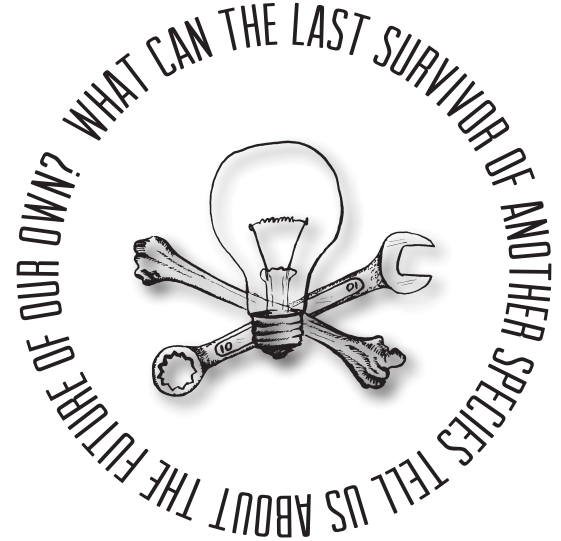

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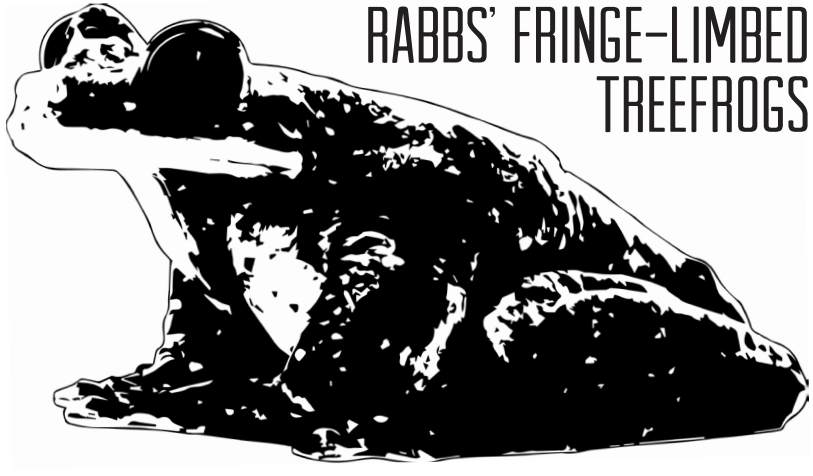
WE MEMENTO MORI ENDLINGS

A MESSAGE FROM TOUGHIE, LAST OF THE RABBS' FRINGE-LIMBED TREEFROGS



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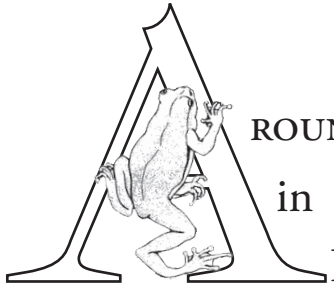
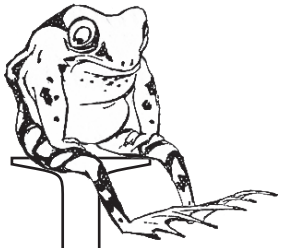


AROUND THE TURN OF THE CENTURY, in the cloud forests of central Panama, a frog named Toughie lived in the treetops of the mountain slopes that face the Pacific above the town of El Valle de Antón.

As a little tadpole, he grew up under the forest canopy in a pool of water that had gathered in a hole in a tree trunk. His father guarded the hole, climbing down into the water to let Toughie and his siblings nibble the skin off his back for sustenance. Later, as an adult, Toughie likely returned to that same pool or another like it to raise little tadpoles of his own.

Toughie had enormous hands and feet. Each of his fingers and toes ended in a pad affording him traction on the trees of his home. His hands and feet were webbed so he could leap from a treetop, spread them out, and glide down through the air to land on another tree or settle on the earth below. His skin was a rich red brown, bejeweled with green flecks that he could change at will, like a chameleon. But the most striking of his features were the deep, soulful eyes with which he surveyed the treetops of the cloud forest.

After nightfall, especially under a full moon or during the warm nights of spring, the forest would come alive with the songs of



Let's take Toughie's life as a memento mori, a reminder to honor what is unique in all of us, to celebrate our tremendous capacity for creativity and for freedom.

material like information in a database, but that we live fully in the present moment.

Rather than mourning the loss of biodiversity, a scientific abstraction, let us experience the end of Toughie's people as the loss of countless Toughies, countless unique individuals. The tragedy that is being inflicted on the earth right now is a composite of all the Toughies confined in slaughterhouses, fisheries, and cubicles—all the lives that are taken from us, all the potential that is foreshortened by a civilization based in destructive resource extraction and top-down control.

This is not a critique of all technology, but a call to evaluate technological systems according to how they increase or diminish our freedom and the freedom of all living things. Biological life is not the only value, just as biological death is not the worst thing that can befall a creature or a species.

There are two ways of conceptualizing what human extinction might mean. Ordinarily, it is understood biologically, as the end of the line of human genetic material. But we could also understand it as our species' total assimilation into a system of control, leaving the cloud forest for confinement in a glass box in the Botanical Garden.

We can imagine a biologist who, coming upon an endling, chooses to leave it in its environment to die on its own terms, insofar as such a thing is possible at all today. Similarly, rather than looking to scientists and administrators to manage our survival in an increasingly violent and toxic world, we might seek to open spaces of freedom and potential outside the logic of management and control, whatever the consequences.

Toughie's kin. First, each little frog would make a call like an owl, consisting of between three and five notes; then, immediately following it, a single barking "grrrrrck." Each of these frogs was advertising a little pool of water in the crook of a tree limb or a broken tree trunk in which a new generation of tadpoles might grow up, nourished by the skin of their father.

Colonization and industrialization have been destroying the forests that sustain frogs like Toughie for centuries, but Toughie's little corner of the world remained fairly stable until 2005. That year, two new arrivals made their appearance in the woods where Toughie lived.

One was a skin disease, amphibian chytrid fungus, which may have been brought to Central America with *Xenopus* frogs that humans imported from Africa. The frogs that caught this fungus slowed down and became erratic. Eventually, their skin peeled off and they suffered convulsions, ulcers, and hemorrhaging. Many frogs and other amphibians in Toughie's forest died this way.

The other new arrival was a field expedition of scientists. They climbed into the trees, scooping up the tadpoles they found in pools of water gathered in the trunks. One of them caught Toughie and confined him in a little vivarium along with the other frogs like him. Within two years, the forest had fallen silent.

Toughie and his kin were brought back to the United States and divided up between the Zoo and the Botanical Garden in Atlanta, Georgia. In 2008, the scientists who had captured them declared that they were a new species with their very own Latin name, *Ecnomiohyla rabborum*. In English, they called the species Rabbs' fringe-limbed treefrog. The captive specimens in Atlanta were the last known examples on earth.

They gave Toughie to the Botanical Garden and paired him with a female. Yet far from the cloud forests of Panama, the two declined to mate. Toughie had stopped singing shortly after his capture. He and his companion bided their time in captivity, staring silently out the windows of their cage.

Toughie's companion passed away quietly in 2009. She was the last female known to exist.

Toughie's only surviving kin was another male housed in the Atlanta Zoo. On February 17, 2012, scientists put him to death to extract his genetic material. This left Toughie the last of his kind.

The term for a creature that is the sole survivor of his species is endling. This neologism has only recently become necessary in our language. Others have suggested the expression terminarch.

Scientists don't usually name their specimens; they ascribe numbers to them, as the Nazis did to the inmates of Auschwitz. Toughie owes his name to the two-year-old son of the Amphibian Conservation Coordinator of the Botanical Garden, who christened him upon learning of his plight. Only a person too young to be desensitized to the typical plight of animals could properly recognize and name him.

Alone, Toughie persisted in his enclosure at the Botanical Garden, persevering from one year to the next—for one never knows what the future may bring. His handlers touched him gingerly, abashed before his mournful gaze, his big eyes seeming to peer through them.

Toughie hadn't made a noise since shortly after his capture in 2005. Finally, on December 15, 2014, he raised his voice again, and for the last time, the song of his people was heard.(https://www.youtube.com/watch?v=_yrobDYyOBI) His call echoed throughout the storage container in which he was imprisoned, unfamiliar to his captors. A song of inquiry, perhaps entreaty, with no answer. Toughie the endling.

Toughie died on September 26, 2016. His image has been projected onto the side of the UN building in New York City and onto St. Peter's Basilica during the Climate Talks in Paris.

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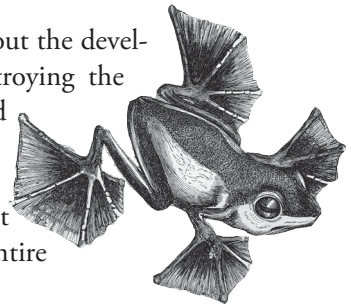

It's easy enough to identify our feelings about the developers and executives whose behavior is destroying the environments that frogs like Toughie depend on. If not for industrialism, we wouldn't be losing biodiversity everywhere around the world. This isn't about a single fungus; it's about human interventions that have knocked the entire biosphere out of balance. In many of the places we live, magical species like Toughie's were exterminated so long ago that we cannot even identify what has been lost. When so little wilderness remains intact, countless species are only a generation away from extinction.

Documenting the remaining species as they blink out one by one is not enough. The only proper mourning would be to take concrete steps to shut down the global industries that are exterminating them.

From the perspective of the scientists, Toughie's death is tragic because it marks the end of a species. In other words—it represents a loss of biological data. Yet one might say that this understanding of Toughie's story is itself an expression of the same way of viewing the world that brought about the destruction of his homeland and his people.

Toughie's refusal to breed is a message for us. He and his companion chose not to raise tadpoles. Offered the option of surviving in captivity, like Melville's Bartleby, they preferred not to.

What they were trying to tell us is that some things are more precious than mere genetic survival. The real tragedy of Toughie's story is not the loss of biological data, but the confinement of an individual creature away from its perishing homeland.

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In a sense, we are all endlings, each the last of our kind. Centralizing the question of whether we can reproduce—or whether we choose to reproduce—reflects a patriarchal focus on lineage and reproduction. There are many other ways to understand what gives life meaning. When we suspend the abstract category of species, we see that each of us is unique, each of us is the bearer of a singular and unrepeatable world. Through this lens, William Watkins, (the scientist who discovered the lone whale that sings at the frequency 52 hertz), is just as singular as the whale in whose solitary song he heard an echo of his own individuality.

We are all going extinct, one by one. When we come to terms with our mortality, with the certainty that the earth will perish, consumed by the sun, what matters is not the preservation of our genetic