

curare on the nerve endings of voluntary muscle, and to which he attributes the cessation of respiration, we may mention that after an animal has been poisoned with neurine, asphyxiation causes little or none of the usual convulsions.

The full paper contains references to previous work on the subject, and complete details of the methods used, and the cases investigated; it is illustrated by reproductions of numerous tracings.

[*Note added April 20, 1899.*—It should be mentioned that in the cases of brain atrophy referred to, the cerebro-spinal fluid was removed soon after death. Since the foregoing abstract was written, we have, however, had the opportunity of examining two specimens removed during life by lumbar puncture, and the results of our experiments with these corroborate the conclusions previously arrived at.]

“On Intestinal Absorption, especially on the Absorption of Serum, Peptone, and Glucose.” By E. WAYMOUTH REID, F.R.S., Professor of Physiology in University College, Dundee. St. Andrew's University, N.B. Received March 30,—Read April 20, 1899.

(Abstract.)

The experiments detailed in the full paper deal with the absorption from the intestine of the animal's own serum, and of solutions of glucose and peptone. The method employed has been that introduced by Leubuscher, in which two loops of intestine are simultaneously employed, the one the experimental, and the other the control, loop.

The conclusions arrived at are as follows:—

1. A physiological activity of the intestinal epithelium in the act of absorption is demonstrated by—

- (a) The absorption by an animal of its own serum (or even plasma) under conditions in which filtration into blood capillaries or lacteals, osmosis, and adsorption are excluded.
- (b) By the cessation or diminution of the absorption of serum when the epithelium is removed, injured, or poisoned, in spite of the fact that removal, at any rate, must increase the facilities for osmosis and filtration.

2. The activity of the cells is characterised by a slower uptake of the organic solids of the serum than of the water, and a rather quicker uptake of the salts than of the water. The relations to one another of the absorptions of these various constituents is variable in different regions of the intestinal canal (upper ileum, lower ileum, and colon).

3. No evidence can be obtained of specific absorptive fibres in the mesenteric nerves.

4. The state of nutrition of the cells is the main factor in their activity, and this is intimately associated with the blood supply.

5. In reduction of the rate of absorption, without detachment of epithelium, the absorption of the various constituents of serum is reduced in the proportion in which they exist in the original fluid.

6. The activity of the cells may be raised by stimulation with weak alcohol, without evidence of concomitant increase of blood supply.

7. The bile has no stimulant action on the cells.

8. The cells exhibit an orienting action upon salts in solution (sodic chloride especially). In a loop of gut with injured cells sodic chloride enters the lumen from the blood, at a time when it is being actively absorbed from a normal control loop in the same animal. (This fact was first noted by O. Cohnheim.)

9. The absorption of water from solutions introduced into the gut is dependent upon two factors :—

(a) The physical relation of the osmotic pressure of the solution in the gut to the osmotic pressure of the blood plasma.

(b) The physiological regulation of the difference of osmotic pressure by the orienting mechanism of the cells.

10. The chief factor in the absorption of peptone is an assimilation (or adsorption) by the cells, while in the absorption of glucose, diffusion, variable by the permeability of the cells (and so, probably, related to their physiological condition) is the main factor.

11. By removal of the epithelium, the normal ratio of peptone to glucose absorption is upset, and the value tends to approach that of diffusion of these substances through parchment paper into serum.

12. Absorption in the lower ileum is greater for the organic solids of serum, and less for peptone and glucose than in the upper ileum. The relative absorption of water in the upper and lower ileum is variable.

13. The relative impermeability of the lower ileum to glucose disappears with removal of the epithelium.

14. Absorption in the colon is for all constituents of serum, and for peptone and glucose far less per unit of measured surface than in the middle region of the ileum.

15. The normal relative excess of salt absorption from serum over water absorption, observed throughout the intestine, is most marked in the colon, and more marked in the lower than in the upper ileum.

16. Finally it is suggested that the cell activity which causes serum to pass over to the blood is of the same nature as that involved in the orienting action of the cells upon salts in solution.