disparity in results, when ours are compared with those of other observers. As before stated, Posner finds albumen in all urines; Stewart in over thirty-two per cent.; Leube in sixteen per cent.; Munn in nearly eleven per cent.; Leroux in slightly less than six per cent., and we in less than two per cent.

Posner and Stewart both used the most delicate reagents, while Munn depended on nitric acid and heat, as did we also in our examinations.

Many of the cases examined by Prof. Stewart were inmates of the poor-house or asylum, and being thus of the poorer class of the population, may be considered to have been predisposed in many ways to albuminuria, and when we take into consideration the habit of using stimulants, so much more common in the English army than in ours, (as we have good reason to believe), may we not conclude that these things account for some of the cases reported by him ?

A review of our cases brings us to the following

CONCLUSIONS.

1st. Albuminuria is much less frequent in the United States than in England. Stewart giving thirty-one per cent. as the general average of his examinations, while ours, conducted on a much larger scale, will not reach two per cent.

2d. The brain workers rather than the muscular workers show the largest percentage of albuminuria.

3d. That the urine of perfectly healthy people rarely shows albuminuria after food, while that of those who suffer from dyspepsia and oxaluria is very liable to do so.

4th. Privation, scanty food and clothing, with unsanitary surroundings, increase the liability to albuminuria.

5th. Cold bathing does increase the liability to albuminuria, though more notably so in people of dyspeptic tendency.

6th. Severe exercise increases the liability to albuminuria, in a very moderate degree.

7th. In very many instances, albuminuria is not associated with disease of the kidneys.

8th. In the matter of life insurance, albumen in the urine should be looked upon as a symptom only, and the cause ascertained. The acceptance or rejection of a risk should depend upon the gravity of the cause.

9th. When heat and nitric acid detect albumen, the history of the case, aided by the microscope, will in the great majority of instances indicate its source, thus proving physiological albuminuria to be of very rare occurrence.

The thanks of the Committee are due the following physicians for their assistance in connection with this report:

Dr. John Moore, Surgeon-General U. S. A.

Drs. John S. Billings and Alfred A. Woodhouse, Surgeons U. S. A.

Drs. J. W. Cable and H. N. Birmingham, Asst. Surgs. U. S. A.

Drs. G. W. Russell, A. W. Barrows, M. Storrs, G. P. Davis, C. D. Alton, G. W. Avery, W. T. Bacon, H. G. Howe, M. M. Johnson, W. W. Knight, E. K. Root, G. C. Segur, and W. A. M. Wainwright of Hartford, and Prof. H. E. Smith, M. D., of New Haven.

We are also indebted to the following Life Insurance Com-

panies for statistics: The Equitable of New York, Mutual Benefit of New Jersey, Penn Mutual of Philadelphia, National of Vermont, Phœnix Mutual and Connecticut Mutual of Hartford.

GEO. R. SHEPHERD, M.D.,
JAMES OLMSTEAD, M.D.,
F. E. BECKWITH, M.D.,
} *Committee on matters of Professional Interest, 1888.*

Table VI.

The following table exhibits facts concerning the three females in whom albuminuria was detected :

	By Whom Reported.	Age.	Occupation.	Hour of Passing Specimen.	Reaction.	Specific Gravity.	Albumen.	Microscopic Appearances.	Remarks.
1	C. D. Alton,.....	26	Stenographer,.	Morning,.....	Acid,....	1.026	Trace,.....	Pus, bladder, and vaginal epithelium.	Nothing from the kidney. Has a mild cystitis.
2	C. D. Alton,.....	30	Not stated, ...	Morning,.....	.....	1.020	Trace,.....	Cells from vagina and bladder.	Has a slight cystitis and no kidney disease.
3	G. R. Shepherd,...	40	Dressmaker, ..	Morning,.....	.....	1.022	Small amount	Pus, mucus, vaginal epithelium.	No kidney derivatives. Has specific leucorrhœa and was put under treatment.
			Same individual, 3 weeks later.	Morning,.....	Acid,....	1.024	None,.....	Slight mucus occasional pus cell, vaginal epithelium.	No kidney derivatives.
			Same individual, 3 months later,	5 P. M. three hours after mixed dinner.	Neutral,	1.017	None,. ...	Mucus and vaginal epithelium.	No kidney derivatives.

In all the above it will be noticed the albumen was accidental and not due to any permanent cause nor renal disease.

Table VII.

The twenty males found to have albuminuria are tabulated as follows:

	By Whom Reported.	Occupation.	Age.	Hour of Passing Specimen.	How Long Since Taking Food.	Character of Last Meal.	How Long Since Active Exercise.	Reaction.	Specific Gravity.	Albumen.	Microscopic Appearances.	Remarks.
1	Prof. H. E. Smith,	Student,	20	A. M. 3 P. M.	2 hours,			Very acid, Very acid,	1.030 1.030	None, 1-50 per cent., Trace,	Normal epithelium. Oxalate of lime,	Heat, nitric acid, and ferrocyanide tests. During 6-8 weeks albumen found to vary from 1-20 to 1-50 per cent.
2	H. G. Howe,	Baker,	24	9 P. M.	3 hours,	Beef, tea, etc.,	Just after,	Acid,	1.008	Present,		Has gonorrhœa.
3	G. C. Segur,	Machinist,	35	A. M.	2-3 hours,	Ham and eggs,	During exercise,	Acid,	1.012	Present,	Blood, epithelium and crystals,	His name was lost off the bottle and he could not be traced.
4	G. C. Segur,	Machinist,	33	A. M., Mixed of 24 hours.	1½ hours,		During exercise,	Acid, —	1.020 1.010	Present, Present but small amt.	Epithelium, hyaline casts, and yeast fungus, Fewer casts than in first specimen,	
5	C. D. Alton,	Banker,	50	P. M.	3 hours,	Dinner,		Acid,	1.010	Present,	Pus and triple phosphate,	Has inflammation of bladder.
6	J. W. Cabell, U. S. A.,	Soldier,	30	A. M., 1 P. M., 3.30 P. M.,	Immediately,		2 hours, Immediately after 1 hour's drill.	Acid, Acid, —	1.028 1.030 —	None, None, Trace,	Heavy sed. of amorphous urates, Negative except few cystic epithelial cells.	Is a hard drinker and gives no symptoms of renal disease. Has not been on sick list since being at this post (18 months) and claims to have been always healthy.
7	G. W. Avery,	Trader,	68	A. M.,				Acid,	1.016	Present,	Blood, pus, and epithelium,	Has pyelitis of right kidney.
8	W. T. Bacon,	R. R. Conductor,	32	P. M.,	3 hours,			Acid,	1.008	Present,	Granular casts,	Has retinitis albuminuria and history of kidney disease for three years. Thinks himself healthy except his eyes.
9	G. R. Shepherd,	Machinist,	27	A. M., Mixed of 24 hours. Mixed,	12 hours,		14 hours,	Acid, Acid, Acid,	1.018 1.022 1.026	Present, Trace, None,	Blood only, Heavy sed. of urates, slight amt. of blood, Negative,	Had chill and fever night before the first examination; temp. 105.2, pulse 128, resp. 38, lasting seven hours. Second examination made two days later, and third examination three days later than that.
10	G. R. Shepherd,	Axe Maker,	47	A. M. Noon, 3 P. M.	2 hours,		Immediately, During hard work,	Acid, Acid, Acid,	1.020 — —	Absent, Trace, Trace,*	Negative, Oxalate of lime, Negative,	This examination was made in 1871, and the man is still hard at work with no symptoms of kidney disease when last seen, though he has occasional albuminuria after hard work or exposure to cold.*
11	G. R. Shepherd,	Merchant,	74	10 A. M., 7 P. M.,	2½ hours, 1½ hours,	Breakfast, Tea,	Just after moderate walk,	Acid, Acid,	1.014 1.012	None, Trace,	Negative, Granular, hyaline, and mucus casts,	Two years ago this man had albumen and granular casts in urine, with frequent attacks of torpid liver. Following the first examination, digitalis was given to flush out the kidneys, and the second examination made next evening.
12	G. R. Shepherd,	Mechanic,	27	6 A. M. 11 A. M.,	12 hours, 4 hours,	Tea, Breakfast,	12 hours, During exercise,	Acid, Acid,	1.022 —	Trace, None,	Negative, Negative,	
13	G. R. Shepherd,	Bricklayer,	32	6 A. M., 5 P. M.,	11 hours, 5 hours,	Tea, Cold dinner,	10 hours, During exercise,	Acid, Acid,	1.018 1.016	Small amt., Larger amt.,	Negative, Negative,	No evidence of kidney disease, but palpitation of heart and hypertrophy.
14	G. R. Shepherd,	Carpenter,	44	8 P. M.,	1 hour,	Tea, toast, and cold meat,	2 hours,	Acid,	1.021	Present,	Epithelial casts, blood, renal epithelium,	Went home from work; took a cold bath; had a chill followed by acute nephritis, for which he consulted physician twenty-four hours after giving me this specimen.
15	G. R. Shepherd,	Clerk,	19	2 P. M.	2 hours,	Light lunch,	Never very active,	Acid,	1.012	Present,	Oxalate of lime, pus, blood, and casts,	Has symptoms of renal calculus.
16	G. R. Shepherd,	Time-keeper,	47	P. M. and A. M. mixed. Bed time,	 3 hours,	 Light tea,	 Many hours,	Acid, Acid,	1.019 1.020	Present, Present,	Urates in excess, Urates less — a few broken casts,	
17	G. R. Shepherd,	Machinist,	29	A. M.,	12 hours,	Mixed tea,	14 hours,	Acid,	1.028	Present,	Renal and bladder epithelium in excess — mucus casts,	Has polyuria and sugar.
18	G. R. Shepherd,	Pattern maker,	52	Mixed of 24 hours. Morning,	 12 hours,	 Tea,	 14 hours,	Acid, Acid,	1.017 1.021	Trace, Trace,	Negative, Negative,	Has frequent sick headaches.
19	G. R. Shepherd,	Clerk,	25	Morning,	12 hours,	Tea,	14 hours,	Acid,	1.022	Trace,	Negative except mucus,	Has stricture from gonorrhœa.
20	G. R. Shepherd,	Clergyman,	67	Mixed of 24 hours.				Acid,	1.018	Present,	Casts and epithelium,	Subsequent examination shows retinitis albuminuria, though he thinks himself well.

*Since writing I have had opportunity to test this man's urine again (1888). It is very acid, sp. grav. 1.018, and a few blood and pus corpuscles and granular and hyaline casts are present. — G. R. S.