

The Positive Side of Negativity

How storms, beaches, and waterfalls make us feel good at the atomic level

When the first pellets of hail started pounding the trail in the High Sierra, I hustled to a nearby stack of boulders beneath a low stand of trees for shelter. I pulled a tangerine out of my pack while thunder roared, peeled it open with my thumbs, and munched on the sweet fruit. Bolts of lightning flashed in the distance. I don't remember how long the storm lasted, but I remember the magnificent sweetness of the tangerine, the smell of the rain on the granite, and an almost electric haze as the sun broke through the dispersing clouds, brightening everything with a yellow glow. It was beautiful and it was thrilling, but also immensely peaceful. Despite spending months working in the High Sierra backcountry that summer, the serenity of that particular afternoon thunderstorm is what etched itself most clearly in my memory.

A branch of science called biometeorology might have an explanation for that. It's the study of how atmospheric processes affect living beings and ecosystems. That can indeed include things like the way weather and climate impact how we live. But some biometeorologists are studying why—besides the obvious like grandeur and awe—being in the mountains during a storm can make us feel terrific.

Okay, this next part might sound like something you'd overhear at a Sedona crystal shop, but: It's all about negative ions. The idea of ions affecting our moods is not new, not by a long shot, but science is starting to back up the woo.

Ions are electrically charged molecules or atoms. They can be positive or negative, though positive ions are typically found indoors or in polluted air and are thought to bum people out, so we won't talk about them. Negative ions, on the other hand, are found everywhere you want to be, like beaches, rivers, waterfalls, and high up in the mountains. Why? Because sunlight breaks up air molecules, as does splashing water, dosing the air with negative ions. An afternoon rainstorm with humid air pierced by sunshine breaking through clouds does the same thing.

In the mid-twentieth century, researchers started looking into whether and how negative ions might affect humans. Study after study bombarded subjects with negative or positive ions, or both, to see what happened. Often these studies showed people seemed calmer and of clearer mind when flooded with negative ions, but the data wasn't

conclusive. Enough non-scientists heard about the studies to be convinced, however, and a cottage industry of personal ionizing devices and quack self-help gurus rose up to make a buck. By the 1980s, the level of pseudoscience seemed to end serious research into the subject.

Recently, though, Michael Terman, a physiologist at Columbia University, showed people who received regular doses of negative ions for three weeks reported a major reduction in symptoms of depression. Catherine Harmer, a psychologist at Oxford, learned negative ion treatments provide similar benefits as artificial sunlight in patients with Seasonal Affective Disorder.

Thing is, scientists still aren't sure exactly how negative ions make us feel good, assuming they actually do. Some think negative ions help regulate serotonin levels by altering minute levels of blood chemistry. Patients in some studies showed lactic acid in the blood was reduced when exposed to negative ions, which would help them feel refreshed. Since positive ions seem to make us feel bad, it's even been proposed dosages of negative ions cause mood-boosting feelings by canceling out the positive ions, though that's not exactly an explanation.

So, we're still in the early stages of understanding, scientifically, how negative ions give us an extra pep in our step. But doesn't it seem there is something vaguely magic about sitting next to rushing river, bathing in the surf of a tropical beach, or the electric warmth of an afternoon thunderstorm? Something that the beauty of the experience alone can't quite explain?

"It's possible that natural increases in negative ions, like camping near a waterfall, might have similar effects [to measured doses in a controlled experiment]" said Harmer. "However, this hasn't been tested using the same methods as we did in our study so it is unknown."

I volunteer to be a research subject. I will camp near a waterfall or dance in a mountain rain shower. You know, for science.

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