that administration of NE in shock prevented decreases in cardiac output, which occurred in the non-treated animals with the progression of shock. Caliva *et al.*(16) using an electropolarographic technic, observed that NE in early shock will restore normal myocardial oxygen levels. These investigators proposed that the prolonged survival period of NE-treated animals was due to a cardiotonic-like action of the hormone. In accordance with our results, the increased survival time may have arisen from the uptake of administered NE by the depleted myocardium. Replenishment of the adrenergic transmitter could have sustained cardiac contractility, thus preventing further decline in cardiac output. On the other hand, some laboratories have noted no change in the steady downhill course of NE-treated animals in hemorrhagic shock(17,18). The current disagreement on the therapeutic value of NE probably arises in comparing experimental results from animals in which NE was injected at different times during the course of shock. It is highly probable that the reported ineffectiveness of this catecholamine in prolonged shock is due to the entry of other factors responsible for its fatal outcome.

Summary. Analysis of NE and E in the left ventricle of 12 normal albino rabbits averaged 1.05 ± .13 and 0.14 ± .06 μg/g respectively. In 12 rabbits subjected to hemorrhagic hypotension for 3 hours at mean arterial blood pressures of 50 mm Hg, myocardial NE declined significantly to an average of 0.16 ± .05 μg/g ($P<.001$). Epinephrine levels in this group rose to an average of 0.24 ± .06 μg/g ($P<.01$). Injection of graded doses (500 to 25 μg/kg) of NE in hypotensive rabbits caused an elevation of myocardial NE in rough proportion to the dose administered and level in plasma.

1. Watts, D. T., Bragg, A. D., PROC. SOC. EXP. BIOL. AND MED., 1957, v96, 609.

2. Manger, W. M., Bollman, J. L., Maher, F. T., Berkson, J., *Am. J. Physiol.*, 1957, v190, 310.

3. Glaviano, V. V., Bass, N., Nykiel, F., *Circulation Res.*, 1960, v8, 564.

4. Nykiel, F., Glaviano, V. V., *J. Appl. Physiol.*, 1961, v16, 348.

5. Raab, W., *Am. J. Cardiology*, 1960, v5, 571.

6. Sarnoff, S. J., *ibid.*, 1960, v5, 579.

7. Price, H. L., Price, M. L., *J. Lab. and Clin. Med.*, 1957, v50, 769.

8. Raab, W., Gigee, A. B., *Circulation Res.*, 1955, v3, 553.

9. Mayer, S. E., Moran, N. C., *J. Pharm. and Exp. Therap.*, 1960, v129, 271.

10. Ward, D. R., Kottegoda, S. R., Krayer, O., *ibid.*, 1958, v124, 340.

11. Lee, W. C., Shideman, F. E., *Science*, 1959, v129, 967.

12. Wiggers, C. J., *Am. Heart J.*, 1947, v33, 633.

13. Gilmore, J. P., Smythe, C. M., Handford, S. W., *J. Clin. Invest.*, 1954, v33, 884.

14. Fozzard, H. A., Gilmore, J. P., *Am. J. Physiol.*, 1959, v196, 1029.

15. Lansing, A. M., Stevenson, J. A. F., *ibid.*, 1958, v193, 289.

16. Caliva, F. S., Napodano, R., Zurek, R., Pombo, T., Lyons, R. H., *Am. J. Med. Sci.*, 1959, v238, 308.

17. Frank, E. D., Frank, H. A., Jacob, S., Weizel, A. E., Korman, H., Fine, J., *Am. J. Physiol.*, 1956, v186, 74.

18. Hackel, D. B., PROC. SOC. EXP. BIOL. AND MED., 1960, v103, 780.

Received May 8, 1961. P.S.E.B.M., 1961, v107.

Antigenicity of Short Ragweed Pollen for White Mice.* (26747)

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In the course of our early studies on enhancement of anaphylactic sensitivity by *Bordetella pertussis* it was found that proteins differed in their ability to sensitize(1-4). Included in the group was extract of

* Supported by grant from N.I.H., U.S.P.H.S.

TABLE 1. Effect of *B. pertussis* on Sensitization by Short Ragweed Pollen.

Challenge dose		Sensitizing dose						
Ragweed	Day	Control	*B. pertussis*	WSR 5 mg	*B. pertussis* 0.5 ml 10% aq.	*B. pertussis* 5 mg WSR	*B. pertussis* 5 mg WSR	Adjuvant 5 mg WSR
0.4 ml 10% aq.	4	0/4	0/11					
5 mg WSR	5	0/10	0/10					
			↓					
0.1 ml 10% aq.	10		↓		0/16			
5 mg WSR			reinject	0/10			1/10	
			↓	↓			↓	
5 mg WSR	15		0/10	reinject			reinject	
			↓	↓			↓	
Idem	17		reinject	0/10		3/10	8/9	2/10
			↓					
"	22		0/10					

Ambrosia elator pollen, the short ragweed, which was found to be of limited antigenicity by us(5) as well as by Bukantz and Johnson (6). The recent literature(7,8) has indicated, however, that extracts of this and other pollens are capable of exciting an endotoxic-like effect in the pertussis-treated mouse. Since previous observations failed to indicate such an action, the question of the antigenicity of short ragweed pollen extract was reconsidered.

Materials and methods. Swiss-Webster female mice weighing about 20 g at start of the experiment were inoculated intraperitoneally with 0.5 ml of pertussis vaccine containing about 6×10^9 phase I organisms. Two preparations of short ragweed pollen were employed; a 10% (w/v) aqueous extract (AE) or the WSR fraction prepared according to the method of Sehon *et al.*(9). Technics consisted of incorporating AE or WSR together with the pertussis vaccine in the initial inoculation followed by an intravenous challenge by the homologous allergen on the 10th and/or a subsequent day following sensitization. In addition, sensitization by WSR alone and in Freund's complete adjuvant(10) was attempted. Finally, the effect of WSR in mice previously treated with pertussis vaccine was noted.

Results. The following observations which are apparent from the data in Table I were made: 1. Neither AE nor WSR was lethal to mice previously untreated. 2. Neither AE nor WSR was lethal to mice treated 4 or 5 days previously with *B. pertussis*. A subsequent inoculation with WSR was also without effect. 3. Repeated injections of WSR into mice on the 5th, 15th, and 22nd day subsequent to *B. pertussis* failed to be lethal. 4. Incorporation of AE or WSR into the initial sensitizing dose of *B. pertussis* failed to enhance anaphylactic sensitivity when the subsequent challenge was made on the 10th day, death being the criterion. With challenge by WSR on the 17th day subsequent to pertussis-inoculation, 3/10 deaths were noted. This compares with 2/10 deaths obtained on the 17th day by challenge of Freund's adjuvant-treated mice. 5. A striking secondary response was observed when mice were challenged with WSR on day 10 (1/10 deaths) and rechallenged on day 17 (8/9 deaths) following sensitization with pertussis-WSR.

Discussion. In agreement with previously unreported results(5,6) the aqueous extract of short ragweed pollen was found to be a poor antigen for mice since no enhancement of anaphylactic sensitivity was obtained by using the pertussis-technic(1). The WSR fraction was also shown to be relatively devoid of antigenic action. However, as has been observed for other systems, a striking secondary response is apparent following a repeated challenge. The relationship of circulating antibody to anaphylaxis is under study.

Contrary to the observations of Kind(7,8) for short ragweed and other pollens no endotoxic-like responses were obtained in the mouse previously treated with *B. pertussis*.

Although it is known that mice so treated show an enhanced susceptibility to many pharmacological agents, histamine, serotonin, Proteose-Peptone, etc., the mechanism involved in probably specific; for other agents, compound 48/80, epinephrine, Bacto-Peptone, etc., are without effect.

Summary. Short ragweed pollen extract is shown to be a poor antigen for mice even with recourse to the pertussis-technic. A subsequent challenge dose demonstrates a striking secondary response. Extracts fail to display any lethal effects in mice previously treated with *B. pertussis*.

1. Malkiel, S., Hargis, B. J., PROC. SOC. EXP. BIOL. AND MED., 1952, v80, 122.

2. ———, *ibid.*, 1952, v81, 109.

3. Malkiel, S., Hargis, B. J., Feinberg, S. M., *J. Immunol.*, 1953, v71, 311.

4. Malkiel, S., PROC. SOC. EXP. BIOL. AND MED., 1957, v95, 133.

5. ———, unpublished results.

6. Bukantz, S. C., Johnson, M. C., unpublished results.

7. Kind, L. S., Roesner, L., PROC. SOC. EXP. BIOL. AND MED., 1959, v100, 808.

8. ———, *J. Immunol.*, 1960, v84, 390.

9. Sehon, A. H., Richter, M., Harter, J. G., *J. Allergy*, 1956, v27, 236.

10. Freund, J., McDermott, K., PROC. SOC. EXP. BIOL. AND MED., 1942, v49, 548.

Received May 15, 1961. P.S.E.B.M., 1961, v107.

Precipitating Antibody in Normal Human Urine.* (26748)

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Agglutinating antibody has been demonstrated in human urine against several organisms(1-5). Significant amounts of globulins have been found in normal human urine, and some of them were shown to be immunologically and electrophoretically similar to those of the serum(6-10). The present paper reports the demonstration of precipitating antibodies in normal urine.

Materials and methods. Patients. Two groups of patients with normal blood urea nitrogen and urine that was free of protein by the sulfosalicylic acid test were chosen for these studies. In the first group, 4 patients who gave a negative Schick test but whose serum failed to react with diphtheria toxoid were injected with 1.0 ml of purified diphtheria toxoid‡ subcutaneously; specimens of serum and 24-hour collections of urine were obtained at the end of the second and third weeks after the vaccination. The second group consisted of 11 patients convalescing from pneumococcal pneumonia; serums from these patients were tested for precipitins using as antigen the supernatant of a 5-day culture of the pneumococcus isolated from their own sputum or blood. Urine was collected over a period of 48 hours from each of those patients whose serum gave a precipitate in the ring test.

Urine. The urines were collected in clean containers without preservative. Each specimen was filtered through Whatman #12 filter paper and the filtrate was dialysed against running tap water at 4°C for 24-48 hours. Comparisons were first made of the efficacy of several concentration procedures which included: evaporation under negative pressure, pervaporation at 4°C and at room temperature, ultrafiltration(11), ammonium sulfate precipitation(10), and lyophilization. The following method was chosen as the most efficient for the purpose at hand: Immediately following dialysis the urines were concentrated at room temperature by pervapora-

* Aided by a grant from Nat. Inst. Health.

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‡ 50 Lf units/ml; obtained from Div. of Biological Labs., Mass. Dept. Public Health.