

are similar to those described for angioneurotic edema in man: edema of the face, lips, buccal cavity associated with vestibular crisis or other neurologic manifestations. Another similarity is the abrupt appearance of the symptoms and their sudden disappearance.

Summary. In the rat a single intravenous or intraperitoneal injection of egg white elicits a reaction characterized by hyperemia, followed by edema of the face, tongue and paws. Although only these regions respond,

they are not necessarily affected to an equal extent. Continued injections of the same dose produce variable reactions in the same animals but there is no acquired tolerance. Age does not play a great influence, but females seem less sensitive than males.

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Cholinesterase Content of Erythrocytes in Normal and Pathological States.

I. Content in Normal Humans.*

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(Introduced by E. B. Carmichael.)

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Several investigators have recently recently reported changes in plasma, or whole blood cholinesterase content in anemias and leukemia. Values reported were expressed in terms of cholinesterase activity per volume of sample. Sabine¹ has calculated the cholinesterase content per cc of red cells but was unable to secure accurate values by direct measurement.

The red cells contain only specific cholinesterase and none of the nonspecific type found in plasma or serum. It is unlikely, therefore, that the cholinesterase in the red cells is derived from the circulating plasma, but, more probably, their esterase content is produced by the tissues from which they are derived or with which they are closely associated. Any change of esterase content per cell may be important, therefore, in reflecting the activity of the reticulo-endothelial elements of bone-marrow. The production of the esterase by the red cell itself cannot at this time be excluded.

Preliminary to some observations of the red cell content in various pathological states, we have determined the cholinesterase content per million cells in 18 normal human subjects. We have been able to secure accurate values by using volumes of washed, resuspended red cells calculated to contain the same number of cells as determined by cell count. The cells were lysed with 10% NaCl at 2°C. The measurements were then conducted at 37.5° by a modification of the method of Ammon² in which the bicarbonate-Ringers solution and the acetylcholine chloride solution were both placed in the large space and the blood sample in the side cup of the Warburg vessels. Values of cholinesterase activity thus secured are expressed as cmm of CO₂ produced per hour per million red cells. Esterase activity so expressed was not proportional to cell count or total blood hemoglobin. Values for different subjects varied from 3.94×10^{-4} cmm to 7.45×10^{-4} cmm with a mean value for normals of 6.16×10^{-4} cmm.

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¹ Sabine, J. C., *J. Clin. Invest.*, 1940, **19**, 833.

² Ammon, R., *Arch. ges. Physiol.*, 1934, **233**, 486.