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The Inhibiting Influence of Formaldehyde Upon the Dale Reaction.

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Kendall[1] has shown recently that formaldehyde will reduce smooth muscle contraction that has been initiated by histamin and by a histamin-like substance obtained in filtrates from cultures of *B. welchi.* Inasmuch as one theory of smooth muscle contraction induced by anaphylaxis postulates the liberation of some substance resembling histamin, the effect of formaldehyde on such contraction was studied.

Female guinea pigs weighing about 250 gm. were injected intraperitoneally with 0.2 cc. of a 1 to 10 dilution of eggwhite solution and were tested two to three weeks thereafter. Others were injected by passive transfer of a potent anti-eggwhite rabbit serum, and tested twenty-four hours later. After each animal had been killed by a blow on the head, the two uterine horns, or two apparently equal intestinal strips were suspended each in a separate bath of a Dale apparatus. This contained 150 cc. of Tyrode solution kept at a temperature of 38° C. and through which free oxygen was passed. One muscle segment served as a control, and the other was tested to the action of formaldehyde.

Experiment I. 0.5 cc. of a 1 to 10 eggwhite solution was added to each of the two baths simultaneously. The second bath had been treated previously with 0.2 cc. of neutral formalin solution (final concentration of formaldehyde about 1 to 2600). In animals that proved to be sensitive, the muscle strip contracted characteristically on the addition of egg white to the first bath, and this was recorded on a kymograph. The strip in the second bath did not contract. This bath was then emptied and eggwhite again added to fresh Tyrode's solution. No contraction occurred, and thus desensitization was simulated. On again emptying the bath, refilling with Tyrode's solution and then adding histamin, an immediate violent contraction occurred to this stimulant. This indicated that formaldehyde had not impaired the contractility of the muscle.

Experiment II. The two muscle strips were arranged as in Experiment I. To each bath egg-white was similarly added but no formaldehyde was placed in the second bath until contraction al-

ready had occurred. In about 60 per cent of the experiments formaldehyde caused relaxation of the contracted strip.

Experiments done with horse serum and horse dander extract showed similar results.

Occasionally smooth muscle was found irritable and spontaneous contractions occurred. Formaldehyde added to these strips had no appreciable effect.

From these experiments it is evident that formaldehyde may prevent and also relax smooth muscle contraction induced in anaphylaxis. Moreover, sensitized muscle exposed to formaldehyde and then failing to react to homologous antigen, will not react subsequently to such antigen, although contractility is not impaired. This effect simulated desensitization.

This is a preliminary report.

[1] Kendall, Arthur I., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 316.

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Formation of Methylglyoxal From Hexose Phosphate by Tissues.

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Methyl glyoxal has long been hypothecated as a probable intermediate in the formation of lactic acid in tissues, for which hypothesis the existence of glyoxalase activity is strong but indirect evidence.

Until very recently methyl glyoxal has never been detected in tissues. Toenniessen and Fisher[1] now report that hexose phosphate with muscle in the presence of pancreas (anti-glyoxalase) forms methyl glyoxal which they were able to identify by the p-nitrophenyl-di-hydrazone. In attempting to repeat this work I find that if muscle, or, better yet, liver extract when incubated with toluol for 24 hours, then hexose phosphate added and the mixture incubated for another day, the solution contains a substance which reacts like methyl glyoxal. It may be determined by the colorimetric method, is destroyed by excess alkali as is methyl glyoxal, and it gives a red di-hydrozone with p-nitro-phenyl-hydrazine which after recrystallization from pyridin melts with decomposition at about 283° (uncorrected). The di-hydrazone made from methyl glyoxal has the same crystal form and melting point. This evidence con-