individuals." The high percentage may be partly accounted for by the fact that eleven of these had been or were in contact with pneumonia cases of Types I and II. Stillman[1] reported a series of three hundred and ninety-eight "normal individuals," finding pneumococcus in one hundred and seventy-two (43.2 per cent.). The specimens examined by us were not, strictly speaking, from normal mouths; but inasmuch as these cases were in the hospital because of conditions unassociated with respiratory affections, it seems quite fair to compare the results with those reported by Dochez, Avery and Stillman. Stillman's figures contain a greater proportion of Types I, II and III than do ours, but most of the individuals harboring Types I and II were "contacts." In our series, only one of whom was known to be a "contact," the virulent types were relatively uncommon, 73.8 per cent. of the cases harboring Type IV pneumococci. There is apparently a considerable variation in the incidence of pneumococci in the mouths of normal individuals at different seasons, in different years and in different groups, and among the individuals harboring pneumococci considerable variation in the proportion of the four types.

Summary.—During 1916 and 1917 pneumococci were recovered from the mouths of 32.2 per cent. of surgical cases before operation. Type I was found in .6 per cent. of the cases harboring pneumococci, Type II in 1.2 per cent., an Atypical II in 11.2 per cent., Type III, in 13 per cent. and Type IV in 73.8 per cent.

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Renal action in acute nephritis.

By **DANA W. ATCHLEY** (by invitation).

[*From the Coolidge Fellowship and the Medical Clinic, Presbyterian Hospital, Columbia University, New York.*]

The clinical discussion of these cases will appear with the functional results in a later paper. In the series are six acute cases and two cases entering the hospital in an acute attack but giving a history of previous renal disease. The phenolsulphonphthalein excretion, the renal test day, the blood urea, the urea index and the chloride index were employed for the functional studies. The

[1] Stillman, E. G., *Jour. Exp. Med.*, 1916, XXIV, 651.

renal test day contributed little of value. Nocturnal polyuria was constant but quite independent of the kidneys' ability to concentrate. "Maximal impairment," according to Mosenthal, occurred in two cases, one showing no other abnormalities of renal function, and the other with very moderate impairment, while a fatal case concentrated to 1.022. The balances of salt and nitrogen so frequently included in the performance of this test were not done because of the obvious unreliability of a twenty-four-hour experiment. Moreover, in view of its great dependence upon a factor so variable as the amount of water excreted, systematic determinations of the specific gravity over a brief period must be very carefully interpreted. Many inconsistent phthalein results were found, but in general the value of the test in acute nephritis may be summed up by saying that variations above a level of 20 to 25 per cent. were rarely of a functional significance coinciding with the rest of the picture. A figure below 20 per cent. was of more serious import, although one case excreting only 15 per cent. recovered completely.

The blood urea estimations proved the most consistently valuable means of determining the severity of the disease in any given case. The highest figure was in the only fatal case, the other high figure was undoubtedly the next most severe, while the two cases without any evidence of retention made the most rapid recoveries.

If we overlook variations above the normal and consider the usual rather than the average results, we have in the urea index an expression of the gross renal function that agrees fairly well with the impression gleaned from the other data. But I would hasten to add that even moderately rigid interpretation of the Ambard as a real index of urea function may lead to the greatest error. This criticism is based on such observations as the following. At constant levels of blood urea, an increase in the water excretion in one case caused a 28 per cent. drop in the index (according to McLean's formula), although the rate of excretion (D.) was the same.

Date.	Volume Urine.	Blood Urea.	Rate—D.	Index.
Feb. 28.....	1,128	0.38	22.5	98
Mar. 14.....	2,448	0.37	22.4	70

In another case the function was higher when the kidney excreted at a rate of 7 gm. than when it excreted 13 gm., with the blood concentration unchanged for the two determinations.

Date.	Blood Urea.	Urine Conc.	Rate D.	Index.
June 21.....	0.29	9.4	7.0	32
July 12.....	0.28	1.7	13.4	27

Other facts could be adduced to demonstrate that Ambard's formulæ are untenable as physiological laws. Whatever clinical value is possessed by the index is due to the fact that a pathological kidney so frequently retains urea and is unable either to concentrate normally or to excrete the usual amount of urea—all factors tending to decrease renal function as expressed by the index.

Numerous estimations of McLean's chloride index were made on these cases but in no case was the rate of excretion clearly dependent upon the concentration of chlorides in the plasma. In general the latter remained fairly constant, as soon as equilibrium was established after diuresis, while the urinary output was proportional to the daily intake. With identical plasma chlorides the rate of excretion showed the widest variations under different dietary regimes. For example, with a constant plasma concentration, one case excreted at a rate of 0.6 gm. on a salt-poor diet and at 13.6 gm. when 4 gm. of salt were added daily to the diet. Other cases showed the same picture, a picture difficult to ascribe to changes in the course of the diseases. The reaction to a single administration of 7 gm. of salt was interesting. There was a rise of 0.2 gm. per liter in the plasma concentration with no change in the rate of excretion; but forty-eight hours later the rate of excretion had increased seven times, although the plasma was unchanged.

I wish to call your attention to a pertinent experiment upon a normal individual. Table I is self-explanatory. There is a marked increase in the threshold with the assumption of a salt-poor diet; in fact, few nephritics show so high a threshold. One of the most striking things is the actual increase in plasma concentration coincident with a decrease in urinary salt output. This experiment I have been unable to repeat (for lack of time), but if confirmed it is sufficient evidence that Ambard's laws of

salt excretion are quite false. Taken with the findings in this series, it quite disproves the assumption that the rate of excretion is dependent upon the height of the plasma concentration above a hypothetical threshold. The evidence here presented seems to indicate that we have quite a constant level in the plasma with a urinary excretion independent of the blood figure and in general dependent upon the amount of salt ingested. This suggestion leaves us still in the dark as to the actual renal mechanism, but opens several interesting leads that I have not time to discuss.

Since any so-called threshold determined during a salt-poor regime is so entirely misleading, even in the normal, the frequency of that regime in the treatment of nephritis makes the clinical application of the index rather limited. Much more valuable than what the formula expresses are the facts that may be obtained from a determination of the plasma chloride concentration together with a knowledge of the daily chloride balance. There is a distinct tendency to find a higher plasma concentration than normal in nephritis and when this elevation occurs I feel that it is significant of an impaired salt function.

As applied to this series, a determination of the blood urea gave the best evidence as to urea function, and total function, while the plasma chloride, together with the daily chloride balance, was the most accurate index of salt function.

TABLE I.

Date.	Diet.	*C.*	*D.*	Actual Plasma NaCl.	Calculated Plasma NaCl.	Threshold.
Apr. 15, 11–1 P. M....	Regular unlimited diet	15.8	10.3	6.10	6.02	5.70
1 P. M....	7 gm. NaCl	—	—	—	—	—
2–4 P. M....	—	17.6	14.8	6.06	6.11	5.57
4–6 P. M....	—	16.6	16.7	6.33	6.13	5.81
Apr. 16.....	Salt-poor diet	—	—	—	—	—
Apr. 19.....	"	5.8	2.5	6.38	5.77	6.22
Apr. 21.....	"	3.2	2.1	6.19	5.74	6.07
Apr. 23.....	"	3.5	1.68	6.00	5.73	5.89