of testosterone all continued to show considerable growth between the second and third days. This protracted action would indicate that the esters are the more practical compounds for clinical use.

Summary. Androsterone, testosterone, testosterone propionate, testosterone propionate oxime, testosterone oxime, and androstenediol have been compared in regard to their effect on the combs of capons.

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Active Sensitization of White Mice.

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According to the only known studies dealing specifically with active anaphylaxis in mice,[1, 2, 3] a certain number of mice given a single prior injection of horse serum may be expected to show anaphylactic reactions when reinjected after the usual incubation period, but a higher proportion of the animals will react if 2 sensitizing injections have been made. In an attempt to attain the maximum degree of sensitivity, we gave different groups of normal mice, one 2, 3, or 4 intraperitoneal or intravenous doses of horse serum or egg white. The mice were then tested for sensitivity by the intravenous or intraperitoneal injection of the appropriate antigen at varying intervals after the last sensitizing dose, but usually after 12-21 days.

The results observed with mice sensitized to horse serum and tested by intravenous doses ranging between 0.5 cc. and 1.5 cc. are summarized in Table I. The effect of repeated sensitizing injections in increasing the liability to severe anaphylactic reactions seems clearly indicated. Only in groups of mice that received 3 or 4 antigen doses prior to the shocking dose were reactions observed in all the animals, and the best results were obtained with mice given 4 sensitizing inoculations. Severe or fatal reactions occurred in only about 40% of mice sensitized by 2 injections, but this percentage increased to 89% in the mice sensitized by 4 injections. In the latter group occurred the highest proportion of deaths (48%).

1 Braun, H., *Munchener med. Wochenschr.*, 1909, **37**, 1880; *Z. f. Immunitats.*, 1910, **4**, 590.

2 Ritz, H., *Z. f. Immunitats.*, 1911, **9**, 321.

3 Von Sarnowski, *Z. f. Immunitats.*, 1913, **17**, 577.

TABLE I.

Effect of Repeated Sensitizing Injections on Anaphylactic Reactions in White Mice.*

Sensitizing injections (horse serum)		Days incubation	Total inoculated	Anaphylactic reactions						No. symptoms	
				Fatal		Severe		Mild			
No.	Amt. and route			No.	(%)	No.	(%)	No.	(%)	No.	(%)
One	0.5cc. i.p.	21	6					1	(17)	5	(83)
	0.5cc. i.v.	23	6	1	(17)	1	(17)			4	(66)
Two	0.3cc. i.p. 0.5cc. i.p. in 5 days	9-21	23	7	(30)	2	(9)	10	(44)	4	(17)
	0.5cc. i.v. 0.5cc. i.v. in 5 days	14	17	2	(11)	5	(30)	9	(53)	1	(6)
	0.5cc. i.p. 1-2cc. i.v. in 21 days	13	13	4	(31)	2	(15)	5	(39)	2	(15)
Three	0.3cc. i.p. 0.5cc. i.p. 0.5cc. i.v. 5 days apart	14-23	18	1	(6)	8	(44)	9	(50)		
	0.5cc. i.v. 0.5cc. i.v. in 4 days 1-2cc. i.v. in 14 days	31-38	17	5	(29)	4	(24)	7	(41)	1	(6)
Four	0.5cc. i.p. 0.5cc. i.p. 0.3cc. i.p. 0.1cc. i.p. 5 days apart	12-16	27	13	(48)	11	(41)	3	(11)		

*All mice tested for sensitivity by intravenous injections of from 0.5cc. to 1.5cc. horse serum

Intravenous and intraperitoneal injections apparently sensitized equally well.

Essentially similar results were obtained with mice sensitized to egg white.

Sensitivity was demonstrated as early as the 9th day, and was shown to persist at least as late as the 40th day, after the last of 2 or more sensitizing injections. Neither the number nor the severity of reactions was apparently influenced by varying the incubation period between the 12th and the 23rd day.

In agreement with the early reports[2, 3] it was found that intraperitoneal injection of the test dose of antigen usually produced no symptoms at all (Table II), although occasionally a typical fatal shock was observed. Intravenous injection of the shock test dose, on the other hand, regularly caused some degree of reaction in mice that were sufficiently sensitized. These inoculations were made into a tail vein, and the typical anaphylactic reactions appeared only

when the injection was well done, so that the entire inoculum was introduced rapidly into the circulation.

From the data presented in Table II it is evident that the degree of sensitization of the animals was a more important factor in determining the severity of the reactions than the size of the intravenous shocking dose. The highest percentage of severe illness occurred among those mice sensitized by 4 intraperitoneal injections and tested by an intravenous dose of from 0.5 cc. to 1.0 cc. Of the 30 mice so treated 15 (50%) died, 12 (40%) were made severely ill, and the remaining 10% showed mild but definite reactions. All of the 18 mice within this group which were given the 1.0 cc. test dose had severe reactions, and 61% of them died in acute shock.

TABLE II.

Effect of Size of Shocking Dose and Route of Injection on Anaphylactic Reactions in White Mice.

Number of previous injections	Shocking dose cc.	route	Total inoculated	Anaphylactic reactions: Fatal No.	(%)	Severe No.	(%)	Mild No.	(%)	No. symptoms No.	(%)
1	0.5	i.v.	2							2	(100)
	1.0	"	6	1	(17)	1	(17)			4	(66)
	1.5	"	4					1	(25)	3	(75)
	2.0	"	6							6	(100)
	1-3.5	i.p.	10							10	(100)
2	0.3-0.5	i.v.	11	1	(9)	1	(9)	5	(46)	4	(36)
	1.0	"	16	3	(19)	2	(13)	10	(62)	1	(6)
	1.5	"	26	9	(35)	6	(23)	9	(35)	2	(7)
	2.0	"	2					2	(100)		
	1-3.0	i.p.	30	1	(3)			7	(23)	22	(74)
3	0.3-0.5	i.v.	9			5	(56)	3	(33)	1	(11)
	1.0	"	30	7	(23)	8	(27)	15	(50)		
4	0.05	"	4	1	(25)			3	(75)		
	0.1	"	5					5	(100)		
	0.2	"	5					5	(100)		
	0.3	"	5	2	(40)	1	(20)	2	(40)		
	0.4	"	8	3	(38)	4	(50)	1	(12)		
	0.5	"	8	4	(50)	2	(25)	2	(25)		
	0.7	"	4			3	(75)	1	(25)		
	1.0	"	18	11	(61)	7	(39)				
	1.5	"	2	1	(50)			1	(50)		
	0.5-1.5	i.p.	12					2	(17)	10	(83)

These results apparently represent the best that may be expected with mice, at least with the procedures used. Fatal anaphylactic shock is evidently not surely predictable with any test dose, but the great majority of fully sensitized mice will show a characteristic severe illnes on the intravenous injection of the antigen.

The reactions in the sensitized mice were shown to be specific, and truly anaphylactic in nature, by numerous control experiments.