

Chapter 8

Protectors to Providers



Using food as a means to help others flourish: This started to seem to me like the beating heart of the urban food revolution. The movement is about how we interact with food, of course. But it is also about how we interact with each other.

Ever since I'd first heard mention of Veterans to Farmers, an organization that was getting former soldiers involved with growing food in greenhouses, I knew I needed to find out more. Dana and Libby had shown me how food can bring people together in community. But can growing food heal what has been broken by war?

SOME 2,500 YEARS AGO, Greek philosopher Heraclitus wrote, "War is the father of all things." This sentence is on my mind as I search in Chu Lai, Vietnam, alongside a man I hardly know, for the ruins of a landing strip—little more than scraps

of cracked tarmac. The place where my father was changed forever has been reclaimed by jungle. Only a few concrete helicopter hangars remain. We stand squinting at the gray humps of them from a distance of a few hundred yards. The scream of insects is so loud it seems a kind of silence. Humidity pearls like sweat on the leaves of plants. My dad tells me he doesn't want to get any closer when I offer to walk with him toward the hangars.

As the child of a Vietnam veteran, I know this: When you help a soldier readjust to life back home, you help more than one person. You help families; you heal communities. PTSD is not just a problem of individual soldiers; it is a problem with which all of us are faced.

Buck Adams, a former Marine Corps soldier turned farming visionary, has a solution. He has solutions to several problems, in fact. He is decentralizing the industrial food system, growing healthful produce, creating jobs for veterans, and building self-reliant communities one greenhouse at a time. He's reviving the family farm—but it's like no farm I've ever seen.

BUCK ADAMS HAS A square jaw that seems as strong as his superhero-like name. But it couldn't withstand the knee of a Samoan rugby player. Along with a shattered jawbone, Buck suffered several concussions while playing rugby in the Marines. In a voice that rumbles above the sound of spilling water, he says, "I don't know if it was the concussions from rugby or the percussions from explosions that gave me my head injury." He explains that surgeons opened his skullcap to remove an osteoblastoma, a kind of tumor that was growing in his brain. His halting speech pattern now makes sense to me: It is symptomatic of someone who's had head trauma. Buck seems to be searching hard for words, and occasionally he can't find them. His laughter comes in staccato bursts, like gunfire.

We sit down at a table in a greenhouse surrounded by a forest of white plastic towers eight feet tall, each one dripping

water and sprouting plants. The greenhouse is located in Lakewood just off busy Wadsworth Boulevard, but the sound of frenetic traffic outside is absent—it's so peaceful inside this growing space we could be in the wilderness surrounded by waterfalls.

Buck tells me he spent several tense months in the early 1990s locked and loaded in the Philippines as a member of the Marine Corps Security Force. Coup attempts destabilized the government and Mount Pinatubo blew apart; then a typhoon arrived, creating a lethal mix of ash and rain, spreading social chaos throughout the Philippines. Buck was tasked with maintaining order and overseeing the evacuation of civilians.

I can easily imagine Buck, who is wearing a button-down shirt and slacks, in a Marine Corps uniform. He's in his early forties but still sports the broad shoulders, thick chest, and trim waist of a jarhead. His hair is a little longer than a high and tight military cut, and it's accented with silver that shines in the bright light of the greenhouse.

"I know how hard it is to transition back to civilian life," he tells me.

Our conversation is interrupted by Buck fielding a call on his cell phone to reschedule a meeting that he's double booked. "I'm doing too many things," he admits. When Buck finishes his phone call, I ask him why it was difficult to reintegrate when his service ended.

"I had PTSD, but it's also hard just not having a routine. No structure. Your life is so regimented in the military. When I got back stateside I drifted around. Didn't know where I belonged."

Buck lived on the beach in California and worked odd jobs like bouncing in bars and modeling for Sears back in the days when Sears had a catalogue. Buck was born the same year I was, 1971. We swap memories of the catalogue—as antiquated now as a rotary phone. "I was the construction guy in the flannel shirt and jeans," Buck says, laughing.

"So how do you get from Sears model to this?" I gesture at the towers covered in plants and splashed with sun.

“I was doing some work for a geothermal heat pump company, and that’s how I caught the sustainability bug.” He explains that he looked into starting a company using geothermal sources to heat greenhouses, which led him into the world of controlled-environment agriculture, a method that manipulates a crop’s environment to achieve optimal growing conditions. “I learned about Mexico’s \$1.8 billion industry exporting tomatoes to America—almost all those tomatoes come from greenhouses using hydroponics. And I learned that China was way ahead of us in building greenhouses. I realized how far we’d fallen behind the rest of the world in growing food in controlled environments. Of all industrialized nations, we’re dead last in greenhouse farming. I saw a business opportunity.”

In 2009 Buck joined with a friend in Colorado to start Circle Fresh Farms, specializing in hydro-organic produce. Buck had grown up on a ranch in Texas, and when he was fifteen his family moved to Arkansas, where they raised chickens on contract for Tyson Foods. Growing tomatoes hydroponically was a long way from poultry farming. But Buck borrowed the Tyson business model, creating a central company that contracted with independently owned greenhouses and then marketed the hydroponically grown organic produce to local retailers on the Front Range. When Buck talks about launching this business, which helped scale up local food production and distribution in Colorado, the serious expression on his face changes to that of a child unwrapping a present. But what he’s even more excited about is Veterans to Farmers, the nonprofit he founded. And I’m starting to understand why.

A veteran-turned-urban-farmer I spoke with a few days before I tracked Buck down told me, “When I’m in a greenhouse, nothing matters as much as the plants I’m growing. That’s my whole world. Soldiers are trained to blow shit up, to break things apart. Nurturing plants to grow is the opposite of everything we’re taught in the military.”

Buck not only wants to help veterans heal, he wants to change the way food is grown. He tells me, “I’m trying to put

the family farm back into America.”

Is this really a problem? Or is yearning for the return of the family farm just a form of nostalgia? The United States Department of Agriculture (USDA) says we definitely have a problem. We are facing a serious shortage of farmers in coming years: The people who grow our food are aging and retiring, and few young farmers are prepared to take their place. The USDA is calling for one hundred thousand new farmers, and Buck is heeding that call.

The tagline for Veterans to Farmers is “Turning Protectors into Providers.” Buck explains that many military recruits come from either inner city or rural areas; when they return from war there aren’t a lot of opportunities available to them in their communities. And for many of them, an academic environment is too overwhelming. “Veterans who are struggling to reintegrate into society don’t want to be pitied,” Buck says. “They want to serve—that’s what they signed up for. When they return home, they want to continue to be of service. Some of them go into fields like police work and firefighting. But that’s too much stress for a lot of them. They need to find other ways to serve.”

Buck taps into the military training of veterans to help them achieve success as urban farmers. They are used to routines and structure; they are accustomed to being assigned tasks and given missions. Perhaps most important, they have a deeply instilled sense of commitment to a larger cause. The task Buck has given them is to redeploy the family farm. Their mission: feed America.

Buck’s larger vision is to create what he calls the National Training Center Greenhouse. This initiative will provide veterans with a stable source of income and healing as they are trained to cultivate food sustainably in urban communities across America. In a sort of boot camp they will receive intensive practical training, and the goals and challenges of the mission will be made clear to them. When their preparation is complete, they’ll be redeployed to a greenhouse and given the opportunity to own it. Through their work

growing food and feeding the community, they will be reintegrated economically and emotionally into society. “Protectors become providers,” Buck says. “It’s good for everyone.”

Buck points to one of the plastic pillars bursting with greenery. “Check this out.” As we walk around a white structure roughly the size of a classical column on a front porch, Buck says, “There are no pesticides or herbicides in this greenhouse. It uses one-tenth the water that conventional agriculture uses. And it yields ten times more food.” Forty towers transform the 1,500-square-foot greenhouse into 23,000 feet of growing space—a fifteen-fold increase.

Throughout the greenhouse, uniform towers stand in soldierly formation. The strict discipline of controlled-environment agriculture seems a world apart from the growing systems that Nick and Ash introduced me to—techniques that celebrate the diversity found in dirt. As I stick my hand through an opening in the tower and feel the water trickling inside, Buck tells me, “The best way to make urban farming commercially successful is to go vertical.”

IN THE NEAR FUTURE, it’s possible that the food we eat will be grown not in fields of dirt but in multistory towers with water dripping downward. From the Hanging Gardens of Babylon to the architect Le Corbusier’s boldly imagined skyscraping worlds in the 1930s, vertical agriculture is nothing new. The modern incarnation of this age-old dream of maximizing food production by growing in three dimensions is sort of like the permaculture herb spiral—but on a massive dose of organic steroids. The effort is being led by Dr. Dickson Despommier, a professor of environmental health sciences and microbiology at Columbia University. As director of the Vertical Farm Project, Dr. Despommier has issued a clarion call to architects and agronomists to erect urban farms in innovative towers, forests in the sky that have a small footprint within crowded cities.

If our food were grown in urban towers, much of the land that we have disturbed and denuded by our unsustainable ag-

ricultural practices could be allowed to heal, and ecosystems could be restored, slowing our destruction of biodiversity. Instead of inundating fields only to have irrigation water evaporate or run off, carrying pesticides and other pollutants to rivers and seas, water would be recycled inside sealed farm towers—we would use a small fraction of the water required to grow crops in fields. Because the indoor environment would be tightly controlled, there would be no need for herbicides and other harmful chemicals. The hyper-efficiency of constant light and calibrated nutrients would ensure staggering yields. Extreme weather events such as droughts, floods, and hurricanes wouldn't affect the food supply. And because the food wouldn't have to be transported far and could be delivered soon after harvest while still alive, its freshness and nutrition would be enhanced. A head of lettuce travels, on average, 1,200 miles to your plate. Vertical farming advocates like Dr. Despommier contend that shrinking this transportation distance, or "food miles," would reduce energy consumption.

Not everyone is sold on vertical farming—or even on the locavore craze. Using food miles as a simple metric of sustainability has recently come under criticism. Opponents of the food-miles paradigm insist that a much larger share of carbon emissions comes from producing food than from transporting it. They also contend that obsessing about how far food has traveled distorts discussion about the most efficient methods for shrinking the carbon "foodprint." One study, for example, found that tomatoes grown in the warm and sunny fields of Spain and shipped to Sweden had a smaller carbon foodprint than tomatoes grown locally in Swedish greenhouses heated by fossil fuels.

In Colorado's indoor growing environments, ground crops like spinach and microgreens can be covered with thermal blankets to help them survive the coldest spells. But commercial greenhouses in Colorado generally need some form of supplemental heat for part of the year. Generating that heat could create a larger carbon footprint than trucking veggies in from California. Critics of vertical farming also point out that

when indoor agriculture goes multistory, the natural lighting benefits of a two-dimensional growing space in a traditional greenhouse or rooftop garden are lost; artificial lighting becomes necessary to illuminate the multiple levels, consuming energy in amounts that can negate the savings of reduced transportation distances.

While experts debate the merits of food farmed in city towers, crowded Singapore has been forced to go vertical. The land-poor, technology-rich nation has emerged as a world leader in vertical farming innovation by banking on its consistently warm temperatures and abundant sunshine. Aluminum trays are rotated toward the sun in a cleverly designed system so efficient it uses only the power required to illuminate a light bulb. But few places on the planet are blessed with Singapore's year-round, 86-degree-Fahrenheit climate and perpetual flood of sunshine.

One of the world's first multistory vertical farms is planned for Jackson, Wyoming. Similar to the system used in Singapore, plants will be moved mechanically on a conveyor belt to maximize their exposure to sunlight. Smart design has reduced the energy footprint of this sophisticated greenhouse—yet it still must be heated in a climate in which winter temperatures plummet so low they freeze the fluids in cars.

Swedish company Plantagon International is building a vertical farm in the Stockholm area, and Plantagon aspires to create skyscraping spheres and soaring conical structures in cities across the planet. Inside these futuristic greenhouses, the company's patented "transportation helix," a spiral ramp designed to slowly move cultivation boxes from floor to ceiling, will allow plants to receive an even distribution of natural light, eliminating the need for artificial lighting. The multistory greenhouse in Sweden will make use of surplus energy supplies in the city and will burn biogas generated from the greenhouse's organic waste.

The largest vertical farm in the U.S. is FarmedHere, a commercial aquaponics operation sited in a windowless, formerly abandoned warehouse in a suburb of Chicago. Taking

advantage of recent advances in efficient lighting technology, FarmedHere began operations in 2013. Plans are underway to use methane gas generated by composting to light and heat the building. A similar energy scheme is being implemented in another vertical farm in Chicago's abandoned stockyards district, and post-industrial buildings in cities across America are being slated for rebirth as urban farms.

Along with biogas, a greenhouse's conventional energy use can be offset by harvesting the sun's heat stored underground. While soil's surface temperature varies tremendously throughout the year, the temperature a few feet below the surface remains relatively constant. In winter, ground source heat pumps can direct this buried warmth into a greenhouse. (Ground source heat exchange is often confused with geothermal power, which taps the tremendous heat that emanates from deep within the Earth's core to generate electricity.) Ground source heat exchange, when combined with other forms of renewable energy such as solar and biogas, could conceivably liberate vertical farms from the conventional energy grid, freeing them to produce vast quantities of food with carbon-neutral methods.

Perhaps technology can keep pace with the dream of forests in the sky. For now, the farmscrapers of the future exist in exquisitely rendered architectural drawings that stir the imagination of science fiction fans. I can't look at them without thinking about self-sufficient colonies on distant worlds. Indeed, one item on Dr. Despommier's list of reasons why vertical farming is necessary is that we won't be able to survive long term in space if we can't first figure out how to grow food on a large scale in controlled environments here on Earth.

Maybe these farms that tower upward among the world's cityscapes will always be a thing of the future, and we will find ourselves forever digging in the dirt, turning the earth with our tools, giving thanks to the microbes and worms that build the soil. There is a part of me that wants my boots to be crusted with dirt and to feel the sun on my neck as I kneel to loosen the roots of weeds with my bare hands and inhale the scent of

soil. There is also a part of me—the part that read a lot of Isaac Asimov when I was a kid—that dreams of life inside sterile towers with their climates controlled by sensors and dials as we feed the planet's hungry masses and prepare to journey toward the stars.

Perhaps the truth, as always, is somewhere in the middle. Maybe a combination of radically different growing systems—some referencing ancient practices to steward the world's soils, others reaching forward to create controlled indoor growing environments in cities—will allow us to feed the nine billion people predicted to fill the planet by 2050.

REGARDLESS OF WHETHER skyscrapers of food will rise in our cities, I'm fascinated with this smaller version of the vertical farm Buck is showing me. While we talk amid the measured sound of cascading water, Buck introduces me to the owner of this greenhouse, Sgt. Evan Premer.

"I had a troubled childhood," Evan tells me. He doesn't go into details about his life before the military or during his service. In response to my questions, he tells me that when he decided he wanted to change his ways as a troubled teen, he joined the Army National Guard. He volunteered to go to Iraq, where he served twelve months as a door gunner on UH-60 Blackhawk helicopters. He ran air assaults and resupply missions to outward bases. "That's all I can say about it," he tells me. But he does talk about his insomnia, the nightmares that plague his sleep.

When Evan came back from Iraq he started a small property management and custom interiors business, but it went bust when the economy crashed. He went to school to study photography. He says, "That's really what I wanted to do, but it's hard to make a business out of it." And the flashes of light triggered wartime memories. He struggled to hold down jobs.

Seven years after his service in Iraq, when Evan sees a lone helicopter flying he feels his pulse quicken. The rational part of his mind knows there are good reasons why a single helicopter

might be in the air. But in Iraq, a lone helicopter always meant something was wrong. He startles when objects are dropped. The sound of a certain tone of low bass in music brings back memories of bomb blasts. Evan says, "Most civilians don't understand the experiences veterans have gone through." He knows that his behavior can seem blunt and abrasive to those who aren't familiar with war. But in combat situations, he explains, a failure to be direct can cost lives. A soldier isn't concerned about people's feelings; he's focused on receiving and issuing orders. Evan reveals that unlearning the communication skills that saved lives in combat is no easy task.

Evan applied for a job at Walmart. "They said I was over-qualified." He tells me this with no show of emotion—it's hard to get a read on how painful his unemployment was for him. "We were taught to never show weakness," he says of his military training. But small cracks appear in Evan's tough demeanor, and pain pours through. He's having trouble sitting still in his chair as we talk. "I was desperate," he says, his hands fidgeting on the table. Searching for some way to fit in to society, he started Googling "jobs for veterans." That's how he found Buck.

"I was always interested in agriculture," Evan says. "But I couldn't afford to buy land." Buck invited Evan to participate in an intensive eight-month program that trained former soldiers in both the technology and business of controlled-environment agriculture. Through Buck's program, and through connections supplied by Evan's mother, Esther Premer, who volunteered at a greenhouse and worked at restaurants, Evan and his mom were able to start this greenhouse business, Aero Farm Co.

We get up from the table and walk around the greenhouse. Evan seems more at ease when moving among his plants. As I watch his practiced hands picking leaves and checking roots, the space where he does his work seems like a decompression chamber. There are no IEDs to be wary of, no insurgents lurking in the ruins of cities, no snipers on rooftops with their sights on his back. In this safe place the temperature remains

constant and the gurgle of water blends with the steady hum of fans.

Evan's mother says the changes she's seen in her son since he began his urban farm business are remarkable. His anger has diminished, his edginess has eased. His time is occupied. "I think the most important thing is he has a sense of purpose," she tells me.

Evan's wife, also a member of the National Guard who served in Iraq, where the couple met, will soon start working at the family business if everything goes according to plan. Their daughter, who is four, likes being in the greenhouse so much she asked her dad if she could camp there. "She wanted to put a tent right in the greenhouse," Evan says with a chuckle, his voice softening as he speaks about his daughter. When she was born, he gave up cigarettes. "She deserved a dad who didn't smoke," he says. "I eat the greens I grow when I'm driving to help deal with road rage, and to keep me from smoking." Evan's master plan is to build an urban farm business that he can pass on to his daughter. Food isn't just helping heal this veteran: It's strengthening his family—and his community.

Though the greenhouse is tucked back from a road and can be hard to find, people seek it out, curious about their neighborhood farmers with their space-age aeroponic towers. Aeroponics is the process of growing plants in an air or mist environment, in contrast to hydroponics, the process of growing plants in a liquid medium. NASA-sponsored research aboard the Mir space station has contributed to the aeroponic growing systems now in use on Earth.

The aeroponic towers that rise in Evan's greenhouse hold net pots—shaped like flower pots but with netlike openings, like little laundry baskets. The plants are started in rock wool, a medium made from molten rock spun into fibers. Then the seedlings are transplanted to the net pots, which tilt outward to point the plants toward the sunlight that streams through the plastic skin of the greenhouse. Water infused with a nutrient blend is lifted upward from a reservoir at the tower's base by a pump similar to what you'd find in a fish tank; the liquid

trickles back down inside the tower, misting the roots with all the water and nutrients the plants need to grow. The greenhouse needs to be heated part of the year, but the natural light of Colorado's Front Range, blessed with three hundred days of sunshine a year, is sufficient to grow greens in the one-story structure. The productivity is remarkable—from seed to salad bowl in less than a month. What really gets my attention, however, is the taste.

The nutrient-rich broth that is slurped up by the plants results in fresh greens so flavorful I wander through the vertical farm sampling crackly watercress and clean arugula, pleasantly bitter chard and tender leaves of kale, savory microgreens and basil with a spicy bite. To suppress this banquet of flavors with dressing would just be wrong. I've never eaten greens that stand so solidly on their own and offer so many distinctive flavors. "It's because they're still living," Evan explains as he shows me the roots attached to a bunch of arugula he just pulled from a pot. Local chefs are eager to purchase these plants because they are still alive when they arrive in their kitchens. The 150 pounds of super-fresh greens Evan produces each week are plated at prominent restaurants in Denver's culinary scene like Linger, Root Down, and Beast + Bottle.

The greens I'm taking home with me from Evan's greenhouse will get drizzled with olive oil and sprinkled with sea salt. Maybe a few pinches of shredded Romano cheese, maybe some cracked black pepper, nothing more. I would buy these greens from Evan because he's a good guy working hard to build his business, but the truth is, I'd buy these greens no matter who was growing them—because they taste damn good.

Community members who live near Aero Farm Co. may soon be dining on the mouth-watering greens, tomatoes, and strawberries Evan grows in his greenhouse. He's creating a CSA program for the neighborhood—the first year-round CSA in the state, Evan explains. "I can grow food in the greenhouse through the winter and feed my neighbors all year long," this protector-turned-provider tells me with evident pride.

ON MY DRIVE HOME, while battling traffic and feeling my blood pressure rise, I try Evan's therapy: I munch handfuls of arugula to keep my anger in check. The fresh bite of the leaves focuses my attention on the sharpness of their flavor—and these tasty greens put a smile on my face that the idiot in the minivan who just cut me off can't erase. I wonder what my dad's life would have been like if he'd entered the controlled environment of a greenhouse after returning from the chaos of war. And I wonder what my life would have been like.

Gardening's therapeutic value is well established in the scientific literature. Though anecdotal evidence suggests farming is highly beneficial for veterans struggling with PTSD, remarkably little science has been done to evaluate its efficacy. An expert advisory panel assembled by the Institute of Medicine determined in 2014 that the efforts of government agencies to track and evaluate the effectiveness of PTSD therapies have been inadequate. Nearly one veteran an hour commits suicide. Do we have time to wait for bureaucracies to fund research that proves that working in greenhouses helps veterans grow?

ON MY TRIP TO VIETNAM with my father, we walk along a beach. The sound of the surf stirs memories of Evan's urban farm in me. The water in his controlled growing space is a stream with many branching channels. It is lifted upward by softly humming electric pumps, and gravity cascades it back down to nourish the roots of plants in a continual loop, a soothing flow. As I imagine helicopters and mortar fire, I am struck by the idea that a greenhouse is the polar opposite of war.

My dad is as tight-lipped as Evan about his war experiences. But his shaking hands belie the steadiness of his speech as we drive back to our hotel from the ruins of the base at Chu Lai where fifty years ago he'd taken shelter in a bunker. While watching my dad's unsteady hands I think about Evan inside his greenhouse, his plants an entire world that surrounds not

only him but his mother, his wife, his daughter. He nourishes the greens that give him strength, and the nutrients that cycle through his greenhouse spread through his family and his community. When soldiers return to society as farmers, swords are turned into ploughshares, destroyers become creators, and all of us are healed.

WHILE SPENDING TIME IN urban farms with people traumatized by war, I thought about Mostafa and the few times he'd told me stories of serving on the front lines of the Iran-Iraq War. What role combat stress played in Mostafa overeating I will never know, though I wonder if the calming release of chemicals triggered by sugar and fat helped steady him when memories from the front lines surfaced. Like my father and Evan, Mostafa would speak to me of his war experiences in a guarded way that made me reluctant to press him for details.

Had I known about Buck's program when Mostafa was alive, and had I known that Mostafa was struggling with his health and with the trauma of war, I would have taken him into a greenhouse. But the truth is, as much as Mostafa had enriched my life, I had paid little attention to how deeply wounded he was, whether by PTSD or by the culture shock of severing himself from his Persian traditions. I had let myself be lulled by Mostafa's stories and his saffron tea into believing that my friend was fine—and then, after he died, I was angry with him for not having been honest with me about his health. But maybe I hadn't looked carefully enough at what was going on beneath his surface. Maybe I had wanted to be charmed by his persistent cheer so that I wouldn't have to do the hard work of helping my friend find his way toward true health—instead of simply badgering him to shed some extra pounds.

One afternoon while I sat inside a greenhouse watching a former soldier grow, I was struck by the thought, as I had been in Dave Wann's community garden at Harmony Village, that what killed Mostafa might have less to do with our food system than with our culture. I had consumed Mostafa's tea

and stories while giving him little of substance in return. My efforts to cajole him into exercising were perfunctory at best. That I hadn't understood the degree of his sickness was not his fault but mine. If we can't bring ourselves to take care of our closest friends in our community, how can we expect to feed the world? In the overstocked aisles of the supermarkets around my home lurked a deep poverty that I was still struggling to fill.