DEADLY LAKE DEFANGED:

Too much bubbly can be dangerous. So concluded an international team of scientists in explaining what mysteriously killed 1,800 people in 1986 near Lake Nyos in Cameroon, West Africa. Thanks to the work of many investigators with funding from UNESCO (the United Nations Educational, Scientific, and Cultural Organization), this unusual natural hazard -- dubbed a lake eruption -- has effectively been eliminated from the list of things we have to worry about on planet Earth.

This elegant case study of science serving humanity gives me hope for the future. At a time of heightened international tension and strained political relations, it's nice to know that scientists from France, the former colony of French Cameroon and the United States can team together. At a time when the integrity of the United Nations is being questioned, I'm pleased to report they got this initiative really right. Though earthquakes, tsunamis, landslides, volcanoes and floods continue to claim human lives, lake eruptions have been rendered impotent with life-saving technology as simple as a drinking straw.

Here's what happened. One night in August 1986, the world woke up to strange news. The bodies of the villagers, their pets and their livestock lay dead on the ground as if struck down by some evil spirit. Everything else looked completely normal. No massacre had taken place. There was no property damage or evidence of disease, or release of radioactivity or poison gas. No witnesses survived, except those who heard a distant explosion. We now know that the unfortunate souls near Lake Nyos drowned in an invisible cloud of gas that bubbled up out of the lake, then flowed silently over the village in a stealthy flood of carbon dioxide.

Lake Nyos is an unusually deep lake lying within the crater of an extinct volcano. Seeping into it are naturally carbonated springs of mineral water similar to what can be found on the shelf of a grocery store. Under normal conditions, springs release most of their dissolved gas upon nearing the surface, where the confining pressure is lower. Something similar happens when we pop the cork, pull the top, tap the keg or unscrew the cap from any carbonated beverage. Opening the container lowers the pressure, which allows the harmless gas to bubble out of solution. The bubbles rise to the top and pop, releasing the gas into the atmosphere.

The degassing of a bottle of champagne is similar to what happened in Cameroon. In that country's case, however, there was so much carbon dioxide near the ground that the victims couldn't breathe in enough oxygen. The cap on Lake Nyos wasn't a bottle cork. Instead, it was the sheer weight of the water column above the slightly heavier basal layer of carbonated water. With a constant groundwater inflow of gas-enriched water to the bottom of the lake, it was only a matter of time before the gas-enriched layer thickened to the height where the overlying fresher water wasn't heavy enough to prevent bubbles from forming. The first few bubbles forming at depth in the lake initiated a chain reaction, creating a fizz, then a foam, then an explosion that rose to the surface of the lake and released the gas. From there, it flowed over the victims like an evil wind.

Within a week, scientific detectives began moving in. Within a year, a solid hypothesis had been proposed. Within a decade, technical papers had been written and presented at international conferences. Within the following decade, an experiment was being conducted to prevent a recurrent tragedy. Recently, the final results of a successful long-term mitigation experiment were reported. The technological fix consists of a non-corrosive plastic pipe inserted into the base of the lake. All the engineers had to do was pump up enough water to initiate the fizzing reaction, then let the process sustain itself at non-lethal rates of gas release. About 2.8 million cubic meters of bubbly fizz out of the lake annually as if from a never-ending bottle of cream soda that was shaken too hard.
Now, that's what I call a happy ending. Residents of this developing nation no longer fear suffocation by their beautiful, beguiling lake.