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**THE ONSET AND DEVELOPMENT OF THE SPINAL REFLEX
DISCHARGES IN THE FETAL AND NEWBORN RAT — AN
ELECTROPHYSIOLOGICAL OBSERVATION**

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**STUDIES ON ACTIVE IMMUNITY AGAINST INFECTION WITH
TRANSMISSIBLE GASTROENTERITIS VIRUS OF PIGS:
CELL-MEDIATED IMMUNITY**

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**A MORPHOLOGICAL STUDY ON THE CORPUS PARACLOACALIS
VASCULARIS IN THE DOMESTIC FOWL**

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The corpus paracloacalis vascularis (CPV) of the domestic fowl was studied in order to clarify its anatomical, histological and fine structures, lymphatic system, and development, with special reference to the erection mechanism and the phylogeny of the copulatory organ.

1) Five different parts were distinguished in the CPV of the domestic fowl: the capsule; the trabecula; the capillary cord; and the peripheral and internal lymphatic spaces.

2) In the three-dimensional view under the scanning electron microscope, the capillary cords of the CPV anastomoses with one another to form thick columns or sheets partitioned by lymphatic spaces. Transmission electron microscopy revealed that the capillaries in the capillary cords consisted of a layer of endothelial cells and numerous pericytes. Large, opened pinocytotic vesicles often appeared on the inner and outer surfaces of the endothelial cells. These cells and the pericytes were surrounded by a basement membrane which was thicker and denser than that of the neighboring arterioles or venules. These capillaries showed two phases which clearly depended on their functions.

3) The lymphatic system of the copulatory organ in the male domestic fowl consisted of complex, bilateral, lymphatic spongy bodies of the CPV and the second fold of the cloaca. The term "corpus paraoccalis vascularis-second fold lymphatic system" was proposed to indicate these lymphatic structures collectively.

4) On the seventh day of incubation, the male or female primordium of the CPV was a very small oval mass of mesenchymal cells, including small blood vessels and nerves (the first stage). The male primordium formed lymphatic spaces (the second stage) and then capillary cords (the third stage). The female primordium formed no capillary cords and decreased gradually in size (the female third stage).

5) Another accumulation of mesenchymal cells, corresponding to the primordium of the corpus spongiosum penis, was noted in both the male and the female on the tenth day of incubation. The cells disappeared in the male and the female on the eighteenth and sixteenth day of incubation, respectively.

6) From the results of this study on the ontogeny of the CPV, it was assumed that the CPV in the domestic fowl might be homologous to the crus penis of the corpus cavernosum penis in the mammal and in some reptiles in terms of development, origin, location, velocity, and involution, and that the spongy bodies of the second fold may be differentiated as parts corresponding to the corpus and the glans penis.

A part of this thesis has appeared previously in "The Japanese Journal of Veterinary Research" Vol. 23, 1-10, 11-16 (1975) and Vol. 25, 93-98 (1977).