That is why

How do bats use echolocation?

A bat times the gap between its shout and the echo; as prey gets closer, echoes return sooner and the calls speed up.

A How the secret came out



Late 1700s: Spallanzani
Blinded bats still dodge obstacles ✓



Charles Jurine
Ears plugged with wax: they crash ✗



Next 140 years
Favorite guess: they feel the air ✗



1938: Griffin and Pierce
A detector picks up their calls ✓

Bats are not blind

They see about as well as we do. Sound is an extra sense for the dark: more than half of the roughly 900 bat species echolocate. Donald Griffin named it echolocation.

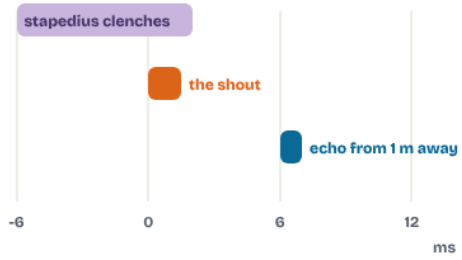
B Shout, damp, listen

Who can hear what (kilohertz)



Loud too: about 110 decibels, like a smoke alarm.

One call, in thousandths of a second (ms)



A tiny ear muscle damps the bat's own shout, then relaxes in time for the echo. Twice as far, twice the wait: the delay is the distance.

C An arms race in sound

A moth that jams back

tiger moth Bertholdia trigona



up to 4,500 clicks a second

Bats reaching the moth



The clicks likely scramble the bat's sense of when echoes return.

Bats that jam each other

Mexican free-tailed bats, roosts up to 1.5 million

Moth catches on a line

Normal



Rival jams the buzz



It worked only when the jamming call overlapped the feeding buzz.

The night was never quiet: we just can't hear it shouting.

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