



## **The Index of Refraction**

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**Published:** 2002

**Categorie(s):** Fiction, Science Fiction, Short Stories

**Source:** <http://www.infinitematrix.net/stories/shortshorts/kadrey45.html>

### **About Kadrey:**

Richard Kadrey is a novelist, freelance writer, and photographer based in San Francisco. Kadrey's first novel, *Metrophage*, was published in hardcover in 1988 by Victor Gollancz Ltd., and went on to various other American and foreign printings in paperback. Mac Tonnie's *Cyberpunk/Postmodern Book Reviews* calls *Metrophage* "one of the quintessential 1980s cyberpunk novels," going on to describe "a gritty acid-trip through an ultraviolent L.A. where nothing is what it seems... . Alongside novels such as [William Gibson's] *Neuromancer* and Lewis Shiner's debut novel *Frontera*, *Metrophage* helped establish the cyberpunk aesthetic: relentless, paranoid and playfully cynical." Kadrey's second novel, *Kamikaze L'Amour*, is described by the same source as "mesmerizing... a surreal (and distinctly Ballardian) account of synesthesia and mutant desire set in the jungle-choked ruins of L.A." Kadrey's short story *Carbon Copy: Meet the First Human Clone* was filmed as *After Amy*. The publisher website, Amazon booksellers, and other sources list a July 15, 2007 publication date for Kadrey's next book, *Butcher Bird: A Novel Of The Dominion* (Night Shade Books). Other works include collaborative graphic novels and over 50 published short stories. His non-fiction books as a writer and/or editor include *The Catalog of Tomorrow* (Que/TechTV Publishing, 2002), *From Myst to Riven* (Hyperion, 1997), *The Covert Culture Sourcebook* and its sequel (St. Martin's Press, New York, 1993 and 1994); Kadrey also hosted a live interview show on Hotwired in the 1990s called *Covert Culture*. He was an editor at print magazines *Shift* and *Future Sex*, and at online magazines *Signum* and *Stim*. He has published articles about art, culture and technology in publications including *Wired*, *Omni*, *Mondo 2000*, the *San Francisco Chronicle*, *SF Weekly*, *Ear*, *Artforum*, *ArtByte*, *Bookforum*, *World Art*, *Whole Earth Review*, *Reflex*, *Science Fiction Eye*, and *Interzone*. Source: Wikipedia

### **Also available on Feedbooks for Kadrey:**

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Traffic was bad all the way out from the city to the airport, and he's afraid he'll be late to meet her plane. After he parks, he's relieved when he checks the information board and sees that her flight is running 20 minutes late. That lost 20 minutes makes him right on time.

It's unseasonably hot. The air in the terminal feels wet and thick. His head swims. The crowd near the arrival gates seems to move in slow motion. Why don't they turn on the air conditioning or a fan or something? He wonders. Like a lot of airports, his hasn't handled new post-9/11 security well, and they've simply packed everyone waiting for arriving passengers into a wide cattle pen at the bottom of the escalators. He walks to the back of the waiting area, hoping he can breathe back there.

He keeps his eyes on the top of the escalator, wondering how long he'll have to wait. A small brunette appears and he looks hopefully, but it isn't her. Traveling at approximately 980,000,000 feet per second (noting that the speed of light is slightly slowed by the atmosphere and suspended particulate matter in the air), the light that carries the brunette's image takes around .0000000005 of a second to travel the distance from her face to his eye.

He looks around at the anxious crowd. A family with a couple of sullen children and bright Happy Birthday Grandma balloons. An older couple who stare up at the rolling escalator, but studiously ignore each other. A handsome long-haired boy in a leather jacket leans against a cement pillar, fidgeting into just the right pose for the pale goth girl slouching down the escalator.

He sees all of them, but is really seeing the past. Light reflects from objects and people, moving through the air until it strike his corneas. The light then passes through the vitreous humor inside his eyes to focus an image on the retinas. From there, an electrical signal moves up his optic nerves to the visual cortex of his brain.

All this activity takes time. Transduction, converting light data into neural information, occurs at the outer segment of the rods and cones in the back of the eye and takes less than a millisecond. Signals propagate along the optic nerve at around 10,000 centimeters per second. The few inches from his eyes to his visual cortex takes another millisecond.

Before that, however, the light slows and bends as it enters his eyes, due to refraction. The index of refraction is the ratio of the phase velocity of light as it moves from one medium (air) to another transparent medium (his cornea and eyeball fluid). If light moves at  $1n$  in a vacuum, it slows to  $1.0003n$  in air. When it hits the lenses in his eyes, the speed of light drops to  $1.413n$ , but picks back up to  $1.336n$  in the vitreous humor.

It takes approximately a millionth of a second for light to hit the back of his eye.

He glances back up the escalator, unaware that he's really looking at nothing more than ghost images of the past. He checks his watch. Time crawls, he thinks. A watched pot. He wishes he could have a cigarette. He remembers when you could still smoke in airports. He'd been a kid. How long ago was that?

And then he sees dark hair cresting the top of the escalator. He stands up straight, craning his head over the crowd. Waiting to make sure it's her, preparing to catch her eye, if it is. The woman on the escalator is examining something in her hand. Her hair, transit weary and messy, hangs down, covering her face. The man frowns and repositions himself, trying to get a better look.

The woman is familiar, but not yet identified in his brain as his wife. That he is looking at an illusion, echoes of his wife's image, doesn't occur to him. These fractions of a second for information processing mean nothing to him. It's still in the terminal and he feels as if he's dreaming. Somewhere in the back of his brain an idea from some long forgotten grade-school science class pops into his head: Moving on a microscopic zip-zag course from the core where it was created, a light photon takes 30,000,000 years to reach the surface of the sun.

When the light that's reflecting off the woman and into his eyes was created, the Earth was cooling and seasonal variations were just starting to become common, prompting mass extinctions among animal species that thrived on a year-round tropical steambath. Flowering plants were becoming the dominant plant form on the planet. Mammals were thriving and the first ape-like animals had just appeared. The crust of the Earth was writhing, buckling and cracking in a million places as the Himalayan and Andean mountain ranges rose from what had recently been the ocean floor. Australia was on its own, having broken free of Antarctica. One of the largest predators in history, the Carcharodon Megalodon shark, stretching 80 feet from nose to tail, ruled the seas.

After its journey to the surface, it still took the new light 8 minutes and 19 seconds to get from the sun to Earth.

He's not thinking about any of that right that right now. The woman looks up. Her face, that image, this moment, which has been in transit for roughly 30,000,000 years, 8 minutes and 19.01 seconds, hits him. He sees it's her and smiles.

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