

acetic acid, great excess being avoided. Next, if the quantity of albumin be excessive the urine should be diluted with one or more volumes of water until the volumetric percentage does not exceed 10 or at most 15 per cent. Observations conducted in the writer's laboratory have determined the fact that accurate and uniform volumetric measurements of albumin in the urine are only possible when the volumetric percentage does not exceed 10 per cent., and this applies both to gravitation and centrifugal force.

With regard to the reagents: the 2 c.c. of 50 per cent. acetic acid should be added to 10 c.c. of the urine, the tubes should be inverted a number of times to insure thorough mingling of the acid with the urine; then 3 c.c. of the 1 to 10 ferrocyanid of potassium should be added, the tubes again inverted till all are well mingled, and lastly the tubes *should be stood aside for ten minutes* to insure entire precipitation of the albumin. Lastly, with regard to packing and measurement: The first and most important essential is an efficient centrifuge. The Purdy electric centrifuge possesses all the essentials for exact work. If this is at hand very few additional suggestions are necessary. If not, then a centrifuge must be employed that possesses certain essential features or is capable of such modification as will include these essentials, which are as follows: *a.* The percentage-tubes must be accurately graduated in tenths of a c.c. up to .15 c.c. *b.* The arm of the centrifuge should possess a radius of exactly $6\frac{3}{4}$ inches, that is to say, the linear distance from the center of the axle to the tip of either tube must be just $6\frac{3}{4}$ inches. *c.* The motor must be capable of an even and sustained speed of 1500 revolutions per minute, with the required radius, and carrying one ounce of urine. *d.* Lastly, some reliable method of gauging the exact speed of the motor must be employed. Any centrifuge that fulfils the above named requirements will give accurate results, as indicated by this method and the accompanying table.

PURDY'S QUANTITATIVE METHOD FOR ALBUMIN IN URINE.
(CENTRIFUGAL.)

Showing the relation between the volumetric and gravimetric percentage of albumin obtained by means of the centrifuge with radius of $6\frac{3}{4}$ inches; rate of speed 1500 revolutions per minute; time three minutes.

Volumetric percentage by centrifuge.	Percentage by weight of dry albumin.	Grains per fluid ounce dry albumin.	Volumetric percentage by centrifuge.	Percentage by weight of dry albumin.	Grains per fluid ounce dry albumin.	Volumetric percentage by centrifuge.	Percentage by weight of dry albumin.	Grains per fluid ounce dry albumin.
$\frac{1}{4}$	0.005	0.025	$13\frac{1}{2}$	0.281	1.35	$31\frac{1}{2}$	0.656	3.15
$\frac{1}{2}$	0.01	0.05	14	0.292	1.4	32	0.667	3.2
$\frac{3}{4}$	0.016	0.075	$14\frac{1}{2}$	0.302	1.45	$32\frac{1}{2}$	0.677	3.25
1	0.021	0.1	15	0.313	1.5	33	0.687	3.3
$1\frac{1}{4}$	0.026	0.125	$15\frac{1}{2}$	0.323	1.55	$33\frac{1}{2}$	0.698	3.35
$1\frac{1}{2}$	0.031	0.15	16	0.333	1.6	34	0.708	3.4
$1\frac{3}{4}$	0.036	0.175	$16\frac{1}{2}$	0.344	1.65	$34\frac{1}{2}$	0.719	3.45
2	0.042	0.2	17	0.354	1.7	35	0.729	3.5
$2\frac{1}{4}$	0.047	0.225	$17\frac{1}{2}$	0.365	1.75	$35\frac{1}{2}$	0.74	3.55
$2\frac{1}{2}$	0.052	0.25	18	0.375	1.8	36	0.75	3.6
$2\frac{3}{4}$	0.057	0.275	$18\frac{1}{2}$	0.385	1.85	$36\frac{1}{2}$	0.76	3.65
3	0.063	0.3	19	0.396	1.9	37	0.771	3.7
$3\frac{1}{4}$	0.068	0.325	$19\frac{1}{2}$	0.406	1.95	$37\frac{1}{2}$	0.781	3.75
$3\frac{1}{2}$	0.073	0.35	20	0.417	2.	38	0.792	3.8
$3\frac{3}{4}$	0.078	0.375	$20\frac{1}{2}$	0.427	2.05	$38\frac{1}{2}$	0.801	3.85
4	0.083	0.4	21	0.438	2.1	39	0.813	3.9
$4\frac{1}{4}$	0.089	0.425	$21\frac{1}{2}$	0.448	2.15	$39\frac{1}{2}$	0.823	3.95
$4\frac{1}{2}$	0.094	0.450	22	0.458	2.2	40	0.833	4.
$4\frac{3}{4}$	0.099	0.475	$22\frac{1}{2}$	0.469	2.25	$40\frac{1}{2}$	0.844	4.05

5	0.104	0.5	23	0.479	2.3	41	0.854	4.1
$5\frac{1}{2}$	0.111	0.55	$23\frac{1}{2}$	0.49	2.35	$41\frac{1}{2}$	0.865	4.15
6	0.125	0.6	24	0.5	2.4	42	0.875	4.2
$6\frac{1}{2}$	0.135	0.65	$24\frac{1}{2}$	0.51	2.45	$42\frac{1}{2}$	0.885	4.25
7	0.146	0.7	25	0.521	2.5	43	0.896	4.3
$7\frac{1}{2}$	0.156	0.75	$25\frac{1}{2}$	0.531	2.55	$43\frac{1}{2}$	0.906	4.35
8	0.167	0.8	26	0.542	2.6	44	0.917	4.4
$8\frac{1}{2}$	0.177	0.85	$26\frac{1}{2}$	0.552	2.65	$44\frac{1}{2}$	0.927	4.45
9	0.187	0.9	27	0.563	2.7	45	0.938	4.5
$9\frac{1}{2}$	0.198	0.95	$27\frac{1}{2}$	0.573	2.75	$45\frac{1}{2}$	0.948	4.55
10	0.208	1.	28	0.583	2.8	46	0.958	4.6
$10\frac{1}{2}$	0.219	1.05	$28\frac{1}{2}$	0.594	2.85	$46\frac{1}{2}$	0.969	4.65
11	0.229	1.1	29	0.604	2.9	47	0.979	4.7
$11\frac{1}{2}$	0.24	1.15	$29\frac{1}{2}$	0.615	2.95	$47\frac{1}{2}$	0.99	4.75
12	0.25	1.2	30	0.625	3.	48	1.	4.8
$12\frac{1}{2}$	0.26	1.25	$30\frac{1}{2}$	0.635	3.05
13	0.271	1.3	31	0.646	3.1

Test—2 c.c. of 50 per cent. acetic acid and 3 c.c. of 10 per cent. solution of ferrocyanid of potassium are added to 10 c.c. of the urine in the percentage-tube and stood aside for ten minutes, then placed in the centrifuge and revolved; rate of speed and time as stated at head of the table. If albumin is excessive dilute the urine with water till volume of albumin falls below 10 per cent. Multiply result by the number of dilutions employed before using the table.

This method has now been in daily use in the writer's laboratory for the past six months, where it has afforded the greatest possible satisfaction. The advantages claimed for this method over all others are its rapidity, simplicity, accuracy and comprehensiveness in expressing results, the volumetric percentage, the gravimetric percentage, the number of grains per ounce and the total amount by weight in twenty-four hours all being apparent by a single glance at the table.

57 East Twentieth Street.

ACCIDENTAL OR SPURIOUS ALBUMINURIA.*

BY CHARLES G. STOCKTON, M.D.

BUFFALO, N. Y.

The term accidental albuminuria as here used relates not only to the presence of albumin in the urine exclusive of disease of the kidney, but also of the various conditions aside from recognized kidney disease, which permit of the passage of serum albumin through the renal parenchyma into the urinary tubules. In other words, the term is employed to include those cases of albuminuria in which albumin finds its way into the urine from the pelvis of the kidneys, from the ureters, the bladder and the genitalia.

Albumin thus appearing possesses indirect interest to the student of internal medicine, because he must be able to exclude albumin arising from the sources above mentioned before he can affirm that he has to deal with albumin coming from the kidneys. As a matter of exclusion, therefore, the question must be made a familiar one.

Accidental albuminuria is of direct interest to the physician, because it is one of the diagnostic data for the recognition of pelvic renal diseases, ureteritis, and cystitis. The occurrence of albumin in pyelitis is almost constant while, in quantity, it varies with the character of the inflammation. It seems to bear direct ratio to the extent of pus formation in the pelvis of the kidney. When there is an inflammatory edema of the pelvis of the kidney, the exudation of albumin may be considerable. Occasionally in tubercular disease of the pelvis albumin may appear in small amount, but as the disease advances the albumin is more abundant, though this may be frequently explained by the fact that the parenchyma of the organ is at the same time involved. In

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calculus of the kidney, albumin at least in traces is rarely absent, nor is it seen in very large amounts.

In all these affections we expect to find the urine acid in reaction, sometimes sharply so, and the appearance of pus, blood and mucus either by macroscopic or microscopic examination, and very often by both. Upon these facts, and on the fact that the tube-casts are absent, we are able to infer that the albumin is derived from a point below the parenchyma of the kidney.

Not enough attention seems to have been called to the undoubted fact that traces of albumin are generally found in that really important affection, ureteritis. This condition, sometimes mistaken for appendicitis, salpingitis, or irritable ovary, is extremely common in victims of lithuria and oxaluria, especially in females. Very often there results an irritable bladder with frequent urination of very acid urine, containing traces of albumin, epithelium, and mucus. Pus-cells are common and also a few red blood-corpuscles.

I have twice seen this affection, in an acute form, produced in the right ureter following parturition in women having floating kidney. In each case there was evidence of irritation of the pelvis of the kidney, and it is believed that this trouble was induced by transient hydronephrosis occasioned by pressure of the fetal head on the right ureter. Both cases were seen by my colleague, M. D. Mann, who concurred in the view that there was no infection in the genital tract, and that the chills, high temperature, headache and profound nervous excitement resulted solely from the trouble with the ureter and renal pelvis.

These cases were both severe; the temperature in one reaching 106 degrees, and the other going above 104; the febrile paroxysms not altogether ceasing after ten days. In these instances the urine drawn with the catheter contained sufficient albumin to cause a slight precipitate with heat and acid, large numbers of pus cells, red blood-corpuscles and epithelium, but at no time were any tube-casts observed, nor was the quantity of urinary solids diminished. In both cases the patient made a perfect recovery, and at no subsequent time showed evidences of renal disease save such peculiarities of urine as are commonly associated with nephropoiesis.

We have all seen albumin accompany the escape of a renal calculus into the bladder. A calculus having found its way into the bladder excites sufficient irritation to evoke a slight exudation of albumin from that organ. Here also we find pus-cells and mucus, as well as bladder epithelium, in the urine. There should be little difficulty in recognizing the albuminuria of cystitis. The well-known symptoms of the disease, together with the abundance of pus and mucus, bladder epithelium and alkaline reaction point at once to the source of the exudation. The error of assuming that because there is a cystitis there is not at the same time a pyelitis is more likely to be made, or a real nephritis. Particularly is this true of paralytics. I well remember a lesson taught me years ago by Gouley, in this pregnant sentence: "Most victims of paraplegia die from uremia secondary to infection of the bladder." According to my observation this is true. It can never be considered safe to allow urine containing albumin to go without frequent microscopic examinations.

In the male it is not uncommon to find albumin associated with inflammation of the prostatic urethra, the prostate; and the seminal vesicles. Needless to say, such conditions usually accompany or follow gonorrhea. Everyone has seen instances of men occasionally showing traces of albumin in the urine, generally associated

with pus, sometimes traces of blood and always mucus, and occasionally some one has been so unwary as to pronounce this affection to be albuminuria and probably Bright's disease. Victims of spermatorrhea not infrequently show traces of albumin in the urine. It is surprising that this is not more frequently the case. Its presence is probably owing to catarrh of the seminal vesicles and irritation of the prostate. It seems hardly necessary to call attention to the vagina as a source of albumin in the urine. If one makes the blunder of filtering the urine before microscopic examination, as I have known to be done, it is possible that he may be led astray. I find that it is the part of wisdom to request women who show albumin in the urine, accompanied by pus, to thoroughly irrigate the vagina and external genitalia before voiding the urine that is to be preserved for examination.

In closing, it should be stated that accidental albuminuria is not to be disregarded, and the source of the albumin should always be most carefully examined into. It should also be reiterated that when albumin is found originating in the bladder, the ureter or the pelvis of the kidney, the urine should be frequently studied to make sure that infection is not invading the more important structures of the kidney.

DISCUSSION.

DISCUSSION ON PAPERS OF DRs. STOCKTON AND PURDY.

DR. ARTHUR ELLIOTT, Chicago.—The significance of albumin in the urine in organic kidney disease has become lessened during recent years, and has been deplored from the position it once occupied in clinical esteem. Had Dr. Musser's paper been read, reference would doubtless have been made to cases of nephritis unaccompanied by albumin in the urine. These cases are, I am sure, more frequent than is generally supposed. Examination of the twenty-four hours' collected urine, with determination of urea and other urinary solids, and microscopic examination of the urine sediment, constitute in conjunction with the information elicited by physical examination a far more reliable basis of diagnosis than does the mere presence or absence of albumin. In cases of interstitial nephritis, albuminuria may be disregarded in arriving at a diagnosis, for its inconstancy in this lesion is notorious, the urine of quiescence being frequently free from albumin, but not so during activity. A point in the clinical aspect of albuminuria, which might be referred to, is the albuminuria accompanying gastro-intestinal disturbances. The urine under such circumstances is of high specific gravity, contains excesses of indican and throws down acid elements. I am inclined, as the result of such observations as I have been able to make, to believe that the albuminuria is the result of irritation of the renal secreting structure by certain toxins of intestinal derivation. This form of albuminuria, although as a rule slight, is contemporaneous with the gastro-intestinal dyspepsia. The albumin, centrifugally estimated, ranges from a faint trace to 2 or more per cent. bulk.

Dr. Purdy's method of estimating the amount of albumin in the urine is a very accurate and beautiful one. Personally I have been using the centrifuge for a number of years, following the original directions given by Dr. Purdy for the approximate determination of albumin. This I have found to be readier and quite as satisfactory as any of the mechanical means. It has been, however, of little value except for clinical and comparative purposes, because of the impossibility until now of converting the bulk percentage into definite quantitative amounts. This procedure is rendered easy by Dr. Purdy's table, and correct estimation is possible.

DR. A. L. BENEDICT, Buffalo, N. Y.—I want it distinctly understood that I do not come here to furnish wisdom, but to obtain some. In connection with albuminuria we occasionally find so-called peptonuria, and yet there is no true case of peptonuria on record. The only cases published were based on a test which was not correct. Thus, instead of peptonuria, we should say albumosuria. A definition of peptone is, "that soluble proteid which is not thrown down by ammonium sulphate." In testing for albumin it is wrong to use cold nitric acid, which throws down a mixture of albumin and albumose; if heat be used, pure albumin is thrown down. I wish to refer to four cases of albumosuria out of two hundred examined. One was acute inflammation of the bladder, combined with a

subacute gastroenteritis. This patient had been on a long journey and had drunk much ice-water. He had albumose in the urine, which cleared up in a day or two. The second was a case of diffuse nephritis, with mitral regurgitation and hepatic sclerosis, and he had been under observation for some time. The albumose persisted for many months and then disappeared, reappearing when the renal function failed. In the third patient it was impossible to make a thorough physical examination on account of obesity. The urine was free from casts, but there was present a small amount of albumin and albumose; the latter cleared up before the former—a phenomenon which is quite characteristic. The fourth was a case of subacute inflammation of the bladder. The primary condition was a colitis which was catarrhal or a mixed infection. The patient presented all the symptoms of typhoid, but the blood test was negative. The urine gave a doubtful Ehrlich's sign. It was a question in my mind whether it was typhoid or not. All these cases had albumosuria and not peptonuria. In some of these cases, also globulin was present. This is something about which we know but little. Peptonization by bacteria might be considered, theoretically, an explanation of albumosuria, but many of the latter cases occur in sterile urine. I have never found albumose to develop in albuminous urine that had been allowed to decompose. In other words, ordinary saprophytes have no peptonizing power.

DR. E. R. AXTELL, Denver, Colo.—We are indebted to Dr. Purdy for the work he has done for us in urinalysis. The test he has presented is in the way of accuracy, without loss of time. There are but few objections that could apply to it. It requires Dr. Purdy's electrical centrifuge. For many of us this is impossible of attainment, because we can not procure the motor force. I may mention the fact that with my centrifuge, having a radius of $11\frac{1}{4}$ inches, I have had to do some original work of my own in getting normal deposits. I find that if I revolve my hand centrifuge two hundred times, my readings are about those laid down by Dr. Purdy. If I take a solution of albumin or chlorid of known strength, and precipitate them by proper reagents, I get a proper reading after the revolution, proving that my results are accurate.

With albumin precipitation, there is a source of error in using a centrifuge. The albumin does not pack down evenly and on a level, but accumulates to a slight extent on the glass of the tube. This is certain to modify the reading. Possibly some little plan can be found to remedy this. I am indebted to Dr. Stockton for the term "ureteritis." I have called such cases renal colic.

DR. CARROLL E. EDSON, Denver, Colo.—I wish to call attention to a paper on "Albuminuria of Adolescence," written within the year, by Dr. Clement Dukes of England, who for many years has been studying this subject of occasional albuminuria in adolescence. Dr. Dukes made observations on school-boys, at either Eton or Rugby, I have forgotten which, and he found a large number of cases in which there were at the period of adolescence, small traces of albumin occasionally present; this amount of albumin was influenced largely by the time of day, by exercise, etc. In this paper he called attention to the fact that he could not speak of conclusions until the lapse of a certain time and the collection of a large number of statistics. He also speaks of having found a considerable number of cases, where the albumin cleared up under rest, and the albumin remained absent during school life where the lads were under control. But, subsequently, when they reached adult life, they developed albuminuria which was quite serious. He recently had a case in consultation, of an adult, where he could trace back the records to the adolescent period, and he found that the patient had been passing albumin at that time. This fact should put us on guard. Certain statistics of Dr. Dukes are sufficiently numerous now to warrant him in bringing it to our attention. This is not the accidental or spurious albuminuria, but cases of albuminuria of adolescence in which all spurious sources of albumin were ruled out.

DR. GEORGE DOCK, Ann Arbor, Mich.—Dr. Purdy's series of investigations are of great value. It might be worth while pointing out that the use of this method in practice is not necessary for proper treatment. The variation in the amount of albumin within small limits is very common and to be expected, from a number of causes. It is more important in practice, so far as albumin goes, to know the approximate amount than to be able to state it within minute fractions, and the examination of the sediment is, after all, of much greater importance. In regard to the matter of functional albuminuria, it is extremely important that we should look on every case of albuminuria, as Dr. Stockton has suggested, as possibly being the earliest stages of kidney disease, therefore, to tell a patient he has functional albuminuria is a dangerous thing to do. Repeated examinations of the urine should be urged. I also

wish to speak of certain forms of albuminuria which come on in persons taking exercise in undue amounts. I have, during the past three years, been making observations on bicyclists and other athletes, and I have found, in a large number of cases, that even a moderate amount of exercise brings on albuminuria, and occasionally casts. In many cases there is not more than a trace of albumin, but a distinct sediment and casts of various kinds, sometimes hyaline, and sometimes blood and blood casts. It will be interesting to find out later if disease follows in these cases. It does not do to use the term nephritis too loosely; very often the condition is not a nephritis but a superficial degeneration. So far, I have not carried the observations far enough to see whether they suffer any permanent damage to the kidney. These observations are important enough to speak of now and they certainly are interesting.

DR. CHARLES E. MINOR, Asheville, N. C.—I was glad to hear such an authority as Dr. Dock dwell on the fact that the exact amount of albumin is not of such great importance. I do not wish to be understood as belittling this admirable work of Dr. Purdy's, but I feel that what we want is the more general adoption of less complicated methods of rapid diagnosis. To be of the greatest use an apparatus for clinical diagnostic use must be such that it can be generally adopted, not only in laboratories, where the conditions for Dr. Purdy's instrument are obtainable, but by the general practitioner throughout the country. Those of us who possess laboratories should remember that we are an insignificant minority and will for years remain so; we should not, as Dr. Purdy seems to do, discourage, but rather encourage the use of apparatus which, like Eschbach's tube, is simple enough for easy use by the general practitioner, and which does not demand an electric current and an expensive machine whose price will certainly prevent its general adoption; it is hard enough in any case to get a majority of the profession to use the methods of precise diagnosis, without making it harder by discrediting the simpler, if not absolutely accurate, ones. What we want in the present state of the profession in the country is a more general adoption of clinical diagnosis in the profession at large, and if we are to make any progress we must not begin by discrediting the simpler apparatus or demanding too elaborate or expensive a one in its place. We will be lucky if we get 50 per cent. of the doctors of the country to pay any attention to the quantitative estimation of albumin; there is some hope of getting them to use Eschbach's tube, none at all of getting them to purchase Purdy's form of centrifuge. I repeat, therefore, that while glad of this addition to our means of precise diagnosis, I regret that the author has seen fit to discourage the use of the older and simpler method.

DR. JUDSON DALAND, Philadelphia—So far as Eschbach's method is concerned, it has been, in my experience, entirely unsatisfactory; it is exceedingly incorrect, in spite of the great commendation given it. A trace, moderate amount and large amount of albumin are terms usually employed by clinicians; but instead of these terms we should use percentages, which is the only accurate method of noting the quantity of albumin. The former terms have been used from necessity. I believe that if Dr. Purdy's instrument be used with these tables, greater accuracy will be secured. So far as the profession is concerned, it is quite impossible to carry on the laboratory work and to attend to a general practice. If you have assistants, they can attend to this work. But that is no argument against the instrument's precision. So far as the centrifuge is concerned it is a simple matter to secure 1500 revolutions per minute, and it is a procedure that occupies but a few minutes. Dr. Purdy's paper deserves a very careful consideration, and to the employment of this method I look forward with pleasure.

I was much interested in Dr. Stockton's paper on "Accidental Albuminuria." Occasionally, a cystitis is accompanied by renal disease. The question, therefore arises, as to how much of the albuminuria is due to liquor puris and how much is of renal origin. If some method could be adopted by which this differentiation could be made, accuracy in diagnosis would be increased. Not infrequently the amount of albumin seems disproportionately large when the small amount of pus is considered. Of course, when tube casts or cylindroids are present the diagnosis is simplified.

I recollect an instance, which occurred lately, of a floating kidney, which was exposed and secured by three ligatures. A careful examination showed no albumin immediately before the operation, but immediately after there appeared an amount of albumin, an amount equal to one-half of the bulk of urine; there was also a moderate amount of blood and a number of blood casts. The urinary evidence was that of an ordinary acute nephritis. In the course of two days the albuminuria rapidly diminished and, in the course of three weeks it had entirely

disappeared, and the urine was normal. This case is interesting as showing the effects on the urine, of three suture tracks in one kidney.

So far as the occurrence of nephritis without albuminuria is concerned, it seems to me that this has been demonstrated, and it also is quite clear that many cases of this form of disease where albuminuria is present are frequently overlooked. In the majority of instances the cause for this is the injudicious employment of light. If the test-tube is held before the window, the trace of albumin is frequently overlooked; but where it is held against a black background, and the light passes through the urine obliquely downward, the smallest trace may be detected. This particular technic is of practical importance.

Dr. SCOTT of Indiana—I wish to express satisfaction with the use of Esbach's instrument; its estimation of albumin depending on the specific gravity. As stated by Dr. Purdy, the alkaloids and other substances are thrown out and measured when the picric acid is added, which makes an erroneous reading of the sediment. It is the sentiment of the society that a uniform radius and uniformity, at least to a certain extent, should be obtained. The centrifuge is indispensable. It seems to me that in the analysis of urine, there is too little attention paid to it. Two things should be considered, the analysis and the interpretation of the analysis. It is important to determine just what the result of the analysis will be. In the question of urea, there is no positive way of estimating the urea. The instruments are all erroneous because they depend so much on the barometric pressure, which varies so. Doremus' ureometer is a good instrument, but it is open to objections.

Regarding the question of albuminuria of adolescence, it is certainly not always true that we have disease of the kidneys or a nephritis. In any case it is impossible to tell which individual illness may not give rise to a nephritis from simple irritation or congestion of the kidneys. And yet it certainly is not wise to report to companies that a true albuminuria is present without determining, by means of the microscope, whether there is present blood or epithelial cells, which would call attention to a diseased condition of the kidneys. Albuminuria alone should not be considered evidence of a nephritis.

Dr. GEORGE W. WEBSTER, Chicago—I wish to record two interesting observations. I have recently had two internes who had been assigned the duty of giving anesthetics. They were employed from four to seven hours each day in the administration of the anesthetics, and usually ether was the one given. In one assistant there appeared a large percentage of albumin, blood and casts. After resting for ten days, all this entirely disappeared. On resuming his duties at the hospital, he worked seven hours, and at the end of that time there appeared a large percentage of albumin, together with blood in the urine. After another absence from the hospital, for one month, he again reported and the albumin and blood had disappeared. It is a difficult question to tell where irritation ends and inflammation begins. The explanation may be the same as in typhoid fever, where albuminuria occurs in 25 per cent. of all cases examined.

Dr. ARTHUR R. ELLIOTT, Chicago—I do not think Dr. Minor is warranted in arriving at his conclusions in reference to Dr. Purdy's paper. Dr. Purdy has said that he has endeavored to supply us with an accurate and simple mechanical means by which the results can be arrived at in the short space of fifteen minutes. To substitute a simple mechanical means for a complicated and tedious chemical procedure is certainly not calculated to introduce any confusing element into clinical work.

Dr. CHARLES G. STOCKTON, Buffalo, N. Y.—I feel with Dr. Daland that, as a rule, the albumin found bears a relation to the amount of pus present. This is not invariable, but is the rule. One peculiar feature in cases of spurious albuminuria is that, in traces, albumin is frequently found associated with ureteritis. The intense acidity of the urine and the increased irritation exercised on the tissues of the ureter explain the occurrence of albumin in that condition. It is small in amount but important enough to call attention to it. Cases called nephritis are often not true nephritis, but simply albuminuria arising from the ureters. I would like very much to discuss the general subject of albuminuria, but I feel it would not be right to discuss it when the chief papers on that part of the topic have not been read.

IN A RECENT charge to the grand jury, convened in Newark, N. J., a justice rendered a decision in the case of accidents due to bicycle riding that: "The law does not create the ringing of the bell as a signal that will exonerate from responsibility."

OBSERVATIONS ON TONSILLECTOMY*

BY J. HOMER COULTER, M.D., Ph.D.

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CHICAGO.

There is yet a lamentable uncertainty and want of precision in the terms used generally by the profession in reference to the pharynx and larynx, this, too, notwithstanding the great amount that has been written and spoken on this particular subject. Such indiscriminate use of terms is not alone by the general practitioner, but in many cases by those who in other respects maintain their standing as specialists in the line of nose and throat work. These facts are in all probability due to the comparatively short history of the specialty as a distinct line of work, and the consequent somewhat limited amount of original investigation that has been made. We note as an instance that many presumable authorities indiscriminately use the terms tonsillitis and quinsy; or that the removal of any portion or of the entire gland is alike termed a tonsillotomy; how little is positively known of the function of the pillars, or indeed of the tonsillar gland itself.

I wish in the beginning to posit as the most important element in the following argument and deductions the opinion that a pathologic tonsil demands entire removal. The exceptions to this rule are few, and are ordinarily not difficult to differentiate. We may maintain as most important exceptions, some cases of malignancy; cases of known or strongly suspected hemophilic tendency; the rare but possible condition of aneurysm in the region of the tonsil; in unusually severe cases of tubercular or syphilitic infection, with special manifestations in or about the tonsil. These, however, it will be observed, are only such conditions as would naturally be inhibitory indications to any operations at any time, and consequently very proper exceptions to the rule laid down above: admitting that there are oftentimes conditions and circumstances which make the case a rule unto itself in a surgical aspect.

I maintain that the above rule is one strictly in consonance with the best practice of the most successful surgery, and that its violation is, as of any other well-established fact in medicine or surgery, unwarranted, injudicious, unscientific and unsurgical. What would be thought of the modern surgeon who would voluntarily and without further excuse than that they were difficult to reach, amputate a breast and leave enlarged axillary glands, or of one who would do a simple mastoid and leave untouched a severe middle-ear involvement, or one who would remove pus tubes and leave a retroverted uterus in situ because the adhesions were difficult to get at or break loose? Yet I believe such argument is applicable to the cases under discussion.

Dr. Goodale, in a recently published monograph on the pathologic histology of acute tonsillitis, has conclusively demonstrated that there are quite sufficient bacteria and other pathologic conditions present to warrant the conclusion that the doubtless resultant chronic condition is one not only demanding careful attention, but also is necessarily a pathology more or less diffused throughout the entire gland. The process of natural or spontaneous repair in cases of acute tonsillitis is yet to be demonstrated conclusively. Certainly, however, the almost universal experience would lead us to anticipate that the acute condition was quite likely an impor-

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