

How does a dog walk? Surprisingly, many of us don't really know

January 26 2009

Despite the fact that most of us see our four-legged friends walking around every day, most of us—including many experts in natural history museums and illustrators for veterinary anatomy text books—apparently still don't know how they do it. A new study published in the January 27th issue of *Current Biology*, a Cell Press publication, shows that anatomists, taxidermists, and toy designers get the walking gait of horses and other quadruped animals wrong about half the time. That's despite the fact that their correct walking behavior was described and published more than 120 years ago.

"Our key finding is that the chance to find erroneous depictions of quadruped walking in our surrounding environment is about 50 percent, which corresponds to nothing else than pure accident," said Gábor Horváth of Eötvös University. "This was quite unexpected because the experts of animal locomotion have known well the characteristics of quadruped walking ever since the famous and pioneering work of Eadweard Muybridge, published in the 1880s."

So, then, how do they walk? It turns out that all four-legged animals step with their left hind leg followed by their left foreleg. Then they step with their right hind leg followed by the right foreleg, and so on. Animals differ from one another only in the timing of that stepping.

The reason that manner of walking is so universal, Horváth said, is that it provides the maximum static stability. In other words, when walking slowly, a horse's or dog's body is supported at all times by three feet on

the ground, which form a triangle. The closer their center of mass is to the center of those three points, the more stable they will be.

Horváth and his colleagues suspect this is so often depicted incorrectly in part due to carelessness. Others probably don't know how the four-legged creatures among us walk, and some likely copy previous illustrations or models, which themselves are wrong.

In the case of children's toys, such an error might not be such a big deal, he added. However, model horses-often depicted mid-step-would fall over less if they were presented according to the correct footfall formula. In natural history museums and anatomy textbooks, though, scientific correctness should be a requirement.

Horváth did note one major exception that he says proves the rule: Hollywood movies such as *Jurassic Park* and *The Lord of the Rings* generally do get the walking of dinosaurs, elephants, and other fantastic, four-legged creatures just right. That's because they often rely behind the scenes on experts in biomechanics and animal locomotion.

Source: Cell Press

Citation: How does a dog walk? Surprisingly, many of us don't really know (2009, January 26) retrieved 25 April 2024 from <https://phys.org/news/2009-01-dog-surprisingly-dont.html>

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