

REVIEW OF AN IMMENSE WORLD

Packed with fun facts. Here are some of my favorites:

- Dogs' noses **retain odorants across breaths**, so their sense of smell involves “a smoother experience” than humans'.¹
- Humans have a much better sense of smell than we sometimes think. English has “just three dedicated smell words: *stinky*, *fragrant*, and *musty*”, but “The Jahai people of Malaysia ... the Semaq Beri, the Maniq, and ... many other hunter-gatherer groups ... have **dedicated smell vocabularies**.”²

In 2006, neuroscientist Jess Porter took blindfolded students to a park in Berkeley and asked them to follow a 10-meter trail of chocolate oil that she had drizzled on the grass. The students got down on all fours, snuffled about like dogs, and looked ridiculous. But they succeeded, and got better with practice.³

- Snakes use their tongues for smell, not taste, and having a forked tongue “allows snakes to **smell in stereo**...”⁴
- On taste vs smell:

...John Caprio, a physiologist who studies catfish, says the difference between smell and taste couldn't be simpler. **Taste is reflexive and innate, while smell is not.** From birth, we recoil from bitter substances, and while we can learn to override those responses... the fact remains that there's something instinctive to override. Odors, by contrast, ‘don't carry meaning until you associate them with experiences,’ Caprio says. Human infants aren't disgusted by the smell of sweat or poop until they get older. Adults vary so much in their olfactory likes and dislikes that when the U.S. Army tried to develop a stink bomb for crowd control purposes, they couldn't find a smell that was universally disgusting to all cultures.⁵

¹Ed Yong, *An Immense World: How Animal Senses Reveal the Hidden Realms Around Us*, 2023 Random House trade paperback edition (New York: Random House, 2023), 18–19.

²Ibid., 24, emphasis added.

³Ibid., 25.

⁴Ibid., 44.

⁵Ibid., 47, emphasis added.

- Humans have “sharper”⁶ vision—“somewhere between 60 and 70 **cycles per degree**”⁷—than most animals. “A lion’s acuity is only 13 cpd, just above the 10 cpd threshold at which humans are considered legally blind. Most animals fall below that threshold, including half of all birds..., most fish, and all insects.”⁸
- Color vision works by “**opponency**”⁹. If you have three kinds of cones, like most humans do, any given wavelength will stimulate each kind of cone to a different degree, and the color you see is based on “neural arithmetic” calculating red cone stimulation minus green cone stimulation, and blue minus the sum of red and green¹⁰. A wide range of animals—including racoons, whales, and octopuses—are “**monochromats**” who can’t see color.¹¹ Beings with two cones, including “dogs, and most mammals”¹² as well as “[m]ost ‘color-blind’ people”¹³ are “**dichromats**”. Humans are “**trichromats**”. Birds are generally “**tetrachromats**”¹⁴. Each additional cone...

...unlocks an entirely **new dimension of colors**. ...dichromats can make out roughly 1 percent of the colors that trichromats can see—tens of thousands, compared to millions. If the same gulf exists between trichromats and tetrachromats, then we might be able to see just 1 percent of the *hundreds of millions* of colors that a bird can discriminate.¹⁵

- Bees are also trichromats, but with an **ultraviolet** cone instead of a red cone.¹⁶ In fact, “UV vision and UV signals are extremely common.”¹⁷
- In case you were looking for a new reason to be terrified of the outdoors: “ticks can detect body heat from up to 13 feet away.”¹⁸
- Squid react to wounds “as if their entire bodies were sore. ... They can sense that they’ve been hurt, but they might not be able to tell *where*.”¹⁹

⁶Ibid., 62.

⁷Ibid., emphasis added.

⁸Ibid.

⁹Ibid., 85.

¹⁰Ibid.

¹¹Ibid., 86–87.

¹²Ibid., 87.

¹³Ibid., 88.

¹⁴Ibid., 96.

¹⁵Ibid., 97, bold added, italics in original.

¹⁶Ibid., 95.

¹⁷Ibid.

¹⁸Ibid., 148.

¹⁹Ibid., 131.

- “Cats... have a lot of **vibration-sensitive** mechanoreceptors in the muscles of their bellies. When a cat crouches down during a stalk... Is it also sensing the vibrations of potential prey?” (this is not known)²⁰
- Owls’ **facial feathers** “act like a radar dish that collects incoming sound waves and funnels them toward the ear holes.”²¹
- “**most insects seem to be deaf**”²²

Near the end, Yong discusses an essay by William Cronon:

...he argued that the concept of **wilderness**, especially as perceived in the United States, had become unjustly synonymous with grandeur. ...

Equating wilderness with otherworldly magnificence treats it as something remote, accessible only to those with the privilege to travel and explore. It imagines that nature is something separate from humanity rather than something we exist within.²³

²⁰Ibid., 201, emphasis added.

²¹Ibid., 212.

²²Ibid., 216.

²³Ibid., 352–53, emphasis added.