

of practically the same titer as it was at the beginning. On the other hand, a considerable number of the tubes developed small cracks which admitted some air. The dried antigen in these tubes changed in appearance, becoming very dark and confluent. This presumably oxidized lipid was found to have lost its antigenic value entirely and also to have developed considerably more anticomplementary property than the original had.

The properties of the original preparation as an antigen were about equal to those of the usual lecithin extracted from beef heart. Complete fixation was obtained at a dilution of about 1-180,000 of the lipid. Slight anticomplementary effect was evident at a dilution of 1-7,500. This gives a ratio between antigenic and anticomplementary doses of about 1-25.

MacLean's reason for devising this method of obtaining a pure lecithin was to avoid the oxidation of the unsaturated fatty acid radical in the lecithin. From our observation the same process, oxidation, is what ordinarily results in the loss of antigenic value; antigen can be preserved indefinitely under anaërobic conditions. It is possible that this indicates that the antigenic value is dependent on the presence of the unsaturated fatty acid radical (oleic acid).

30 (1405)

Changes in the concentration of the carbon dioxide of the blood following changes in the circulation through the medulla oblongata.

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It is desirable and even necessary, in attempting to estimate the rôle of the afferent nerves in the regulation of the respiratory movements¹ to investigate more carefully the effects upon respiratory movements of changes in the volume of blood flowing through the medulla oblongata.²

¹ Pike, F. H., and Coombs, Helen C., *American Journal of Physiology*, 1918, vol. 45, p. 569; this journal, 1918, vol. xv., p. 55.

² Pike, F. H., *Science*, 1918, xlvii., pp. 121-122.

The experiments described here were done on cats. Etherization and tracheotomy were routine procedures. Some of the cats were decerebrated, after which no more ether was necessary. The two common carotid and two vertebral arteries were isolated in the neck so that they might be ligated temporarily or permanently. Blood pressure was taken from the left carotid artery and the respiratory movements recorded by a Crile stethograph and a Verdin tambour. Blood for the estimation of the carbon dioxide was drawn from the femoral artery, and the estimations were made by the Van Slyke method. Changes in the volume of blood flowing through the medulla were brought about by occluding the cerebral arteries. Control samples of blood were taken at the beginning of each experiment. Other samples were taken during the period of occlusion of the cerebral arteries and after the release of these arteries and the restoration of the cerebral circulation. In some of the experiments, the arteries were never occluded, but changes in the blood flow to the medulla were produced by successive small hemorrhages of eight to ten cubic centimeters each. Pulse counts in some of these experiments were made by Miss Ethel Wickwire.

Simple occlusion of the cerebral arteries was sufficient to produce severe dyspnœa in some animals, but in others, dyspnœa appeared only after a considerable quantity of blood had been drawn. In all animals, the effects of the occlusion became more and more severe as more and more samples of blood were drawn. Hemorrhage alone, if carried sufficiently far, is followed by dyspnœa. Any injury to the spinal cord which prevents the compensatory rise of systemic blood pressure is followed by more severe dyspnœa on occlusion of the cerebral arteries than otherwise results.

The changes in the total carbon dioxide of the blood attending occlusion of the cerebral arteries are shown in the following table.

It is seen that the total carbon dioxide of the blood falls during each occlusion and rises again during each period of free flow of blood through the medulla until about forty per cent. of the total volume of the circulating blood has been drawn off for analysis. Beyond this point, there is a fall in the concentration of the carbon dioxide of the blood as each sample is drawn. Hemorrhage

Character of Operative Procedure.	Amount of CO ₂ Expressed in c.c. per c.c. of Blood Plasma.	Direction of Change in Total CO ₂ of the Blood.
Etherization.....	490	
Two vertebrales and one carotid occluded. Blood pressure from other carotid. Ether intermitted.....	525	
One carotid released.....	485	
“ “ occluded.....	460	Fall.
“ “ released.....	480	Rise.
“ “ occluded.....	435	Fall.
“ “ released.....	460	Rise.
“ “ occluded.....	445	Fall.
“ “ released.....	447	44 per cent. of total volume of blood drawn up to this time.
“ “ occluded.....	380	Rapid fall.
“ “ released.....	350	Slow fall.
“ “ occluded.....	311	Rapid fall.
“ “ released.....	247	Rapid fall.
“ “ occluded.....	247	Animal died.

alone, after forty per cent. of the blood has been drawn will give a similar fall in the carbon dioxide of each successive sample of blood without occlusion of the remaining carotid artery.

31 (1406)

The influence of milk upon tetany in Salamander larvæ.

By EDUARD UHLENHUTH

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As reported in the meeting of the Society held on November 15, 1918, calcium lactate as well as magnesium lactate suppresses the tetanic convulsions of thymus-fed tetanic larvæ of salamanders. Since it has been claimed that milk also has this effect, it was interesting to test its action on tetanic larvæ.

Curves are demonstrated which show the percentage of tetanic individuals among two series of thymus-fed larvæ of the salamander, *Amblystoma opacum*. The animals of one series were kept in a weak milk solution, those of the other series which served as controls were kept in tap water. It is evident from the curves that milk was extremely effective in suppressing the tetanic con-