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in the esophageal region of the stomach in the swine, degenerative process in the intramural plexus (containing degeneration of vascular nerves), and degenerative process of the autonomic nerves (polyneuropathy).

Formal-pathogenetically the ulcerative processes (erosion and ulcer) in the stomach (or alimentary canal) may develop on the basis of the edema of the lamina propria and hydropic-degenerative process of the epithelium, and the edema and degenerative process may be neurogenic-angiogenically brought about in consequence of a functional disorder of the autonomic nerves (neurogenic erosion and ulcer). The degenerating epithelium signifying the decrease of resistance may be desquamated by means of a natural transition and/or an action of the gastric contents (acid, pepsin, microorganism, etc.).

A STUDY OF THE FINE STRUCTURE AND PILI FOUND IN *CORYNEBACTERIUM RENALE*

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(Summary of Masters thesis written under direction of Dr. R. YANAGAWA)

Corynebacterium renale is a Gram-positive organism causing pyelonephritis in cattle. This paper is a study of the fine structure of *C. renale* using sections fixed with osmium tetroxide and embedded in Epon 812.

1) Pili of *C. renale*, which were discovered by YANAGAWA et al. (1967), were confirmed and studied in detail.

2) Around the cell wall of 40~60 Å a outer-most layer was observed which had a thickness of 30~50 Å.

3) All observations of *C. renale*'s fine structure were almost identical to those of other Gram-positive bacteria except for the pili and the outer-most layer.

Since pili have not been found before in Gram-positive bacteria, the pili found in *C. renale* have been compared to those of Gram-negative bacteria.

1) The diameter of these pili was about 20 Å, which is comparative to type II strain No. 35 and type III strain No. 42.

2) Electron microscopic studies of *C. renale* failed to turn up the subunit normally seen in Gram-negative bacteria.

3) The pili seen in *C. renale* were present under all observed conditions which cannot be said of the pili of Gram-negative bacteria as they disappeared in some of these conditions.

- 4) The pili found in *C. renale* did not agglutinate the same cells as those observed in Gram-negative bacteria.
- 5) The pili antigen was heat-labile and of a distinctly different antigenic property from the somatic antigen.
- 6) Type II strain No. 35 pili were antigenically distinct from the type III strain No. 42 pili.

THE AVERAGE SURFACE TEMPERATURES IN THE FOWL

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The average surface temperatures of the male fowl were measured randomly at constant environmental temperatures between 5 and 30°C. In addition, the surface temperature was measured in a climatic chamber with copper-constantan thermocouples and the surface area was measured by the "gampi" paper method and the geometrical method.

- 1) The ratio of feathered to unfeathered portions was 4:1 to 5:1.
- 2) The average surface temperature was found to fluctuate with time and the environmental changes in temperature.
- 3) In calculating the average surface temperature, it was found that large fluctuations in small surface areas had as much influence on the average surface temperature as similar changes did in large areas.
- 4) The surface temperature of the feathered portion fluctuated constantly even at steady environmental temperatures, but this fluctuation was less than that of the unfeathered portion.
- 5) The skin temperature of the unfeathered portion fluctuated greatly with constant environmental temperatures.
- 6) There was a direct correlation between the surface temperature of the feathered portion and the skin temperature under it.
- 7) I used about the same classification of temperature changes as HONMA et al. did in his studies on the patterns of temperature change in the male fowl: type 1 included the comb, type 3 the wattle, shank and toe, type 4 the cheek, skin breast, back and abdomen and to type 2 most of the feathered portions of the body, except the thigh which belonged somewhere between type 3 and type 4.