

WHAT THE ELEPHANT NEVER FORGOT

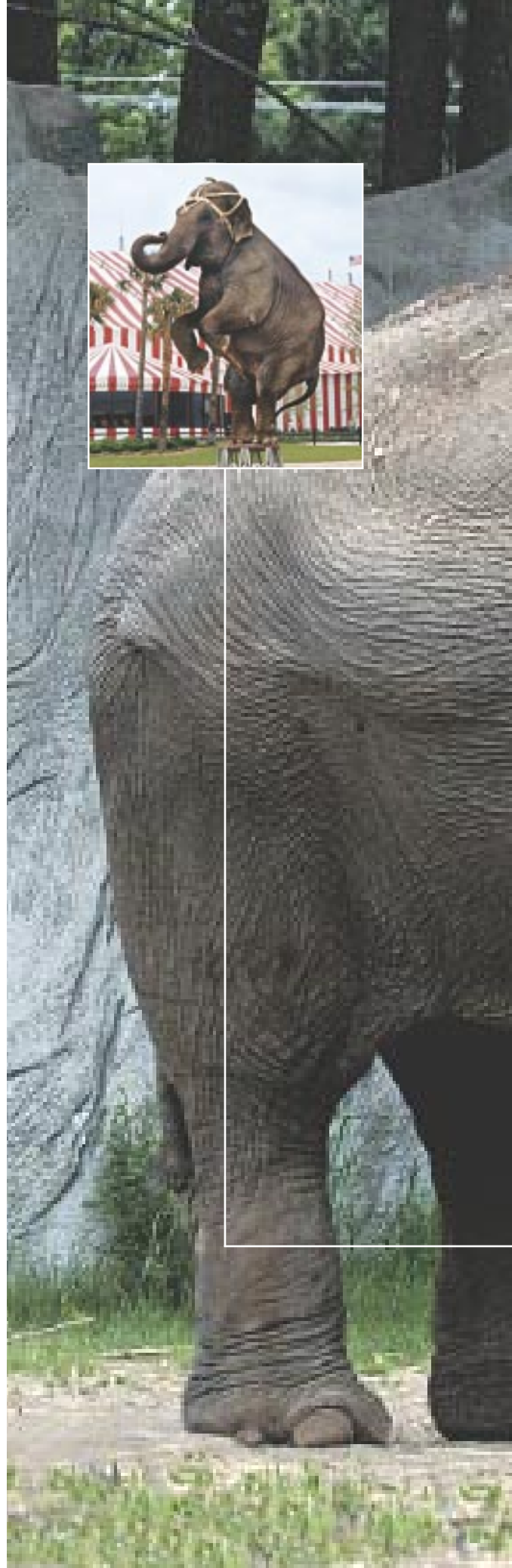
A mysterious sore on an elephant's foreleg leads to a diagnosis of post-traumatic stress disorder and an exploration of body memories that every human should know about

BY DAWN ADRIAN ADAMS

The zoo's curator of mammals met me that hot summer morning in a bright pink golf cart at a side gate because the main entrance wasn't open yet. He'd told me that the zoo's female elephant, Melinda, had a problem with one of her forelegs. But I wasn't sure why he'd called me — a scientist who worked on biomechanics of large animals — instead of the zoo vet. I watched the back fences and buildings whizzing past as he filled me in.

Melinda had a recurring infection. It always started as a swelling on the front of her lower left foreleg, on the joint equivalent to the back of a human wrist. The elephant seemed to be in pain while it developed, often refusing to stand on that leg, as if the source of infection was much deeper than the skin. The swelling would enlarge until it broke to form a running sore, and each time this happened, the vet prescribed antibiotics. The infection would clear up, only to return weeks or months later. The cycle of episodes seemed random, and the curator suspected that another sore was developing now. He hoped I might be able to find the underlying, untreated cause, which he suspected was biomechanical.

The pattern of Melinda's problem didn't sound purely structural to me, though. I asked about associated factors, and the only constant seemed to be a disturbance of some sort in Melinda's normal environment — being bullied by the other zoo elephant or having her schedule disrupted. As the curator brought the golf cart to a



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halt outside the elephant house, I suggested that Melinda might be suffering from post-traumatic stress disorder (PTSD). He was surprised, associating PTSD only with human war veterans. So I described the common symptoms of PTSD and the current theories that explained them.

When a human or other animal experiences trauma, its body releases various hormones to help it survive. Some of these hormones trigger the fear that makes an animal run away, others cause physiological changes such as higher blood pressure and heart rate that allow it to run fast or fight hard, and others encode state-dependent memories related to the circumstances of the situation. This last type makes sure the animal avoids similar situations in

the future.

In PTSD, the first trauma is so severe that whenever something happens later that resembles the original event, the whole series of hormones is released again — from those causing fear to those that increase metabolic rate to those that

replay the state-dependent memories encoded at the time of the original trauma. This explains the well-known tales of war veterans who dive beneath a truck for cover when a passing car backfires. The veteran responds without thought, as if the sound really is gunfire.

Returning to the same physiological states or emotions linked to the original trauma can also reactivate the suite of hormones. For example, if a battle veteran with PTSD starts anxiously running to catch a plane, the elevated heart rate and anxiety can cause the vet — now safely aboard a jet lifting in takeoff — to suddenly become certain the plane is going to crash. The feeling is real, even though it's a response to a threat from the past.

The most important thing about this type of response is that the fear triggered in PTSD ignites, causing the rest of the hormone cascade associated with trauma. Anxiety over the plane's imagined impending crash causes the veteran's heart rate

and blood pressure to soar without relief, since he can only feel safe again when the plane lands. Over the long term, such physiological changes can damage heart and artery tissue in ways that constitute heart disease. PTSD seems to be a factor in other stress-related or stress-induced illnesses as well, from cancer to allergies to rheumatoid arthritis. Some research suggests that in cases where the onset of an autoimmune disease is linked to PTSD, inflammation and consequent damage can be concentrated in the part of the body that was hurt in the initial event. And often, such inflammation is cyclic but apparently random — like Melinda's problem.

By the time I finished explaining all this, we were standing outside Melinda's enclosure. She stood silently, rocking her weight in a gentle rhythm of comforting self-distraction, eyes nearly closed. A pile of sweet yellow hay lay on the clean concrete floor near her feet, wisps strewn here and there showing that she'd already eaten some. Then, as I watched, a wave of unease rippled through her whole body and she raised her left forefoot. She held it in the air a moment, awkwardly, as if she didn't know quite where to put it, and then finally set it down again gingerly. The curator explained that this was how she acted when a new infection was about to set in.

I asked the curator if Melinda had ever been injured in the place where she had now developed the infection, and he didn't really answer me. But when I asked again, he admitted that she had. The zoo that had sold Melinda to this one had shipped her in the back of a truck. She'd been manacled to a fitting welded to the truck frame, and her leg had swelled enormously during the long trip. By the time she'd arrived, the manacle was no longer visible under the swollen mass of flesh surrounding it. They'd had to work hard even to reach the manacle to cut it off and release her from the trailer. The manacle had been in the exact location of the recurrent infection.

I wondered why the curator hadn't mentioned this story to begin with, but it certainly suggested that trauma was the underlying cause. Now I needed to know whether the inflammation had created secondary problems that might be treatable. To learn that, I needed to palpate Melinda's leg.

Melinda stood silently, rocking her weight in a gentle rhythm of comforting self-distraction, eyes nearly closed. A wave of unease rippled through her whole body and she raised her foot.



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I started to carefully probe the shapes of bone and tendon deep beneath the shifting skin. Some swelling and gnarled-over bone in her left wrist suggested arthritis, but as I felt the way she shifted her weight in a constant, helpless effort to ease the discomfort of standing, I realized that her hind legs, and probably her pelvis and back, were in the most pain. That was why she kept putting her left foreleg back down, even though it hurt to stand on it. When she lifted it off the floor, it threw too much of her weight onto her other three legs, and the back ones couldn't handle the added burden. But when I voiced my thoughts about Melinda's back legs and pelvis to the curator, he was skeptical. The obvious problem was on her front leg, he pointed out, where the infection kept developing.

I showed him the line of Melinda's back, high above our heads, which bent very slightly in different ways as she tried to flex her weight off one hind foot and then the other. He shrugged, unable to see the movements, and I had to admit they were subtle. But I had seen and felt them, nonetheless. I couldn't find a way to get high enough to palpate Melinda's hips and back. The curator said it might be possible to have her X-rayed, but his concern was still primarily her foreleg. He thanked me for the insight about the manacle and PTSD and asked me to examine a giraffe with a deformed foot. I kept thinking about Melinda. And as we drove back toward the exit later, I saw her in the elephant yard standing in a way that made her prognosis suddenly and terrifyingly clear.

Melinda was positioned "head down" on a low hill, her hips noticeably higher than her shoulders. She had chosen a position where gravity would pull the greatest part of her weight onto her forelegs, relieving the burden on her back ones. But since her left foreleg was sore too, she had positioned her right foreleg so its foot was nearly under the center of her chest instead of to one side, taking some of the weight off her sore foreleg — so her only sound leg was bent sideways beneath her at an unnatural angle. It couldn't hold up under that kind of stress, and when it failed she'd go down. An elephant that goes down dies, because its unsupported weight crushes its own heart and lungs.

This time the curator could see some of the indications I pointed out, and he stopped the cart to listen. As I explained, he began to accept that

Melinda's primary problem was pain in her back, pelvis, and rear legs that had no obvious cause. This was suspiciously like PTSD, and, given Melinda's history, I asked whether anything had happened to her hind quarters.

The curator said that the other zoo elephant sometimes rammed Melinda and could have injured her hips or back, but I pointed out that she seemed to be equally inflamed on both sides. I didn't see how another elephant could get the leverage to hit both sides that hard at once. The curator pointed out that perhaps such an incident, if it happened, could trigger PTSD from an earlier but unknown trauma. When I agreed, he nodded acceptance of the idea that PTSD might well be causing the pain and inflammation in Melinda's hind quarters and asked what would be done to treat a human in such a situation. Counseling obviously wasn't an option, but medication was. I suggested trying an antidepressant such as Prozac.

The idea behind such treatment is that inflammation can sometimes result from a deficiency of certain neurotransmitters related to the trauma state. Prozac is thought to increase levels of those biochemicals enough that the inflammation doesn't begin. Or if inflammation has already started, it subsides. The curator talked eagerly about trying Prozac; if it worked, other zoo curators and keepers would be interested.

But we never got to try. Human trauma specialists declined to guess the dose for an elephant. Veterinarians who had prescribed Prozac to small animals were unwilling to treat Melinda, and the



I saw Melinda in the elephant yard standing in a way that made her prognosis suddenly and terrifyingly clear. ...Counseling wasn't an option.

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We can survive — with deeper humility and the generosity of life itself.

Some sleep here at night, others are bussed to outside facilities. We eat a mystery salmon dish and hear from a homeless lady how the system works — how to enter the bureaucracy and move toward work and housing. She gives a more than generous explanation.

We walk, talk, share life stories, problems, meet homeless people, and move toward Union Square where we will beg as a practice. Begging is hard. We feel so exposed, so reduced. Some of the group beg for food from an outdoor farmers' market. They are profoundly moved by the vendors' generosity. Others ask for spare change. I find the experience very hard — seeing the pain, the barriers, and the fear of the people who help us. After a while I cannot bear it. Batman never asks for money on the streets. He has a full-time job on a garbage truck and gives his salary to his ex-wife for his daughter's education. Now he asks in the spirit of the group, and is refused over and over. "They looked at me like I was nothing," he says. Few of us will simply ignore people begging from now on.

With bread, organic sandwiches, pretzels, and more, we move on. We spend that night at Batman's old haunt. The steam is ON! Some are able to sleep. Others walk the neighborhood. At about 10 p.m., a popular bread store throws out pastries and yogurt, a delightful dessert. Conversations with street comrades inform us of worlds we know little about — turning tricks, abandonment, drug dealing, time in jail, and lack of respect. Exhausted by people's suffering and this strenuous lifestyle, I sleep.

Saturday morning, after a long walk to ignore the breakfast that won't happen, we go back to Washington Square Park to close our retreat. We are exhausted, dirty, and intensely moved by the everyday things, the unexpected, and the life that we witnessed and experienced in such a short time. It's hard to leave each other, but we walk our separate ways, forever connected. We can survive — with deeper humility and with the generosity of life itself. ❖

Elephant

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only vet who'd treat her was unwilling to give her Prozac. An international expert on trauma concurred with the PTSD diagnosis but didn't write prescriptions. Before I could find a solution, Melinda went down. She never got up again.

The autopsy showed arthritis in her left wrist, beneath the area of the recurring infection and of the manacle before that. There was no evident pathology of her pelvis, hind legs, or back, although the curator said it was clear she'd gone down because they'd given out on her. He said he didn't know why. Neither did I — except I was certain that PTSD was part of it. Something terrible had happened to Melinda. Ten years later, I found out what it was.

A passage in a book about animals and the legal system described a particular elephant in a famous zoo that had never learned to stand on its two hind legs. The trainers had tried to teach it this stunt in the usual way, by putting a harness around the elephant's forequarters, running a chain from the top of this harness up over a tall A-frame, then hauling the elephant up backwards until it was standing on its back legs. Eventually, an elephant learns to stand on its own this way. But this particular elephant could never master the trick. She cried and squirmed, and acted as if her back legs were unable to bear her weight. So the trainers beat her. They forced her to remain standing upright in the harness and chain for longer and longer periods even though she never stopped crying and writhing in pain. The elephant's story came to light after charges of animal cruelty were filed against the trainers. In an effort to deflect the negative publicity, the zoo sold several of the animals involved, including this particular elephant. The book reported that she'd died a few years after going to her new home — and named the zoo where I'd seen her.

Immediately, I realized three things. The curator had known what had happened. Melinda's case was famous. He just hadn't realized that trauma could affect her physically the way it had — until I explained it to him. That's why he had been so interested in trying the Prozac.

Melinda had known what had happened to her. She hadn't been able to tell me verbally. But her body never forgot. It told me so clearly that I heard it in moments on a hot summer morning.

Memory doesn't reside only in the brain. But the body's memory is different from that of the mind. It is memory that persists without distortion. And it speaks of what it's experienced in a language every bit as painfully eloquent as the spoken or written words of a trauma survivor.

Hidden Trauma in People

The denial and cover-up surrounding Melinda gives some sense of what happens to many who have suffered trauma. Adults abused as children often remember being told, "This isn't the way you think it is; nothing is wrong; everything is all right." And they believe it and rewrite their memories. Generally, what finally brings such people to a psychologist isn't the idea that they've experienced past trauma. It's a physical condition such as unexplained pain, recurring headaches, or an autoimmune disorder with no physical explanation. It is their bodies that have remembered, and it is their bodies that tell them, their referring physician, and then a therapist that something traumatic happened. If there is any place for error or "contamination" of memory in such situations, it's in the details of who, when, and where. Those are things that should not be presumed or supplied by anyone. But that's a separate issue from the reality of the traumatic event itself.

Meeting Melinda gave new meaning to that adage, "An elephant never forgets." I'm sure this time I'll remember it. ❖