bird unit was as follows: (1) 790 cc., (2) 500 cc., (3) 650 cc., (4) 415 cc., (5) 920 cc., (6) 650 cc. Average 652 cc. per bird unit.

Chicken Feces. For these studies rooster and capon feces were used. In each case 630 gm. of fresh feces were shaken with water acidified to 1% with sulfuric acid and allowed to stand several days before filtering. The filtrate was extracted in the same manner as the stallion urine.

The rooster feces extract was assayed on 3 birds and the amount of original feces required to give a bird unit was found to be (1) 84 gm., (2) 78 gm., (3) 70 gm. Average 77 gm. per bird unit.

The capon feces showed no growth effect even when the equivalent of 310 gm. of feces was injected subcutaneously into a single bird. When injected into the base of the comb the equivalent of 250 gm. produced growth of less than 3 mm. Since injection into the base of the comb is about 20 times as effective as intramuscular injection[1] it would appear that there is about one bird unit in 1000 gm. of the capon feces. The small amount of androgens in capon feces is surprising in view of the fact.that it is easily demonstrated in hen feces.[2] This divergence may be explained by the method of extraction, which in one case was specifically for the female hormone and in the other for the male hormone.

9486 P

A Vasopressor Phenomenon Following Intra-arterial Administration of Hypertonic Solutions.

HARRY A. DAVIS, ROBERT J. JERMSTAD AND ROGER M. CHOISSER.
(Introduced by Vincent du Vigneaud.)
From the Department of Pathology, The George Washington University.

The behavior of hypertonic solutions in the blood stream has been investigated both in normal[1-5] and in shocked animals.[6, 7] In all in-

1 Fussganger, *Med. Chem. (I. G. Farbenindustrie)*, Leverkusen, 1934, p. 194.
2 Domm, Gustavson, and Juhn, in Allen, *Sex and Internal Secretions*, p. 626.
1 Moritz, F., *Deutsch. Arch. Klin. Med.*, 1887, **41**, 395.
2 Weed, L. H., and McKibben, P. S., *Am. J. Physiol.*, 1919, **48**, 512, 531.
3 Keith, N. M., *Am. J. Physiol.*, 1924, **68**, 80.
4 Adolph, E. F., and Lepore, M. J., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 963.
5 Davis, H. A., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 242.
6 Erlanger, J., and Gasser, H. S., *Ann. Surg.*, 1919, **69**, 389.
7 Davis, H. A., PROC. SOC. EXP. BIOL. AND MED., 1936, **34**, 21.

stances there occurs a temporary blood dilution which is diminished in hemorrhagic shock[8] and increased in dehydration.[8] During an investigation of the local fluid loss resulting from trauma, a pressure phenomenon was noted following the injection of hypertonic electrolyte solutions into the arterial system. This study constitutes a preliminary report of this phenomenon with particular reference to its nature and basic mechanism.

Dogs weighing from 10 to 15 kg. were used. Nembutal was the basic anesthetic. The right and left femoral arteries and veins were exposed and, also, in several experiments, the brachial arteries. The arterial blood pressure was recorded from the carotid artery by the usual methods. The following solutions were utilized: (1) 25% sodium chloride solution; (2) 50% glucose solution; (3) 30% gum acacia dissolved in 0.9% sodium chloride solution; (4) 50% sucrose solution. The quantity of solution used in each experiment was 5 to 10 cc. A series of 20 experiments was performed.

The intraärterial injection of hypertonic solutions results in an elevation of the systolic blood pressure from 10 to 50 mm. Hg. above the initial level. The duration of this pressor response is from 1 to 3 hours or even longer. The effectiveness of the solutions varies. Sodium chloride solutions produced the most prolonged elevation of blood pressure, whereas solutions of gum acacia had little, if any, result. Control solutions of isotonic sodium chloride did not increase the blood pressure. Certain other local and general effects were noted during and following the administration of these hypertonic solutions. During the injection, the muscles of the extremity, whose arterial supply was being used, became tense and frequently contracted strongly. Weight experiments of the affected area before and after injection revealed a diminution in weight, which, it is suggested, results from a loss of tissue fluid by a process of osmosis. The respirations are at first greatly increased in rate and depth, but later become slow and regular in rhythm. The intravenous injection, in contrast to the intraärterial, produces a depression of the blood pressure with a return to the initial level within 3 to 5 minutes. If the blood pressure has been lowered previously from any cause, the depression following intravenous administration of the solution may reach a critical level.

Total section of the spinal cord in the region of the 12th dorsal segment completely abolished the pressor reaction. Following bilateral adrenalectomy, the pressor response to intraärterial hypertonic solutions took the form of a more gradual elevation of blood pressure

[8] Davis, H. A., PROC. SOC. EXP. BIOL. AND MED., 1934, **32**, 210.

which, however, was maintained. Division of the sciatic and femoral nerves of the affected area did not have any significant effect upon the pressor phenomenon. The vasodepressor effect of hypertonic solutions administered by the venous route was also studied. Bilateral vagotomy did not prevent the fall of blood pressure, suggesting the presence of other factors in this reaction. This investigation has not yet disclosed the nature of the factors involved.

The phenomenon of vasopression following the administration of hypertonic solutions of sodium chloride by the intraärterial route can be attributed to a stimulation of the peripheral nerve endings in the involved area with a resultant generalized vasoconstriction effected by the central nervous system. The degree of stimulation of the peripheral nerves of the extremity varies directly with the amount and hypertonicity of the solution used. In view of this fact, the demonstrable relationship between water metabolism and chronaxie of nerve[9] is interesting. The release of protein-containing tissue fluid from the extremity, resulting in an increase in the circulating blood volume, is of lesser importance, in spite of recorded losses in weight up to 100 gm. of areas studied in several experiments.

Summary. A prolonged elevation of blood pressure occurs after the intraärterial administration of hypertonic solutions of sodium chloride. This pressor effect appears to be predominantly nervous in origin, inasmuch as it disappears after section of the spinal cord.

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Treatment of Pneumococcal Infections in Rabbits with Sulfanilamide.

WILLIAM A. KREIDLER. (Introduced by H. A. Reimann.)

From the Department of Preventive Medicine and Bacteriology, Jefferson Medical College.

A number of studies have been made to show the curative effect of sulfanilamide in rats, mice, guinea pigs and rabbits, infected with pneumococci by various routes. Because of the difference of opinion concerning the efficacy of the drug in the treatment of infections caused by this microörganism, it was considered timely to investigate further its effects on controlled pneumococcal infection. For this

[9] Achelis, J. D., *Pflüger's Arch.*, 1930, **226**, 212.