

scale⁵ is far at the end of the scale near O₂ itself. NaNO₂ on addition to oxyhemoglobin still gives a weak band at 576 mμ, indicating that only a certain proportion of the oxyhemoglobin has been changed to methemoglobin. The methylene blue system is a weak oxidant located almost at neutrality in the pH-Eh oxidation-reduction scale.

10324 P

Growth of Small Numbers of Acid-fast Bacteria in Blood and in Serum.*

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The survival or growth of tubercle bacilli in blood is an important question from several points of view: the immunological action of serum and leucocytes, the investigation of tuberculous bacillemia, and the suitability of blood as a culture medium. Some investigators have emphasized the unfavorable action of blood on the growth of tubercle bacilli on solid media, while others have reported the growth of these organisms in blood. These points of view were reconciled when it was learned that the influence of blood in the two situations is quite different. This note indicates that, although blood interferes with the growth of tubercle bacilli on a solid substrate, it is actually an excellent medium.

Saline, defibrinated rabbit blood, or serum, .45 cc, were mixed with .05 cc volumes of 4 decimal dilutions of "clump-free" suspensions of human, bovine, avian, and timothy bacilli in 10 x 75 mm Pyrex tubes. Of these mixtures .05 cc was spread evenly on each of two slants of Corper's egg-yolk medium (in screw-capped tubes) which were free of surface moisture. The small tubes containing the mixtures were sealed with paraffined corks; both solid and liquid mediums were incubated with their surfaces horizontal.

From the results in Table I, several conclusions may be drawn: (a) Rabbit blood and serum were as favorable as the solid medium, with two exceptions: the irregular growth of bovine bacilli in blood,

⁵ Clark, W. M., *Studies on Oxidation-Reduction*.

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TABLE I.

Culture	Growth on Corper's medium inoculated with mixtures from:										Growth in rabbit serum and blood									
	saline	serum pooled	bloods*								serum pooled	bloods*								
			1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
H-37 (human)	++ 21 1	++ 30 —	4	9	1	3	1	7	3	—	+	+	+	+	+	+	+	+	+	
R.S. (bovine)	31 9 1	40 11 —	—	—	1	2	—	1	—	3	+	+	+	+	+	+	+	+	—	
A-12 (avian)	++ 23 —	++ 18 2	16	40	16	24	38	29	40	12	+	+	+	+	+	+	+	+	+	
No. 581 (timothy)	++ 13 9	++ 18 1	++	++	++	—	—	—	—	—	+	+	+	+	—	+	+	+	+	

*Each small column represents blood from a different rabbit. The results in solid medium show colony-counts from 0.1 cc (2 tubes); ++ means more than 50 colonies. In liquid media, + means growth, checked by staining. Only the 3 highest dilutions could be shown. The growth of timothy bacilli in rabbit serum was delayed.

and the delayed growth of timothy bacilli in serum. (b) There was no evidence of the growth-inhibitory effects hitherto ascribed to hemoglobin or to "autolytic products" of blood. (c) The failure of tubercle bacilli to grow suitably on solid medium inoculated with blood was again confirmed. Positive results cannot be obtained with small numbers of bacilli.

Since these results were confirmed by quantitative studies on human tubercle bacilli in human blood, it seems that the surest way to demonstrate bacilli in human blood is by the incubation of the blood.

Growth of small numbers of bacilli was obtained also in liquid substrates composed of: serum-leucocyte mixtures, blood or serum diluted with water or with Long's medium, in polymorphonuclear leucocytes and saline, and in the washed cellular fraction of blood suspended in saline or dilute Long's medium. The more dilute systems appear equally favorable for growth and offer the advantages of economy of materials and greater ease in seeing the growth.

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Intra-Arterial Hypertonic Saline Solution in Experimental Shock.

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Davis and his coworkers^{1, 2} have reported prolonged elevation of blood pressure after intra-arterial administration of 5 to 10 cc of 25% solution of sodium chloride. The pressor effect of such injections was thought by these workers to be predominantly nervous in origin, since it disappeared after section of the spinal cord. The possibility of using hypertonic solutions of sodium chloride as an emergency treatment of traumatic shock was suggested. The experiments reported in this paper were done to determine the efficacy of such treatment.

The experiments were carried out on dogs anesthetized by means of nembutal (pentobarbital sodium), given intravenously in doses

¹ Davis, H. A., *M. Ann. District of Columbia*, 1937, **6**, 344.

² Davis, H. A., Jermstad, R. J., and Choisser, R. M., *PROC. SOC. EXP. BIOL. AND MED.*, 1937, **37**, 144.