

Elizabeth Kolbert's new book, *Under a White Sky*, opens with the story of the battle to keep invasive Asian carp out of the Great Lakes. The problem exists because of two earlier interventions with nature. A century ago, we reversed the flow of the Chicago river to keep the city's pollutants out of Lake Michigan by sending them down the Mississippi. Later, Asian carp were brought to the U.S. as a way of controlling aquatic weeds and algae in sanitation treatment ponds. They eventually escaped control and reached the Mississippi River basin, where they have been spreading ever since. Now we are struggling mightily to keep them from reaching the Great Lakes with electric barriers, nets, and everything else we can think of.

Kolbert views the Invasion of the Giant Carp as emblematic of the Anthropocene task of managing the world created by our earlier interventions. Or, as she says, of people trying to solve the problems created by the efforts of earlier people trying to solve problems. She leads the reader on a lively tour of such efforts including an artificial replica of the cave pool inhabited by the endangered Devil's Hole pupfish, a breeding program to create heat-resistant coral to replenish the Great Reef; a massive sediment dispersion program to duplicate the effects of past Mississippi Delta floods; and genetic engineering projects aimed at eliminating invasive species. Potentially the most sweeping would involve reengineering the climate by removing CO<sub>2</sub> from the atmosphere and burying it in rock, or by filling the sky with sulfur compounds to reflect sunlight back into space. One side-effect of the latter effort would be to change the color of the sky from blue to white, giving Kolbert the title for the book.

Like the scientists and engineers she talks with, Kolbert is caught between optimism that these problems can be solved and pessimism about what these solution can accomplish. She calls this stance "techno fatalism": a sense that these solutions are simply the best we can do given the situation we have already created. We have already gone too far into the no-analog future, she thinks, to have any hope of avoiding future change. And perhaps there will be compensations: we may end up with a white sky, but in return we'll get spectacular sunsets.

The subtitle of the book is *The Nature of the Future*. That phrase asks us to consider what the future will be like, but also, what the term "nature" means in a world comprehensively reshaped by human interventions. This is a topic that scholars like Holly Doremus are beginning to address. It arises in contexts that are more mundane than the ones Kolbert describes. For instance, if a species is going extinct in its one remaining location on the top of one mountain, should we move it to another mountain where it may be able to survive — in the process, changing the natural ecosystem at the top of that mountain? Or would it be better to leave the two mountain ecologies to develop without our interference?

Not all of the interventions that Kolbert discusses raise such profound philosophical issues. Capturing carbon that's already in the atmosphere seems to be a necessary part of the effort to control climate change. As one of the experts cited in the book puts it, using chemicals in the stratosphere to reflect more sunlight back into space is something like chemotherapy: a really bad remedy that we should adopt only if all else fails.

Indeed, one lesson of the book is to reinforce the urgency of cutting carbon emissions. The more we emit, the more we will be faced with the need for a series of rearguard actions to salvage as much as we can from an increasingly dire situation. And then, of course, our efforts to solve those problems will spawn their own problems for later generations to confront. The best way to clean up messes is not to get into them in the first place.

Or failing that, at least don't make them worse than they already are.