

# ENDANGERED

THEY SAW A  
THYLACINE  
Justine Campbell  
and Sarah Hamilton

EXTINCTION  
Hannie Rayson

THE  
HONEY  
BEES  
Caleb Lewis



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## 86 Billion—Plus Three—Reasons to Save the World

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We are doing impossible things. The Mars Exploration Rovers, Cassini's amazing Enceladus fly-bys, the Kepler Space Mission—all defy incredible odds while looking for life, and we are doing it just for the greater good of human knowledge. That, and just in case humans might want to, might have to, desert the Earth for an alternate habitat. This, though, raises a fundamental question: why we don't just fix the pale blue dot we're already on?

To begin that undertaking however would suggest our culpability in the breaking of our planet in the first place, a responsibility these three plays all explore. This is an ethical, environmental, industrial, scientific and political mess—hence great drama—and one that sees us at a stalemate as the Doomsday Clock ticks ever closer to midnight.

For those of you too young to remember being haunted by the Doomsday Clock, let me scare you now: it was invented by a group who called themselves the Chicago Atomic Scientists in 1947 (most were Manhattan Project Alumnus) as a symbolic countdown to humanity's end/global catastrophe/nuclear cataclysm. It was seven minutes to midnight then; by the early '70s it was out past ten minutes to midnight; in 1991 with the ending of the Cold War it had relaxed to 17 minutes; in 2015 and 2016, however, it has accelerated back in, now at three minutes to midnight, the worst it has been since the US tested the H-bomb in 1953 (that first test revealing a weapon 450 times as powerful as the A-bomb that destroyed Nagasaki). The crucial thing to note about the Doomsday Clock is that what it's prophesying is entirely avoidable.

Before going any deeper into the slough of doom, AKA today's planet Earth, or remarking any further on our imminent and asymptomatic proximity to ecological devastation, I want to briefly discuss some extraordinary things—proton gradients and brain soup (and if I had more space, the secret life of trees)—that, like the plays, offer a spark, a shimmer, a flash of hope, or lines of flight towards actual, useful change.

It is appropriate, though, that a qualification is embedded here—why talk science in an introduction to three plays? My contention is that these plays bridge a gap that has emerged in the last 150 years: the artificial separation of science and art. Canadian novelist and biologist, Kristi Charish, asked in a 2012 speech to women in science and technology:

Why is there such a disconnect between the two [art and science]? As a whole we tend to shuffle art and science into different compartments. We identify as either artists or scientists, as if allowing the two to cross paths will lead to imminent catastrophe . . . like a zombie apocalypse.

At least until the mid-to-late nineteenth century, most artists were scientists and vice versa. Indeed the word ‘scientist’ (much loathed at the time of its coining for the irregularity of its etymology!) is a relatively recent invention (c.1834). One need only think of Leonardo da Vinci, Mary Shelley, Hedy Lamarr, Samuel Morse, Beatrix Potter or Isaac Newton to recall the once-intuitive marriage of the two roles. The popular scientist Carl Sagan argued that science (once known as natural philosophy) is a way of thinking, not just a body of knowledge—reliant on the critical tension between creativity and scepticism. Sounds like art. Given the state of the world, re-uniting art and science couldn’t make things any worse; it might even remind us that the human imagination has no limits.

This brings me neatly to an astonishing instance of the meshing of creativity, science and hope: brain soup. A Brazilian scientist, Suzana Herculano-Houzel, asked a very simple question of her colleagues—how many neurons are there in the brain? Herculano-Houzel (who did undergraduate studies in virology, graduate studies in the nervous system and a PhD in visual neurophysiology from the Max Planck Institute for Brain Research in Frankfurt) discovered that the reputed count of 100 billion neurons was a guesstimate. She devised a new method (‘brain soup’) that involves dissolving brain cell membranes in detergent (of all things) and then counting the nuclei and neurons left behind.

She found that while our brain wasn’t exceptional for a primate of our relative weight and brain size, we do have more neurons in our cerebral cortex than any other creature (humans have 16.3 billion neurons in our cortex, gorillas 9, chimps 6 and elephants 5.6). Her total human

neuron count was 86 billion. That is not quite the 100 billion that had been guessed at, but even if just one neuron connects with 1,000 others (which is where estimates currently lie), that means we have a minimum of 100 trillion synaptic connections. That's the equivalent to a processor that moves at one trillion bits per second. That's a whole lot of number/emotion/creative crunching. Not all brains are the same, and ours are unique and exceptional. And they should not be wasted.

Another amazing instance of science-meeting-art-meeting-hope is the proton gradient. One of the things that has always, at least for me, seemed utterly mysterious, was the 'spark of life' that saw beings emerge on this seething, volcanic, Hadean rock. In the late '80s, Mike Russell postulated—and this was one hell of an outlier theory—that undersea vents were responsible for biology emerging from geology on Earth 3-4 billion years ago. The more mainstream model holds that life on Earth began just 540 million years ago with the rise of oxygen, land plants, marine invertebrates, dinosaurs, and then eventually us—life as we know it. Marine explorers and scientists knew of the existence of acidic undersea vents, 'black smokers', but they are too hot and toxic to work as drivers of life, especially when ancient oceans were acidic anyway. It was possible that alkaline vents might theoretically have created the right soup for life to emerge but no-one had ever seen one.

When an alkaline vent was discovered in 2000—the so-called Lost City near the mid-Atlantic ridge—this wild undersea vent theory was tested. The 'energetics' crucial for the emergence of life were found. In this volcanic nursery there was not only catalysis provided by the metals present, but also proton flow across the vent system's mineral membranes because of alkaline conditions on one side and acidic sea water on the other. New chemical combinations were forged, including something like ATP, the chemical that powers all living cells. These molecules then drove the formation of amino acids and nucleotides, the building blocks for RNA and DNA—crucially, molecules that reproduce. With the addition of fatty molecules, protocells formed in the bubbles. These protocells, when added to the first enzyme cooked up in this infernal froth, harnessed energy from the proton flow. This meant the protocells could replicate and exist independently of the thermal broth. Bingo: bacteria and archaea. Life on Earth!

Life—its force, profusion and grandeur— is at the heart of all the plays in this volume. *They Saw a Thylacine*, by Justine Campbell and Sarah Hamilton of the HUMAN ANIMAL EXCHANGE, charts the end of life and the extinction of a species. *Thylacine* is a rich, beguiling story of the wars between a beast, a tracker, and a zookeeper. The image that confronts us at the start of the play is totemic: ‘Smoke in my eyes’. The play is a potent plea for understanding, yet the way forward for them is obscured. The tracker and the zookeeper articulate the care that should be taken in our stewardship of this precious place but they also feel viscerally the delicate equilibrium in our world, a system tending towards decay and chaos. Alison, the zookeeper, comments that her colleagues couldn’t tell the difference between a penis and a pouch on a thylacine. Many of the barriers to conservation action are gendered. Alison declares that this blindness and self-interest is the preserve of the privileged, the decision-makers, the men. The inference we draw is that this does not have to be the case.

*Thylacine* is a paean to the power of language, to the immediacy of vernacular, and the amazing tools of communication—word, metaphor and story—that transport, transform and transmogrify. Using little more than two interrelated yarns, this play speaks with great muscularity of the last human contact with a creature lost to us because of greed and cupidity. Campbell’s and Hamilton’s language imagines us back there—has us yearning for things to be different, to feel that cold and see that beauty, hear that growl, the cry, the screech across Tasmania that says hunger, that says sex, that says, ‘I want more life’.

The disappearance and potential extinction of the humble *Apis mellifera* is the cue for Caleb Lewis’ *The Honey Bees*. Here, unlike in *Thylacine*, the mode adopted is naturalism. Life is presented on a slab for us to examine, diagnose and discuss. Here is imprudence, the best of intentions (often deployed ill-advisedly), rage, trust, kindness, cruelty, the search for justice and the crippling legacy of insatiability and avarice. Here of course is a family—a core part of mimetic drama since the word was invented. Their fight is our fight; their agony, our agony. Naturalism is a Trojan horse for the smuggling in of metaphor and argumentation, and Lewis’ stretch of WA farmland stands in for all of the Western industrialised First World.

We, like Joan’s family, need to acknowledge that we are but pieces

in an interconnected whole whose various parts we barely comprehend, let alone command. While we may think we are special, we are always interdependent with our environment. When we merchandise and monetise nature, there are costs and consequences. In *The Honey Bees*, colony collapse disorder, whether because of the aggregation of hives or the varroa mite, is the end result of greed. Disaster borne of pride is not a new message. I am reminded of the Bible's book of Hosea:

Set the trumpet to thy mouth ... they have transgressed my covenant and trespassed against my law ... of their silver and their gold have they made idols ... they have sown the wind and shall reap the whirlwind ... the stalk hath no head; the bud shall yield no meal. (Chapter 8, verses 1-7)

Hosea was a prophet during a dismal time for Israel. Though surrounded by doom, he still believed in love's replenishment—but only once priorities were rebalanced. *The Honey Bees* is a play essentially, and intentionally, unbalanced. It demands that we think on ways to correct it, to right their wrongs and steer a sensible, sweeter, course of action than that which sees the business of feeding ourselves become beset with disease and ruination. But at least, as was observed in Proverbs 16.24: 'Pleasant words are a honeycomb, Sweet to the soul and healing to the bones'.

We begin Hannie Rayson's *Extinction* with broken bones: an accident in which a tiny rare creature is caught under a luxury motor car. Elemental forces then play out in a naturalistic fashion, in a thriller genre, mixing humour, intrigue, despair, fury, love and sex, tenderness and frailty. Humans are pitted against the thing they should not confront: life itself. When science, government or business sets itself apart from and above nature, or spies a landscape's resources as something to be extracted and sold (with inevitable waste dumping alongside); when we conquer and colonise; carve up or cut down; take without giving; we run into trouble. *Extinction's* quartet of arrogant, smart and blinkered characters sure run into trouble. Rayson's special skill is in capturing the fluidity of thought and the black humour of those who seek to use language, hypocrisy and cant to win at all costs. There are no villains or heroes here: just people in all their contradictory, short-sighted glory, striving to do what they think is right.

What the play does so cleverly is to play with our sense of empathy: who or what is right? While we may wring our hands at the loss of a quoll (or a thylacine, or a honey bee), unless we take heed it will be our own extinction soon enough. This play is that taking heed. The hope glimpsed in *Extinction* is not in a character, a course of action, a phrase or even an idea (though the play of course has all of those things and more), but a reminder of our ability to laugh at ourselves, at our bad behaviour and wilful foolishness. No matter how pompous or grasping or unthinking we become, humour can cut through bombast and righteousness like a scalpel. Aristotle argued that comedy was more frivolous than tragedy. Yet Rayson, like a few other highly skilled modern playwrights, knows that colliding humour and suffering, tragic pathos with sudden glory, delivers meaning, relief and profundity through the revelation of the heroic, the ridiculous and the corrupt.

So, impossible things have happened before on this planet. Life did find a way in the most unlikely, most hostile, of circumstances. And if life can emerge from volcanic soup, and if the human brain is the most interconnected thing—ever—then maybe we can save this planet. With words, with the right balance, with laughter. Each of these plays urges us to think on the costs and benefits of current actions, past misdeeds, and our very real potential to save the world. We have done impossible things. We will continue to do impossible things. Impossibility is a species less endangered than you might think.

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