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ELECTRONICALLY REPRINTED FROM AUGUST 2009

FIELDWORK

# DISASTER IN THE MAKING

**BROKEN HOME** A rescue worker guides an earthquake victim from a 7,000-square-foot mountain of lumber.

The best way to prepare for catastrophe?  
Head to the place where they engineer it.

BY LISA TADDEO PHOTOGRAPHS BY BRENT HUMPHREYS



**TRAINING FOR THE WORST** Among Disaster City's props is a derailed train. Photos of train wrecks helped in getting the angles of the crash perfect.

### MARCH 28, 2009: 4 P.M.

*Down here it smells like fresh wood. Sawed lumber and shop class. It's the smell of things being built.*

*The scent is misleading. It's the mind playing tricks. For Kelly, it's the opposite of creation. She's in a hole, 12 feet underground, supine in a rubble tomb. Five seconds ago she was in a building, looking out at another blue-sky day. With a grave convulsion, the ground broke and the building died on itself, and now she is trapped. That's how disaster works—one moment it's today and all the days that came before it, and the very next moment the future becomes unrecognizable. She can't see the dust, but she can feel it in her lungs. She could be alone, jailed for hours, days, her cries getting lost in the rubble.*

*A sudden, flooding flash beams down, and the dark belly lights up with the halogen brightness of Home Depot aisles. One man rappels toward her. Two others shout from overhead. It's help, in the purest sense of the word. It's rescue.*

*The man on the rope seems too large to squeeze into the black hole, but down he comes and another follows, and then a third. These big men jam in, becoming two-dimensional like milk cartons in a trash compactor. Reaching Kelly is hard enough, but before they can lever her out they must also assess the damage to her body. She says her abdomen is in terrible pain. She could have crush syndrome: The position and weight of the heap on top of her might be holding her organs together in such a way that if she is suddenly freed, she will die. Working with a sense of controlled urgency, as*

## BIGGER THAN ALL OF THE SEPARATE HORRORS IN A DISASTER IS THE VIRULENT PANIC OF ORDER GONE AWOL.

*quick as careful allows, they shimmy her body onto a sled-like rescue stretcher. They lace her up, top to bottom like a woman in a shoe.*

*Above, another group has shored up the aperture with wooden beams, crisscrossed and slanted, quickly secured with nails to hold back the rocks.*

*The men lifting Kelly tell her she's going to be OK, in the clipped manner of people who are comfortable but just*

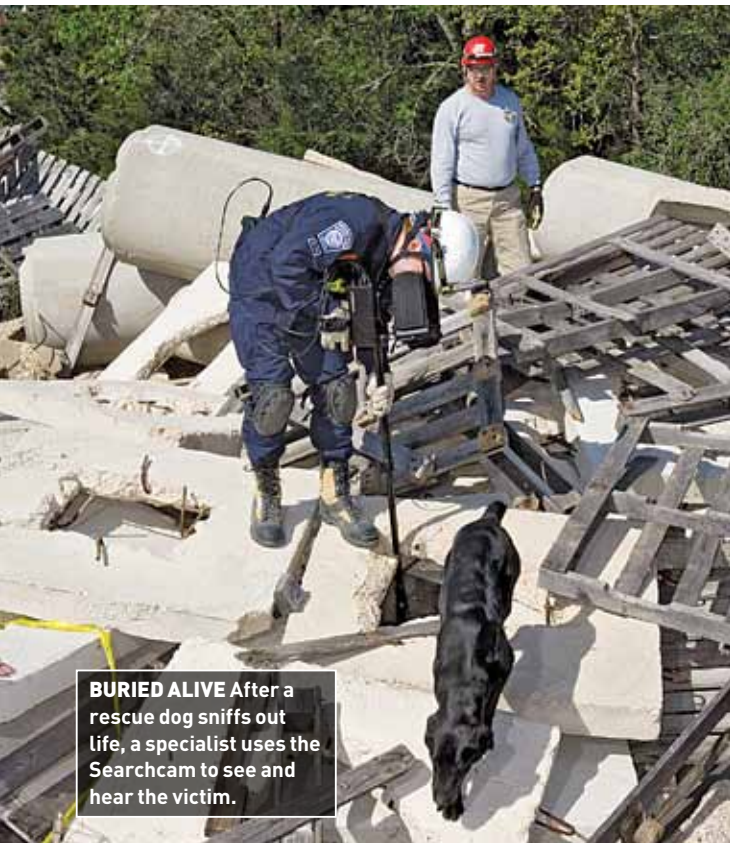
*scared enough themselves to do a job correctly under pressure. Finally, out comes Kelly from through the hole, and the feeling is relief, success. It is fleeting.*

*Up here, it doesn't look like success. It's a rebar sea. Fat piles of rubble form uneven crags and outcroppings. Metal and glass glint from the peaks of imploded storefronts. A Chevy Lumina tilts into a fissure. A derailed train curls like a giant silver horse with a broken leg. On the streets it's an Armageddon videogame. Victims stagger across roads, not dead but three quarters of the way there. Some lie on their backs screaming for help.*

*That is the worst thing, the desperation. Bigger than all of the separate horrors is the virulent panic of order gone AWOL.*

### REVERSE-ENGINEERING CHAOS

Today, panic is the point. No one wants to experience the shaking terror of an earthquake, but for the rescuers who came for Kelly, experiencing all the things that make disaster terrifying is essential, because you cannot save someone who's freaking out when you're freaking out yourself. You



**BURIED ALIVE** After a rescue dog sniffs out life, a specialist uses the Searchcam to see and hear the victim.

cannot think calmly when you're staring into a rubble pile of bodies, half of them moving and half of them still. You have to have been there before. Suppressing panic during crisis takes practice, which is precisely why 150 people have gathered on this dusty 52-acre plot called Disaster City in College Station, Texas: to practice imposing order where normally there isn't any.

So, no, Kelly did not experience a real earthquake. It was a simulation, a drill. But not just any drill. It's *the* drill, the world's single biggest dress rehearsal for the Big One. Disaster City isn't a city but a vast disaster-simulation center designed to look and feel as close to catastrophe as you ever want to be. Each hairline crack, each mangled car, all the mountains of rubble are modeled on wreckage from real disasters, like the 1994 Northridge earthquake in Los Angeles that killed 72 people and injured nearly 12,000. The 1993 World Trade Center bombing inspired the collapsed parking garage, with cars dangling off the sides like spiders from a ceiling, while the 12-foot-deep rubble catacombs resemble those from Ground Zero.

"It's like a Jerry Bruckheimer set," says Brian Smith, Disaster City's public information officer. In fact, Disaster City is the epicenter of a new paradigm of rapid and effective response to large-scale devastation, a proving ground where EMTs, police officers, firemen, search-



**FAKEOVER A** "moulage" artist preps the author for disaster.

## WHEN ALL ELSE FAILS, MACGYVER IT! LAST-DITCH SURVIVAL TIPS

**SITUATION** Your split-level Shangri-la with a view is about to head to the valley floor on the back of a mudslide.

**SOLUTION** It's time to make a break for higher ground, remembering that it's best to run perpendicular to the slide. But dashing over the slick slurry in flip-flops won't cut it—you're going to need grippy mudshoes. Quickly pull the rectangular metal mesh filters, which should be a few inches larger than your shoe soles, from the hood of your oven and use a screwdriver to poke a hole on each side of them. Then thread a shoelace through each hole, lash the mesh to your feet, and head for the hills.

**SITUATION** You're blasting down the highway when you notice something ominous in your rearview: a monster twister.

**SOLUTION** Your best bet is to take refuge in a permanent shelter, such as a basement. If you don't see one, get out of your car and lie low in the ditch next to the highway. If you have a few moments and a good wrench, you can improve your survival odds by anchoring yourself to the ground. Shimmy under your muffler and then locate and remove four U-bolts, usually found along the exhaust system. Return to the ditch, strip out of your shirt and pants, and use the wrench to pound the bolts through your sleeves and pant legs into the hard ground. Slide back into your clothes, and watch for flying cows.

**SITUATION** It's the bottom of the third with two outs when the organ stops and the announcer tells everyone to remain calm: A fast-moving outbreak of antipodean rooster pox has put the stadium under indefinite

quarantine, a death sentence if ever you've heard one.

**SOLUTION** Although experts agree that masks usually can't stop you from getting a virus because the bugs are too small to filter, masks can prevent direct contact from sneeze splashes or careless coughers. Grab a heavy-cotton T-shirt from a vendor. Cut out a large rectangle of fabric, slicing two slits on each side to create ties. Place it over your nose and mouth, knotting the lowest tie under your ears and behind your head. Sharpen a stick. Poke anyone who doesn't close their mouth when they cough.

**SITUATION** You're four Mai Tais into your vacation when the tsunami sirens go off. The panicking crowd makes it impossible to get off the beach, not that it matters—this little atoll doesn't have any higher ground.

**SOLUTION** Make a life preserver. Pick your pants off the sand, and cinch the cuffs closed using your shoelaces. Scrounge the beach for sturdy plastic bags or other inflatable items. Blow them up. Stuff the inflated balloons into the legs of your pants, and tighten the belt to hold them in. Wrap the legs around your neck and tie the shoelaces together, creating a life preserver. Take a last sip of your Mai Tai. You're going to need it.—JASON DALEY

## NATURAL-DISASTER DEATH ZONES

These maps detail some of the most disaster-prone places on Earth, from Tennessee to the Himalayan Front. According to Art Lerner-Lam, director of the Center for Hazards

and Risk Research at Columbia University's Earth Institute, assessing natural-disaster risk isn't just a question of where and when cataclysmic events will occur, but how society

### TORNADOES

**"Dixie Alley" (parts of Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Georgia)** Pop. 25 million.

This region is home to the highest percentage of nighttime tornadoes, the deadliest variety.

### VOLCANOES

**Mexico City, Mexico** Pop. 18 million.

Popocatepetl, 40 miles southeast of Mexico City, is a constant death threat. In 2000 the active volcano had its largest eruption in more than 1,000 years, causing 56,000 people to flee.

### EARTHQUAKES

**Himalayan Front (Turkey, Iran, Afghanistan, Bhutan, Bangladesh, Pakistan, India, Nepal, China)**

Pop. 230 million. Unstable construction and an active fault line put this area at the top of the list.



and-rescue crews, hazmat teams and volunteer victims gather once a year for a wild weekend of practice that gives hope and perhaps continued life to anyone—maybe you, maybe me—who in the future might happen to be in the wrongest place at the wrongest time.

Of course, Bruckheimer is nowhere to be found. Today's action is the creative genius of G. Kemble Bennett, the 69-year-old dean of engineering at Texas A&M University. Bennett helped the university's governing body, Texas A&M University System, create the near-\$100-million complex in 1997 after the Oklahoma City bombing. "I felt like it was just a matter of time before terrorism came to our shores again," he says. "Oklahoma City was a real wake-up call. Then with all the floods and the hurricanes, it became clear that we needed the capability to train." He realized that there was no place that could thoroughly train people for the entire scope of disaster, so he made it his mission to create one.

The Disaster City complex is one of three core facilities. The Brayton Fire Training Field is the largest live fuel-burning center in the world, and its outdoor classrooms are big fire props, pipelines and massive structures that are set ablaze with dummies inside to rescue. The Emergency Operations Training Center is an ordinary-looking building that houses a master computer simulation with the capacity to conjure any disaster in any place—a dirty-bomb detonation in Chicago, say, or an earthquake in Tennessee.

Finally, there is Disaster City itself, the urban search-and-rescue training ground. If you save lives, this is where you come for your skills training, to learn Superman moves like breaching building structures—being able to go through walls—and shoring, to keep collapsing buildings upright long

enough to save the people inside. This is the heart of the operation, where engineers spend months building disaster scenarios so chillingly accurate that they draw rescue workers from all over the world, because there's no other place that can match its infrastructure.

"Nowhere does it all come together like under this big umbrella," says Bennett's colleague Bob McKee, the director of emergency response and rescue for Texas Engineering Extension Service, which funds Disaster City and oversees its day-to-day operations, in addition to managing the state's urban search-and-rescue team, Texas Task Force 1 (TX TF-1).

There are other, smaller piles of rubble around the country that other task forces use to simulate the real thing, but much of their inspiration comes from Disaster City. Brian Giachino, the director of Iowa's Task Force 1, has had his team creating rubble and honing canine searches ever since he first visited Disaster City in 2004. "Ours is not on the scale of Disaster City," he says. "That place is truly unique."

The facility is also a command center for real-life disaster response. McKee and his crew are in constant contact with the Federal Emergency Management Agency to dispatch search-and-rescue teams. Even on the morning Kelly is rescued, as TX TF-1 members train, quiet yet important people with telephones for hands sit inside a deceptively unexciting room called the coordination center deploying other TX TF-1 rescuers to North Dakota, where record-setting floods have left tens of thousands homeless.

Just like in the military, Disaster City trainees often head from their apocalyptic boot camp into real situations. Last May, after a mile-wide tornado slashed through Parkersburg, Iowa, leaving nine dead and eight times that injured,

adapts as burgeoning populations and economies expand into notoriously high-risk territories. Here, the ones that have made Lerner-Lam's watch list.—LINDSEY KONKEL

## HURRICANES/CYCLONES

### India, Bangladesh, Myanmar

Pop. 1.3 billion. Flat topography, intense storms and the densest coastal populations on the planet put the low-lying regions surrounding the Bay of Bengal at risk for deadly hurricane disasters.

## LANDSLIDES

### Central America Pop. 40 million.

Mountainous terrain, unstable soil and exposure to monsoon rains, hurricanes and earthquakes make this region landslide central.

## TSUNAMIS

Indonesia Pop. 240 million. The fourth-biggest population in the world, combined with low-elevation coastal areas and close proximity to the Indo-Australian and Eurasian fault creates a perfect target for killer tsunamis.



Giachino and his team were on the scene. "I just did what I learned in Texas," he says. "It has the logistics of rescue down better than anybody, so I used their model. We arrived in the darkness and rain and said, 'Let's roll this baby out just the way we did it in Texas.' And we did, and it was the logistics that helped us respond, I'd say, almost perfectly."

The need for expertly trained responders like Giachino has never been greater. Bennett calls emergency response a growth industry, and indeed, calamity is a burgeoning market. In 2008, cyclones, hurricanes, earthquakes and other planetary convulsions killed an estimated 236,000 people, by the United Nations's count, making it one of the deadliest years on record for natural disasters. This year hasn't been much better so far, with wildfires in California, earthquakes in Italy and floods in the Dakotas. Even now, as hundreds of employees and trainees prepare for the fake Big One, McKee and his team stand ready for when the real deal hits in Dyersburg, Tennessee, along the New Madrid fault line. The region is the highest earthquake risk in the U.S. outside the West Coast right now, and some seismologists say it's got a feverish past-due timeline. By rights, it should have happened yesterday.

## 10 A.M.: MAKING THE DEAD

Like Kelly, I'm among the victims today. A few hours before the simulation, I watch unpaid people being "mouled,"

## DISASTER CITY IS A VERITABLE WORLD'S FAIR FOR NEW RESCUE TOOLS TESTED AND VETTED BY TOP EXPERTS.

or gore-ified by makeup artists. They use vampire blood, Halloween leftovers on sale. They make chicken bones and turkey bones and rebar pieces pop out of legs and rib cages. Rebar is big here, because that, along with glass shards, is what's most dangerous when a building collapses. It's real enough, brutal enough—glinting metal jutting from plaid shirts—to give the rescue workers the feel of an actual situation, so they have to

triage the conditions to see who's in the most critical shape.

Stephanie Thompson, a full-time employee at the Brayton fire center who's made disaster makeup her niche side job during simulation weekends, instructs one of her moulage disciples: "The burns should be the worst at the hands. And I don't want any black up there on the arms; that area should be red." There are little tricks, like painting sugar water and blood onto the flesh and blow-drying it to a gleaming stain.

One official reviews an exercise action plan that lists all the volunteers, their interests and capabilities. Some of them say they would enjoy hiding in a rubble pile for hours. They want to be the most difficult rescues; they want to be trapped in the dark and the dust, for the thrill and the sense of helping in a more dramatic way. Then there are the people who just want to hand out water, watch from the sidelines. But the reason they're all here, any of them will tell you, is for the spirit of it, to be part of something serious and noble.

Before you get to the disaster, you must be processed and assigned a role at the Gateway, the hangar-like hub, which is effectively a big rescue warehouse where they stash the

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**DANGER BY DESIGN**  
A victim awaits rescue on an 11,000-square-foot pile of concrete. More victims lie beneath the rubble in engineered tunnels.



## THE PORTABLE CITY

Designed to be a rescue worker's one-stop shop during disasters, Titan Energy's new Sentry 5000 Mobile Utility System is a 17-foot-long trailer containing a reverse-osmosis water purifier capable of generating more than 3,000 gallons a day. With a diesel power generator, an air compressor, a satellite phone and other off-the-grid necessities, it was first deployed last year in Baton Rouge after Hurricane Gustav, where it was used to cool down the airport during sweltering 100° heat. It requires no tools to hook it up, making it easier to assemble than Ikea furniture. MSRP: \$175,000.

equipment, the prepackaged hazmat sheets and the stacks of MREs (Meals Ready to Eat). Next to the dusty packages of Tuna, the Pasta with Garden Vegetable is a newer one, a hotter ticket.

An army of rescue workers unpacks everything and hands out the gear, the jackhammers, gloves, hydraulic cords, wool blankets, shovels, the radios with the screw-on antennas. Here is where you learn that quickness in disaster is not of the essence. It can't be. The rescuers don't just gallop out like wild horses. This morning they're preparing the way they would for a regular deployment. There are people in imposing uniforms trooping about, dogs, and tables of Dr Pepper and breakfast tacos and American flags.

## 12:30 P.M.: EARTHQUAKE

It's time for action. I'm beached on a rock outside a single-family home across from a pancaked House of Pancakes. On the corner is a mini-mall with a Maytag shop, beaten to a heap. Power lines are down, one of which speared a 1985 Cadillac sedan. Smashed glass shines on the grass like shallow water. Volunteer victims burrow in holes, in buildings and cars. Some will take naps while they wait to be rescued. Others will scream the whole unnerving time. It will get to me, no matter how much I try to remember this is a simulation. That's the idea.

The man in charge of organizing and rallying the victims is Smith, the public information officer, who is also known as Disaster Smitty. A former Navy military police officer, Smith is Terminator-size, with his pants tucked into his boots, and he's screaming at the victims. "All right, guys! Act it up!" he shouts, the veins in his neck bulging with the strain.

There is no Animatronic shaking of the ground, which is a bit of a letdown. You must only imagine that the earthquake has just happened. But then, more quietly than the real thing and more methodically, Disaster City rises

up and is born into the horror it was engineered to be.

First come the EMTs, a volunteer group of students from Texas A&M, whose role is an extension of their university training. They're drawn like sharks to whoever is leaking the most blood. Medics take pulses, carry away the worst-off, and attach victim cards to the wrists of the rest to catalog survivors. There is the haunting Level I, a black bar with a shovel, which means the person is dead. There is Level II, with an image of a rabbit, which means rush to help. Level III, the turtle, is noncritical, and Level IV, the luckiest one, shows an ambulance with a slash through it; you get dealt this card, and you might be able to walk away.

Next come the rescuers, the particular team of TF-1 guys who are training today. They are in gray shirts and navy pants, descending in an orderly fashion from red trucks. There is a slow-motion drama to their sudden appearance. The head of the EMTs confers with the head of the rescuers, and they pass off information reports—where they found and treated victims in plain sight and, eerily, where they can hear people crying but cannot get to them. That's where the rescuers come in: pulling victims out from impossible places.

Per Disaster Smitty, the screaming commences. "Help us!" Coming full force at the rescuers, begging, telling them, "My father is trapped under his car. He's got glass in his neck!" Or "My child is under a wall! Please, please God, she's *dying*." The victims don't care about anybody but their own loved ones. This is obvious, maybe, but to see one human trampling across a wounded one and begging a rescuer to come save *her* father, and not this other one, is chilling, even if it's only an act.

The rescuers must choose, and that's the terrible thing. Not being able to help people right away is tormenting. But Disaster City is where protocols are established, and so the plan must be followed to assess its effectiveness. The fact

# DISASTER IN THE MAKING

that the facility sets the standards, McKee says, allows disaster units around the globe to forge one giant, well-trained whole. For example, the Center for Domestic Preparedness in Anniston, Alabama, provides hands-on specialized WMD training to state and local emergency responders, and the U.S. Department of Energy's Nevada Test Site is the leader in training rescuers to handle live-agent stimulants and explosives. But in Disaster City it's about taking all those potential disaster variables, from WMDs to explosives to earthquakes, and creating a single hell to address them all.

Paul Murphy, the urban search-and-rescue manager for Merseyside Fire and Rescue in Liverpool, says, "In the U.K., we're still a few years behind the States. We're still playing catch-up after 9/11 and Oklahoma, and over at Disaster City it gives us the most realistic situation, the capacity where you can actually run an exercise of all the possible logistical problems on such a large scale. We've developed our systems over here based on those models."

Now, in this model, the rescuers are deciding who to help first and who to put on the back burner to maximize the lifesaving. It's as unfairly organic as natural selection. It's disaster selection.

Me, they put gauze on my gaping wound and carry me to the triage area with a bunch of other bleeding people. I'm classified as a Level II, the non-critical turtle. I look over at the Level I beside me and find myself feeling an odd resentment that the care of his life has been prioritized over mine.

One of the first rescues is a girl under a pile of wood at a nearby site. "She's all the way back in there," calls one worker to his teammate, pointing to the shudder of a breathing thing across a mass of fallen things. The rescuers catapult chairs and mattresses

into the air, out of their way. They tie the girl to a piece of wood after stabilizing the stuff over her head. The rule is, you need four rescuers to lift a person: one at the head, two at the hips, and one at the feet. They stick to this even though one man could lift this girl with one hand. Process, routine. History has shown that if you follow the rules, you save more lives.

## 2:30 P.M.: ROBO-RESCUES

The triage room is getting crowded, so I walk my fake flesh wound over to witness the action at the Oklahoma City-inspired Government Complex, a two-story operation with exposed pillars, hanging slabs and cars hanging over its edges that make it the thorniest rescue site and require the workers to break out more-advanced tools. Murphy says this particular site was a huge training coup for him and his team: "We've never had the problem of a hanging slab in England, so until now we've never had that training."

Here rescuers must breach upward through a teetering car without knowing if there is a victim inside. If the car was earthbound, dogs would sniff out the site. But this car is hanging in the air, so first they drill a small hole in the base of the vehicle to insert the Searchcam 2000 Victim Locating System, which articulates in both directions to provide visual and aural evidence and allows them to talk to a potential victim. During the day, workers will also test the Delsar LifeDetector seismic listening device, and multi-gas monitors and WMD detectors, for sniffing out faults and hazardous material. These impressive machines extend the rescue's reach, and whenever possible the crew will put the life of a mechanized device in harm's way before a human one as long as the same result can be achieved. They're quick to say that it's not instead

of a responder, it's to aid a responder.

Testing these tools in the two-year-old Product Development Center is one more way Disaster City is forging a new standard of disaster relief. As an avenue for manufacturers to demo their untried products, the Development Center is a veritable World's Fair for rescue tools tested and vetted by a major research university with deep experience in actual national disaster response. Some of the wildest items being tested this weekend are the Remote Auxiliary Power System, which can "steal" juice from a fallen power line and convert it into something usable, and the Sentry 5000, a brand-new all-in-one rescue unit meant to make a disaster area as survivable as possible for rescuers and victims alike while the former gets the latter to safety [see "The Portable City," page 52]. Responders learn to use the tools by breaking them out in these situations, to maximize the "I've been here before" muscle and mental memories.

## 8 P.M.: SPAGHETTI

It's dusk, and the screaming has stopped. Two volunteers, older men with deep wrinkles and hard hats, are laughing at a college kid playacting out his injury, a wood shard sticking out of his chest, even though the day is over.

The volunteers are going home, perhaps to brag to their families over dinner about how they were lifted out of a car dangling off a caved parking garage. Some still wear their moulaged bloody cheeks and popped femurs, walking down the street so they can spook passersby. The rescue workers are going out for pasta to replenish the energy they burned tossing rubble and lifting bodies. They know that as they hang out drinking cold beers, tearing at bread rolls with earned hunger, all across the planet fault lines are creeping toward rupture, storm systems are gathering darkly off blue oceans, and terrorists are devising sicker ways to kill people. So they train for it by reverse-engineering mayhem, by attempting to turn the unpredictable and unknowable into a science.

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*Reporter and novelist Lisa Taddeo lives in comparatively calm New York City.*



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