Eric Boodman

Geigenbaumeister

The violin arrived at Ute’s workshop in a ratty case. The owner, a seventy-something music teacher from Hartford, knew that she could die any day now, and she did not want her instrument to end up in some antique shop, gathering dust beside chintzy lamps and Rockwell prints. She had heard about Ute before: there were rumors that she had once repaired a Stradivarius. So, in 2004, the teacher’s violin was strapped into its case and driven to Ute’s workshop in Wallingford, Connecticut.

 When Ute pulled back the protective cloth, she could see the violin was barely playable. Its body was a dizzying roadmap of fissures and dents. The neck was loose, and open cracks zigzagged around the tuning pegs. The glue was flaking. The joints creaked. There were patches where fingernails had worn away the varnish, revealing the naked wood underneath.

 She held it up to the light of the window, tilted it, peered into the f-hole. Tilted it a little more. Inside the shadowy interior of the violin Ute could just make out a discolored tag, fraying at the edges. *Hendrik Jacobs Me Fecit in Amsterdam 1704.*

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Ute Brinkmann lives in a gray shingled house on a side-street of downtown Wallingford. The only sign that you are at the center of anything is the sigh of trains pulling into the station a few blocks to the west. Her street is quiet; her house is quieter. The rooms are filled with violins, but they are there to be fixed, not played.

They hang in cases in the living room. They lie on their sides under the kitchen table. Some rest in cubbies in her workshop, others doze beneath her desk. They sit on shelves in her back room and crowd the top of her workbench. They even populate her bathroom, where they are held by figurines of frogs and grasshoppers and googly-eyed men.

 Ute is a *Geigenbaumeister*, a master violin-maker. The title was conferred upon her by the German Guild of Violin and Bow Makers in 1987, and although hundreds of new German luthiers are accredited every year, Ute is not just another *Geigenbaumeister*. For nine years, she slept in the unheated attic so that her violins could occupy all three upstairs bedrooms. Now, since some of her instruments have moved to her shops in Westport and New Haven, the violins inhabit only two of the bedrooms, but their needs still come first. In the smaller bedroom, there is a line of machines: a scroll-saw, a drill, a few electronic blades for sharpening tools. In the larger room, two Home Depot doors have been turned into a workbench, with brushes for mixing varnish and a hot plate for heating glue.

 Ute lives in twenty-first-century Connecticut—she gets her horsehair from Mongolia, her bow-wood from Brazil, and her messages from an iPhone—but her work harkens back to a less frenetic time and place. “A month is nothing in the world of violins,” she says. “Take a photo of my studio, come back in a month, and nothing will have moved.”

 She loves the smoothness of ebony dust coating her hands. She loves the quiet accumulation of scuffs, rips, and wood-colored stains on her green apron. She loves peering through her wire-rimmed spectacles at a coat of varnish, knowing she can understand it only if she uses natural light. She loves shifting the sound-post, which transmits vibrations from the top of the violin to its back, to create a deeper sound. “In German, we call it the voice, but really it is the soul,” she says, rolling a new spruce sound-post in her fingers. “Only in English do they call it the post, like a broomstick. There’s no harmony, no poetry in the English language.”

 Ute also dislikes the speed of machines. She uses a rounded knife to shape a bridge, making cuts so tiny you can hardly see the shavings. It takes her an hour and a half. The feet of the bridge need to be perfectly molded to the arch of the violin. She does not rush.

 Ute cannot work with anyone else present. It makes her too self-conscious. She becomes distracted, and she is no longer able to feel the wood, to find its scars and blemishes. On most days, she sits at her workbench for twelve hours, long enough for the light to grow clear and grow dim again, for the commuter trains to come and go. At the end of the day, she makes herself a simple supper. Later, she returns to her bedroom, marked by a black sign on the door that says “Private”.

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But don’t let the stillness fool you. The world of violins is also a world of auctions and investments, with centuries of deceit and millions of dollars’ worth of theft. The love of violins isn’t just about an instrument’s sound. Since Andrea Amati glued together the first violin in Cremona, Italy, early in the sixteenth century, a complex taxonomy of makers and techniques has been mapped out. A violin properly placed within that hierarchy can make you a millionaire. A violin fraudulently placed there can make you even richer.

In 1685, an Italian violinist named Tomasso Antonio Vitali peeled back the label of his Amati to find that it wasn’t an Amati at all: underneath was a label that said “Francesco Ruggieri”. Ruggieri may have been an apprentice to Nicolo Amati, but that hardly mattered: it was like buying a Renoir only to discover that it had been painted by the artist’s younger brother. Vitali was incensed. He wrote to the Duke of Modena, and the matter ended up on the desk of a local magistrate.

The courts have been filled with violin fraud ever since. In 2012, an Austrian violin dealer known as “Mr. Stradivarius” was accused of selling 154 million dollars’ worth of falsely labeled violins. A forestry expert was brought in. He could read a tree’s history in the lines of its grain, and by examining the wood of the violin, he knew that this spruce could not have been cut until decades after Antonio Stradivari’s death. He turned off his microscope and wrote a report that would send “Mr. Stradivarius” to prison.

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It was this kind of story that ran through Ute’s head as she examined the old music teacher’s violin. She had seen mass-produced Chinese violins with German or Italian names inside, often with a fake year to match. The factories had taken care to discolor the tag in order to make the date more believable. The same thing happened even with hand-made nineteenth-century instruments. “It says 1780, but it might be a liar,” says Ute. “Or they might have purposefully made it unreadable. You cannot believe labels. You look at the instrument, and the last thing you look at is the label.”

If Ute was going to buy the Hendrik Jacobs, she wanted to be sure she really knew what she was buying. She called friends and colleagues from around the state to have a look, and together they pored over the instrument. Every part of its biography was of interest to them. They noted the Amati-like elements—the high arch, the redness, the wide f-holes. They agreed that the varnish wasn’t bright enough to be Italian, and examined the purfling together. The purfling is a dark inlay that delicately outlines a violin, like the thin black contours that frame a Modigliani face. Most European violin-makers used ebony purflings, but Dutch luthiers had a fondness for whale-bone. It came from the Greenland Right Whale, a fatty creature that floats when harpooned. The corpses would be tied to the whale-ship’s port-side hull and lugged back to the villages around Amsterdam, where the blubber would be boiled down for oil, and the bones carted off to urban tradesmen. When used for purfling, whale-bone glints. Ebony is resolutely matte. Ute and her luthier friends were looking for the tell-tale glint, and sure enough, the violin’s purfling sparkled when held up to the light.

Not only did the violin look Dutch; it also looked old. Ute could point out two centuries of repair jobs. She could see the scars from the mid-nineteenth century, when all older violins had their necks cut to make room for the new neck angle that would allow for a bigger sound. She could see where later repairers had tried to reinforce the wood with a clumsy cutout; its edges were jagged, its varnish was a jarring yellow against the uniform red.

Put together, these clues—the color, the shape, the purfling, the remnants of repair—pointed to an early-eighteenth-century Dutch violin. Ute bought it. She would not say how much she paid, but Hendrik Jacobs violins regularly sell for the price of a new turbocharged Audi.

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Ute was not rich growing up, but her family was wealthy enough to supply all the children with instruments. She was born in 1961, in Bielefeld, Germany, only a three hours’ drive from Amsterdam. The youngest of four, she had no choice but to play the trumpet in order to complete her siblings’ brass quartet. Their house was a cacophony of practicing—the buzzing of embouchures, the ups and downs of arpeggios and scales. Ute loved her trumpet, vowed to stick with it through good times and bad, and she has: she still plays for festivals at the New Haven Lutheran Church. But becoming a brass-luthier was a different story. “If you make trumpets you are basically a celebrated plumber,” she says. Her laugh is dry and staccato.

She grows serious when she talks about her father. He was a woodworker who took over a workshop from his own father when he came of age. Together they made windows, doors, staircases, tables, wardrobes, coffins. Ute still remembers the smell of commercial varnish. She was not involved in the wood-working business, or the funeral business that went with it, but she could hear the saws and smell the varnish when she went to visit her grandparents.

 One of her brothers has stayed in Bielefeld. He continues to run the family funeral business, but the company no longer makes coffins.

 “Nobody makes coffins. That was industrialized after the war. Suddenly you had big sanding machines. That was the beginning of the end. And they started making windows out of plastic, and every woodworker would say, ‘This is not going to last.’ And then it turned out they were more stable than wood windows, and every year more of these plastic windows were sold. And then all the windows in all the new buildings were standardized, windows had this-and-this size, and slowly goes your window business.

“And then goes your door business because now all the doors have the same size and all the ceilings have the same height.”

She pauses. “Things have changed. Just the violins are custom made.”

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In 2004, not long after buying the Hendrik Jacobs, Ute used a wedge to pry off its back. She tapped with her knuckle along the outline of the belly, listening for the rattle that would indicate a weak spot. Then, she inserted the wedge into the loose joint. The tool looked like a silver butter knife, the blade thickening at the back. The violin complained as the metal went in.

Musicians have fainted while watching a luthier take the back off an instrument, the way some people faint when they see a vial of their own blood. Ute knew better than to try this while the owner was in the house. Now the owner was out of the picture, but she had other worries. On the back of the violin was a small black line. It snaked upwards, right at the spot where the sound-post connects the belly to the back. It could be a scratch or it could be a crack. If it was just a scratch, then everything was fine. But if it was a crack, the violin’s worth would be lowered by fifteen thousand dollars. If it was a crack, her Audi had just become a Toyota.

It nagged at Ute. She would show it to customers; they held their breaths. She traced the line on the back with her finger.

One day not long after she had bought the instrument, she showed it to a customer who was a violin-playing dentist. She had just read an article in a violin-making magazine about performing medical imaging on instruments, and an idea began to solidify in her mind. It was a crazy idea. What if she could see an x-ray of the violin?

The next week, she placed the violin in its case, draped it with a protective cloth, snapped the buckles and drove it to the dentist’s office in Portland, Connecticut. He had her come at lunch hour, so as not to interrupt the flow of patients. He carefully placed the violin on the machine. He tried different settings, but the x-ray just came out as a black circle. At one o’clock, he returned to his toothaches and she returned to her neck grafts.

It had been fun for both of them, a kind of historical detective work, done on the sly. But Operation Crack or Scratch was far from over. The next operative was another client of hers, a surgeon in Meriden, whose daughter was on her way to becoming a professional violinist.

The surgeon referred Ute to a chiropractor in Wallingford. Ute pointed out the crack-or-scratch as the machine took the x-ray. But all you could see was the purfling, and the stark white bones of Ute’s hand.

The surgeon was frustrated with the results, and he invited Ute to come to the private hospital where he worked. He took time from his schedule of surgeries to supervise the x-ray. He stuck pins onto the violin with stickers, to delineate the area of interest. But the x-ray came back blank: all you could see was the white of the pins.

In order to verify whether this was a crack or a scratch, you had to be able to see the other cracks, or at least the instrument’s center seam. The doctor wrote Ute an apologetic email:

The only thing that might be helpful to do is a 3-D CT scan. Unfortunately, I don’t think I have the power to arrange that. The CT scanners are so busy that even inpatients are sometimes bumped from the schedule. A CT scan costs about 2500 dollars, and the 3D imaging on top of that. We have to get this done for free.

But Ute wasn’t discouraged. She knew that another customer would come through. This time it was a violin-playing engineer. He had worked on the x-ray machines in the pediatric clinic of a big Boston-area hospital, and he had contacts there. It would have to be secret, but he thought he could get the violin x-rayed by a more powerful machine.

 This final stage of Operation Crack or Scratch was the most difficult. The engineer met her at the hospital’s front desk. He whisked her down hallways and through swinging doors, past doctors in lab-coats and nurses in scrubs, past patients wheeling IV poles, past rooms where patients lay recovering from surgery. Ute and the engineer could not wait in the waiting room, beside sick kids and their mothers, so the engineer brought Ute through a back entrance of the clinic, into a room whose purpose she couldn’t quite surmise. They waited. When there was a momentary lull, they were called into the radiology room. The violin was placed on the x-ray machine, which grew warm and began to hum.

They waited for the image to appear. The radiologist held it up to the light, but all he could see was the purfling, and the three pins that the last doctor had put on. He needed to get back to his patients. But he suspected that perhaps wood, despite its rigidity, might act more like tissue than bone. He called his friend in mammography down the hall. Said something about an interesting case. The mammographer said to send them on over.

They only had a few minutes in the mammography clinic. A breast needs to be flattened to make a readable mammogram, but the pressure would destroy a violin. For the Hendrik Jacobs, the mammographer moved the compression paddle. The image would be fine without it.

“You know how doctors talk. You have a clean x-ray, and they still won’t say you don’t have cancer,” Ute says. The doctors never put forth a diagnosis. Ute and the engineer quickly had to vacate the mammography clinic, to make way for women coming in for testing. But Ute could see the center seam, its thin line of glue running vertically through the mammogram. She could see the other cracks. Between the three surgical pins, there was nothing. Not even a hint of a crack. Ute lets out a raucous laugh at the memory.

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There was a time in Ute’s life when violins were everything. She was working for W. E. Hill & Sons, the foremost violin shop in the world. At night, she would practice the next day’s procedures in her room, at a workbench her father gave her. She did not want to make a mistake on a Stradivarius, an Amati, a Guarneri. She was living in a dreary English town outside London called Great Missenden. She knew nobody.

Late at night she caught programs from Germany on a little shortwave radio. That was how she heard that the Berlin Wall was coming down before the news reached the English papers. The next morning she told everyone she saw: the greengrocer, her colleagues at the workshop. “The Wall is down, the Wall is down!” They thought she was crazy, or drunk.

She laughs wistfully about the work. “Instruments that should be in a museum, we had them on the bench,” she says. Owners would fly to London and then travel out to Great Missenden to have their instrument looked at. The repairers could take as much time as they wanted, and had the best possible woods, the best possible tools, the best possible glue and varnish pigments from around the world. All that mattered was the quality of their work.

The workers were paid almost nothing, but Ute didn’t care. Every morning at 8:15, she would be back in the workshop, working on neck grafts, retouching varnish so that you would think it had been mixed in Cremona three hundred years earlier.

But in 1992, W. E. Hill & Sons closed. The brothers who owned the business had decided to part ways. Ute stayed on with one of them for a while, but it wasn’t worth it. “Life is more than just wooden boxes,” Ute says.

She moved to Japan, repairing violins at an atelier that served mostly orchestra musicians. When her boss picked out a man for her to marry, she knew it was time to go. Her English was good now, if accented. She was only thirty-two. She decided she would come to America.

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It is now twenty years after Ute’s arrival in Connecticut. The Hendrik Jacobs lies in a cubby in her studio, its neck loose, its back detached. She hasn’t found the time to repair it since 2004. She has been too busy re-hairing bows and running a business. Two years ago, she helped found an orphanage for “Untouchables” in eastern India. “Now I’m a mum,” she says. “I have two first graders. Asho and Vikash.”

Since then, she has raised enough money for six others to join them. She has begun cutting down on her expenses and sending all her extra earnings to India. She no longer takes vacations or attends luthier conferences. She buys her blouses and sweaters at Goodwill. She thinks twice before eating out. Last year, she even gave up her health insurance, opting instead for the cheaper option of Christian Health Shares.

She likes to talk about the Hendrik Jacobs violin, but not too much. She does not go into details. “I cannot buy stories, I can only buy instruments. A story is just a story.”

One day, though, she will take out the Hendrik Jacobs and begin to undo the damage of nineteenth-century repair. She will replace the neck graft, put in a new sound-post, replace the peg-box, the top-nut, and the saddle. She will dissolve tree resins in ethanol. They have names like dragon’s blood and krappwurzel. She will mix them on a little white painter’s palette, pushing away her lamp to see the colors in natural light. She will dab them onto the violin, matching the three coats of varnish that were laid down in 1704.

And then she will glue the pieces back together. She will use glue made from animal hide. She will melt it down in a little pot on her hot plate, and brush it on, without a single drop landing where it shouldn’t. It will blend in with the color of the varnished wood. In seconds, it will be dry, and no one will ever know that the violin looked any different.

Wasting Away: Why Tuberculosis Won’t Disappear from American Cities

Mariana Ornagua did not seem like the kind of patient who would give a doctor trouble. She had gone out of her way to be tested for tuberculosis in mid-November, waiting in line after her English class at the New Haven Adult Education Center to see the visiting TB nurse. A few days later, Ornagua took more time out of her schedule to get her results. The tiny bit of TB protein that had been injected into her forearm had raised a dark reddish welt about the size of a penny: a sign that the disease was present in her body. The nurse told Ornagua that the Winchester Chest Clinic could determine whether or not her immune system was keeping the disease in check—whether her TB was latent or active. She followed the nurse’s advice and set up an appointment at the Winchester as soon as she could.

Her cooperation with the medical system continued: On November 30, she showed up for her appointment at the Winchester, located within Yale-New Haven Hospital. When she was given a bright green mask, she dutifully put it on and let herself be whisked into an examining room.

Ornagua is a slight woman of thirty-two, with a shy smile visible behind a cascade of hair. (To protect the patient’s identity, her name has been changed.) To most of us, there would be nothing remarkable about the image of her sitting in the examining room, her coat scrunched in her lap. All she had done was show up for a medical appointment. But in the eyes of the medical system, her presence at the Winchester on November 30th was a sign that she could be trusted.

The populations in the United States who are most likely to be infected with TB are the homeless, the alcoholic, the drug-addicted, and recent immigrants. If you don’t speak English, don’t have a permanent place of residence, are juggling two jobs, or have run afoul of the law, a hospital is a scary place, with its endless series of official forms to fill out and its hierarchy of orderlies, nurses, residents, and doctors, all of whom seem to wield a God-like power over what happens to your body. Once you enter, it seems that you give up whatever autonomy you had outside, and so you are unlikely to seek out a TB test. If you do get tested and are positive, you are unlikely to show up for your appointment. And if you do show up for your appointment and have active TB, you are unlikely to finish the course of your treatment, because the medications will alleviate most symptoms after the first couple of weeks and the medications have some nasty side effects, including vomiting, stomach aches, urine discoloration, extreme lethargy, and a potentially fatal inflammation of the liver.

Up to thirty-one percent of recorded TB patients in the US have refused to come in to their appointments or to take medication. For decades now, physicians and public health officials have viewed non-compliance as the single biggest roadblock in treating this country’s TB problem.

Once known as wasting disease, or consumption, TB is an infectious disease that has plagued humans since the Neolithic era. The disease is transmitted by the microscopic beads of liquid we release into the air when we cough, sneeze, talk, or laugh. If someone walks around with untreated TB, they are likely to spread it around their community. This sounds bad enough, but it gets worse: If the person has begun treatment and allowed it to lapse, the disease will have had the opportunity to become resistant to the drugs prescribed. The beads of liquid the person emits with each cough or “How are you?” then carry a strain of TB that the standard regimen of drugs cannot cure. Patients who don’t take their medication could be creating ever-more-invincible strains of TB.

This threat can feel very remote. Most of us think of TB as a disease conquered by antibiotics, an affliction of our forebears and of the Third World. We cannot imagine anyone in our city wasting away because of lungs infected with tuberculosis bacteria. Yet people all over the US—people like Mariana Ornagua—suffer from TB, and their non-compliance could have very serious consequences.

The prospect of a TB epidemic is so scary that since the 1990s, the United States has implemented a treatment program that squelches any possibility of non-compliance. It is called Directly Observed Therapy (DOT), and it involves a public health nurse meeting up with patients every day to make sure they are taking their medication. This lasts between six and nine months, and patients have no choice in the matter: If they have contagious TB, the law requires them to fulfill their treatment. “The nurse doesn’t just ask them if they took the pill,” says Dr. Lloyd Friedman, a Professor of Pulmonary Medicine at Yale. “She watches them take it, and she watches them swallow it. They can refuse treatment, but we’ll put ‘em in jail. We’re pretty aggressive: If they disappear, we find them.”

The aggressiveness of DOT has brought TB to its knees in the United States. The number of people infected with active TB is the lowest it has ever been—in 2011, there were just over 10, 500 reported cases in the US, less than a tenth of what it was in 1953 and less than half of what it was in 1991. Doctors and public health officials credit DOT with those happy statistics.

While DOT may be a public triumph, it can also produce private tragedies. With it, doctors and public health officials are trying to solve the problem of patients disregarding their doctor’s orders. But sometimes the doctor’s orders don’t take the patient’s whole situation into account. The word “non-compliance” brings to mind a hardheaded refusal on the patient’s part. Yet more often than not, the DOT regimen demands a debilitating commitment from the patient without providing the support that would make such a commitment feasible. And as TB funding gets cut, public health departments have fewer avenues to tailor treatment to the patient’s needs.

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As Ornagua waited on November 30th, Dr. Hilary Cain pulled up her chest X-ray on a computer in the clinic’s conference room. Ornagua’s ribs were a series of graceful arcs, broken only by the white ghost of her heart. But what Cain was interested in was an area at the top of her right lung.

“An easy sign that things are normal is symmetry, and we have asymmetry here,” Cain said, pointing to a white lump near Ornagua’s collarbone. It had a pinprick of pitch black near its center, which Cain identified as a possible cavity created by TB. “If I were looking at this in a seventy-year-old smoker, I would say she had lung cancer. But in a thirty-two-year-old who doesn’t smoke? It certainly raises the suspicion of TB.”

Before Cain headed into the examining room, Ming Lai, the nurse who runs the Winchester’s TB program, handed her a turquoise mask like the one Ornagua was wearing. These masks—N95—are supposed to block out everything larger than 0.3 microns if used properly. “The misuse of these N95 respirators may result in serious injury or even death,” reads a warning in fine-print on advertisements for N95.

Cain pulled both straps behind her ears, and molded the metal bar to the shape of her nose. “If you can’t breathe, you’re wearing it right,” Lai said wryly. This small patch of green fabric was all that would protect Cain from Ornagua’s germs.

But when she got into the examining room, she found that Ornagua herself had not properly put on her mask. It was upside down, with one of the straps hanging uselessly down her neck and the metal bar resting loosely against her chin.  Not wanting to embarrass her patient, Cain made no mention of the misuse. “I am Dr. Cain,” she said, taking Ornagua’s hand before sitting down beside her.

Cain is a tall woman with a quivery voice. Her manner is gentle but firm, finely tuned to putting patients at ease. This is particularly important when dealing with TB patients because of their frequent distrust of the medical system. “There is a stigma attached to TB,” she told me before she slipped into the examining room. “It’s important that the patient knows we’re here to support and not to criticize her.”

Cain felt immediately that Ornagua was a patient she could trust. Ornagua was good-natured and polite, answering Cain’s questions as best as she could through a Spanish-speaking interpreter in the examining room. Her hands lay folded on her jacket and purse, which were piled in her lap, and she calmly maintained Cain’s eye-contact. Every so often, she jiggled her pink and white Sketchers, betraying her nervousness, but mostly she sat still.

Cain’s confidence in Ornagua was bolstered even further when she heard about Ornagua’s responsibilities. Every morning, she got her twelve-year-old son ready for school before walking him to the bus-stop. She spent the rest of the day balancing domestic duties for her family with English classes at New Haven Adult Ed. Then, at night, she worked as a cleaning lady in an office building.

Ornagua was not displaying any external TB symptoms: She wasn’t coughing, losing weight, getting fevers, or being kept up at night by chills and abundant sweat. But the lump in Ornagua’s chest was worrisome enough for Cain to treat her for active tuberculosis.

“I’m still concerned that you have active TB, and so I’m going to start you on medication,” said Dr. Cain.

Ornagua nodded. The fact that her lungs were infected with a deadly contagious disease didn’t seem to scare her much.

“You’re going to have to stay at home for next two weeks. Is that ok?”

This was the first time that Ornagua’s composure began to crack, her eyes flicking from Cain to the interpreter and back again. “I am in school and I need to finish the semester.” Ornagua’s voice was plaintive, but the interpreter’s tone stayed even. His expression never wavered from its baseline of discreet concern. He kept his hands folded demurely in front of him.

“I’ll give you a note so you don’t have to go to school,” said Cain, touching Ornagua’s arm and looking her in the eye. “You need to stay at home. It’s very important. And when I say stay at home, I mean don’t go out at all. No shopping, no laundry. You have to stay in your house. We are going to have a nurse come to your house every day to bring you your medication. We do this for everyone who has TB. It’s not that we don’t trust you—these are health department regulations.”

“Ok,” said Ornagua tentatively.

Cain left to begin filling out a prescription. “She seems responsible,” she said to Lai as they passed in the hallway. “I think she should come back in a month.” Ornagua didn’t drink, use drugs, or live on the street. She hardly fit the profile of a non-compliant tuberculosis patient.

But when Lai went into the examining room to collect a sample of phlegm for testing, Ornagua said, “I can’t honestly tell you that I’m going to stay home.”

Lai came out to tell Cain, who rushed back into the room. She told Ornagua that she would have to be admitted to the hospital if she couldn’t stay at home, and Ornagua began to cry.

“You don’t understand,” she told Cain through her tears. “I’m going to lose my job. I have to pay the rent.”

When Cain mentioned the possibility of summoning a police officer, Mariana became even more upset. She had come to New Haven from Ecuador seven years ago. Whether or not she had legal status as an immigrant, it could be disastrous for her family if a police officer showed up at their door.

Cain and Lai didn’t know what to do. They left the examining room and stood huddled in the white hallway of the Winchester, discussing their options. They couldn’t send her home if they thought she would be exposing her community to TB—it would be both illegal and unethical. After all, their first duty was to make sure that Ornagua didn’t spread the disease.

But they didn’t want to call the police on her either, as they would be endangering the life she’d built in Connecticut over the last seven years. Forcibly keeping her in the hospital wasn’t much more appealing. Ornagua was their patient. Her well-being was their responsibility. They were here to help her. But neither of them could figure out which course of action would cause the least harm.

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The dilemma that Cain and Lai faced was exactly the kind of situation that DOT was supposed to solve. The Center for Disease Control and Prevention (CDC) allocates a budget to each state’s public health department to cover TB care and meds. The program is designed to preclude a TB epidemic by providing the patient with free, humane, personalized treatment. For many patients, DOT has been just that.

If there is anyone who knows about the success of DOT in New Haven, it’s Maureen Bruce. Bruce has the build of a linebacker, and although her eyes are warm, they have a bloodhound’s intensity. From the early 1990s until 2009, Bruce was the public health nurse responsible for DOT in the city of New Haven.

Despite her dogged personality, Bruce was, to most of her patients, like a member of the family. Often she would go meet her patients at the Winchester Chest Clinic just after they’d been diagnosed with active TB. Unless Maureen and her colleagues were sure that the patients were no longer contagious, they would not let them leave the hospital. (The verdict has changed since then: Doctors now feel that there is less risk of contagion if patients go home and stay there, given that the people they live with have probably already been exposed to the disease, which is not the case for everyone who comes to the hospital.)

Bruce used that first meeting at the Winchester to determine how she could find her patients once they were released, so that she could make sure they were taking their meds. For some that meant visiting their house, coming into the living-room. For others, she drove to the door of the factory where they worked, and they would come out, sit in the front seat of her car, and take the pills she gave them. For her homeless patients, she would meet them on a street corner or in one of New Haven’s shelters; often she would get the shelter to bend its rules so that the patient could stay and wait for her there after the other sleepers had been kicked out at seven AM.

But her devotion went far beyond meeting up with her patients at their preferred spots. She would drive them to their doctor’s appointments, take them out for coffee and a Danish, bring them groceries, or take care of their kids. “I had one man who was homeless,” she recalled, “and as long as I had clean socks for him, he would go to his doctor’s appointment. I would go to BJs, and I would buy bags of socks and keep them in my trunk. As long as I had a pair of clean white socks, he would get in my car.” Bruce lent another patient enough money for her to make the down-payment on a car. Bruce is not handing out socks anymore. In 2009, her position got cut down to just nineteen hours a week, and she had to move to another position at the public health department to keep working full-time.

If the position of DOT nurse for New Haven were still a full-time job, at least Lai and Cain could have relied on someone other than the police to check that Ornagua was staying at home. But Bruce’s replacement only works half-days.

And yet, at its root, the problem is not one of enforcement. Rather, public health officials need to make DOT a program that a patient is able to comply with freely. If a doctor asks a patient to stay home, that means compensating for the patient’s lost salary.

For most Americans, the idea that the state of Connecticut pays for Ornagua’s TB meds and care is already impressive enough. But there was a time, when Bruce was still working as a TB nurse, that the Connecticut Department of Public Health would pay patients’ rents when they weren’t allowed to go to work. That means that they were able to get treatment for TB without risking eviction.

These cuts—of the budget to supplement a patient’s rent, of the DOT nurse’s hours—turned out to herald a larger trend. This year, the CDC announced even further cuts to the TB budget allocated to each state.

In the eternal fight for funding, TB lost a little ground because numbers of infection have been going down. What the people making the budget failed to realize is that these funding cuts will make cases like Ornagua’s not just more difficult to solve, but also more frequent.

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TB experts know all too well what happens when TB funding gets cut. The last time there were significant cuts was in the late eighties. TB numbers had taken a nosedive since the advent of drug therapy in the fifties, and with fewer and fewer cases of active TB, American public health officials believed they were well on their way to eradicating the disease. The CDC and other public health organizations, always pressed for funds, could shift some of their TB money to the prevention and control of other illnesses.

Dr. Lloyd Friedman remembers that era well. His desk at the Milford Hospital Intensive Care Unit is covered in towers of articles and patients’ files, which are all linked to TB. One can’t help but think that his mind might look similar: endless reams of TB history waiting to be recalled with a scrunch of his chiseled face.

In the late eighties, Friedman was fresh out of med-school, doing medical screening at a welfare intake center in midtown Manhattan. “You go down this assembly line,” he said of his patients in his rapid-fire Brooklyn accent. “Get your ears tested, your eyes tested, your urine tested for drugs, blood drawn, EKG, skin-tests for TB, chest x-ray. We were seeing six to seven hundred people a day, and at least one case of TB among them.”

To Friedman, that number seemed higher than it should have been, and he became increasingly concerned that the US was heading into a TB epidemic. But the public health officials remained steadfast in their belief that TB would soon be a disease of the past, and Friedman’s warnings went unheeded. “I came out with an abstract describing the problem, and nobody would publish it,” Friedman said.

Friedman’s inklings turned out to be right. Looking at the data today, you can see a spike in TB numbers beginning in the late 1990s and peaking in 1992 and 1993. The spike was partially due to the AIDS epidemic, which allowed TB to piggyback on the virus’ destruction of immune systems, easily infecting people who otherwise might have warded the disease off.

But for Friedman, funding cuts were at the heart of the TB epidemic of the 1990s. The cuts meant that there was not adequate care for these AIDS-TB patients, creating a deadly cycle of transmission. “The infrastructure to take care of TB just wasn’t there,” Dr. Friedman said. “As soon as the money goes away, then the rates go back up.”

In 1993, the World Health Organization declared that there was an international TB crisis. American public health officials could no longer ignore the number of TB cases within their borders. DOT became a part of American public health policy to counter that epidemic. As the CDC allocated more TB money to public health departments, and as nurses like Maureen Bruce began to visit patients’ houses, the TB numbers began to fall again. By 1996, they were lower than they had ever been in the United States, and the trend has continued.

But the CDC is now falling into the same sinkhole it did in the late eighties. Taking the success of DOT programs as a sign that the disease is on its way out, the CDC has made over a million dollars in cuts and has reorganized the funding so that states where TB control has been deemed effective are not eligible for as much money as they received in the past.

Lynn Sosa, the deputy epidemiologist at the Connecticut Department of Public Health, is worried about the implications of these cuts. “There’s still a lot of work, and we feel we don’t have all the staff we need,” she said in a phone interview. “It means that TB patients will fall through the cracks and get more people infected. It’s a cycle.”

She sees that cycle progressing on a larger scale than just a few individual cases. “Our cases go down, we hit a point where they start cutting people, we don’t have the resources to maintain that low rate, and so our cases go up,” she said. “I see that happening in the next five years.”

Epidemiologists like Sosa are in the business of reading trends and speaking in statistics. But the problem with these funding cuts is not simply that they could spark another epidemic. They also fail to acknowledge that TB is still a problem for patients like Ornagua, and that the medical system is not doing enough to solve it. Some doctors have come to view the term “non-compliance” as a form of medical name-calling. It pins the blame on the patient, leaving no room to question the orders the patient is obliged to follow. There is no doubt that contagion needs to be prevented, and in DOT public health officials have found a very effective way to prevent it. Given that the program’s strength lies in the way it can be personalized, it does not seem that hard to extend that personalization one step further, so that TB treatment helps patients unequivocally, without posing any threat to their jobs or their families. Yet to do that, the CDC would have to increase TB funding instead of cutting it.

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When she went back into the examining room to discuss the options with Ornagua, Cain understood that forcibly keeping Ornagua in the hospital would not only be traumatic, but also pose a public health risk. Ornagua’s distrust would only have deepened if she were made to stay at the hospital, and she would have passed that distrust along to her friends and family. In keeping Ornagua in the hospital, Cain would essentially have been discouraging other people in Ornagua’s community from getting tested for TB.

Ornagua was sitting against the wall, her eyes red from crying. “My friend told me not to get this skin-test,” Ornagua said when she saw Cain. “She said, ‘If you get that skin-test and it’s positive, those doctors will make trouble for you.’ I did the test because I wanted to be a good citizen. Now look at the trouble I’m in.”

Ornagua’s regret was very real. Like her friend, she felt that having undiagnosed active TB would have been better than being forced into this treatment system which could potentially threaten her income and the well-being of her family. Despite her exemplary compliance when getting tested, in getting the results, and in coming to the Winchester, she saw the nurses and doctors at the clinic as people who were hurting her rather than making her better.

Cain tried to imagine other solutions that would allow Ornagua to stay home without losing her job. She asked Ornagua if she had family or friends who could take her shifts at the office building. Ornagua said that she lives with her husband and sister, each of whom already works two jobs. They just didn’t have time to add other tasks to their list. But Cain pressed on: Perhaps they could take over for Ornagua, just until the TB medication took effect and she was no longer contagious? Wasn’t that better than being kept in the hospital or having the police show up?

Framed that way, there was no question. Ornagua agreed. Her husband would find the time to clean the office building at night, and her sister would take over whatever household tasks that required leaving the house.  Ornagua would stay home and wait for the DOT nurse to give her the prescribed meds. Calmer now, Ornagua provided a sample of phlegm, and was allowed to leave.

But the case still bothered Cain when I went to talk it over with her at her office a week later. She pointed out that the DOT system in place was very good at protecting the general public from TB, but that it could be tragically detrimental to the patient.

“In medicine, we have these multiple agendas,” said Cain. “We are fixing the physiology that’s wrong, but we have to fix it in the context of a patient’s life. Really, their family becomes our patient.” That was why she decided to send Ornagua home, hoping that she would keep her word and not go out. “I chose to believe her. But I’m still not sure that that was the right judgment.”

Mabel’s Room

I know a lot about Mabel before I ever get to meet her. I know that she is close to 1600 miles from home, and that she might not be completely comfortable in New Haven, even though she did most of her growing up here. I know that she prefers to eat meat, and that she is something of a night owl. And I know that she can be antisocial—aggressive, even—and that, if upset, she might lash out viciously. So it is with some trepidation that I go to visit her for the first time.

She lives on the northern edge of Yale’s campus, near the end of a hallway of locked doors. As I get closer and closer, I begin to picture the ways she might react to my presence. She might try to scare me off by stridulating, rubbing her legs together so that they rasp loudly. She might try to sting me with her urticating hairs, which she can release from her abdomen with a flick. Or, if I have really overstepped my bounds, she might give me a nip, injecting my hand with venom and turning my sinews to soup.

Mabel is a tarantula, a Haitian Brown Bird-Eater. My job as an assistant at the Peabody Museum is to make her feel at home.

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Mabel arrived at the Peabody last year, in a little plastic container that might be better suited to bringing leftovers for lunch. She was with two fellow Bird-Eaters, each about the size of your thumb-nail. As they grew, Mabel quickly outshone the two males she was with—she would become the biggest and pinkest of the three, with a dusty rose body visible beneath her brown bristles. When I come to visit, she is almost as big as my entire hand.

She is destined to join the leafcutter ants and bearded dragons in the Peabody’s “Discovery Room”, where she will be the centerpiece of a corner devoted to arthropods. In the meantime, she lives in a storage space in the Environmental Science Center.

To most people, this room is an amalgam of nightmares. It is the kind of room where a Stasi interrogation might take place: white walls, low ceiling, bright lights, the incessant hiss of ventilation. At any moment, a dour official of the GDR could enter and begin talking you to death. Alternatively, the arthropods that line the walls could make for excellent instruments of torture. While Mabel and her fellow tarantulas are the only ones that can truly inflict harm, the others are just as fearsome looking. There are red-eyed flightless fruit flies whose maggots squirm on the walls of clear containers. There are tailless whip scorpions that look like huge armored ticks. There are meal worms as fat and long as my little finger, walking sticks with sharp-looking black jaws, and big hissing cockroaches from Madagascar.

But if you can put aside your claustro-, arachno-, and entomophobias for long enough to venture inside, you will realize it is a masterpiece of planning, a collection of perfectly curated little universes. Holly Hopkins, a retired grade-school teacher from Stony Creek, Connecticut, is one of the people responsible for keeping these worlds in balance.

“I was one of those kids who always comes home with fireflies and butterflies, and salamanders in my pocket,” Holly says. Her mother had to carefully pick through clothes before doing the laundry to make sure that none of Holly’s creatures was clinging in a fold.

 Now, she keeps her charges in much cushier environments. Mabel lives in a dollar-store terrarium carpeted with dark wood chips. They give off an earthy, tangy smell, like that of a forest floor, and they create the same kind of rough terrain. There are little dips and gullies where crickets can hide while she is stalking them; there are dimples into which she can nestle when she wants to sleep. Holly also thought Mabel might like some privacy, and so brought her a toilet paper roll devoid of all its paper: Mabel likes to crawl into the cardboard tube and sit with her eight legs scrunched together, the way you might curl up in a bean bag chair. If she read the *Sunday Times*, this is where she’d do it.

 Mabel’s crickets are purchased every Friday, and brought from the pet store in a clear air-filled plastic bag. They live in a terrarium smaller than hers, decorated primarily with egg cartons. Three times a week, Holly reaches in, shakes off the turd-flecked cartons and sets them on the counter. The space is nearly empty now, and she can easily reach in to snatch a few crickets one by one. Not only does she ferry them across the room, trapped in a tiny container; she also prepares them, dusting their bodies with “Herptivite: Multivitamins for All Reptiles and Amphibians.” This powder is whitish yellow, and reeks of rotten fish, but apparently does nothing to hinder tarantula appetites.

 The crickets themselves are well-fed. They get fresh organic greens, and Cricket Food Bites, which “gutloads any insect into a power building health food!”

Holly has perfected this feeding ritual down to every last move. When changing Mabel’s water, she even squishes a paper towel into the bowl—it breaks the surface like an iceberg—to make sure that the spider does not fall in and drown.

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Mabel does not stridulate as I approach the see-through walls of her home. She does not urticate, or rear back like a startled horse, as she sometimes has when Holly is trying to feed her. She just sits there.

I had seen none of this when I was told I would be designing the Haitian Bird-Eater display. All I had was *Phormictopus cancerides*, Mabel’s Latin name.

What does a tarantula want? How was I supposed to know? I was a sheltered Jewish boy from Montreal now living at Yale. What contact had I had with tarantulas? So I did what any undergraduate would do: I consulted Wikipedia. I hoped that its reference section on *P. cancerides* would point me to more scholarly sources. I found, instead, that it pointed me towards Kovarik Frantisek’s *Chov Sklipkanu*, a tarantula-keeping manual in Czech, and what seems to be a list of spider species found around the world. The only peer-reviewed paper on this species explains that if you cut off its food supply its metabolism slows.

Jewish Montrealers, on the other hand, have been written about extensively. You can log on to Google Scholar and find out about the risk I have of contracting colorectal cancer, about the way my English differs from that of my waspy neighbors, about the politics of my community institutions.

It was by calling up tarantula-keepers around the world that I learned what I know about *Phormictopus cancerides*. I learned that Mabel’s terrarium in the “Discovery Room” could be little larger than this one, that coconut mulch, sphagnum moss or peat all would work as alternate substrates but not sand, gravel, or rock. I learned that red or blue lights might show her off better, making the daylight hours look like night.

Beside her terrarium are others, now empty, a sprinkling of dirt or sand the only reminder of their last occupant. There are piles of drinking bowls, the plastic striated to look like algae-slick rock. I cannot help thinking of my own past rooms. They are not so far from here, each furnished by a keeper who knows exactly what I need: a writing desk, a chair, a bed, a dresser, some book shelves. And I wonder what those people would think if they were to peer into my window to watch me for a few minutes.

After a while, Mabel’s legs begin to twitch, and I know it is time to go.