A mineralogical analysis of the meteorite is now being made by C. Moore, curator of the Nininger Meteorite Collection at Arizona State University. It appears that this specimen must be classified in a new subclass of the aerolite group.

The meteorite will bear the name Bondoc, a station on the Bondoc peninsula that appears on the latest map of Luzon Island.

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Fine Structure of the Interpseudotracheal Papillae of the Blowfly

Abstract. *Electron-microscope studies of the interpseudotracheal papillae of the blowfly* Phormia regina *(Meigen) revealed that each papilla contains four nerve fibers. The nerve fibers are encased in a cuticular sheath located in the lumen of the papilla inside the vacuole of the trichogen cell.*

During a recent study of the fine structure of the chemoreceptors on the labellum of the blowfly *Phormia regina* (Meigen) (*1*) an opportunity arose to observe the interpseudotracheal papillae of the blowfly with an electron microscope.

The interpseudotracheal papillae are minute sensilla basiconica which project through the syndesmoses between the pseudotracheal and the interpseudotracheal plates on the oral surface of the labellum. According to Dethier (*2*) there are from 135 to 189 of these papillae on the labellum of the fly. The papillae are 10 μ long, 5 μ in diameter at the base, and 2.5 μ in diameter at the tip.

Some of the earlier workers—Kraepelin (*3*), Hewitt (*4*), and Graham-Smith (*5*)—claimed that the structures are gustatory, and Graham-Smith (*5*) suggested that they have an additional tactile function. Dethier (*2*) described the morphology of the sensillum and the relationship between the distal nerve fibers and the papilla, confirming some of the earlier observations of Kraepelin (*3*) and others.

While earlier workers were aware of the distal nerve fibers they made no attempt to relate them to the papilla itself. Dethier (*2*), employing methylene blue and silver preparations, detected two distinct nerve fibers and suggested the possible existence of a third nerve fiber.

In the study of the blowfly labellum with the electron microscope (*6*), a number of interpseudotracheal papillae were observed in section. The cuticular portion of the sensillum consists of a peg surmounting a broader base with a sclerotized annular area. The peg itself is heavily sclerotized. The lumen of the peg is an extension of the vacuole of the trichogen cell. The nerve fibers extend up through this vacuole into the peg. The nerve fibers, however, are completely isolated from the cytoplasm of the trichogen cell by a dark cuticular sheath which surrounds each nerve fiber (Fig. 1).

In the labellar hairs the cuticular sheath around the nerve fibers does not extend into the lumen of the hair itself but terminates at the base of the hair shaft (*1*). In the papillae the cuticular sheath does extend well up into the lumen of the sensillum (Fig. 1). In the labellar hairs the cuticular sheath is seen as an invagination between but not completely surrounding the nerve fibers (*1*), while in the papillae the cuticular sheath completely encloses each nerve fiber.

In the labellar hairs the cuticular sheath probably is responsible for the formation of the double-walled structure observed in the chemoreceptors, which maintains the separation between the nerve fibers and the cytoplasm of the trichogen cell (*1*). In the papillae the cuticular sheath serves the same function, but it is not fused to the wall of the papilla. It remains in the lumen of the peg, where it is surrounded by the vacuole of the trichogen cell. This situation is similar to that which was observed by Slifer *et al.* (*7*) in the grasshoper.

The cuticular sheath, which extends from the base of the papilla up through the lumen, is probably what Dethier (*2*) described as the inner sclerotized annular area lying within the sensillum.

In all of the papillae observed there were always four nerve fibers, each fiber being separately enclosed in the cuticular sheath. These fibers may be seen in the cross section of a typical sensillum basiconicum (Fig. 1).

The neurons lie in the epidermal cell complex 30 to 40 μ below the cuticle. Associated with the nuerons at this level are two larger cells which are probably the trichogen and tormogen cells. The epidermal cell complex associated with each sensillum basiconicum has not as yet been studied in great detail with the electron microscope. The proximal fibers from the nerve cell bodies of all the sensilla join to form a branch of the labial nerve; this branch, in turn, goes to the subesophageal ganglion.

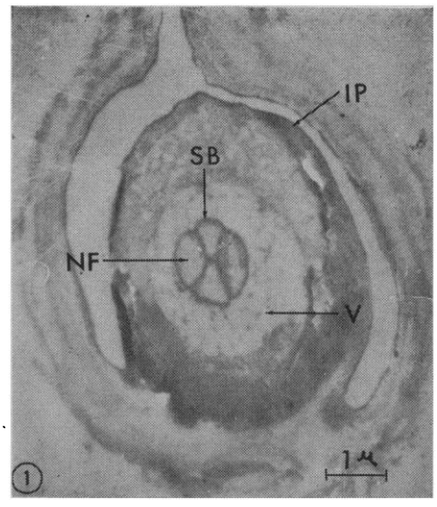

Fig. 1. Section through an interpseudotracheal papilla (*IP*). Note the four nerve fibers (*NF*) enclosed in the cuticular sheath (*SB*) situated in the lumen of the peg. The nerve fibers in the cuticular sheath are completely surrounded by the vacuole (*V*) of the trichogen cell.

The relationship of the nerve fibers to the tip of the peg has not as yet been observed. Slifer (*7*) has shown in grasshoppers, and Adams (*8*) has shown for *Stomoxys*, that the distal processes of the nerve fibers extend to the extreme tip of the chemoreceptors, where they are exposed to the atmosphere through a small pore. Whether this holds true for the sensilla basiconica of the blowfly *Phormia regina* still remains to be seen.

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References and Notes

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