"Magical." —SUSAN ORLEAN "Shocking." —SY MONTGOMERY

"Perfect, just perfect." —MARY ROACH

Why Fish Don't Exist

A Story of Loss, Love, and the Hidden Order of Life

NATIONAL BESTSELLER

Lulu Miller

10.

A Veritable Chamber of Horrors

The erosion of David Starr Jordan's presidential power began almost immediately after Jane Stanford's death. Displeased by his rash dismissal of Jane's informant, Julius Goebel, the board of trustees voted to strip David of his authority to fire faculty. And a few years later, in 1913, the board asked him to step down altogether. They allowed him to keep the ceremonial title of chancellor but divested him of any remaining executive power.

With a heaping amount of free time suddenly on his plate, David found himself a new hobby. His travels as a fish collector had taken him a few times to a village in the Italian Alps called Aosta. There, he had seen something shocking. Aosta was a sort of sanctuary city for people with disabilities, both mental and physical. For centuries, the Catholic Church had provided shelter, food, and care to people who had been rejected by their families because of their condition. And many of these people had ended up becoming skilled workers, in the fields or in kitchens; many of them ended up falling in love, getting married, having children. What had emerged was a sort of upside-down town. A town where the abnormal was normal, where people often disabled by society received the support that allowed them to flourish.

Some might see something beautiful in this town, a radically humane way of helping society's most vulnerable live with dignity.

But David Starr Jordan, when he visited in the 1880s, had described it as "a veritable chamber of horrors," overrun with "creatures" with "less intelligence than the goose . . . less decency than the pig."

Over the years, the town of Aosta continued to nag at David. He worried that it was proof of that thing Louis Agassiz had suggested could take place in the animal world: degeneration. David wrongly believed that immobile creatures like sea squirts and barnacles had once been higher forms of fish and crabs but had "degenerated" back into lazier, weaker, less complex, less intelligent forms of life, as a result of acquiring resources parasitically. More broadly, he believed that any kind of long-term aid to a creature would result in its eventual physical and cognitive decline. He called this misunderstanding of how nature works "animal pauperism," and he worried that the same phenomenon was taking place in Aosta, that the people of Aosta were literally degenerating into a "new species of man." So he began working on a book. A book that would alert the public to the dangers of charity, causing, as he believed it did, "the survival of the unfittest." A book that would recommend the extermination of these "*crétins*" as the only way to prevent against a worldwide "decay" of the human race. A book that would rely heavily on a word that had come into being only a few decades earlier. A word without much popularity in America when he first began. A word he himself would champion with so much zeal and scientific authority, he'd help propagate it on US soil.

Eugenics.

* * *

The word was coined back in 1883 by a British scientist named Francis Galton, a famous polymath in his own right, who also happened to be the half cousin of Charles Darwin. When *On the Origin of Species* had first come out, Galton had read his cousin's book

and been so inspired he called it a new "epoch in my own mental development." Once Galton had come to comprehend that there were forces of natural selection shaping the array of life on Earth, it dawned on him that perhaps you could actually manipulate those forces to select for a master race of humans, by breeding out traits he incorrectly believed to be associated with blood: poverty, criminality, illiteracy, "feeblemindedness," promiscuity, and more. He called this technique of killing off groups of people you don't like "eugenics," Greek for "good" and "birth." And he began telling anyone who would listen to him—Darwin's cousin!—about his scientific-sounding plan for making Europe great again.

He trotted out his ideas at fancy gatherings and in fancy magazines like *Nature* and *Macmillan's*. He even wrote a sci-fi novel called *The Eugenic College of Kantsaywhere*, about a community where only those who passed rigorous tests were allowed to procreate, and anyone else who tried would be imprisoned and punished with "sharp severity." Galton saw his book as a happy tale. A how-to guide for saving the human race from decay.

Plenty of people dismissed Galton. There's a chance that eugenics could have remained in the realm of speculative fiction had a small group of influential scientists not championed its cause so zealously. David Starr Jordan, despite all his railing against the dangers of "sciosophy," was one of the earliest and loudest. He drank the eugenics Kool-Aid hard and fast. He began hallucinating evidence of heritable personality traits everywhere. Even his smitten biographer, Edward McNall Burns, had to admit it was ludicrous. "He attached so exaggerated an importance to biological inheritance, that he seemed to think almost every quality of human personality could be explained thereby." Poverty, laziness, the ability to classify birds—all simply a matter of the blood!

David Starr Jordan was one of the first to bring Galton's ideas back to America. As early as the 1880s, decades before most Ameri-

can eugenicists got the fever, David had begun to tuck these ideas into his lectures at Indiana University, informing students that traits like "pauperism" and "degener[acy]" were heritable and thus could be "exterminated just as swamps are drained." In time, he began taking the ideas outside of the classroom, giving speeches to large gatherings of prominent politicians warning that the "republic shall endure [only] as long as the human harvest is good." He published his first pro-eugenics article in 1898 and followed it with a flurry of books advocating for the cleansing of the gene pool: *The Human Harvest*, *The Blood of the Nation*, *Your Family Tree*, and so on. In his writings, David took all the kinds of people he wanted to rid from the Earth—the paupers and drinkers and "*crétins*" and "imbeciles" and "idiots" and morally depraved—and he lumped them into one category, the "unfit." *Unfit!* Such a catchy word, so evocative, so trim. It could take his opinions about which groups of people deserved to live and wrap them in the cloak of science. *Unfit!* Not one man's judgment, just a reality of nature.

On speaking tours, David made stops at churches and almshouses, where he'd warn the devoted staffs about the dangers of their work fomenting, as he claimed it did, "the survival of the unfit." He'd share the cautionary tale of Aosta, describing a land where "goitered" and "imbecile" "creatures" roamed free, drooling, panhandling, behaving indecently; an old woman, he claimed, once "even lick[ed] my hands like a dog." He had sketches made of the people he had supposedly met there—an old woman hunched over a cane, grimacing maniacally, with missing teeth and warts; a man with a coconut-size goiter sprouting from his neck—and he warned that this was where the human race was headed if society didn't take action. The solution? Some eugenicists considered paying elites to have more babies to flood the gene pool with "superior" stock. Others suggested legalizing polygamy for the upper class. But David Starr Jordan had what he considered a far better idea. A way of

making real that "extermina[tion]" he had once proposed to his students. By simply snipping the reproductive organs of people he saw as "unfit," David assured audiences that "each individual cretin should be the last of his generation."

In the wake of these talks and similar ones given by other early eugenicists, back-alley sterilizations and, occasionally, executions began taking place all over America. In 1915, a doctor in Chicago named Harry Haiselden began leaving disabled babies to die, earning him the nickname "the Black Stork." There were rumors of a mental hospital in Illinois that was intentionally killing off its patients with tuberculosis-infected milk. According to scholar Paul Lombardo, who has done heroic work unearthing huge chunks of this history, a handful of doctors began boasting of sterilizing "unfit" patients, while countless more performed the operation in what was sometimes called the "quiet way"—behind the scenes and without legal authority.

But David Starr Jordan, good Puritan, was not a fan of breaking the law, so he began advocating for the legalization of eugenic sterilization. In 1907, a few of his friends from Bloomington successfully legalized forced eugenic sterilization in Indiana—the first such law not just in the country but in the world. Two years later, David helped get it passed in California. His commitment to the cause apparent, he was asked to chair the Eugenics Committee of the American Breeders Association. He eagerly accepted.

I can't believe I made it through my entire education without ever learning about our country's leading role in the eugenics movement. But eugenics seemed as roaring a part of American culture as flappers and the Model T. This was not a fringe movement; it crossed party lines; the first five presidents of the twentieth century hailed its promise; eugenics courses were taught at prestigious universities all across the country, from Harvard to Stanford to Yale to UC Berkeley to Princeton and back again. There were eugenics

magazines. Eugenics cosmetics. Even eugenics competitions. Often held at state fairs, under festive white tents. Contests would be held for the fittest families and best babies—measured and weighed like pumpkins. Blue ribbons for the fairest skin, the roundest head, the most symmetrical features.

And as for the losers? Slowly, more and more states passed sterilization laws. Connecticut. Iowa. New Jersey. Have a sexually transmitted disease? *Snip*. An epileptic seizure? *Snip*. An out-of-wedlock baby, a criminal record, a low score on a standardized test? *Snip*. *Snip*. *Snip*.

Still, the actual rate of sterilization was low. The policies David helped to put in place required an "unfit" person to first come into contact with the law or the medical, education, or welfare system before a sterilization could take place. Then, in 1916, an American guy named Madison Grant published a eugenics book that a German guy named Hitler would later call his "bible." In the book, *The Passing of the Great Race*, Grant proposed a policy that, in certain ways, resembled Galton's sci-fi vision: that all the nation's "moral perverts, mental defectives and hereditary cripples" be rounded up under the guise of charity and sterilized. American eugenicists thought it was brilliant. When over a decade later Hitler passed Germany's first mandatory sterilization law, American eugenicist and doctor Joseph DeJarnette whined, "The Germans are beating us at our own game."

Not all Americans, however, were so gung-ho about this plan of creating a better society via genetic cleansing. There were some very loud voices of dissent. In 1910, the president of the American Bar Association called eugenic sterilization "barbari[c]"; a lawyer with Oregon's Anti-Sterilization League called it "an engine of tyranny and oppression"; the Catholic Church was one of its loudest opponents, on the grounds that it violated the sanctity of life. In 1906, Pennsylvania governor Samuel Pennypacker struck down what would have been the first compulsory sterilization law in the world,

saying, "To permit such an operation would be to inflict cruelty upon a helpless class . . . which the state has undertaken to protect."

And then there was the mounting scientific dissent. More and more scholars were calling the science behind eugenics "rot," pointing out that a person's environment played a crucial role in many of the traits eugenicists thought could be eradicated by sterilization—poverty, promiscuity, illiteracy, criminality. Other scientists questioned the validity of the concept of "degeneration," the idea that charity causes physical deterioration; they were unconvinced that life moved "backwards" in the way David claimed it did, unconvinced that sea squirts, for example, had devolved into immobile sacs as a result of relying on food from other species. These skeptics would later be proved right.

And then there was that key point in *On the Origin of Species*. That crucial point that somehow both David and before him Francis Galton had missed. What does Darwin say is the best way of building a strong species, of allowing it to endure into the future, to withstand the blows of Chaos in all her mighty forms—flood, drought, rising sea levels, fluctuating temperatures, invasions of competitors, predators, pests?

Variation. Variation in genes, and hence in behavior and physical traits. Homogeneity is a death sentence. To rid a species of its mutants and outliers is to make that species dangerously vulnerable to the elements. In nearly every chapter of *Origin*, Darwin hails the power of "Variation." He marvels over how diverse gene pools are healthier and stronger, how intercrossing between different types of individuals gives more "vigor and fertility" to their offspring, how even worms and plants that can produce perfect replicas of themselves are equipped for sex, for introducing variety back into the gene pool. "How strange are these facts!" he cries. "How simply are these facts explained on the view of an occasional cross with a distinct individual being advantageous or indispensable!"

"Diversify your genetic portfolio" would be another way of saying it. You never know which traits could prove useful as conditions change. Darwin even goes out of his way to warn against meddling. The danger, as he sees it, is the fallibility of the human eye, our inability to comprehend complexity. Traits that might seem "abhorrent to our ideas of fitness" could actually be beneficial to a species or ecosystem, or could, in time, become beneficial as conditions change. It was that ungainly neck that gave the giraffe an edge over its competitors, the seeming deadweight of blubber that allowed the seal to thrive in the advancing cold, the divergent human brain that might hold the key to inventions, discoveries, and revolutions that the majority is unable to fathom. "Man can act only on external and visible characters; nature cares nothing for appearances. . . . She can act on every internal organ, on every shade of constitutional difference, on the whole machinery of life."

Consider the case of the cyanobacteria. A tiny green speck in the sea, so insignificant to the human eye that for centuries we didn't even have a name for it. Until one day in the 1980s when scientists accidentally discovered it was producing a significant portion of the oxygen we breathe. Now we revere it, this tiny green speck, *Prochlorococcus marinus*; we fight to protect it. This was the kind of scenario Darwin prophesied. Why he warned, so unambiguously, against attempting to rank Earth's bounty: "Which group will prevail, no man can predict."

And this wariness, this humility, this reverence for an ecological complexity that defies human comprehension is, in fact, a very old idea. It's a basic philosophical concept sometimes called the "dandelion principle": in some contexts a dandelion might be considered a weed to be culled; in others, it's a valuable medicinal herb to be cultivated.

The eugenicists failed to consider this very simple principle of relativity. By trying to cull the gene pool of its "indispensable" vari-

ety, they were in fact foiling their very best shot of building a master race.

* * *

And yet not a single one of these arguments, philosophical, moral, or scientific, seemed to penetrate David's certainty about eugenics. He, along with other eugenicists, dismissed their dissenters as naïve, sentimental, too dim to see the bigger picture. "[E]ducation can never replace heredity," David declared in a eugenics manifesto entitled *Your Family Tree*, adding: "An Arab proverb puts the matter bluntly: 'Father a weed; mother a weed; do you expect daughter to be a saffron root?'"

In fact, in the face of mounting dissent, David only pushed harder to create a mandatory eugenics program in America. He persuaded his friend the wealthy widow Mary Harriman to give over half a million dollars (about $13 million today) to seed the Eugenics Record Office, a shiny, new pro-eugenics research hub in Cold Spring Harbor, New York. The ERO would go on to collect boatloads of data on tens of thousands of Americans. The researchers would then use the information to construct family trees that suggested that complicated phenomena such as poverty, criminality, promiscuity, dishonesty, and a fondness for the ocean (which was given the clinical term "thalassophilia") were predestined in the blood. While the ERO did turn up a few legitimate discoveries—useful information about the inheritance of albinism and neurofibromatosis, for example—the majority of its work would be unequivocally debunked. The researchers had a habit of fudging data, of encoding gossip as fact, and it is now well established that intergenerational poverty or criminality, for example, is brought about by a swirl of insidious environmental factors.

In spite of the studies churned out by the prestigious ERO (it

also received substantial support from the Rockefeller family and the Carnegie Institution), by the early 1920s the public was beginning to change its tune on the subject. More and more doctors who had performed sterilizations faced lawsuits, and the Supreme Court of New Jersey decided to strike down its eugenic sterilization law due to its "palpable inhumanity and immorality." It was looking like perhaps David's dream of a national eugenics program had finally fizzled out.

Enter Albert Priddy.

Priddy was the slick-haired doctor in charge of the Virginia State Colony for Epileptics and Feebleminded, in Lynchburg, Virginia. He was a zealous eugenicist, known for having sterilized women for being "man-crazy," having "wanderlust," telling "coarse stories," and even passing notes in class. In 1917, he had been sued by a man named George Mallory for sterilizing his wife and daughter while Mallory had been traveling for work. Dr. Priddy's justification? That a house full of women with no man in charge must have been a brothel.

"I am a humanbeen as well as you," Mallory wrote to Priddy after learning what Priddy had done. "You ought be ashamed of your selft. . . . Just stop and think of how she have been treated." The judge sided with Priddy, but the Colony was shaken by the lawsuit and urged Priddy to cool it on the sterilizations. Instead of repenting, though, Dr. Priddy dug in. He began searching for a case that would prove to juries that "feeblemindedness" was hereditary and must be stopped by sterilization.

And one day in 1924, Dr. Priddy found what he'd been looking for. A young woman named Carrie Buck was dropped off at the Colony. She was an orphan, and had become pregnant at the age of seventeen after being raped. After she gave birth, her foster parents sent her away to the Colony. When Carrie landed on Dr. Priddy's doorstep, he was struck by something familiar about

her face. Those high cheekbones, those pensive eyes. It turned out that her biological mother, Emma Buck, was also in residence at the Colony under allegations of being a prostitute. After Priddy realized the two women were related, he had Carrie's baby, Vivian, tested by a famous eugenicist researcher from the ERO. The researcher ran a few tests—likely running a coin in front of the baby's eyes or clapping his hands to test her attention—and determined that little Vivian "showed backwardness." This official assessment then gave Priddy the thing he had been dreaming of for years. Proof that "feeblemindedness" was heritable over three generations.

A lawyer named Irving Whitehead was appointed to represent Carrie Buck to protest the sterilization, but scholarship by Lombardo suggests that Whitehead was a proponent of eugenic sterilization, likely in cahoots with Dr. Priddy. When the prosecution accused Carrie of coming from a "shiftless, ignorant, and worthless class of people," Whitehead failed to provide what could have been a decent defense for her (she had good school records, and neighbors and teachers willing to vouch for her character) and kept appealing the ruling until he got all the way to the Supreme Court.

The year was 1927. The month was April. David Starr Jordan was seventy-six years old. He had begun to grow weak. Just a year earlier, his son Eric—little Eric, his replacement for Barbara, this boy who had grown into a paleontologist—had died in a car accident at the age twenty-two as he headed out on a collecting trip. David was weak from grief, weak from exhaustion, weak from too many years of formaldehyde eating away at his eyes; his vision was going; he had developed diabetes; in just a couple of years he would need a wheelchair. But he would have been energized by the reports coming out his radio. Scientists from the ERO, an institution that he had helped bring into existence, were providing evidence to the Supreme Court, asserting that "moral delinquency" was encoded in the blood and could be eliminated

through mandatory sterilization. This notion that had once been a hazy idea in David's mind had, through his proselytizing, become a thing of this Earth. An entity so real it was poised on the precipice of entering federal law.

The nine somber-faced justices considered the evidence, the fancy words and intricate family trees that suggested sterilization was a sound way of protecting citizens against crime, illness, poverty, suffering. They considered the girl, Carrie: timid and trusting. Asked during her first hearing if she had anything to say for herself, she had replied, "No, sir, I have not. . . . It is up to my people." Her people voted 8 to 1 to make compulsory sterilizations legal "in order to prevent our being swamped with incompetence."

Five months later, Carrie Buck was taken into a squat brick building at the Lynchburg Colony and brought to the second floor, where a skylight provided extra light for the surgeon. She was placed on an operating table and sliced open just above her pubis. Using probes, the surgeon located her fallopian tubes and swiftly ligated each one. He then sealed each cut with carbolic acid so the dead end would hold tight.

Carrie awoke to a new reality: that no other child with her distinctive eyes, with her unique mix of traits, would ever walk this Earth again. "They done me wrong," she would later say. "They done us all wrong."

Carrie's case paved the way for over 60,000 sterilizations, performed legally and against people's will, all over America in the name of "public welfare." Many of the "unfit" have been forgotten, but researchers have fought to keep what stories they can find in the light. In 2007, a historian from the University of Michigan, Alexandra Minna Stern, discovered a set of microfilm reels in an old file cabinet in a government office in Sacramento. On them was a sort of eugenics registry—the names and demographic information of

every person sterilized in David's adopted home of California from 1919 to 1952. The list was nearly 20,000 people long.

Stern has spent years analyzing the records with a team, and together they've been able to fill in the picture of what "unfit" really meant, what kinds of people lived inside that category. As Stern writes, those deemed unfit "often were young women pronounced promiscuous; the sons and daughters of Mexican, Italian, and Japanese immigrants . . . and men and women who transgressed sexual norms." Other studies have shown how women of color were disproportionately targeted for sterilization. The US government has admitted to forcefully sterilizing over 2,500 Native American women in the early 1970s. The Eugenics Board of North Carolina sought out and sterilized hundreds of black women during the 1960s and 1970s. And, mind bogglingly, approximately *a third* of all Puerto Rican women were sterilized by the US government between 1933 and 1968.

The ruling that made this all possible, by the way, is still on the books. That's right. The Supreme Court ruling has never been overturned. At our highest level, it is still written into law that if the government deems you "unfit," officials have the authority to pull you from your home, stick a knife through your abdomen, and terminate your bloodline.

While most legal scholars will tell you that *technically* the law is in a state of limbo because every state has since repealed its eugenic sterilization law, the reality is that nearly half of the states still allow for involuntary sterilization of people deemed unfit, only now they use words like "mentally incompetent" or "mentally deficient." Meanwhile, forced sterilization continues to be performed in the "quiet way" all over the country. Much of it remains undocumented and hard to catch—coercive sterilizations in low-income hospitals, meth clinics, prisons, institutions for people with disabilities, and

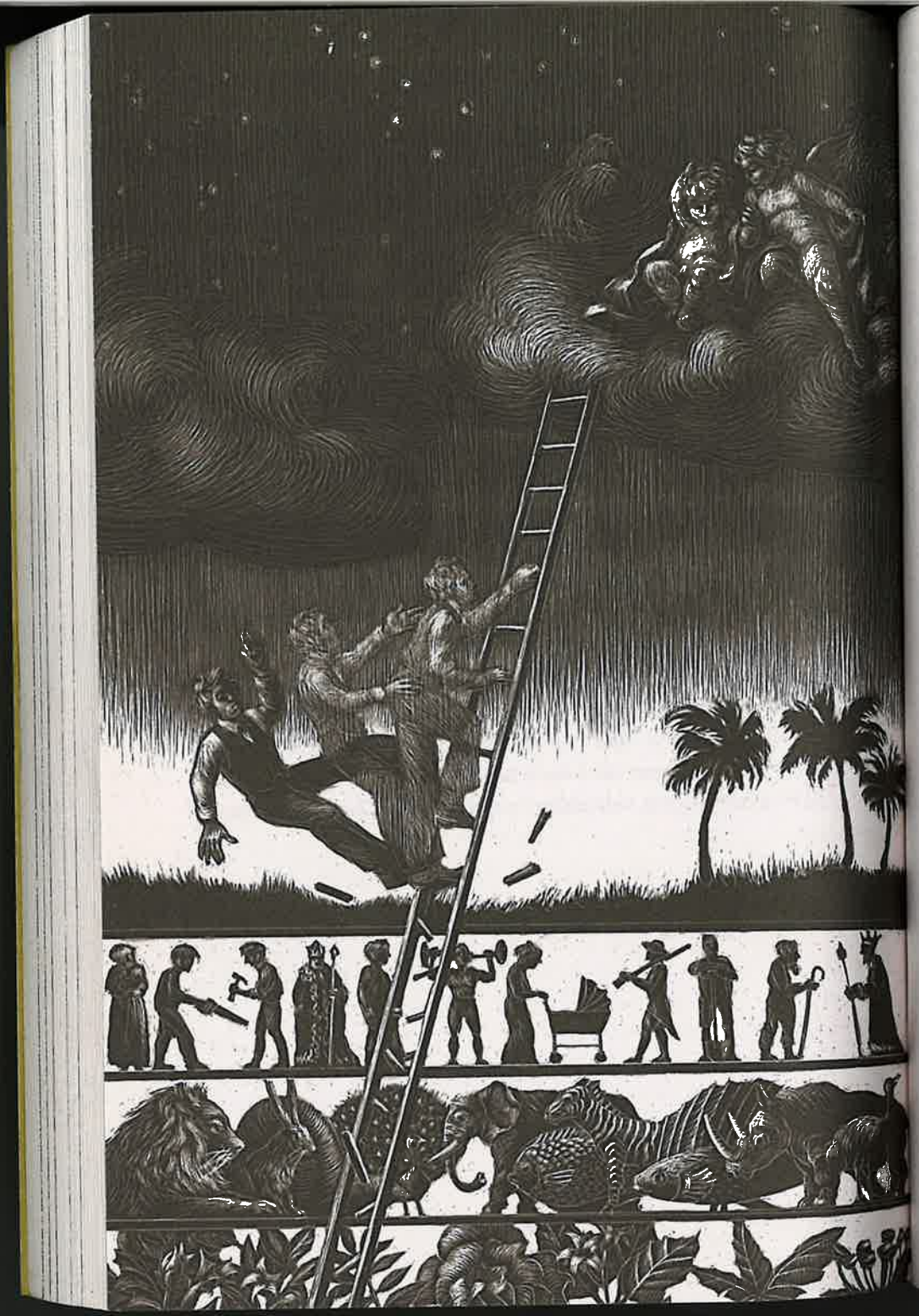
beyond—but big cases come to light every few years. Over the period of 2006 to 2010, for example, nearly 150 women were illegally sterilized in California prisons, without the women's consent and occasionally without their knowledge. And in the summer of 2017, a Tennessee judge named Sam Benningfield was found to be offering petty criminals reduced jail sentences in exchange for being sterilized.

There it is. That same mind-set. Galton's folly. The misbelief that poverty and suffering and criminality are a matter of the blood and can be excised from society with a knife. Eugenic ideology is anything but dead in this country; we are sticky with the stuff.

Stroll down the National Mall in Washington, and when you get to Twenty-First Street, look north and you will see him. Francis Galton, in bronze, over the doorway to our nation's temple to science, the National Academy of Sciences. Walk up the main promenade on Stanford's campus, and one of the first statues to greet you is that of Louis Agassiz, believer that blacks are subhuman, still presiding from his Corinthian pilaster. Behind him is a massive sandstone building, with sweeping archways and a clay tile roof, named in honor of the man who toured our country calling for the "exterminat[ion]" of society's most vulnerable groups. Jordan Hall.

11.

The Ladder



David Starr Jordan remained an ardent eugenicist until his dying day. There's no evidence of any last-moment realization or remorse. Not about the thousands of people who were brandished with scars and shame thanks to his efforts. Not about the individuals he trampled as he fought to maintain his power—Jane Stanford, the doctors he slandered, the spy he fired, the librarian he accused of sexual perversity.

It was chilling. His brutality. His remorselessness. The sheer depth of his descent, the breadth of his rampage. I felt sick. I had been fashioning myself after a villain, after all. A man so sure of himself and his ideas that he was capable of ignoring reason, of ignoring morality, of ignoring the clamor of thousands of people begging him to see the error of his ways—*I am a humanbeen as well as you.*

How had it happened?

How had that sweet boy, so devoted to caring for the "hidden and insignificant," turned into a man who would so readily kill off the same? Where in his story had he changed? And why?

Looking at the full spread of David's emotional anatomy, the most obvious culprit seems to be that thick "shield of optimism" he was so proud to possess. He had "a terrifying capacity for convincing himself that what he wanted was right," writes scholar Luther

Spoehr, who was struck by how David's certainty in himself, his self-delusion and hardheadedness, only seemed to intensify over the years. "His ability to crush those in his path multiplied even as he became convinced that his path was the one of righteousness which led to progress." As much as David had railed publicly against self-delusion, *privately* he seemed to rely on it, especially in times of trial. *It is the will of man that shapes the fates.* Perhaps that group of psychologists had been right, the ones who warned that positive illusions can ferment into a vicious thing if left unchecked, capable of striking out against anything that stands in its way.

But could that have explained all of it? How hard David was able to push his eugenics agenda, how far? Overconfidence, grit, and pride make a dangerous cocktail, surely, but they didn't seem to fully account for how rabidly he devoted himself to the cause of genetic cleansing.

I worked backward, looking for the swerve, the event or idea that nudged his rudder, made him veer so disastrously off course. I scanned back through the chapters of his life, the boat trips across the Pacific, the Garden of Eden in Palo Alto, the fire in Bloomington, the starry nights of his boyhood in upstate New York. Year by year, I went, sifting through his stories, unstacking the encounters, jar by jar, fish by fish.

Until, eventually, I found myself inside a barn on Penikese Island, beneath a halo of circling swallows, examining the germ of an idea that Louis Agassiz had implanted in young David's mind. It was the belief that there is a ladder built into nature. A *Scala Naturae.* A divine hierarchy from bacteria to humans that points objectively toward better.

This idea rebuilt David's world. It transformed his shameful habit of collecting flowers into "missionary work of the highest order." It filled the cavity of his chest with a burst of purpose that sailed him through life, winning him jobs, awards, wives, children, presidencies.

It fueled his work, through one disaster and then the next. Onward he went, reading nature like a compass, believing that in the shape of a fin or a skull lay moral guidance. He was sure that if he looked closely enough he could glean whom to emulate and whom to condemn; he could glean, in short, the true path to enlightenment, to peace, to whatever fruits lay at the top of that ladder.

And when he thought he saw humanity beginning to slip, he felt called to rescue it by any means necessary. He wielded his belief in a natural order like a blade, convincing people that sterilization was the soundest way—the only way—of saving the human race.

"I just wish he had considered what Oliver Cromwell once said," Luther Spoehr told me on the phone one June morning, as he tried to make sense of this man he had studied for so many years. "'I beseech thee in the bowels of Christ, consider that thee might be mistaken.'"

"Are you saying you wish he had more doubt?" I asked.

"Yup."

But he didn't. Despite his prophet's warning—that "science, generally, hates beliefs"—David held fast to this idea of a ladder. He clung to it, in the face of waves of counterevidence that should have eventually eroded it.

When Darwin came along, debunking the idea of a divine plan, David accepted that Earth's creatures had come about accidentally. But he somehow found a way to preserve the idea of a hierarchy of perfection. He told himself that time, not God, had forged its shape—the slow tick of time forming fitter, more intelligent, more morally advanced forms of life.

When he encountered the growing chorus of opposition to his eugenics agenda, when judges and lawyers and governors began trying to overturn eugenic laws, he wrote them off as sentimental, unscientific. When *scientists* began to question eugenics, to point out all its shoddy assumptions about the heritability of morality, about

the concept of degeneration, he questioned their courage, their commitment to the cause of bettering society.

But perhaps the most damning argument came from nature herself. Had David followed his own advice to look to nature for truth, he would have seen it. This dazzling, feathery, squawking, gurgling mound of counterevidence. Animals can outperform humans on nearly every measure supposedly associated with our superiority. There are crows that have better memories than us, chimps with better pattern-recognition skills, ants that rescue their wounded, and blood flukes with higher rates of monogamy. When you actually examine the range of life on Earth, it takes a lot of acrobatics to sort it into a single hierarchy with humans at the top. We don't have the biggest brain or the best memory. We're not the fastest or the strongest or the most prolific. We're not the only ones that mate for life, that show altruism, use tools, language. We don't have the most copies of genes in circulation. We aren't even the newest creation on the block.

This was what Darwin was trying so hard to get his readers to see. There is no ladder. *Natura non facit saltum,* he cries in his scientist's tongue. There are no "jumps." The rungs we see are figments of our imagination, more about "convenience" than truth. To Darwin, a parasite was not an abomination but a marvel. A case of extraordinary adaptability. The sheer range of creatures in existence, great and small, feathered and glowing, goitered and smooth, was *proof* that there are endless ways of surviving and thriving in this world.

So why was David unable to see it? This mountain of counterevidence stacked up against his faith in a ladder. Why would he protect it, this arbitrary belief about how plants and creatures should be arranged? When challenged, why would he only double down and use it to justify such violent measures?

Perhaps because his belief gave him something more important than truth.

Not just that first spark of purpose as a young man on Penikese, not just a career and a cause and a wife and a cushy life. But something even more profound. A way of turning that roiling morass, of the sea, of the stars, of his dizzying life, into clear, shining order.

To let go, at any point—from his first read of Darwin to his last push for eugenics—would have been to invite a return to vertigo. He would have been transported back to being that lost little boy, shaking before a world that had just taken his brother. A terrified child, powerless before the world, with no way of understanding or controlling it. To let go of that hierarchy would be to release a tornado of life, beetles and hawks and bacteria and sharks, swirling high into the air, all around him, above him.

It would have been too disorienting.

It would have been Chaos.

It would have been—

—the very same vision of the world I myself had been fighting so hard not to look at ever since I was a little girl. That sense of falling off the edge of the world, plummeting alongside ants and stars, with no purpose or point. Of glimpsing the glaring, relentless truth so clear from inside the swirl of Chaos. *You don't matter.*

That's what the ladder offered David. An antidote. A foothold. The lovely, warm feeling of significance.

In that light, I could understand why he clung to it so tightly, this vision of a natural order. Why he protected it so ferociously—against morality, against reason, against truth. Even as I despised him for it, on some level I craved the very same thing.

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I closed David Starr Jordan's autobiography. The second and final olive-green volume. I set it on the nightstand in my little guest room in Heather's apartment in Chicago. The night air was quiet.

Heather was staying across the city with her boyfriend. The hot light of the city screamed through the window.

There were a few stars. They were hard to see, but they were there, winking behind the pink garbage mess we have made of the sky. I was back on the earth I had been trying so hard to escape. The bleak one, with no refuge or promises no matter what you do, how much you believe in your mission, or how hard you repent. I had messed up a lot of the good things in my life. And I wasn't going to lie to myself any longer. The curly-haired man was never coming back. David Starr Jordan wasn't going to lead me into some beautiful new existence. There was no way of overcoming Chaos, no guide or shortcut or magic phrase to guarantee everything would end up okay.

So what do you do after letting go of hope? Where do you go?

12.

Dandelions