

chicks. Of 2140 eggs washed with permanganate (average hatch 66%) no infections were noted during 4-6 weeks. However, as soon as these chicks came into contact with existing flocks, the disease spread rapidly among them. When chicks hatched under the same conditions were kept away from infected stock they developed without infection.

10. A total of 26,636 eggs washed with permanganate and sulphite gave an average hatch of 69.1%, showing that treatment has no damaging effect on eggs.

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Comparative Effects of Horse Serum, Horse Serum Albumin and Horse Serum Globulin in Experimental Shock.*

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Previous reports have been made regarding the effects of the intravenous administration of bovine serum albumin to man¹ and to lower animals.² The present communication is concerned with the intravenous use of horse serum, horse serum albumin, and horse serum globulin as blood replacement fluids in experimental shock.

Materials. Normal horse serum from healthy horses was used. The albumin and globulin fractions were separated from the horse serum by the method which we have described previously.¹ From analysis, the whole serum contained 9.2 g % of total proteins, 4.0 g % of albumin and 5.2 g % of globulin. After separation, the horse serum albumin solution contained, from analysis, 3.7 g % of albumin. The serum globulin solution contained 5.4 g % of globulin. The experimental animals were healthy dogs weighing from 3.2 kg to 6.8 kg.

* Since the completion of this investigation on bovine and horse serum albumin, our attention has been drawn to two preliminary reports of work along similar lines. No details of methods used or data are given in these reports.^{3,4}

¹ Davis, H. A., Eaton, A. G., and Williamson, J., *Proc. Soc. Exp. Biol. and Med.*, 1942, **49**, 96.

² Davis, H. A., Eaton, A. G., *Proc. Soc. Exp. Biol. and Med.*, 1942, **49**, 20.

³ Janeway, C. A., and Beeson, P. B., *J. Clin. Invest.*, 1941, **20**, 435.

⁴ Keys, A., Taylor, H. L., and Savage, G. M., *J. A. M. A.*, 1941, **117**, 62.

Methods. Light ether anesthesia was used in all of these experiments. The blood pressure was recorded in the usual manner from a cannula inserted into the right carotid artery. Shock was produced by graded hemorrhage from the carotid artery. The sera were administered by gravity through a cannula inserted into the right femoral vein in amounts equal to the quantity of blood removed from each animal. No preliminary cross-matching of the sera with the blood of the prospective recipient animal was carried out.

Results. Whole Serum. The intravenous administration of whole horse serum caused a rise in blood pressure of dogs subjected to severe hemorrhage. The rise in blood pressure was maintained and all of the animals recovered (Table I). Mild temporary dyspnoea was observed in these animals during and for a short time following the injection.

Serum Globulin. Serum globulin solutions caused marked dyspnoea in all of the animals. One animal died 12 hours after the injection. At autopsy, the tissues of this animal revealed subcutaneous, subserosal, subpleural, subepicardial and subendocardial hemorrhages. The liver was congested and the spleen was contracted. The remaining animals, which survived, were noticeably sick and listless for several days. The rise in blood pressure following the injection of serum globulin solutions was not as pronounced as that following the injection of whole serum or serum albumin solutions (Table I).

TABLE I.
Comparative Effects of Horse Serum, Horse Serum Globulin and Horse Serum Albumin in Shock.

Dog wt, kg	C.B.V., cc	Amt. blood removed, cc	Solution inj., cc	Blood pressure			Result
				Initial mm Hg	After hemorrhage mm Hg	After inj. mm Hg	
			H.S.*				
4.4	396	180	180	130	30	140	Mild dyspnea, recovery
4.8	432	185	185	110	17	108	" " "
6.0	540	235	235	155	25	150	" " "
			H.S. globulin				
5.2	468	195	195	120	23	93	Severe " "
3.6	324	165	170	155	35	120	" " "
5.6	504	220	220	150	35	115	" " "
4.4	396	185	185	170	40	120	Death 12 hrs later
			H.S. albumin				
6.8	612	210	205	140	20	130	No dyspnea, recovery
3.2	288	100	100	137	50	135	" " "
4.0	360	150	150	135	40	110	" " "
4.8	432	185	185	152	30	150	" " "
3.8	342	110	110	100	26	80	" " "
4.2	378	190	190	140	30	138	" " "

*Horse serum.

Serum Albumin. The intravenous injection of serum albumin solutions resulted in a rise of blood pressure to almost the initial level. The rise in blood pressure was maintained and all of the animals recovered without after-effects (Table I). No dyspnoea or other anaphylactic phenomena were observed in this group of animals.

Discussion. It would appear that normal horse serum is less toxic to dogs than is bovine serum.² The toxic effects following the injection of horse serum globulin are similar to those observed with bovine serum globulin.² Horse serum albumin, like bovine serum albumin, does not appear to be toxic to dogs, inasmuch as it is able to raise and maintain the blood pressure of dogs subjected to severe hemorrhage. In these experiments the concentration of serum globulin was approximately the same in the whole serum and in the globulin solution obtained after separation. Despite this fact, serum globulin was more toxic when injected alone than when administered with the other constituents of whole serum. This suggests the possibility that some substance in whole horse serum, *e. g.*, serum albumin, tends to diminish the toxicity of the globulin when whole horse serum is injected.

Summary. Horse serum albumin solution is effective in raising and maintaining the blood pressures of dogs subjected to severe hemorrhage. Equally effective is whole serum from the horse. However, horse serum globulin solution is much less effective in this respect and appears to be more toxic.

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The Pubertal Increase in Response of Accessory Sex Organs to Steroid Hormones.*

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The fact that age plays an important rôle in determining the response of the accessory sex organs to stimulation by testoid (or "androgenic") compounds has previously been emphasized on the basis of experiments on female rats. It could be shown that testoi-

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