TABLE I.

	No. of recoveries	No. of deaths	% recoveries
After 30 min. period of 50 mm hypotension			
No infusion	1	9	10
Ringer's sol.	5	2	71
Pectin "	8	5	61
After 60 min. period of 50 mm hypotension			
Ringer's sol.	4	2	67
Pectin "	3	8	27
After 90 min. period of 50 mm hypotension			
Ringer's sol.	0	3	0

mately 30 minutes. Supplementary subcutaneous injections of saline do not appear to extend the time of effectiveness. The dogs which survived showed no ill effects from a possible retention of a foreign colloid in the body, nor were gross evidences of organic disturbances seen at autopsy.

3. Pectin solutions seem to have no advantage over simple saline solutions; indeed, the latter act more favorably when administered after a 60-minute period of 50 mm Hg. hypotension.

These results, contrary to general belief, suggest that after severe hemorrhage the introduction of salt ions may be more important than the injection of foreign colloids. The reasons for this remain obscure. However, saline solutions lose their effectiveness after the deleterious effects of prolonged hemorrhage—in 3 cases 90 minutes of 50 mm Hg.—have become operative. This again stresses the fact that saline solutions must be used promptly after severe hemorrhage in order to exert any beneficial effects.

Summary. Results on 50 dogs submitted to variable periods of 50 mm Hg. post-hemorrhagic hypotension confirm the conclusions of Middleton and Wiggers[1] that infusions of pectin solutions do not materially increase the chance of recovery unless they are given during an interval which does not exceed 30 minutes of such hypotension. They extend these observations in showing that these beneficial effects are certainly no better than those achieved by administration of simple saline solutions. Finally, they once more stress the fact that the latter are not wholly useless provided they are administered before deleterious effects of prolonged hypotension become operative.

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The Antithyroidal Substances of the Blood and Vitamin A.

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An extensive literature has appeared which has confirmed the findings of Anselmino and Hoffmann[1] concerning the ether-soluble substances of the blood which have a pronounced antithyroidal effect and also are effective in animal experiments, as well as in the treatment of hyperthyroidism.

The present investigation was undertaken in order to determine the relationship of these ether-soluble substances of the blood to vitamin A. This question seemed important to us, since by animal experiments it had been previously demonstrated by one of us,[2] that vitamin A has a strong antithyroidal effect.

The comprehensive literature on the antithyroidal effect of vitamin A includes papers

1 Anselmino, K. J., and Hoffmann, F., *Klin. Wchnschr.*, 1933, **12**, 99.

2 Fellinger, K., and Hochstädt, O., *Wien. klin. Wchnschr.*, 1936, **49**, 1339.

TABLE I.
Relation of Extraction Time to Vitamin A Content and Antithyroidal Potency.

Time of extraction	1 hr.	2 hr	5 hr	15 hr
Vit. A content of ether-extr.	414 units/60 ml blood	No vit. A	No vit. A	No vit. A
Potency of antithyroidal substance of ether-extr.	No antithyroidal effect	No effect	Slight effect	Strong effect

by Abelin,[3] von Euler and Klussmann,[4] Schneider,[5] Falta,[6] Fleischmann and Kann,[7] Wendt[8] and others. Because this literature has undoubtedly shown the antithyroidal effect of vitamin A, its relationship to the antithyroidal substances of the blood was questioned since both must be removed from the blood simultaneously during ether-extraction. We therefore assayed the antithyroidal extract for its vitamin-A content and determined whether the antithyroidal effect may be caused or increased by the presence of vitamin A.

Methods. Blood from normal individuals, with no thyroidal disturbance was extracted in the Soxhlet with ether for varying lengths of time. The extract was distilled under reduced pressure to remove the solvent and the residue was dissolved in Wesson oil. This solution was assayed spectroscopically for its vitamin-A content.* The antithyroidal effect of the extract was determined by the method of Fellinger and Hochstädt,[9] a modification of the Reid Hunt technic.[10] In this modification thyroxin, which increases the resistance of white mice to acetonitril-poisoning quite markedly, is bound by the antithyroidal substances. Thus, the mice, no longer protected, succumb to the acetonitril.

Results. In our first experiments, blood was extracted with ether for 15 hours or longer. The extract always showed a strong antithyroidal effect on white mice, but vitamin A could not be demonstrated in any of the extracts. In successive series of experiments, it was found that after as little as 2 hours of extraction, there was no demonstrable vitamin A in the extracts. A moderate amount of vitamin A could be demonstrated only in experiments in which the extraction did not exceed one hour. In Experiment 6, for example, 60 ml of blood was extracted for 55 minutes and the extract contained approximately only 414 units of vitamin A. The normal average vitamin-A content of this quantity of blood should be about 4000 units. No vitamin A could be demonstrated in the residue of blood after extraction. Moreover, hardly any antithyroidal effect could be demonstrated after one hour of extraction.

Table I shows the relation between the extraction-time, the vitamin-A content and the antithyroidal content of the ether-extract.

Discussion. In review, we can say that the antithyroidal substances of the blood do not contain vitamin A. The antithyroidal substances were obtained by hours of extraction in the Soxhlet, a method in which the vitamin A is completely destroyed. Since we know that the destruction of vitamin A occurs in the presence of oxygen, we have to assume, that, in our procedure, the destruction of the vitamin A is accomplished rather rapidly in the receiving flask. Another possibility for the rapid destruction of vitamin A is the fact that this vitamin becomes more susceptible to oxidation when removed from the anti-oxidants which are present in the blood. We also found a strong antithyroidal effect of the ether-extract after 15 hours of extraction, a slight antithyroidal effect after 5 hours and no effect after less than 5 hours of extraction.

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[10] Hunt, R., *Am. J. Physiol.*, 1922-23, **63**, 257.