

The big brown bat is a medium-sized bat found throughout North and Central America.

Its favorite food is the moth, which it catches using echolocation. The big brown bat screams a little scream. The scream bounces off the moth and echoes back to the bat, who then learns something about the position of the moth.

Since time immemorial bats and moths have been engaged in an arms race, each evolving and adapting new skills to thwart each other. In a nutshell: moths want to hear bats, and bats want to be unheard by the moths. In the bat's perfect world, the bat screams a sound that the moth cannot hear; the sound provides the location of the moth; the bat eats the moth. Yet the pesky moth keeps adapting its hearing abilities to detect the sound of the bat and thus evade capture. So they go back and forth, the bat learns to make sounds the moths can't hear, then the moths learn to hear them.

And some moths have even learned to battle sound with sound by vibrating different parts of their bodies. Tiger moths vibrate their tymbals; Hawkmoths vibrate their genitals. We're not yet sure why. It could be that their sound physically interacts with the echo of the bat scream so that the bat receives faulty coordinate data, or the sound could be a warning of some sort.

The big brown bat is nocturnal, roosting during the day in natural spaces such as hollow tree trunks, and also man-made structures such as attics, barns and belfrys. Now, consider that bat sleeping during the day up in a belfry. Wouldn't the noise of the bells wake it up? One thing to keep in mind is that bats do not have the same range of hearing that we do. They can hear much much higher than we can, but not as low. The big brown bat can hear down to about 850Hz, if that sound is very loud. It hears best between the range of about 15,000-70,000 Hz. The highest bell in a bell tower is about 5,000 Hz.

So rest assured, dear listener, when a bat sleeps in a belfry the sound of the bells is not likely to wake it up. Not only because they are low in the hearing range of the bat, but also because bats are less affected by exposure to loud sounds than other mammals, presumably because they are accustomed to being in crowds of bats that, all put together, are really loud, sometimes even as loud as 140dB, which is louder than the Big Bang.

So, the bells are ringing very loudly, but the bat doesn't care because it doesn't mind loud sounds, and also because it can barely hear the bell sounds anyways. And the bat is screaming loudly, but we don't care because we can't hear it.

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