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## Reaction of Bronchial Smooth Muscle in Sensitized Guinea Pigs on a Vitamin C Deficient Diet.

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In a previous communication[1] we gave experimental evidence for the conclusion that removal of vitamin C from the diet of virgin female guinea pigs causes a loss of uterine smooth muscle reactivity to antigens and smooth muscle stimulants. This paper records similar observations on the effect of this dietary deficiency on the sensitized smooth muscle of the bronchi to horse serum, which calls attention to a lack of parallelism existing between the smooth muscle responses in these 2 different regions.

Virgin female guinea pigs weighing 250 to 350 gm. were fed for about 4 weeks on a diet of rolled oats and evaporated milk, a little bran being added to prevent possible intestinal obstruction from the hard fecal masses produced by the oats and milk. When the animals had been on this diet for about a week, they were sensitized by the intraperitoneal injection of 1 cc. horse serum. Some time between the second and third weeks the guinea pigs were sacrificed and simultaneous observations made on the smooth muscle reactivity of the bronchi and uterus of the same animal. The bronchiolar muscle reactions to horse serum were studied by the bronchial perfusion of the isolated, sensitized lung,[2] whereas the uterine segments were suspended in warmed Locke's solution.

Preliminary results support the conclusion that there is a lack of parallelism in the reactivity of the bronchial and uterine smooth muscle in sensitized animals on a vitamin C deficient diet. Whereas the uterine strips of such animals fail to respond both to antigen and smooth muscle stimulants, histamine, pituitary and barium, the introduction of horse serum and these pharmacologic agents into the bronchial tree cause a marked bronchoconstriction as evidenced by a reduction in the outflow of the perfusion fluid through the lung.

In five out of six guinea pigs on a vitamin C deficient diet the uterine and bronchial smooth muscle responded as recorded in the

[1] Hurwitz, S. H., and Nicholls, E. G., PROC. SOC. EXP. BIOL. AND MED., 1930, **28**, 139.

[2] Hurwitz, S. H., and Wessels, A. L., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 120.

paper. Twelve animals were used as controls, in them both the smooth muscle of the bronchi and uterus responded to antigen and smooth muscle stimulants.

These results are in agreement with some unrecorded observations made on anaphylactic shock in sensitized guinea pigs fed on vitamin C deficient diet. In these animals the intracardiac injection of the second dose of horse serum produced typical anaphylactic shock with rigid distention of the lungs. Death usually resulted in 2 to 5 minutes both in these animals and in those on a normal diet.

The results do not support the general assumption that the reactivity of anaphylactic smooth muscle in different regions is essentially the same. A vitamin C deficient diet modifies the responses of the sensitized uterus without affecting the sensitized bronchi. This lack of parallelism is difficult to explain unless it be assumed that the uterine smooth muscle being limited to one sex, is more highly specialized and functionally more readily influenced by dietetic and other factors.

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## Device for Automatic Measurement of Oxygen Consumption in Closed Circuit Type of Metabolism Apparatus.

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In the closed circuit type of metabolism apparatus the measurement of oxygen consumption is usually dependent upon changes in the internal pressure of the system. Inasmuch as carbon dioxide is rapidly removed by absorption in alkali, the consumption of oxygen necessarily leads to a reduction in pressure in a system of given volume. The rate of oxygen consumption is then ordinarily determined by measurement of the quantity of oxygen that must be added for restoration of the original pressure, or by compression of the residual gas through the addition of a measured volume of liquid.[1, 2]

The device now to be described is based upon the latter principle, and permits automatic measurement of the volume of liquid that must be added to maintain a constant pressure within the system. It consists of a 4-liter bottle which serves as an oxygen reservoir,

[1] Wesson, L. G., *J. Nutrition*, 1931, **3**, 503.

[2] Ebeling, A. H., and Corey, R. B., *J. Exp. Med.*, 1930, **51**, 41.