

filtrates are used for both injections. In the rabbits injected with 10 cc. of 10% soluble starch solution, only 1 of 7 failed to react with hemorrhage. The literature of the subject shows that from 25 to 30% of rabbits die after the intravenous injection of bacterial filtrates. No deaths occurred after the intravenous injection of soluble starch.

7457 P

Rôle of Pressor Substances in Etiology of Arterial Hypertension.

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The theory that circulating substances play an etiological rôle in arterial hypertension has been revived recently by a series of studies carried on by Bohn and his associates.^{1, 2, 3} These investigators of the Volhard clinic have reported the finding of increased amounts of pressor substances in the urine and in the blood of patients with "pale hypertension" (Volhard). In view of the important implications of Bohn's conclusions, we have reinvestigated this problem.

Because of the fact that several hormones and chemical substances are present in greater concentration in the urine than in the blood, and because large amounts of urine are readily obtainable for maximum chemical concentration, we have studied particularly extracts of urine. Blood and chest, abdominal and cerebrospinal fluids were also tested, both before and after extraction. In order to ascertain the efficacy of the alcohol-acetone fractionation of pressor and depressor substances, we have tested biologically not only the alcohol but also the acetone fraction, whereas Bohn utilized only the former. Twenty-one subjects were studied, 8 of whom were normal, 7 had malignant hypertension, 2 benign hypertension, and 4 chronic glomerulonephritis with hypertension. Extraction of a number of 24-hour urine specimens on each subject was performed. A total of 120 extracts were repeatedly tested on 55 cats. Dial and amytal given intraperitoneally were used as anesthetics, but

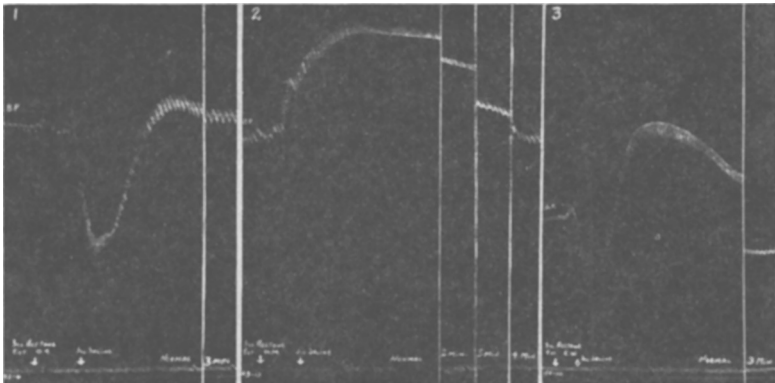
¹ Bohn, H., *Z. f. klin. Med.*, 1931, **119**, 100.

² Bohn, H., *Z. f. klin. Med.*, 1933, **123**, 558.

³ Bohn, H., *Verhandl. d. deutsch. Gesellsch. f. inn. Med.*, 1933, **45**, 182.

comparative observations were also made of the effect of identical extracts on animals anesthetized with ether, chloral hydrate and urethane. Care was taken to test the same extracts in different animals, as well as to test different extracts obtained from the same subject in the same animal.

A pressor effect of over 25 mm. Hg. was obtained in the majority of subjects tested, using an amount of urine extract equivalent to one-fifth of the total 24-hour amount. The injected volume was 6 cc. Pressor effects as high as 100 mm. Hg. and over, lasting at times over 20 minutes, were obtained from both alcohol and acetone fractions. The majority of high pressor effects were obtained from the urine of normal subjects. We were unable to confirm Bohn's observation that the type of curve is as important as the height for we have repeatedly observed pure pressor curves (curve type 3 of Bohn) from the extracts of urine of normal subjects. Only rarely has this been seen in the "pale hypertension" group.



Types of blood pressure curves obtained from acetone extract fraction of urines of normal subjects.

Tracing 1. Initial pressure 200 mm. Hg; maximal pressure 220 mm. Hg (Bohn type 1).

Tracing 2. Initial pressure 192 mm. Hg; maximal pressure 280 mm. Hg (Bohn type 3).

Tracing 3. Initial pressure 126 mm. Hg; maximal pressure 200 mm. Hg (Bohn type 2).

The form, height and duration of the blood pressure curves obtained were extremely variable and were found to depend, in part, on (1) unknown variations in the subjects from day to day; (2) variations, as yet unexplained, in the response to the same extract observed both in different cats, and in the same cat at different times; and (3) the rate of injection of the extract. The type of anesthesia used has produced only quantitative changes in the reaction of the

animals. No correlation was found between the responses obtained with the extracts and those obtained with epinephrin, pituitrin, saline, or by induction of the carotid sinus pressor reflex. Atropin has been found to abolish the depressor part of the curve but to have no effect upon the pressor portion. Control injections of saline at times induced a rise of as high as 30 mm. Hg for a period of one or 2 minutes' duration.

Nineteen blood extracts were made on as many patients, using both the Bohn and a modified technique. These patients included normal subjects and hypertensive subjects of the different types. Three extracts of ascitic fluid, chest fluid and spinal fluid were made, by a modified method, on 9 subjects, including both normals and hypertensives in each group of fluids. Using both the original fluid and the extract, we were unable to demonstrate any significant pressor effect. Similar results were obtained in the case of blood. Recently de Wesselow and Griffiths⁴ and Page⁵ were unable to demonstrate increased amounts of pressor substances in the blood of patients with arterial hypertension.

Our observations fail to confirm the claim of Bohn that increased amounts of circulating substances are responsible for "pale hypertension". The separation of pressor and depressor substances by the alcohol-acetone fractionation method proved to be impracticable.

7458 C

Effect of Heavy Water (deuterium oxide) on Viability of Mouse Sarcoma and Rat Carcinoma.

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It was clearly shown¹ that the proliferating capacity of the mouse sarcoma 180 and the mouse melanoma was unaffected by heavy water (14.8 and 40% H₂O) when it contained salts of Locke-Ringer solution in an isotonic amount.

⁴ de Wesselow, O. L. V. S., and Griffiths, W. J., *Brit. J. Exp. Path.*, 1934, **15**, 45.

⁵ Page, I. H., *Fishberg's Hypertension and Nephritis*, Lea and Febiger, Philadelphia, 1934, p. 230; and personal communication.

¹ Sugiura, K., and Chesley, L. C., *PROC. SOC. EXP. BIOL. AND MED.*, 1934, **31**, 659.