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Experimental Production of Gas Bacillus Infection with Wool Implantations.

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The organisms producing gas bacillus infection are widely distributed in nature, the most frequent source being from contaminated soil by the excreta of both man and animals. That the organisms can, and do occur in finished products made from both wool and hair from animals were reported by the author.[1] It was demonstrated at that time both clinically and bacteriologically that clean wool cloth and wads from shot gun shells were the sources of the gas-producing organisms in clinical cases of gas gangrene. Clean wool samples and shot gun shell wads were cultured at the same time and the *Bacillus welchii* was demonstrated in each culture.

The following experiments were performed on animals either to refute or substantiate these clinical and bacteriological observations. Five dogs were used. The right and left thighs were shaved over the flexor group of muscles, thoroughly washed with soap and water, and followed by alcohol and iodine. Incisions were made in both thighs through skin and *fascia lata* down to the muscles. One muscle belly of the flexor group was then traumatized by crushing forceps. Pieces of wool cloth were introduced into this traumatized muscle of the left thigh and wads from shot gun shells introduced into the traumatized muscle of the right thigh. The *fascia lata* was then closed over the foreign body in the muscle and the skin was closed with continuous silk suture.

Nineteen hours after the introduction of the foreign bodies, the dogs showed the development of gas bacillus infection in each thigh. The presence of gas increased in 40% of the animals and decreased in 60%. The decrease in the amount of gas in 3 of the animals was due to rupture of the wound, which allowed the gas to escape.

Roentgenograms were taken at 19, 28, 41, and 51 hours respectively of both legs. In each instance, gas was demonstrated in the tissues. There was an increase in the amount of gas in the tissues in each instance until the wound ruptured in 3 of the animals, which allowed the gas to escape producing radiographic evidence of the decrease in the amount of gas present. Bacteriological study of

[1] Gage, I. M., *Am. J. Surg.*, 1926, **1**, 177.

the wounds revealed the presence of gas bacilli *(B. welchii)* in each animal.

The accidental contamination of traumatized wounds, either by clean wool cloth or wads from shot gun shells will result in the development of gas bacillus infection.

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Enzymes in the Alimentary Canal of Mosquito Larvae.

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An attempt has been made to determine the presence of enzymes in the digestive tract of certain species of mosquito larvae. Phillips[1] and Bertholf[2] demonstrated the presence of enzymes in the honey-bee, both larvae and adults, by feeding them on solutions of chemically pure carbohydrates and comparing the length of life in contrast to controls fed on water alone. By this method they hoped to eliminate the interference of any enzyme from the tissues surrounding the gut, a difficult matter in isolation techniques. However these workers did not exclude microorganisms from the alimentary canal and it is conceivable that organisms hydrolysed the carbohydrates which were able to maintain the insects alive for considerable periods.

The writer applied this method to *culicid* larvae and endeavored to exclude bacteria, etc., by sterilizing all media, either by autoclaving or filtering. Mosquito eggs disinfected in Hexyl Resorcinol (Hinman[3]) were introduced into solutions of chemically pure compounds, dissolved in a modified Ringer's Solution and incubated at a suitable temperature. Soluble starch, sucrose, galactose, xylose, levulose, lactose, maltose, glycogen, creatinine, cystine, tyrosine, a mixture of tyrosine and glycogen, a mixture of sucrose and tyrosine, have all been used. Solutions varied in strength from 0.1% to 1.0%. The results of these experiments have been rather inconclusive owing to inconsistency when repetitions were made. Checks

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1 Phillips, E. F., *J. Agric. Res.*, 1927, **35**, 385.

2 Bertholf, L. M., *J. Agric. Res.*, 1927, **35**, 429.

3 Hinman, E. H., *Am. J. Trop. Med.*, 1932, **12**, in press.