and not to any intrinsic difference in the mechanism of the response. Few responses could be elicited owing to the persistent low level of the blood-pressure, although respiratory gasps indicated that the medulla was not exhausted. Injection of adrenalin or tyramine caused a sufficient vaso-constriction to raise blood-pressure enough to restore the medulla, so that further anemic responses could be elicited; but in general, the number and magnitude of these responses was far below normal. This difference was probably due not to any interruption of an essential part of the vaso-motor pathway, but to the general condition of the organism.

160 (2683)

The distribution of the immune bodies occurring in Types I, II and III antipneumococcus serum.

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Avery[1] states that the immune bodies occurring in Types I and II are completely precipitated by 38 to 42 percent saturation with ammonium sulphate, and that they were incompletely precipitated by (a) ammonium sulphate in less than 38 percent saturation, (b) saturation with sodium chloride, (c) dilution and saturation with carbon dioxide and (d) removal of crystalloids by dialysis. He states that the most practical purification appears to be precipitation by 38 to 42 percent saturation with ammonium sulphate. The higher saturation, *i. e.*, the 42 percent, corresponds to about 47.6 cc. of saturated ammonium sulphate solution.

Felton[2] finds that a 10 times dilution with distilled water containing 4 percent N/1 phosphoric acid per volume of antiserum, will, with Type I, completely precipitate the immune bodies. He has been less successful with some of the antisera of Types II and

[1] Avery, O. T., *J. Exper. M.*, 1915, xxi, 133.

[2] Felton, L. D., *Boston M. & S. J.*, 1924, cxc, 819.

III, especially those of low protective value. We have corroborated Felton's findings with Type I. Practically a complete precipitation of the immune bodies occurs when diluted with distilled water containing 4 percent N/1 phosphoric acid per volume of antiserum. Felton's same technique on Types II and III has given us varying results.

Using ammonium sulphate as a precipitating agent, we corroborated Avery's work in finding that the immune bodies were completely precipitated by half saturation with saturated ammonium sulphate solution. We also found that the methods of separation of the so-called euglobulin and pseudoglobulin by ammonium sulphate and sodium chloride showed immune bodies in both globulins. We found, however, that that portion of so-called euglobulin which is precipitated with 30 percent saturated ammonium sulphate solution, saturated sodium chloride or 12½ percent dried sodium sulphate, contained after dialysis only 8 to 10 percent of the total immune bodies. This holds true for all three types.

Using Felton's technique for diluting these dializates, the white precipitate that is obtained contains practically all the immune bodies from these first fraction precipitates or so-called euglobulins.

The filtrate containing the globulins soluble in 30 percent saturated ammonium sulphate solution, and precipitated by adding saturated ammonium sulphate solution to half saturation, contains after dialysis about 90 percent of the immune bodies.

The saturated sodium chloride soluble globulins, precipitated by the addition of only 25 percent saturated ammonium sulphate solution, contains after dialysis about 90 percent of the immune bodies. The filtrate containing the globulins soluble in 12½ percent dried sodium sulphate, and precipitated by adding dried sodium sulphate up to 18½ percent at 36° C., also contains, after dialysis, about 90 percent of the immune bodies.

Using Felton's technique for diluting these dializates, the white precipitate that is obtained contains practically all the immune bodies from these second fraction precipitates. This holds true for all three types. In all instances where Felton's white precipitate is obtained in the three types of pneumococcus antisera, the immune bodies are found in his white precipitate.

The albumins have no immune bodies, and no white precipi-

tate appears when diluted with distilled water. Heating the antisera to 58° C. for two hours destroys about 60 percent of the immune bodies in all three types.

Heating to 56° C. for two hours does not impair its protection value.

All protection tests were made by Miss W. Carey Noble, to whom I am greatly indebted.

161 (2684)

On the function of the colonic spindle (*Fusus coli*) of the rabbit.

By JOHN AUER.

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In previous notes[1] attention was drawn to an apparently undescribed, macroscopic, spindle-shaped, sphincter-bearing structure which connects the transverse colon of the rabbit with the descending colon.

One of the main functions of this organ apparently is to prevent, under normal conditions, the passage of scybala before they have been deprived of most of their water content. This seems to be accomplished largely by mechanical pressure exerted on the moisture-soaked scybala by the muscular spindle, the passage of the pellet into the descending colon being prevented by contraction of the sphincter at the spindle neck.

Evidence for this action is furnished by inspection of the active spindle in the living animal, and by inspecting and weighing the scybala in the order of their location in the transverse colon, the spindle and in the descending colon. In the living rabbit under morphin narcosis, where peristalsis has been accelerated by the intravenous injection of 0.1 to 0.3 mg. of physostigmin, one may occasionally see a spurt of fluid spiralling through the neck of the spindle into the descending colon, as a powerful per-

[1] *J. Pharmacol. and Exper. Therap.*, 1925, *Proc. Soc. Pharmacol. and Exp. Therap.*, and PROC. SOC. EXP. BIOL. AND MED., 1925, xxii, 301.