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mating calls of male frogs, using 3 echolocation to yield information on the background of the target. And, there are our own North American bats, like the Eastern pipistrelles (fig. 9), with an acuity of vision that contradicts the "blind as a bat" aphorism. In short, there are "great bats, small bats, lean bats, brawny bats..." S

1-The Gambian epauletted fruit bats have no ability to echolocate. Instead they rely on their vision and an acute 4 sense of smell to find the ripe fruit that they eat.

2-California leaf-nosed bats use vision to find their food when there is enough light — for this bat light levels equivalent to a bright star-lit night are enough. How many insects could you catch in that light? In total darkness they use echolocation.

3-Pallid bats, from New Mexico, use echolocation to chart their course. When it comes to snagging dinner though, they use sounds generated by their prospective meal. Many insects have to warm up their bodies before they can fly in the evening, and they usually do this by vibrating their wings. Hunting Pallid bats are quick to locate moths with vibrating wings and make silent (nonecholocating) approaches to catch them.









5-This Egyptian slit-face bat is coming to take a moth which is frantically vibrating its wings in an effort to escape. The bat is producing echolocation calls at this stage of its attack, but it is relying on sounds from the moth to locate its target.

6-The basic technique for echolocation is the same, but the specifics vary as much as the faces of the bats in these photos. This fuzzy face belongs to a Little brown bat, the most common species in Canada, and the experimental subject of some of the early work on echolocation. Little brown bats use echolocation to locate their flying prey, usually aquatic insects.

7-For most bats, Doppler shifting of echoes is a source of error, minimized by using signals that cover a wide range of frequencies. This Bushveld bat from Zimbabwe has mechanical and neurological tuning of his cochlea that permits him to use an extremely narrow band call and hence exploit the Doppler-shifted echoes that the fluttering wings of his prey produce.

8-Large slit-faced bats, common in some parts of Africa, have a remarkably variable diet: bats, fish, frogs, birds, and insects. They use echolocation to gather background information, literally.

9-The large eyes in this grinning face put to rest the notion of being "blind as a bat." This is an Eastern pipistrelles, a widespread but little known bat from eastern North America. These bats also use echolocation to catch dinner, but their eyesight is just fine.







