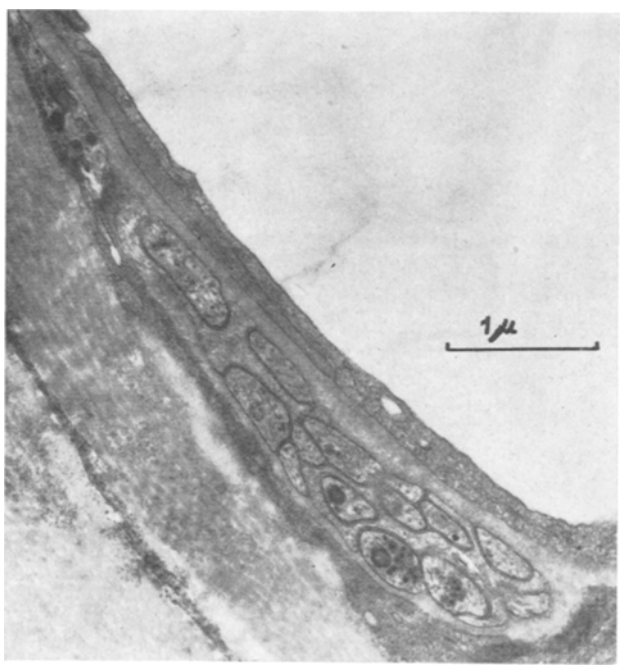
Innervation of Pulmonary Capillaries

In the dog, branches of the pulmonary artery down to 30 μ in diameter have smooth muscle cells in their wall[1] and receive a cholinergic and noradrenergic innervation[2]. At this diameter they lose their smooth muscle coat and their innervation. The arteries are encircled by bundles of non-myelinated axons which often appear to be more closely related to portions of the lung parenchyma than to the artery they are innervating. Nerve fibres intimately associated with pulmonary capillaries have been described in the kitten[3] and the snake[4].

The relation of nerve fibres to pulmonary alveoli and their capillaries was examined with the electronmicroscope. Lung lobes in anaesthetized dogs were perfused through the pulmonary artery with 2.5% glutaraldehyde in 0.1 *M* phosphate buffer; small pieces of tissue were postfixed with 1% OsO_4, embedded in araldite, and thin sections stained with lead and examined in an AEI 6B electronmicroscope. Between the smooth muscle layer of pulmonary arteries 100–200 μ in diameter and the pulmonary alveoli and their capillaries, there is a space of 3–4 μ occupied by collagen fibres, processes of fibrocytes and bundles of non-myelinated axons enclosed in Schwann cells. The axon bundles run at varying distances from the smooth muscle cells of the pulmonary arteries.



Bundle of axons, some containing vesicles, lying between capillary endothelium and process of a pericyte. Glutaraldehyde-OsO_4 fixed dog lung. Calibration 1 μ.

In the Figure a bundle of axons is seen in close apposition to a capillary and separated by the full width of the collagen layer from the smooth muscle cells of the pulmonary artery. The axon bundle lies between the capillary endothelium and the process of a pericyte. Several of the axon profiles are partially bare of Schwann cell cytoplasm and contain vesicles. One such axon is within 1000 Å of the endothelial cell and another within 450 Å of the pericyte. The axons are of 2 kinds depending on their vesicle content: one kind contains agranular vesicles 500 Å in diameter and occasional vesicles around 1000 Å in diameter with a moderately electron-dense core. This is the appearance characteristic of cholinergic terminal fibres[5]. The other kind of axon contains 3 types of vesicles: vesicles 500 Å in diameter with an intensely electron-dense core; vesicles of 1000 Å with a moderately electron-dense core, and vesicles 850–1000 Å in diameter with a more electron-dense core. This is the appearance characteristic of noradrenergic terminal fibres[5,6].

Such bundles of vesicle-filled axons closely related to capillaries are not infrequent. The capillaries, which are close to pulmonary arteries or arterioles, in addition to their endothelial lining are always surrounded by processes of pericytes, but have no smooth muscle cells related to them.

The great majority of alveolar capillaries are not innervated[2], but the present findings suggest that there are some vessels in the lung parenchyma, lacking a smooth muscle coat, and therefore called capillaries, which receive a double motor innervation. These capillaries all have pericytes and it may be these cells which respond to the released transmitter[7].

Zusammenfassung. Nachweis einer doppelt motorischen Innervation eines Teiles der Kapillaren in der Hundelunge: Bündel markloser Nervenfasern mit elektronenmikroskopischer Charakteristik cholinerger und noradrenerger Nervenendigungen bis 1000 Å Entfernung von der Kapillarwand.

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Cell Proliferations in *Lymantria dispar* L. Larvae Infected with the Nuclear Polyhedrosis Virus

In invertebrates both the proliferating processes and their causes have been less studied. The malignant degeneration of some tissues in this group is difficult to demonstrate, and because of lack of material some alterations which have been observed especially in insects cannot be compared with the true malignant processes in vertebrates[1].

There are tumours known to be produced in insects by some parasites or experimentally induced by inoculating nucleic acid extracts[2–5]. PAILLOT[6] described active neoplasm-like tissue proliferations induced by viruses in *Agrotis segetum* L., and BIRD[7] observed abnormal cell growth and proliferation of the midgut in the regenerative nidi area. In 1959, L'HELIAS[8] succeeded in purifying a