

ECOLOGY

What we lose when it is never night

A bat scientist laments the ecological effects of light pollution

By **Christopher Kemp**

One summer midnight several years ago, standing outside a wooden cabin in Michigan's Upper Peninsula, I looked up. It was a revelation. The sky was filled with thousands of stars. There were constellations I had never seen before, except in books. The spiral arm of our home galaxy, the Milky Way, unfurled across the sky. The sight of thousands of stars was almost enough to make me, a non-believer, offer a word of gratitude up into the star-filled sky. But to whom? Perhaps to Johan Eklöf, author of *The Darkness Manifesto*.

A bat scientist, Eklöf works in the night shadows in Bollebygd in western Sweden. His work on bats requires a specific kind of darkness—the absolute kind, unpolluted by light. But this category of darkness is threatened. In the 1980s, Eklöf tells readers, two-thirds of the churches in Sweden's southwest housed bat colonies. Not any longer. “Today, forty years later, research I've done with my colleagues shows that this number has been reduced by a third due to light pollution and other factors. Because the churches all glow like carnivals in the night,” he writes. “We are blasting ourselves with light.”

We have all noticed it when driving through a city—any city—at night. Empty places are floodlit. Sometimes, on a quiet night, you can even hear the light. How bright must light be to hear the processes that make it?

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Inhabitants of Hong Kong live beneath a night sky that is 1200 times brighter than an unlit sky. Citizens of some large cities, writes Eklöf, have never allowed their eyes to adapt to true night vision (it takes half an hour of complete darkness for our eyes to make the shift). We are only now beginning to understand the effects of all this light.

A third of vertebrates and two-thirds of invertebrates are nocturnal. Excess light is incredibly destructive to the complex ecosystems these animals inhabit. It scares away the bats that Eklöf studies. It stuns light-sensitive moths, leaving them vulnerable to predation or flying endlessly into porch lights that will never return their love. Newly hatched turtles crawl away from the shoreline toward the lights of distant coastal cities, corals no longer mate on schedule, reef fish eggs go unhatched. Birds do not migrate on time—they forget to even sing. Modern advancements such as LED lights could significantly reduce some of the worst impacts, but they have not. At least, not yet.

Eklöf's excellent book covers a lot of ground. It shaped and sharpened my thinking on a subject I knew I was supposed to feel something about. In the week after I read it, I found myself saying, again and again, at the dinner table (six bulbs above it where one would suffice), “Yes, children, but did you know...?” I can think of no better praise than that.

It is worth mentioning that middle-aged white male writers like Eklöf can advocate for a darker world—for darkened cam-

Artificial light illuminates the skies above Geneva, Switzerland, on 24 September 2019.

pus and unlit parking lots. And middle-aged white male book reviewers can agree with him. But darkness is not safe for everyone. We need to address the social issues that make lighted places so appealing in the first place.

The bottom line: We can change if we want to. Parts of Denmark have been designated “Dark Sky Communities.” In 2019, France passed legislation limiting how much light can be emitted into the sky. In Vienna, Austria, the city's lights are turned off at 11 p.m. In contrast, China has announced plans to launch several moonlike satellites that will reflect the Sun's light after dark. These new moons will bathe cities in even more light.

Some of the solutions to light pollution—motion-detecting lights, shielded lights that do not reflect light upward, artificial light with wavelengths that mimic natural light—are already within our grasp, if we just reach for them. “We could just turn it all off, but I guess we don't want to,” said Eklöf in a recent interview. “So it's vital we find a middle way.”

Right now, it is hard to know what that middle way might look like. In 50 years, every city could be lit by an array of programmed and environmentally low-impact LED lights, or we might have completely forgotten what darkness is—the sky filled with little moons. ■



The Darkness Manifesto

Johan Eklöf, translated by Elizabeth DeNoma
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