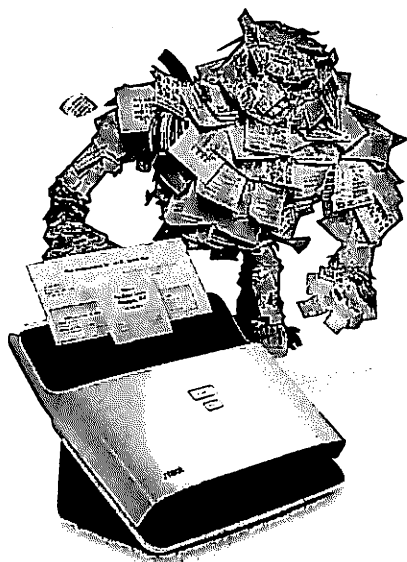


NOTES FROM UNDERGROUND

Florida's sinkhole peril.

BY DAVID OWEN

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In the fall of 1999, much of Lake Jackson—a four-thousand-acre natural body of water just north of Tallahassee and a popular site for fishing, waterskiing, and recreational boating—disappeared down a hole, like a bathtub emptying into a drain. Trophy bass became stranded in rapidly shrinking eddies, enabling children to catch them with their hands and toss them into picnic coolers, and many of the lake's other fish, turtles, snakes, and alligators vanished into the earth. At various times during the next few years, the lake partially refilled, re-drained, and refilled again. Jonathan Arthur, who is Florida's state geologist and the director of the Florida Geological Survey, was among several people who, during a dry period, descended a ladder into the main opening, which was about eight feet in diameter. "You could climb down twelve feet or so and then walk under the lake bed," he told me recently. "I hadn't gone very far before my red flags went up, and I was, like, Maybe I won't go any farther."

Two weeks ago, a wider, deeper cavity opened under a house in Seffner, Florida, a suburb of Tampa, about two hundred and seventy-five miles southeast of Lake Jackson. A portion of the house's concrete-slab foundation gave way, as though it had been punched with a cookie cutter, and a bedroom collapsed with it. A thirty-six-year-old man named Jeffrey Bush had been asleep there. His younger brother, Jeremy, heard him scream and ran to the room. "Everything was gone," he told CNN the next day. "My brother's bed, my brother's dresser, my brother's TV. My brother was gone." Jeremy jumped into the hole, but couldn't find his brother and had to be pulled out by a sheriff's deputy, who risked his own life to save him. Officials searched the wreckage with listening devices, but eventually gave up. They demolished the house and dumped gravel into the hole, which by that time had grown to be about sixty feet deep.

The opening that drained Lake Jackson and the one that killed Jeffrey Bush are both sinkholes, and Florida has a huge number of them. Florida's bedrock, which is mostly limestone and dolostone, is the hardened remnant of a thick accumulation of deceased sea creatures, which sifted onto the seabed for aeons, at a time when sea levels were much higher than they are today. During subsequent aeons, slightly acidic rainwater permeated the ground and riddled the rock with conduits and caverns and underground streams, and from time to time the overlying strata collapse or subside.

I visited Jonathan Arthur at the headquarters of the Florida Department of Environmental Protection, in Tallahassee. He told me that the technical name for Florida's water-riddled terrain is karst, and he showed me slides of collapsed driveways, sunken houses, semi-consumed motor vehicles, and a swallowed drilling rig. "You may remember dripping hydrochloric acid on limestone in a science class," he said. "It went pssssss. In Florida's bedrock, that same thing happens over time. A cavity in the ground grows larger and larger, then, basically, it migrates to the surface." In the nineteen-nineties, he told me, a woman was working in her yard when a young child, who was playing near her, disappeared through the sod. "She heard a cry for help and saw fingertips at the grass level," he said. The woman grabbed a hand and pulled, and the child was unharmed, at least physically. In early 2011, Carla Chapman, a forty-seven-year-old resident of Plant City, about twenty-five miles east of Tampa, took a few steps from her back door and plunged through the turf in the same way, becoming trapped in a deep cavity approximately two feet in diameter. She dialed 911 on her cell phone, and the police officer who responded to the call comforted her—while reaching far enough into the hole to grip her

arms—by saying, “I’m not going to let you go, angel.”

Remarkably, Chapman had fallen into a sinkhole the year before as well. The immediate cause of that accident was an emergency crop-preserving practice employed by local farmers, who, during a single winter week, sprayed so much well water on their strawberries, to protect them from freezing overnight, that the local water table fell by as much as sixty feet. “The aquifer couldn’t recover in time,” Arthur told me, “and during that period several hundred private wells went dry, and a hundred and forty sinkholes opened up.” The water had been supporting the ground, and when it was gone the weakest sections gave way. Insurers paid millions of dollars in claims, and the over-all loss was compounded when low prices for strawberries from California and elsewhere made harvesting most of the Florida crop uneconomical, and caused farmers to leave their rescued berries to rot. The Plant City fiasco was unusually severe, but in many ways it was just a speeded-up version of what has been happening all over the state for years, as Florida’s population and water consumption have soared.

An excess of water can be a problem, too. Last June, during Tropical Storm Debby, more than twenty inches of rain fell during a single twenty-four-hour period in an area just south of Tallahassee. Within a few days, more than two hundred sinkholes appeared across the state. Arthur dispatched field crews to a number of the hardest-hit areas. “Near the town of Live Oak, a member of my staff was standing in a field and could hear water running under the ground,” he said. “A couple of days later, a huge sinkhole opened up right near where he was standing.”

One of the most famous Florida sinkholes opened in Winter Park, in

1981. According to an account published in a local magazine, a woman named Mae Rose Owens heard a “swishing noise” in her yard, and then “saw a sycamore tree disappear as if it were being pulled downward by the roots, making a sound that she described as a ‘ploop.’” The opening grew to be three hundred and thirty-five feet in diameter and more than a hundred feet

“unlike any geological happening ever in Central Florida.” You can build a case against that assertion by making a quick flyover on Google Earth: several large sections of the state, including much of the central portion and parts of greater Tallahassee, appear densely spattered with water features that resemble Lake Rose. Indeed, most of Florida’s natural lakes are probably karst-related. The Florida Speleological Society has likened the state’s geology to “Swiss cheese coated with soil.”

Sinkhole-related deaths are an extreme rarity; Arthur knows of just three in the state, ever, including the recent one. But the human impact of Florida’s Swiss-cheese geology extends far beyond the occasional spectacular collapse. The subterranean cavities and conduits are major elements of one of the most productive sources of freshwater in the world: the Floridan Aquifer, which underlies the entire state and extends below parts of Mississippi, Alabama, Georgia, and South Carolina. Sinkholes and other karst features constitute direct portals into major parts of the Floridan. That’s fortunate in one way, because the openings allow rainfall to replenish the groundwater rapidly, without having to seep through intervening strata. By contrast, parts of the Ogallala Aquifer, in the Great Plains, recharge so slowly that hydrologists worry that they will be exhausted before mid-century. Much of the water that’s been pumped from the Ogallala is so-

called “fossil water,” which entered the ground millions of years ago and is unlikely to recover while humans are around to exploit it.

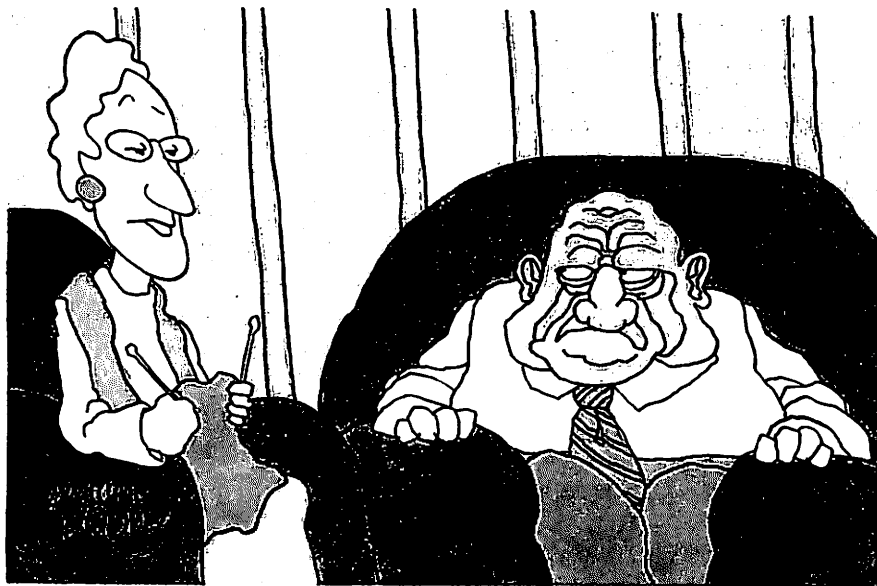
But the permeability of the Floridan represents an environmental challenge, too, because it allows bad things on the surface to migrate quickly into the region’s water supply, with little or no natural



Sinkhole collapses are common in Florida, but fatalities are rare.

deep, and it swallowed, among many other things, a municipal swimming pool, a number of Porsches (which were recovered), and Owens’s house (which wasn’t). The hole later filled with water and is known today as Lake Rose.

An article published in the journal of the Florida Engineering Society in 2009 described the Winter Park catastrophe as



"I figured you'd end up looking like that."

filtration. When Lake Jackson drained away in 1999, the aquifer had to absorb not just an influx of disoriented aquatic creatures but also human-generated pollutants and toxins, most of which had entered the lake as storm-water runoff, a major source of water pollution in the United States.

Arthur took me on a field trip in his truck, which doubles as a kind of mobile office. One cup holder was crammed so full of ballpoint pens that they appeared to have been hammered into the console. We drove south of the city on Route 61, and pulled into the driveway of the Tallahassee Korean Baptist Church. He parked near a tall chain-link fence, on the other side of which was a broad, bowl-shaped depression obscured by trees and underbrush. At the bottom, maybe forty feet below the parking lot, was a round pool of milky green water: a sinkhole. "This is Church Sink," he said. "Down at the water's edge, you can see a nice exposure of the carbonate rocks that form the top of the aquifer. If I were a kid, I'd be wanting to jump in there."

Jumping in had not been my first thought: the water was so opaque that I assumed it to be shallow. But Arthur told me that the hole we saw, which was forty or fifty feet in diameter, was roughly analogous to the narrow opening at the waist of an hourglass; far below it, in the bedrock, was an unseen cavity that was large

enough to have digested a huge plug of collapsed rock, sand, soil, and other surface material while leaving a deep column of water for heedless youths to hurl themselves into.

Floridians have usually treated sinkholes the way humans treat most water-filled abysses: as places to heave stuff they don't want anymore. (Divers in Lake Rose have found abandoned cars, among other odds and ends.) I noticed some discarded plastic food containers near the edge of the water, and pointed them out to Arthur. "That trash is only the superficial thing," he said. "What I see is algae." The water had a pea-soup look, and there were masses of cottony green stuff floating in it. He explained that rainwater draining into the sinkhole carries nutrients from fertilizer and from human and animal waste.

Contaminants that enter the aquifer can travel long distances rapidly—as the D.E.P. has demonstrated by injecting dye into sinkholes and waiting for it to reappear downstream. This is news that homeowners, farmers, real-estate developers, city officials, and others are not always eager to hear, since it raises concerns about surface activities that were previously thought to be harmless, or even beneficial. For a quarter century, Tallahassee recycled much of its treated wastewater by using it to spray-irrigate a farm southeast of the city—seemingly an inge-

nious instance of turning an environmental liability into an asset. But a 2006 study led by the Florida Geological Survey proved that the practice was responsible for sharply elevated nitrogen levels miles to the south, and Tallahassee has had to redesign its sewage-treatment procedure. Even so, nitrogen levels remain a problem. The once pristine Wakulla River, which arises south of the city, is infested with an invasive plant, for which, Arthur said, the region's groundwater is effectively a liquid fertilizer.

The Church Sink lies near the northern edge of the Woodville Karst Plain, a four-hundred-and-fifty-square-mile section of former seafloor that extends like a terrace between the southern part of metropolitan Tallahassee and the Gulf of Mexico. The bedrock under the plain is relatively close to the surface, and it contains a number of large sinkholes, more than two dozen of which are now known to be connected by underground conduits. The conduits are branches of the longest known underwater cave system in the United States. Since 1990, roughly thirty miles of the system have been explored by deep-water cave divers. In 2007, a pair of divers set a world record by making a seven-mile traverse through the system, from an opening called Turner Sink to Wakulla Springs, a state park about fifteen miles south of downtown Tallahassee. That dive, which required a large team of closely coordinated support divers and other helpers, was the culmination of a decade and a half of preliminary exploration and planning. The average depth of the traverse was close to three hundred feet—about the same as the wreck of the *Lusitania*—and the total submerged time was twenty-one hours.

On the evening of my field trip with Arthur, I had dinner with one of the men who set the record, Casey McKinlay, and with three other divers. I'm either ashamed or proud to report that it took me more than an hour to ask a question that McKinlay told me most people ask within a minute or two. Here's the answer: They didn't. David Rhea, who has made more than fifteen hundred cave dives, said, "You need so much energy to move and to keep warm that you basically burn everything in your system." In addition, McKinlay said, divers are careful not

to eat anything unusual at dinner the night before a long dive—a non-trivial challenge at Carrabba's, the restaurant they'd chosen for the evening—and, in the morning, to pay close attention to their breakfast choices, coffee drinking, and bathroom scheduling. McKinlay told me that, on long dives, eliminating old nutrients is actually less of a concern than acquiring new ones, because it's hard to keep proteins from going bad during extended immersion and because eating underwater is tricky. "You'd hate to choke to death on a banana," he said.

Sitting across the table from me was John Rose, who, when he isn't swimming in sinkholes, is an associate professor of computer science at the University of South Carolina. I asked him why he had come so far to dive in the aquifer. "You're basically exploring an unknown river, except that it's underground," he said. "Where else in the United States nowadays can you be Daniel Boone?" Rhea—who works in the diving-equipment business, as does McKinlay—said, "Every time you go around a corner, whatever you see there you know you're the first humans who have ever seen it." Among the marvels they've encountered are buried coral reefs, ancient fossils, and cathedral-like "rooms" more than a hundred feet high and a hundred feet wide. They've also seen life-forms that don't exist on the surface, including a blind, translucent, lobster-shaped mini-crustacean called a cave crayfish. "I consider us the NASA of diving," Rhea said. "We go places no one has ever gone."

Nevertheless, during the past decade McKinlay and the others have come to think of themselves not just as explorers but as environmentalists. This is a direct consequence of an unnerving decline they've observed in water quality—most noticeably, the decrease in the water's clarity, thanks to algae and pollution. "It used to be that when you looked into a spring in northern Florida it glowed white, because the water was so clear that the sand on the bottom looked like the sand on a Panama City beach," Rhea said. "The walls of the caves used to be pristine. Now they're all starting to be green and hairy."

Wakulla Springs, the exit point of the 2007 dive, is one of the world's most productive springs: the Wakulla River flows out of it at an average rate of two hundred

and fifty million gallons a day. The park used to be famous for its glass-bottomed boats, from which tourists could view multitudes of fish and easily make out mastodon bones and other prehistoric detritus more than a hundred feet below. Today, though, many of the fish are gone, and the clarity of the water has declined to the point that the glass-bottomed boats are deployed on only a handful of days. Rose told me that, previously, a diver just inside Wakulla's funnel-like cave entrance could sometimes look back up, at an angle, through two hundred and fifty feet of water and clearly see trees on the far shore. "That was only a decade ago," he said, "but you don't see anything like that now." The divers have also noticed a drop in the flow rate of the water throughout the system.

"It's looking like a death spiral," Rose said.

Early the next morning, I met the divers for breakfast at their favorite Tallahassee assembly point, the Village Inn on Apalachee Parkway. Their menu choices—fried eggs, omelettes, pancakes, bacon, sausage, hash browns, toast—seemed to reflect no particular concern about the fact that they were planning to spend much of the weekend underwater. After breakfast, we drove south, in a caravan, through heavy rain. Our destination was Turner Sink, which turned out to be a weedy, mosquito-infested mud hole in the woods. Nevertheless, it's a door to a vast realm, which McKinlay described to me as "a superhighway of water heading south." A diver who squeezes through the slot-like restriction, thirty feet down, eventually reaches a deepening canyon of brisk currents and striking geological forms.

Swimming in the Floridan Aquifer is not something you simply decide to do. The state's consent is usually mandatory, and cave diving requires specialized equipment and a high level of certification. McKinlay's outfit for the day weighed more than two hundred pounds and took almost two hours to arrange and put on. It included an insulated full-body undergarment and an extensive inventory of breathing tanks, each of which had been labelled, in large numerals, to indicate the maximum depth in feet for which it was intended. His "300" tanks, for the deepest portions of

the day's dive, contained only about nine per cent oxygen, or less than half the proportion found in ordinary air. Non-divers think of oxygen as the life force, but it can be toxic to those who breathe it underwater in too high a concentration. And nitrogen, which is the main component of air, is also dangerous. If divers ascend too quickly, the drop in pressure causes nitrogen dissolved in their blood and body tissues to form bubbles, and they suffer the potentially fatal malady known as decompression sickness, or the bends. Deep-water divers prevent the bends by reducing the nitrogen in their breathing mix and by ascending very slowly, in stages. A typical two-hour dive in the aquifer, McKinlay said, requires about eight hours of submerged decompression, and the divers spend most of that time watching the clock and listening to waterproof MP3 players. One diver told me that magazines, because they're printed on coated paper, hold up pretty well underwater, but that books and newspapers fall apart.

Because of the dangers, McKinlay and Rhea, who were diving as a team, double-checked the depth numbers on each other's tanks and verbally ticked off items from a mental list while standing, shoulder-deep, in the muck at the edge of Turner Sink. Major mistakes and accidents are rare, but the consequences can be grim. The day's dive was informally dedicated to the memory of Jim Miller, a fifty-year-old diver who had died nearby a little less than a month earlier. Miller apparently confused two of his tanks and, at depth, breathed a mixture intended for a hundred and fifty feet nearer the surface. The elevated oxygen level induced a seizure, and he quickly drowned. Turner Sink is named for Parker Turner, who died in the aftermath of an underwater landslide that occurred during a dive in 1991. He managed to squeeze through an opening in the blockage, but he ran out of breathing gas and passed out just thirty feet from his decompression tanks. He floated to the cave ceiling and drowned. His diving partner, who had searched for an escape route in a different direction, later found the opening that Turner had dug and reached fresh tanks just moments before his own tanks ran out.

Over the years, McKinlay and the other divers have mapped the cave system

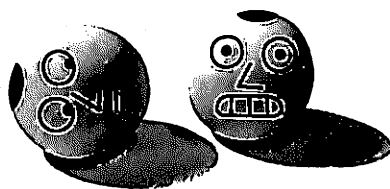
not only on paper but also in situ, with nylon line and labelled arrows. At Turner Sink that day, they repaired some of these navigational markings inside the aquifer. The next day, at Wakulla Springs, they replaced a broken flow meter inside the cave, the opening of which is more than two hundred feet below the surface. After they had reëmerged, they made their final decompression stop on a limestone ledge about twenty-five feet down, directly beneath the park's two-level concrete diving platform. Leaping children never reached the ledge, but they could see the divers as they jumped, and the divers could feel and hear the concussions of their cannonballs and can openers above their heads.

The next day, I drove to Tampa. About forty miles north of the city, I stopped at Weeki Wachee Springs, a state park. It was founded, in 1947, as a private enterprise by a former Navy diver, and its main attraction has always been a mermaid show. I arrived a few minutes before the day's final performance, and joined a crowd of children and parents watching the mermaids (and a turtle, whose shell was so covered with algae that it resembled a Chia Pet) through the big glass windows of the underwater theatre. The mermaids smiled a lot, breathed from what looked like gas-station air hoses, and did a pretty good job of using awkward-seeming tails to propel themselves across the stage, a deep spring that is part of the Floridan Aquifer.

Tap water in towns near Weeki Wachee—as well as in Tampa, St. Petersburg, and New Port Richey, and in three surrounding counties—is produced by Tampa Bay Water, a public utility. Until 2002, all the water supplied by the utility came from the Floridan Aquifer, though now it is supplemented by river water. Producing drinking water from the aquifer costs only about half as much as producing it from surface streams—aquifer water is cleaner to start with—but pumping too much water out of an aquifer has drawbacks. If wells in coastal areas pump too much, the subterranean point where freshwater and the salt water meet can migrate inland—an increasingly common problem around the world, as coastal populations have grown. During the past decade, the water utility that serves Hilton Head, South Carolina—which lies near the northern edge of the Floridan—has

had to abandon half a dozen ruined wells, as saltwater intrusion has spread.

Groundwater can be exquisitely sensitive to external forces, including tides. The earthquake in Japan in March, 2011, made water levels in Florida's wells fluctuate by three inches, and the drop in atmospheric pressure caused by passing hurricanes often makes them move even more. Climate change is likely to have a greater impact: shrunken glaciers will eventually mean less meltwater supplying surface streams and, in turn, increased demand for water from aquifers; meanwhile, rising sea levels can cause salt water to creep farther inland. These issues are of potentially critical significance all over the world. The rapid growth of India's population in recent decades has been fuelled by irrigation practices that have depleted ancient aquifers and drawn huge amounts of water from rivers fed by Himalayan glaciers—a resource that contracts as the glaciers recede. Heavy irrigation has also elevated the concentration of salts and other contaminants in the soil, thereby rendering formerly arable land unusable. Parts of the United States face related problems. If large portions of the Ogallala Aquifer really do go dry, some of the country's most productive farmland could become unsuitable for agriculture. And farmland in some areas of California subsided more than thirty feet between the nineteen-twenties and the nineteen-seventies, as underlying aquifers were emptied. One possible remedy, in regions where precipitation coöperates, is to recharge endangered aquifers artificially, by pumping sur-



face water into the earth—in effect, using emptied aquifers as reservoirs. India is doing this now, with some success, and so is Florida, most notably in the Everglades.

Florida is also taking steps to deal with salt. Tampa Bay Water operates the largest seawater desalination plant in the United States. Desalination offers a promising way of reducing freshwater shortages all over the world—places like Dubai already depend on it—but it is complex and requires a huge amount of

energy, which carries a heavy environmental cost. The electricity that runs Tampa's facility is generated by burning coal, at the city's Big Bend Power Station, next door.

A large area near Tampa has been known for years as Sinkhole Alley, and within it there are stretches of roadway along which nearly every other billboard seems to advertise a lawyer who handles sinkhole claims. I visited one of those lawyers, Joseph A. Porcelli, at his office in New Port Richey. He was wearing gym shorts, flip-flops, and a Nike T-shirt, and was about to pick up his daughter at school. He told me that his firm, at that moment, had more than a thousand outstanding sinkhole cases, and that he urges all residents of the region to add a sinkhole rider to their homeowner's insurance. "There's no law on the books that requires developers to test the ground before they build homes," he said, "so they typically just knock down the trees and start building. There can be sinkholes that don't show themselves until after the construction is finished. A cow is not that heavy, but a house is very heavy, and, over time, with the action of rainwater and the like, it can cause a collapse."

Most of Porcelli's sinkhole clients are homeowners, and they often come to him after their insurance company has rejected their claim. It can be surprisingly difficult to establish that property damage was caused by a sinkhole and not, say, by an incompetent contractor—and recent changes in Florida's statutes have made it harder. If an adjuster concludes that a sinkhole may have occurred, an insurance company will usually hire engineers to test the soil with hand augers and ground-penetrating radar. In some cases, they conduct so-called "standard penetration tests," which can bore more than a hundred feet below the surface. Even then, the facts aren't always clear. Jonathan Arthur told me that, although he hadn't inspected the site, he felt that the sinkhole that killed Jeffrey Bush had characteristics that could be considered unusual. "The puzzling thing about it is that the surface expression of the sinkhole did not extend beyond the walls of the home," he said. "Ordinarily, you would expect something that deep to widen like a funnel"—resulting in an hourglass-shaped declivity, more like that of the Church Sink, which prob-

LIGHTNESS IN AGE

It means not having to muscle your bag
Onto the baggage rack for the flight to Dublin.
A girl your daughter's age will do that for you.
It means the boy distributes the groceries justly
In your carry-alls so you'll make the car without spillage.
Those lightnesses are not to be taken lightly,
But more than those it's the many-faceted lightness
Of the goldfinch feathering down at morning,
The chickadee's darting blur for the one seed
He spirits away and devours discreetly,
And it's the tenderness of a long-known kiss
Touching your mouth or eyelid or anywhere
With this new lightness, its flickering back-lit by the glow
Of that consuming first one fifty years ago.

—Gibbons Ruark

ably would have swallowed the entire structure. The soil above the collapsed bedrock had to have a significant moisture content or some amount of clay, he thought, in order to leave a relatively straight-sided hole, as it did. "I think we're going to learn more about the circumstances of that sinkhole as time goes by," he said.

Many of Porcelli's clients come to him after receiving insurance settlements they consider inadequate. "As you can surmise," Porcelli said, "there are expensive methods of repair, and there are inexpensive methods of repair, and typically the insurance company is going to go with one that is perhaps more inexpensive." The costliest measures generally take place out of sight, beneath the foundation. In the most common method, a concrete slurry is pumped into the soil under pressure, often in staggering quantities: a recent residential repair, Porcelli told me, required sixty-four full concrete-mixer loads. Sometimes an expanding polyurethane foam is injected into the first few feet of soil under the slab. And sometimes dozens of steel supporting rods are sunk from the foundation of a house all the way down to the bedrock—a technique called "underpinning." Often, the cost of the necessary repairs exceeds the market value of the house, and homeowners sometimes take their insurance money and sell the property, unrepaired, to a so-called "sinkhole investor." Porcelli said, "There are probably thirty or forty

contractors in Florida who specialize in sinkhole repairs, and sinkhole investors work with them." Because investors usually own multiple properties, they get better repair deals than individuals can. "It's like retail versus wholesale," he said.

He gave me a copy of a newspaper article about a recent collapse, and after we'd talked I drove over to the house where it happened. It was owned by an elderly couple, who had been inside with seven great-grandchildren when three large sinkholes suddenly opened, two in the back yard and one in the street. The city had filled the hole in the street, which was fifty feet deep, although the site was still cordoned off with police tape. I couldn't see into the back yard, but two children on the sidewalk hollered, "We walked in the sinkhole!" The couple, serendipitously, had purchased insurance not long before the collapse.

Historically speaking, the emptying of Lake Jackson in 1999 was nothing new. Native Americans who lived in the area for centuries called the lake Okeehoopkee, or "disappearing waters." Archeologists have found evidence of prehistoric agriculture around parts of the lake bed, and a clergyman writing in 1842 described the lake as "self-willed and unreasonable." Nevertheless, many modern drainage events and sinkhole collapses, including the one that killed Jeffrey Bush, reflect more than Florida's unusual geology. The karst processes that

created the cavities in the state's bedrock have operated for millions of years, but they have been altered by human pressures. Population growth in central Florida has increased sinkhole activity, by lowering groundwater levels, and sprawling development has placed more people and property at risk. The state's geology provides an unusually clear illustration of an environmental truth that's of growing significance all over the world: what happens on the surface of the earth is closely connected to what happens underground, and the relationship runs in both directions.

Florida authorities took advantage of Lake Jackson's 1999 dry-down—as major drainage events are known—to undo several decades' worth of environmental degradation. They removed many thousands of cubic yards of nutrient-enriched muck from the lake bed, and built treatment facilities and storm-water filtration ponds beyond the lake's perimeter. The lake hasn't fully returned to its pre-1999 water levels—today, large sections look more like marsh than like lake—but its health has improved, and not everyone who owns waterfront property misses the waterskiers. I drove around the perimeter on my first day in Tallahassee, and I pulled in at every public landing I could find. I noticed only one boat on the water: a small, flat-bottomed motorboat with two fishermen standing in it.

Even if Floridians decided that they did want the old Lake Jackson back, there's probably nothing they could do. "Geologically speaking, the fluctuations we're seeing now may be the norm," Arthur told me. A dry-down occurred in the nineteen-fifties, and when it was over officials tried to plug the lake bed permanently, with junked cars and loads of concrete. But in 1982 the lake disappeared again. "When it went dry in 1999," Arthur continued, "there were people who said, 'Hey, let's drop a bus down that thing—I want my fish back.' But I went up in a helicopter and counted at least fifty closed depressions in the basin. They were places where organic material had flowed and concentrated"—like grounds in a coffee filter—"and they might all be buried sinkholes or other plugged karst features. You see the same thing in other parts of the state. My theory is that, if you artificially plug up one opening, another might pop through." ♦