THE NEW YORKER

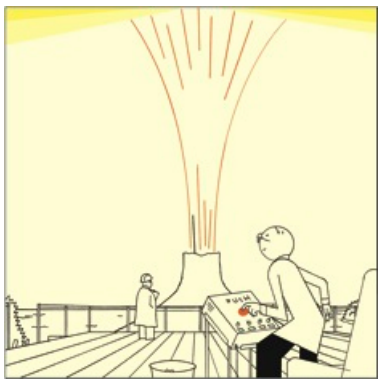
BOOKS

HOSED

Is there a quick fix for the climate?

by Elizabeth Kolbert

NOVEMBER 16, 2009



"SuperFreakonomics" has some ideas for reëngineering the planet.

In the eighteen-sixties, the quickest, or at least the most popular, way to get around New York was in a horse-drawn streetcar. The horsecars, which operated on iron rails, offered a smoother ride than the horse-drawn omnibuses they replaced. (The *Herald* described the experience of travelling by omnibus as a form of "modern martyrdom.") New Yorkers made some thirty-five million horsecar trips a year at the start of the decade. By 1870, that figure had tripled.

The standard horsecar, which seated twenty, was drawn by a pair of roans and ran sixteen hours a day. Each horse could work only a four-hour shift, so operating a single car required at least eight animals. Additional horses were needed if the route ran up a grade, or if the weather was hot. Horses were also employed to transport goods; as the amount of freight arriving at the city's railroad terminals increased, so, too, did the number of horses needed to distribute it along local streets. By 1880, there were at least a hundred and fifty thousand horses living in New York, and probably a great many more. Each one relieved itself of, on average, twenty-two pounds of manure a day, meaning that the city's production of horse droppings ran to at least forty-five thousand tons a month. George Waring, Jr., who served as the city's Street Cleaning Commissioner, described Manhattan as stinking "with the emanations of putrefying organic matter." Another observer wrote that the streets were "literally carpeted with a warm, brown matting . . . smelling to heaven." In the early part of the century, farmers in the surrounding counties had been happy to pay for the city's manure, which could be converted into rich fertilizer, but by the later part the market was so glutted that stable owners had to pay to have the stuff removed, with the result that it often accumulated in vacant lots, providing breeding grounds for flies.

The problem just kept piling up until, in the eighteen-nineties, it seemed virtually insurmountable. One commentator predicted that by 1930 horse manure would reach the level of Manhattan's third-story windows. New York's troubles were not New York's alone; in 1894, the *Times* of London forecast that by the middle of the following century every street in the city would be buried under nine feet of manure. It was understood that flies were a transmission vector for disease, and a public-health crisis seemed imminent. When the world's first international urban-planning conference was held, in 1898, it was dominated by discussion of the manure situation. Unable to agree upon any solutions—or to imagine cities without horses—the delegates broke up the meeting, which had been scheduled to last a week and a half, after just three days.

Then, almost overnight, the crisis passed. This was not brought about by regulation or by government policy. Instead, it was technological innovation that made the difference. With electrification and the development of the internal-combustion engine, there were new ways to move people and goods around. By 1912, autos in New York outnumbered horses, and in 1917 the city's last horse-drawn streetcar made its final run. All the anxieties about a metropolis inundated by ordure had been misplaced.

This story—call it the Parable of Horseshit—has been told many times, with varying aims. The latest iteration is offered by Steven D. Levitt and Stephen J. Dubner, in their new book, "SuperFreakonomics: Global Cooling, Patriotic Prostitutes, and Why Suicide Bombers Should Buy Life Insurance" (William Morrow; $29.99). According to Levitt and Dubner, the story's message is a simple one: if, at any particular moment, things look bleak, it's because people are seeing them the wrong way. "When the solution to a given problem doesn't lie right before our eyes, it is easy to assume that no solution exists," they write. "But history has shown again and again that such assumptions are wrong."

Levitt and Dubner tell the horseshit story as a prelude to discussing climate change: "Just as equine activity once threatened to stomp out civilization, there is now a fear that human activity will do the same." As usual, they say, the anxiety is unwarranted. First, the global-warming threat has been exaggerated; there is uncertainty about how, exactly, the earth will respond to rising CO_2 levels, and uncertainty has "a nasty way of making us conjure

up the very worst possibilities." Second, solutions are bound to present themselves: "Technological fixes are often far simpler, and therefore cheaper, than the doomsayers could have imagined."

Levitt and Dubner have in mind a very particular kind of "technological fix." Wind turbines, solar cells, biofuels—these are all, in their view, more trouble than they're worth. Such technologies are aimed at reducing CO_2 emissions, which is the wrong goal, they say. Cutting back is difficult and, finally, annoying. Who really wants to use less oil? This sounds, the pair write, "like wearing sackcloth." Wouldn't it be simpler just to reëngineer the planet?

One scheme that Levitt and Dubner endorse features a fleet of fibreglass boats equipped with machines that would increase the cloud cover over the oceans. Another calls for constructing a vast network of tubes for sucking cold water from the depths of the sea to the surface. Far and away their favorite plan involves mimicking volcanoes.

During a major eruption, huge quantities—up to tens of millions of tons—of sulfur dioxide are shot into the atmosphere. Once aloft, the SO_2 reacts to form droplets known as sulfate aerosols, which float around for months. These aerosols act like tiny mirrors, reflecting sunlight back into space. The net result is a cooling effect. In the year following the eruption of Mt. Pinatubo, in the Philippines, average global temperatures fell, temporarily, by about one degree Fahrenheit.

"Once you eliminate the moralism and the angst, the task of reversing global warming boils down to a straightforward engineering problem," Levitt and Dubner write. All we need to do is figure out a way to shoot huge quantities of sulfur dioxide into the stratosphere on our own. This could be done, they say, by sending up an eighteen-mile-long hose: "For anyone who loves cheap and simple solutions, things don't get much better."

Neither Levitt, an economist, nor Dubner, a journalist, has any training in climate science—or, for that matter, in science of any kind. It's their contention that they don't need it. The whole conceit behind "SuperFreakonomics" and, before that, "Freakonomics," which sold some four million copies, is that a dispassionate, statistically minded thinker can find patterns and answers in the data that those who are emotionally invested in the material will have missed. (The subtitle of "Freakonomics," published in 2005, is "A Rogue Economist Explores the Hidden Side of Everything.") In this way, Levitt and Dubner claim to have solved the mystery of why crime, after soaring in the nineteen-eighties, dropped in the nineteen-nineties. (The explanation, they say, is the legalization of abortion, some eighteen years earlier.) They also have proved—at least to their own satisfaction—that names like Ansley and Philippa will be popular for girls in the coming decade, that reading to your kids doesn't matter, and that drunks should be encouraged to drive rather than walk.

Given their emphasis on cold, hard numbers, it's noteworthy that Levitt and Dubner ignore what are, by now, whole libraries' worth of data on global warming. Indeed, just about everything they have to say on the topic is, factually speaking, wrong. Among the many matters they misrepresent are: the significance of carbon emissions as a climate-forcing agent, the mechanics of climate modelling, the temperature record of the past decade, and the climate history of the past several hundred thousand years. Raymond T. Pierrehumbert is a climatologist who, like Levitt, teaches at the University of Chicago. In a particularly scathing critique, he composed an open letter to Levitt, which he posted on the blog RealClimate.

"The problem wasn't necessarily that you talked to the wrong experts or talked to too few of them," he observes. "The problem was that you failed to do the most elementary thinking." Pierrehumbert carefully dissects one of the arguments that Levitt and Dubner seem to subscribe to—that solar cells, because they are dark, actually contribute to global warming—and shows it to be fallacious. "*Really simple arithmetic*, which you could not be bothered to do, would have been enough to tell you," he writes, that this claim "is complete and utter nonsense."

But what's most troubling about "SuperFreakonomics" isn't the authors' many blunders; it's the whole spirit of the enterprise. Though climate change is a grave problem, Levitt and Dubner treat it mainly as an opportunity to show how clever they are. Leaving aside the question of whether geoengineering, as it is known in scientific circles, is even possible—have you ever tried sending an eighteen-mile-long hose into the stratosphere?—their analysis is terrifyingly cavalier. A world whose atmosphere is loaded with carbon dioxide, on the one hand, and sulfur dioxide, on the other, would be a fundamentally different place from the earth as we know it. Among the many likely consequences of shooting SO_2 above the clouds would be new regional weather patterns (after major volcanic eruptions, Asia and Africa have a nasty tendency to experience drought), ozone depletion, and increased acid rain. Meanwhile, as long as the concentration of atmospheric CO_2 continued to rise, more and more sulfur dioxide would have to be pumped into the air to counteract it. The amount of direct sunlight reaching the earth would fall, even as the oceans became increasingly acidic. There are eminent scientists—among them the Nobel Prize-winning chemist Paul Crutzen—who argue that geoengineering should be seriously studied, but only with the understanding that it represents a risky, last-ditch attempt to avert catastrophe.

"By far the preferred way" to confront climate change, Crutzen has written, "is to lower the emissions of greenhouse gases."

Levitt and Dubner call their chapter on global warming "What Do Al Gore and Mount Pinatubo Have in Common?" As it happens, Gore has also a written a new book on the subject, "Our Choice: A Plan to Solve the Climate Crisis" (Rodale; $26.99). Like Levitt and Dubner, Gore argues that if people simply put their minds to it they could figure out a way to deal with global warming. "We have at our fingertips all of the tools we need to solve three or four climate crises—and we only need to solve one," he writes. But the similarities end there.

Where Levitt and Dubner avoid climate scientists, Gore appears to have talked to just about every one of them. (The acknowledgments for "Our Choice" run to four single-spaced pages of tiny type.) If you're curious about the relative contribution each of the major greenhouse gases makes to climate change, Gore has it. (CO_2 is the largest contributor, followed by methane.) If you want to know how a photovoltaic cell works, or a solar thermal tower, or where the ten largest wind farms in the United States are, you can find that in the book as well. Gore runs through the difficulties of feeding power from intermittent sources, like the sun and the wind, into the electrical grid, and describes how these difficulties might be overcome. He discusses carbon capture and sequestration, nuclear energy, agricultural policy, and conservation.

Just about the only strategy for coping with climate change that Gore isn't interested in is geoengineering. Indeed, the very idea strikes him as delusional. "We are already involved in a massive, unplanned planetary experiment," he writes. "We should not begin yet another planetary experiment in the hope that it will somehow magically cancel out the effects of the one we already have."

Though Levitt and Dubner couldn't have read "Our Choice," they nevertheless manage to anticipate Gore's position. The two argue that *his* views are the ones that rest on magical thinking. "If you think like a cold-blooded economist instead of a warm-hearted humanist, Gore's reasoning doesn't track," they write. "It's not that we don't *know how* to stop polluting the atmosphere. We don't *want* to stop, or aren't willing to pay the price." Here the two have a point. By the end of "Our Choice," it may be clear that we possess the tools needed to dramatically reduce our carbon emissions, but the book has

also shown—intentionally or not—that deploying them would require a lot from us. It would mean changing the way we eat, shop, manufacture, and get around, and, ultimately, how we see ourselves.

It is the difficulty of imagining such changes that makes schemes like Levitt and Dubner's at once so alluring and so dangerous. Just about every time anyone with any sort of credentials offers a "simple and cheap" solution to global warming, the idea is hailed as bold or innovative, and taken far more seriously than it deserves to be. Recently, *The Atlantic* named the theoretical physicist Freeman Dyson one of two dozen "brave thinkers" who are shaping the future. This was not for his pioneering work on quantum electro-dynamics and the exclusion principle but for his proposal that global warming will be resolved by "carbon-eating trees." For his "apostatical" views on climate change, Dyson was also the subject of a generally admiring profile earlier this year in the *Times Magazine*.

"Carbon-eating trees" certainly sound nice. But how, exactly, would they work? Dyson has never elaborated, and neither the *Times* nor *The Atlantic* seems to have asked. Would the trees take up CO_2 while they're alive, and release it back into the atmosphere only slowly, once they're dead? If so, the world already has those sorts of trees. They are called, well, trees. Or would the trees absorb carbon dioxide from the air and convert it, as Dyson once vaguely suggested, into "liquid fuels," so that instead of at gas stations we could fill up our cars at orchards? In that case, the idea seems not so much "brave" as off the wall. (Dyson, it should be noted, has also proposed genetically engineering plants made of silicon and trees that could be grown on Mars.)

To be skeptical of climate models and credulous about things like carbon-eating trees and cloudmaking machinery and hoses that shoot sulfur into the sky is to replace a faith in science with a belief in science fiction. This is the turn that "SuperFreakonomics" takes, even as its authors repeatedly extoll their hard-headedness. All of which goes to show that, while some forms of horseshit are no longer a problem, others will always be with us. ♦

ILLUSTRATION: LAURENT CILLUFFO