ON ALBUMEN TESTS AND PEPTONURIA VERSUS ALBUMINURIA.

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DURING my absence from home, I find that the question of peptonuria *versus* albuminuria in connection with the tests for albumen now on their trial, has been raised in the JOURNAL and talked about. Before reading the article on "Picric Acid as a Means of Distinguishing Albumen from Peptone" which appeared in the JOURNAL of March 31st, I had performed several experiments on albumen and peptone, with a view to discriminate these bodies by the reagents which, last January, I introduced to professional notice in the form of test-papers. The results of these observations will, doubtless, just now be interesting to many, who are working with these and other tests, so as to decide for themselves their comparative range and power, and I will briefly record them without delay, before proceeding to further inquiry.

The peptone was derived from digesting at a temperature of 100°, with pepsina porci or pepsin-essenz (Liebreich), and an acid (hydrochloric or lactic), one or other of the following forms of albumen: (a) White of egg boiled for half an hour, or (b) albumen purified after the method of Wurtz, (c) albuminous urine (ser-albumen). After several hours, eight or ten, a final boil enabled me to filter off a clear solution, which, judging from the negative results obtained by boiling and by nitric acid, was free from ordinary albumen. Peptonised albuminous urine appears to me to be a valuable guide in the inquiry as to whether peptones can be discovered in the urine as well as albumen, for it provides, as a starting point, peptone, derived from serum albumen in the urine itself, and the behaviour of it to the tests can be more safely compared with that of albumen in ordinary albuminuria, than when the peptone or albumen is added to normal urine; and surely, to note accurately the operation of the tests upon the mixtures in different proportions of the same urine—one portion albuminous and the other peptonised—should be the right preparation for the study of this obscure corner. Speaking merely from my own observations, I must confess to have derived a ray of light from these experiments, for they explain certain results in the testing of some urines, which must otherwise have remained unintelligible to me. Two drachms of liquor pepticus (Benger), which requires no acid, or one ounce pepsin essence (Liebreich), with one drachm of lactic acid, should be added to eight ounces of urine. The process of conversion can be followed step by step. With Benger's preparation, the coagulation by heat and nitric acid steadily diminishes, until it ceases entirely; but, when lactic acid is used, even in the small proportion of .12 per cent., heat falls from the first to induce coagulation; but nitric acid (after Heller) is still available as an indication of the progress of the digestion. It is best to neutralise all acid by carbonate of soda before boiling and filtering. Inasmuch as liquor pepticus, diluted as in the urine, after boiling, gives reactions like those of a peptone, it is necessary to boil and filter two drachms of it in eight ounces of water, or normal urine, and to use it side by side of the peptonised urine, as a check in estimating the peptone contained in the latter; but this is not necessary when the digestive selected is pepsin essence with lactic acid.

1. *Peptone*.—An immediate turbidity was induced by the potassio-mercuric iodide, sodium tungstate, and picric acid test-papers (the corresponding solutions were also used for corroboration), but it was most dense with the first. In every case it remained as an opacity without coagulating, and it completely and quickly dissolved up, without collecting into clots, on applying heat, even short of boiling, and as readily reappeared as the liquid cooled. Much less heat was required to clear up the mercuric and picric turbidity than the tungstate one. On the other hand, the potassium ferrocyanide paper gave negative results.

2. *Albumen*.—The precipitates which all these tests give with serum-albumen can be readily distinguished from the peptonic opacity by the application of heat; for, while the latter merely dissolves, the former gather up into clots, and will then either float to the top like clotted cream, or will fall; in either case, the urine is left quite transparent, until the coagula are diffused through it by shaking. After warming—for the result described can be reached without boiling—the dense coagula remain as they were left by the heat, while, as it cools, the urine becomes turbid; then the turbidity collects into flocculent coagula, which, with the heavier ones, fall, and the fluid above is left quite transparent. But the result is different when the peptonised is mixed with the albuminous urine: then the coagula form on heating, and fall, but the supernatant

liquid does not become clear; it remains opaque, and the opacity is proportionate to the amount of peptonised urine which has been added. Can we thus readily detect the presence of albumen only in one case, and of albumen with peptone in another? Perhaps, before positively deciding this question, it will be safest to wait for further clinical and experimental evidence. It may appear a small thing to mention—but it may be a matter of practical convenience to be reminded—that about an inch column of urine, or the upper part of a longer column, may be readily boiled, *without the slightest smoking*, by a wax match or candle, providing the tube is held a quarter of an inch above the tip of the flame; the spirit-lamp—cumbersome, and so apt to get out of order—is quite unnecessary; and, besides, the heat can be more carefully graduated, according as warming or boiling is required, by a wax match than by the spirit flame.

Of the four reagents which form the series of albumen test-papers, there is but one which, though precipitating albumen, leaves peptone untouched,—viz., potassio ferrocyanide. I take it, this fact may be turned to useful account: for it is pretty clear that serum-albumen cannot be distinguished from peptone by the use of one reagent only without calling in the aid of heat; while such aid may be dispensed with entirely by employing the ferrocyanic as well as another precipitant; thus, the presence of peptone may be inferred if the potassio-mercuric iodide gives an opacity, while the ferrocyanide test does not, and the latter, though negative as to peptone, is positive as to albumen. Should both bodies coexist, it will be easy to compass that fact, by first precipitating all the albumen by the ferrocyanic test, filtering, and testing the filtrate for peptone by the potassio-mercuric iodide; or, using the latter test only, a match may perhaps decide the matter without the necessity of filtering.

The mercuric test is undoubtedly quite as sensitive for peptone—or the group of bodies that go by that name—as I have proved it to be for albumen in all forms; in both respects, it is unsurpassed or even equalled by any other reagent with which I have worked. Experiments teach me that peptone is not a single body: I have, for instance, obtained evidence that picric acid can leave something which potassio-mercuric iodide can still throw down; while in every case the latter reagent completely cleared away all the peptones, so that, after using it, picric acid induced no further precipitation.

Keeping in view this matter of peptone and the forms of albumen—acid and alkaline—met with in urine, all requiring to be discriminated in various ways and by different tests, very few trustworthy observers will, I think, feel disposed to pin their faith to one or even two reagents, until, at any rate, they have carefully and without bias worked with all of them side by side for some time, and deliberately chosen the most trustworthy in all the various kinds of urine.

ON THE DELIGATION OF LARGE ARTERIES BY THE APPLICATION OF TWO LIGATURES AND THE DIVISION OF THE VESSEL BETWEEN THEM.

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IN reference to the very interesting communication upon the above subject which appeared the BRITISH MEDICAL JOURNAL, for April 7th, and in which Mr. Walsham cited three cases of popliteal aneurysm which he conducted to a successful issue, where he had adopted the practice of dividing the femoral artery between two points of ligature placed at rather less than an inch apart, it occurred to me that one possible objection to this practice becoming habitual is that a large branch may be given off from the part of the trunk between the ligatures. Of course, the objection does not hold good where deligation is performed on an artery from which no branches other than the terminal arise, as, for instance, the common carotid; but, in other instances, the exact position of the giving off of even large branches is so extremely variable, that it is quite impossible to be sure that such may not arise from the part of the artery between the points of ligature; the profunda femoris, for example, is said by Quain to most frequently arise from the common femoral at an inch to two inches below Poupart's ligament; and yet, in the comparatively small number of subjects which I have myself seen in the Westminster Hospital dissecting-room, this large branch was found, in one instance, arising as high as the ligament, and in another fully three inches below the same structure. In the latter case, it would be quite likely that the large branch would communicate with the part of the trunk between the double