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Reactions of Arthropods to Artificial and Recorded Sounds

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The reactions of adults of the following insects to "pure" tones at many frequencies between 50 and 40,000 cps and intensities of 80 - 125 db were studied:

LEPIDOPTERA

Cercyonis pegala (Wood nymph butterfly)

Ctenucha virginica (Virginian Ctenucha moth)

Scepsis fulvicollis (Yellow collared scape moth)

Apantesis spp. (Tiger moths)

HYMENOPTERA

Apis mellifera (Honey bee)

All were found to respond with characteristic reactions. In the moths, which have specialized sound-receptors, the reactions differed with frequency, higher frequencies stimulating the tympana, lower frequencies stimulating more generalized receptors.

An attempt was made to attract or repel mosquitoes (*Aedes stimulans* and *A. vexans*) by broadcasting to them recorded wing sounds of females attracted to food or being injured. No attraction or repulsion were found under field or laboratory conditions.

The reactions of a spider, probably *Araneus cavaticus*, to "pure" tones were studied. A characteristic extension of the anterior legs occurred at frequencies between 400 and 2000 cps and intensities of 80 - 125 db. Earlier workers almost all attributed reactions of web-spinning spiders to vibration of the webs. By measurements of intensity thresholds needed to induce the responses with various mutilations of the webs, it was found that resonance of the webs was not involved. Spiders were removed from the webs and either were allowed to suspend themselves from strands of silk or were fastened alive onto wax blocks and were tested with the same sounds. The thresholds were similar to those when the spiders were in the webs. Thus, the sounds were received independently of the webs. The receptors are probably generally distributed tactile receptors or proprioceptors.

The Role of Cell Deaths in Morphogenesis of the Limbs in the Chick

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The limb buds arise in the chick as flat, paddle-shaped protrusions from the body wall. By means of carbon-mapping experiments on the 3 - to