

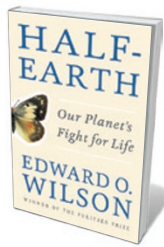
“a biological species in a biological world”, adapted to going forth and multiplying as if there were no tomorrow. There might not be. Only if we protect ‘Half-Earth’ can the vast majority of species be saved.

Wilson’s vision begs questions that he does not address in detail. Is it feasible? How close are we to achieving it?

In which ecosystems — forests or deserts or reefs — might we succeed? Where might failure be inevitable? Instead, he presents a manifesto. Half, he says, is a safe limit, because our own survival depends on the services of nature. Wilson argues a psychological need, too. He intends his goal to inspire us to strive nobly against the odds on behalf of all life. We must articulate an endpoint beyond the day-to-day business of saving particular species and habitats.

The consequences of protecting less than half are as close as my local supermarket on Key Largo, Florida, where I do my fieldwork. It is 500 metres from the Atlantic Ocean on one side and the Gulf of Mexico on the other, yet the fishmonger’s slab is covered with farm-raised salmon and tilapia, and scallops from the Southern Hemisphere. Even the mahi-mahi — available locally — is from Mexico.

Wilson castigates those who think that there is no problem with humans eliminating species 1,000 times faster than the natural background rate. Will new species evolve as they did after the mass extinction that killed the non-avian dinosaurs? It took evolution 5 million years to restore previous



Half-Earth: Our Planet's Fight for Life
EDWARD O. WILSON
Liveright: 2016.

levels of diversity. Will invasive species fill in the gaps? Alien species from rabbits in Australia to zebra mussels in the United States already cause harm costing billions of dollars per year.

Nor is Wilson kind to “new conservation”, a movement that he notes is embraced by the large US land trust the Nature Conservancy. Its proponents denigrate those who believe in pristine landscapes and, as he puts it, “prefer ‘working landscapes’ presumably as opposed to ‘lazy and idle’ landscapes, thereby making them more acceptable to ... business leaders”. A Google search suggests that the term pristine landscapes may have appeared in the flagship journal *Conservation Biology* once in the past decade — raising the question of who the professionals are who supposedly believe in them.

The Amazon exemplifies what Wilson calls wilderness: regions with small human populations, mainly indigenous ones. Companies that extract resources have historically been insensitive to the cultural disruption, and even genocide, that this can trigger. Wilson emphasizes how cultural diversity and biodiversity are important and can reinforce each other. I share his impression that the individuals most uncaring and dismissive of wilderness and biodiversity are those who have had the least experience of it. As nineteenth-century explorer Alexander von Humboldt put it: “The most dangerous worldview is the worldview of those who have not viewed the world.”

Is Half-Earth possible? The trajectories are favourable. About 5 million square kilometres of land and almost none of the oceans were protected in the mid-1970s; now the figures are close to 17 million and 10 million square kilometres, respectively. Vast marine no-take zones have been established

annually since 2000. Globally agreed targets aspire to more, and more representative, protection. Large tracts of land — deserts, the Amazon, the boreal forests — are protected because they are remote. The challenge will be to protect areas near cities, or areas that, like temperate grasslands, are easy to convert to livestock grazing.

A change in moral reasoning gives Wilson most hope. A 2015 encyclical letter from Pope Francis contains an outstanding tour of the challenges in mitigating damage to natural habitats. Its moral imperative, that we have no right to do harm, echoes Wilson’s concluding sentence: “Do no further harm to the biosphere.”

Wilson lauds those who devote their lives to that cause. The degraded longleaf-pine savannahs of the US Gulf coast — neglected by

“We must articulate an endpoint beyond saving particular species and habitats.”

federal authorities and land trusts — found a champion in the philanthropist M. C. Davis. Entrepreneur Greg Carr has helped to restore Gorongosa National Park in

Mozambique after a brutal civil war. Entrepreneurs Douglas and Kristine Tompkins have protected more land worldwide than any other private individuals — and in temperate grasslands, to boot. Progress on Half-Earth is possible in unlikely places. It is an aspiration worthy of our species. ■

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PSYCHOLOGY

No blank slate

Sara Reardon is moved by a play about the toll of infant sex-assignment surgery.

In 1966, psychologist John Money of Johns Hopkins University in Baltimore, Maryland, met someone who he felt was the research patient of a lifetime. David Reimer, then an eight-month-old boy, had had his penis mutilated in a circumcision accident. Doctors concluded that surgical reconstruction was too difficult. Money proposed a ‘solution’: could the child be turned into a girl?

Money studied people born with intermediate sex characteristics — then called

hermaphrodites. Standard medical procedure at that time (and still all too often) was to guess the sex that a baby ‘should’ be and surgically alter their genitals accordingly.

Money believed, as did many psychologists at the time, that the right training and environment could shape a child into any gender as long the process was started early enough. And because there was no doubt about whether

Boy

ANNA ZIEGLER
Clurman Theatre, New York City.
Until 9 April 2016.

Reimer had been born a boy, and without the other variables such as hormonal or genetic characteristics that can contribute to gender identity in intersex individuals, Money thought that the baby presented the perfect test case for the nurture theory. Reimer even had a control, a twin brother.

This tragic experiment is the inspiration for Anna Ziegler’s play *Boy*, now showing at the Clurman Theatre in New York City. The story cuts between 1989 and the 1970s, following the young adulthood of Adam



Bobby Steggert (left) as Adam and Paul Niebanck as psychologist Wendell Barnes in *Boy*.

(played by Bobby Steggert) and his childhood, first as a baby boy named Samuel, then as a girl. After a circumcision accident, Samuel's parents reach out to famous psychologist Wendell Barnes (Paul Niebanck), who counsels them that being an "incomplete" male would do irreparable damage to the child's psyche, whereas raising him as a girl should be fine. "We're blank slates," says Barnes. Thus, Samuel becomes Samantha.

After the child is given surgery to create a vagina, Barnes imposes a harsh regimen of counselling and hormone treatments. Samantha must never know the circumstances of her birth: Barnes believes that the revelation would scar her. He regularly flies the family from Iowa to meet with him in Massachusetts. Samantha's mother is given a script and directed to overload her child with stereotypical female interests: dolls, baking, figure skating, "open conversations about our bodies".

Steggert hops back and forth across the stage, alternating between the adult Adam and the child Samantha with neither a costume change nor a major personality shift. His constant face is a powerful reminder that the same male person is there all

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along, even if Samantha temporarily accepts girlhood.

What we don't see immediately is how broken she is. Being kissed by a boy in junior high school was the worst experience of his life, the adult Adam tells his girlfriend Jenny. Samantha would urinate standing up, try to shave her face and watch her pubescent brother explore his own sexuality in their shared bedroom. "I had it too, this sensation of wanting to get somewhere," the adult Adam explains in a heartbreaking letter to Barnes. "But I'd look down and there was nothing there."

The child Samantha tells Barnes none of this; she is desperate to please the doctor who she believes cares more for her than her own parents. Barnes listens when her parents do not and plays chess with her while every child in her class shuns her. She begs to move in with him.

Their special relationship breaks down when Samantha enters puberty. Barnes insists that she undergo surgery to repair the "vagina you were born with". He urges: "You need to be made whole."

Today, intersex advocates decry such language, arguing that people can live happy lives with uncommon genitalia. Whether to have surgery, they feel, should be a choice made by the person themselves, as an adult.

So legal challenges are beginning to mount. In 2013, a couple sued the Medical University of South Carolina in Charleston for performing surgery on their adopted son, who had been wrongly assigned female genitalia before they adopted him. And in 2015, the United Nations' special rapporteur on torture called newborn genital surgery a human rights violation — a follow-up report will be released this year.

But change is a slow process. And Money's work was groundbreaking, despite all the harm that it caused to Reimer — a failure that devastated the psychologist. He was among the first to describe sex — defined by physical traits — as a distinct entity from gender, which is how one identifies oneself. Feminists seized on his work as proof that women's difficulties in typically male professions are the result of culture rather than biology. And Money, who died in 2006, supported surgery for older people who felt that they had been assigned the wrong sex.

So the writers of *Boy* deserve credit for not portraying a stereotypical arrogant scientist willing to do anything to prove his theory, an accusation that Samantha's parents make. Although clearly eager to defend his work — who isn't? — Barnes does seem to care for Samantha. He writes to her frequently, teaches her classic literature and becomes genuinely distressed by her problems at home and school. "Not only is [she] an exemplar for science, she is a delightful girl," he tells the audience at a lecture. In their final showdown, when Adam confronts Barnes and reveals that he had his penis reconstructed at age 15, Barnes accepts Adam's decision and admits that he is male.

Despite some tedious dialogue, we cringe at the physicality of Adam's struggle each time he considers whether to share his secret with his love, even as every instinct screams no. Afraid to touch Jenny, Adam focuses his attention on her toddler son — the child he desperately wants but will never be able to have, no matter how much reconstructive surgery he undergoes.

Adam's love story ends predictably, but his future is probably far from rosy. Money was not wrong about the incredible malleability of children. Although they are far from being blank slates, children are perhaps like line drawings, coloured in by experience. Adam's 15 years of lies, sexual confusion, hormone treatments and social exclusion will not be easily overcome.

David Reimer found love, marrying in 1990. But 14 years later, at the age of 38, he killed himself. He was a victim of a rush to put children into neatly labelled buckets that continues even today. ■

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