

Shocking discovery: All mammals take about 21 seconds to go pee (http://io9.com/shocking-discovery-all-mammals-take-about-21-seconds-t-1447826324)



That's right, all of them — and the shape or size of the animal doesn't matter. Scientists are calling it the Law of Urination, and it's a process driven by the way mammalian urinary systems evolved to eject fluids from the body in the quickest and most efficient way allowable by physics.

To make this discovery, Patricia Yang and colleagues brought their high-speed camera to the Atlanta Zoo. They filmed male and female rats, dogs, goats, cows, and elephants taking a whiz. The researchers produced this rather delightful video:



Later, they studied YouTube videos of the same. This allowed them to create a mathematical model of urinary systems — a model showing that mammals take the same time to empty their bladders despite considerable differences in the size of their bladders — differences in volume than can range from 100 mL to 100 L.

New Scientist explains what's going on (http://www.newscientist.com/article/dn24425-universal-law-of-urination-found-in-mammals.html#.UmFhIpRVBdo):

(/)

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According to the team's model, an animal's size does make a difference to urination time – but only very slightly. Their law of urination says that the time a mammal takes to empty a full bladder is proportional to the animal's mass raised to the power of a sixth, meaning even very large changes in mass have little effect on the time.

There are limits to this scaling. Gravity only plays a small role in the urination of very small mammals like rats and bats, which urinate in under a second. Instead, viscosity and surface tension dominate, which explains why their urine is released as a stream of individual drops rather than the continuous jet seen in larger mammals.

You can check out the entire study at the preprint archive arXiv: "Law of Urination: all mammals empty their bladders over the same duration (<http://arxiv.org/abs/1310.3737>)."

Top image: An elephant on a toilet, origin unknown.

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B (<http://brianwalsh1975.kin...>)

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42 ★ (/posts/1447929030/reply)

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Then why do lady elephants take so much time in the bathroom?

I wonder what it says about me when after reading this article my mind immediately went:

Am I right, fellas?

So does mean I can have a "crossing the streams" fight with an elephant and have a chance of winning?

taps on microphone

Is this thing on?

Yesterday 11:42am (<http://io9.com/then-why-do-lady-elephants-take-so-much-time-in-the-bat-1447929030>)

Balmut (<http://balmut.kinja.c...>)

operaghost21 (<http://operag...>)

★ (/posts/1447934852/reply)

1 ★ (/posts/1447946339/reply)

Women only take more time if there are other women in there :P

Just curious. How exactly does one win a stream-crossing...contest (match? competition? tournament?)?

They like to chat :/

Yesterday 12:04pm (<http://io9.com/just-curious-how-exactly-does-one-win-1447934852>)

Yesterday 11:49am (<http://io9.com/women-only-take-more-time-if-there-are-other-women-in-t-1447934852>)

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2 ★ (/posts/1447958898/reply)

4 ★ (/posts/1447963751/reply)

For us [my brothers and I] it went down to one major factor: How long you can go - last remaining wins.

A girl I once knew told me that if you're on a date and they get up to go to the bathroom,

The rest of the "sword fighting" aspect with the stream was just fun. Like who can block whom's stream. who has the most control, contest, etc.

your fate is being decided.

Yesterday 12:29pm (<http://io9.com/a-girl-i-once-knew-told-me-that-if-you-were-on-a-date-1447963751>)

Nimja IV (<http://nimavikhoda...>)

Corpore Metal (<http://corpor...>)

1 ★ (/posts/1447992240/reply)

★ (/posts/1447944021/reply)

B and 8 others... Does this explain why when I have so much urine that my bladder hurts, and I go to pee after waking up, the stream just loses pressure after a while even though there's still urine left?

So urination, in broad limits, is scale invariant? Weird.

I either have to stay there until it all slowly comes out, or this: once, I woke up and went to urinate and this happened. I stayed a bit, but even after the stream was down to drops my bladder still hurt. I went back to bed, woke up like an hour later, and went to the bathroom again. This time, all the remaining

I wonder if we can exploit the mechanisms honed by evolution for high volume fluid transport. If a whale can move 100 liters of piss out of the body in 21 seconds, there might be something to learn there.

Yesterday 12:01pm (<http://io9.com/so-urination-in-broad-limits-is-scale-invai>)