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Oxygen Absorption Through Skin. Effect Upon the Vascular Reaction to Stasis and to Histamine.

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The cyanosis which develops in an arm with the circulation totally or partially occluded, may fail to appear when the part is surrounded by an atmosphere of oxygen. The skin of the forearm is usually maintained free of cyanosis under these conditions, while the fingers especially and the hand are quite refractory. This investigation, suggested by the work of Shaw and his coworkers,¹ is quite consistent with their finding that oxygen is absorbed by the skin. However, contrary to the interpretation which they place upon their work, we must conclude that, under the conditions of our experiments, the oxygen finds its way into the blood of those vessels which give color to the skin.

The reactive hyperemia, which invariably appears upon the release of a circulatory occlusion of an arm in air or nitrogen, is absent in an arm which has been in an atmosphere of oxygen during the period of circulatory arrest, except in those parts which were cyanosed or "dusky" before the release, *i. e.*, the fingers and hand. The oxygen, therefore, would seem to prevent the dilatation of the skin vessels which prevails in an arm with arrested circulation.

The failure to obtain a reactive hyperemia under these conditions was examined in the light of the hypothesis of Lewis,² which ascribes the control of the small vessels of the skin to an "H" substance, a normal metabolite, the identity of which with histamine Lewis believes to be established by a wealth of convincing evidence.

The findings here recorded would seem to indicate that either histamine is not produced or it is destroyed under prevailing conditions. The idea as developed by Lewis precludes the first possibility, since if one assumes that dilatation of the small vessels of the skin under a variety of physiological conditions is due to the "H" substance, one must of necessity, as indeed Lewis does, postulate that the substance is a normal skin constituent, present in but small amounts normally, but piling up when the circulation is arrested.

¹ Shaw, L. A., Messer, A. C., and Weiss, Soma, *Am. J. Phys.*, 1929, **90**, 107. Shaw, L. A., and Messer, A. C., *Am. J. Phys.*, 1930, **95**, 13; 1931, **98**, 93.

² Lewis, Thomas, "The Blood Vessels of the Human Skin and Their Responses." London, 1927.

As to the second possibility, a destruction of the histamine by the high oxygen tension, it might be expected, if this were the explanation of our findings, that there would be a diminution or failure of the histamine reaction to develop when histamine is introduced intradermally into an arm in oxygen. On the contrary, the reaction is obtained even in very high dilutions. Indeed, under these conditions one observes a well-defined flare, a fact also incompatible with Lewis' belief that this part of the "triple reaction" of histamine is exclusively a reflex arteriolar dilatation.

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Effect of Salt Concentration on the Colorimetric Phosphorus Determination.

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In studies involving the fractionation of blood phosphate compounds by means of hydrolysis with N HCl certain difficulties were encountered in the determination of the resulting orthophosphate by Kuttner's colorimetric procedure.¹ The results were usually too low, and analyses of known quantities of P under similar conditions likewise gave values below those expected. Although inclined to attribute our difficulties to the losses of HCl during hydrolysis, we had the same trouble even when we prevented such alterations in concentration. We had no more trouble when we substituted N H₂SO₄ for the N HCl. Our analyses on known quantities of P were also entirely satisfactory when H₂SO₄ instead of HCl was used for the hydrolysis. This led us to investigate the probable influence of different salts in high concentration on the orthophosphate values determined by the Kuttner method. We discovered subsequently that Rimington² had already pointed out the effect which the concentration of various salts used as anticoagulants may exert upon the quantitative determination of P in blood by Brigg's procedure. We, nevertheless, present these results to call attention once more to this important matter, and thus save other investigators the time and trouble it has cost us to find out this simple

¹ Kuttner, Th., and Cohen, H. R., *J. Biol. Chem.*, 1927, **75**, 517.

² Rimington, C., *Biochem. J.*, 1924, **18**, 1297.