# My Life with the Horror

## *There's nothing funny about motion sickness. Really. I mean it.*

DONALD KATZ

The second-worst physical sensation I've ever encountered came upon me like a hurricane just a few miles off the coast of Virgin Gorda. I was in the British Virgin Islands to do some deep-sea fishing with a bunch of professional anglers. I remember well the élan with which we wolfed down our breakfast of banana-nut pancakes sodden with heavy maple syrup, and I remember that as we headed out to the marlin lanes as the sun rose, the sea began to churn.

The horror came upon me before anyone had cast a line. As always, it began with a strange idea. How absurd, I thought. Here I am heading out for a bit of rod-and-reeling in the deep blue when all of life as we know it is doomed as of today.

The violent bout of motion sickness that ensued continues to rank very high on my list of remembered agonies in motion, less for its physical intensity than for its terrible and unceasing length. By 7 A.M. I was paralyzed—so spent that one cheek was riveted to the bottom of the cabin, so weak that I couldn't even moan. For the next ten hours—as the day grew hot and steamy above me—the old boys on deck continued to fish, eat innumerable salami sandwiches, guzzle beer, belch, and tell long, derisive stories about other seasick wimps they'd observed over the years.

There are so many other moments, each of them welded forever to my memory. There was my first ride on the Boomerang, an amusement at the now-dismantled Riverview Park in Chicago and clearly invented by a psychopathic sadist. The Boomerang rotated a tiny car so quickly that the very lips of the four children seated inside would roll back to

reveal the tops of their gums. The dreaded machine then unleashed the whirling car into a parabolic tunnel, the walls of which bore the results of more than a few riders' neurovestibular responses.

There was the day I spent in 28 feet of fiberglass hell called *Livin' II* —a craft from which I trolled for coho salmon and provided free chum for several hours under a hot sun. There were the times I rode the elevators—vertical coffins, really—in the old Morrison Hotel in Chicago. The elevators stopped short of the desired floor several minutes before your kishkes caught up, and they never failed to make me ill. There was the un-air-conditioned airplane in northwestern China that was missing a cowl over one engine, which actually might have been fine if not for the various farm animals on board that were as sick as I was. I'm not proud to admit it, but there are even rocking chairs of an uncertain arc that have set my gizzards and soul to quivering.

One of my favorite examples of bureaucratic understatement has long been the commercial airlines' decision to refer to the horror of motion sickness on their official barf bags as "motion discomfort." "Discomfort" describes the internal upheaval of motion sickness in the way that "neck ache" describes hanging. The specific feelings that attend a full-fledged case of motion sickness are probably impossible to describe, but what the hell, let's try.

It begins subtly enough with a flickering sense of ennui. You might find yourself sitting in a boat or a plane or a Boomerang car at Riverview, minding your own business, when you realize in passing that you are strangely uneasy about something. You might sigh a few times and notice that you are salivating uncommonly. Then you might feel clammy.

By now you have begun to yawn. This, I've always believed, is your system's way of suggesting that in a perfect world you would be at home in bed, fast asleep, for no organism should have to experience what's about to happen next.

You soon realize that your entire life to this point has been devoid of meaning, and then you actually begin to lose touch with your emotions, your capacity to reason, and most of your motor skills. The demons of motion sickness are now fiendishly disengaging all unnecessary functions to allow you to concentrate every faculty on the appalling sensations that are on their way. Your operative senses become sharpened to everything too loud or too bright. Engine noises seem deafening, and radios scream like air raid sirens. Terrible, noxious odors begin to gallop through your nose in stampede.

You begin to pant. Your skin grows tingly, then numb, then cold as your blood abandons your useless extremities (your throbbing, spinning head, for motion sickness purposes, being an extremity), and flows into your heaving thorax to rally round your heart as if to make one valiant last stand.

A thin coating of sweat covers your entire body, and the world around you begins to resemble a vast emissive basin. You are now approaching the peak of the exponential curve traveled by the symptomology of the affliction. The pain is astonishing: a braying, mocking, undefined sort of pain that makes you yearn for a gunshot wound or a compound fracture . . . anything to distract the mind.

Eventually a centrifugal force begins to emanate from the bonfire in your gut. A private tide then sets out on its inexorable rise toward the blinding light, and finally emerges as an expression of such unbelievable biological urgency that people some distance away will join you in wishing that you had never been born. Finally—and in many ways, worst of all—the horror crosses that delicate membrane that separates transitory sensation from indelible experience. It lodges there in your trauma file forever, ready to be trundled out for future travels so that it can all be recapitulated in great detail once again.

IT'S NOT PRETTY, and as any survivor can assure you, it most certainly is not funny. My casual research indicates that the idea that throwing up is somehow humorous is rooted more deeply in our drinking cultures than in our peripatetic ones. The British, not surprisingly, have created an entire comedic idiom devoted to barfing—"talking to God on the great white telephone" and "driving the porcelain bus" being just two inspired examples. And the men of Dartmouth College have, over time, developed as many variations on the vernacular verb "to boot" as there are Eskimo nouns for snow. But the boozy analogues have nothing at all to do with the feeling of losing it on the road, at sea, in the air, or at the Morrison Hotel.

Precious little cuteness or mirth decorates the awful truth of motion sickness because the sensation is in fact characterized by unmitigated and reverberating horror. There are really only two thoughts that come to the addled mind of the afflicted, and they are both variations on the same theme: You either believe that you are about to die, or you realize from the last time it happened that you can't actually die from motion sickness, and wish only that you could.

Which brings me to the single worst physical sensation I've ever known. It occurred 13 years ago, during a particularly rough winter crossing of the English Channel. Several hours into the trip, a series of gigantic waves began to slowly but powerfully roll the huge ship from side to side. The decks seemed to dip at right angles to the sea when, quite suddenly, it appeared that some universally suggestive wave frequency had been attained, because all at once, several hundred people began to vomit.

The entire ferry turned into an orgy of airborne bile. People fell upon their neighbors, retching uncontrollably. Children screamed and threw up on their mothers. People could be seen grabbing at the boat's paper-thin metallic ashtrays and spewing all over and past the little things, like a great waterfall might overflow a pitched good-luck penny.

I saw an elderly porter trudging through the miasma, seemingly unaffected by the nightmarish scene. He held a whisk broom and a metal dustpan, bending down every so often to dip his pan into one of several raging torrents while giggling strangely to himself. All around him greenish passengers lay on their backs with their eyes open wide like the recently dead.

The bathroom was worse. People crawled pitifully along the floor and a halfhearted fistfight was being waged over who was to be next in a stall. I don't remember how I actually secured a toilet, but I do remember that it was there, on the Southampton-Ostend ferry, through the twilight of my waning consciousness, that I had my one and only waking vision.

Perhaps it was due to the proximity of the Normandy coastline, but I suddenly believed it was June 6, 1944—D day—and I was staggering through the surf toward the beach from a landing craft, my weapon cast into the sea. I was waving wildly to the Germans manning the machine gun nests on shore. "Shoot me!" I pleaded. "Oh God, please shoot me!"

As I faded back to reality and heard once again the sobs and moans outside the cubicle, it came to me that I truly wanted to die. How interesting, I thought. Here was a physical sensation that can render in moments an otherwise happy individual ready and willing to exit his life forever. I clutched the sides of the stall, and wondered: Just what is this secret force and why hasn't it been eradicated by our wizards of science? One of these days, I thought, I'm going to look more deeply into the face of the horror.

Then I passed out.

. . .

MOST EXPERTS AGREE that there are as many kinds of motion sickness as there are means of propelling objects through space. Camel sickness, for instance, is a problem in the Middle East and North Africa, and one that profoundly afflicted T. E. Lawrence. Legend has it that no less a tough guy than Emperor Hadrian lost it atop his elephant. Lord Nelson was famous for suffering regularly through bouts of seasickness, and still managed to become one of the greatest sailors of all time. Charles Darwin, another mariner of note, reportedly came upon his theories of evolution in the Galápagos only because he demanded to be let off the *Beagle* so that he could walk.

Motion sickness has always been one of the most powerful impediments to the successful waging of war, but until recently it was only during war that any thought or research was devoted to the subject. Though 60 to 70 percent of all naval recruits are afflicted during training in boats or planes, the traditional attitude in senior military circles has been that because motion sickness goes away after a few days, a soldier should just tough it out. But these days a big war might not last much longer than a medium-grade case of motion sickness. And some sailors actually don't get over it until they stop moving. My father-in-law's bunkmate on the U.S.S. *Coral Sea* provided evidence throughout most nights of the Korean conflict that some people just can't lick it.

For 40 years it's been understood that motion sickness involves dysfunctions within the sensory systems that help to tell us where we are. A great deal of organic activity goes into telling the brain that you're sitting up straight. There's vision, tactile information from the skin, input from the muscles, and an extremely intricate vestibular response that emanates from a bunch of organs and canals in the inner ear. Those organs and canals are designed to respond to both motion and gravity, and as long as you remain on terra firma, they work quite well.

It is the vestibular response to gravity—or to the lack of it—that has provided the key to what little is really known about motion sickness. And the lion's share of the existing information has been generated by scientists and physicians doing research for NASA. It turns out that a case of motion sickness in space makes a few hours circling La Guardia after the kid next to you has missed his doggie bag seem like mere practice.

Though NASA hasn't publicized the fact, more than half of the men and women in space have suffered through extreme cases of the horror.

During the earliest flights it wasn't much of a problem. Our chimps and the Mercury and Gemini astronauts reported no discomfort. Only the Soviets seemed prone to losing their instant stewed borscht. The Ruskies even had to bring their first woman in space back early because of her space motion sickness, and the great Titov, one of the Soviets' earliest and most popular cosmonauts, reportedly vomited throughout his entire flight.

American astronauts experienced the problem only when they began to move around the larger Apollo crafts. While one of the Apollo astronauts, Rusty Schweickart, was traveling through the chute that connected the command module to the lunar excursion module, his "egress was compromised," as they say at NASA, and the poor guy proceeded to lose a meal right there. He was sick for 50 hours afterward, a torment that in my book should have earned him the Congressional Medal of Honor. From then on, especially after the shuttle flights began, reports of illness came back with every mission. "I began to experience a mild epigastric awareness, and the awareness of salivation," one astronaut recorded after his return. "Then I upchucked after eating a can of stewed tomatoes."

During space motion sickness all of the symptoms appear in overdrive. A couple of victims haven't even had time to get their bags up, and in a state of weightlessness, projectile vomiting takes on a whole new meaning. Many astronauts are so destabilized by the time they return to Earth that they can't walk for a few days. After one Skylab flight, two got badly sick on the recovery vessel.

The first full-time test subject sent aloft to study space motion sickness was the flying senator from Utah, Jake Garn. Though Garn was a military reserve pilot with considerable aerobatic training, and was known for his cast-iron stomach, he still managed to perform awesomely for the sensors tethered to his body and the microphones listening to his bowels. To this day, the wags at NASA speak of measuring the intensity of a space motion sickness episode in "garns."

There have been two shuttle flights with research physicians on board, and the NASA Life Sciences Division has spent more money on motion sickness than on any other research subject. The best academic talents in the field have been contracted, and separate labs have been established at the Ames Research Center in Stanford, California, and at the Johnson Space Center in Houston. I'd heard that scientists in Houston had constructed a rambling complex of gigantic machines that study the

relationship between vestibular stimuli and nausea by simulating uncomfortable traveling conditions. The machines were designed as "ground modalities," and if nothing else had been accomplished, NASA apparently had perfected the ability to make people as sick as dogs. It was thus with considerable trepidation, clammy hands, and the faintest flutter in my stomach that I filled out an application to become a test subject.

THE HUGE, high-tech vomitorium that is the neurophysiology lab of the Johnson Space Center exceeded my expectations—and my fears. I was shown a giant steel swing that looked like a cross between a Nautilus machine and some device from the Spanish Inquisition, and a helmet (with an official NFL-style chin strap) that covered your whole head in blackness and bombarded your eyes with whirling images. A terrifying rotating chair—a stainless steel contraption with a green waterproof cushion and Velcro wrist straps—was designed at great expense to revolve test subjects at a constant velocity until they "exhibited symptoms." The floor of most rooms in the lab was covered with indoor/outdoor carpeting, and though it was clear that the scientists and technicians were immune by now, the place smelled of experimental results.

Dr. Mil Reschke, the director of the lab, took me to see the machine employed in the dreaded "sudden-stop" test. "It's a very acute test . . . extremely provocative," said Reschke. "You are accelerated to a constant velocity of 50 revolutions per minute, and you are held there for 20 seconds before being slammed to a stop. You are stopped in less than a second, and then you are started again in less than a second, and it's repeated over and over again until you get sick . . . but hardly anybody makes it past three trips."

The most essential research tool available to the motion sickness scientists of NASA, however, is too big to be housed in the lab. I was there for several days of training for an eventual flight as a test subject on the infamous KC-135, the "vomit comet." A souped-up 707 with padded walls, floors, and ceilings, the KC-135 is designed to go into such powerful climbs over the Gulf of Mexico that a force of two Gs—roughly equivalent to a flying tackle by Refrigerator Perry—is exerted upon its occupants. It flies up along a specific parabola that, at its peak, creates a period of almost 30 seconds of total weightlessness. The KC-135 then descends into a screaming dive of 15,000 feet that exerts two Gs in the opposite direction. I flashed briefly on my day of banana-nut pancakes and deep-

sea fishing when I was informed that the KC-135 would travel its gut-wrenching parabolas not once, but many tens of times, before returning to base. It would dive toward the Gulf for four hours while test subjects with government-issue motion discomfort bags attached to their jumpsuits suffered for science in its cabin.

Those who don't get sick describe the flight as one of the most thrilling experiences of their lives. Some do endless somersaults and launch themselves from one end of the plane to the other like superheroes. Those who do get sick don't want to talk about it, though one fellow offered the observation that under microgravity, vomit tends to form before you into thousands of little BBs before attaching to the nearest wall or person when the plane reaches the top or bottom of the dive. During our first lecture as part of the training, the instructors told us that those who failed to hit the bags fitted conveniently below their chins would be required to clean up the plane after landing.

Some 400 civilians and NASA employees are qualified volunteer test subjects in the motion sickness program. Though most people in my training program were engineers or astronauts, a few were space groupies. One of my classmates, Sharline, showed me sensitive poems she'd written about individual astronauts and about spaceflight in general, and she claimed to be more than ready to go up and blow lunch for the Red, White, and Blue.

"How many a ya's gonna fly zero-G?" she barked before class began the second day. A few raised their hands, but the weak response clearly disappointed her.

BECAUSE THE KC-135 is a high performance aircraft, test subjects must go through the same sort of preliminary physiological program and pass the same written examination as fighter pilots and astronauts. For two days our trainers—all of them ex-military fliers of the old school—took turns standing next to the silver space suit propped lifelessly in the corner. They ran through the rudimentary physics of flying at altitude, and taught us a great deal about the substernal pains, the loss of speech, and the feeling of ants crawling under your skin that come with rapid flight. We learned the many symptoms of hypoxia, or oxygen deprivation, at altitude. ("It's different than land-based hypoxia—strangulation," drawled a flat-topped instructor. "Like, you know, in an auto accident when grass and dirt are driven down your windpipe.") We learned how to parachute out

of a plane and how to survive in the jungle or on the open sea. "You probably won't need to know this for your flight," said the instructor. "In all these years there's never been a bailout of a KC-135 . . . 'course there have been crashes."

The instructors all hailed from a certain camp within the NASA establishment that appeared to have considerable antipathy for the scientific and medical communities, and for their test subjects. In the macho tradition of the old *Right Stuff* ethic, the instructors held motion sickness researchers in particular disdain, believing that they were only developing tests that would keep perfectly tough fliers on the ground.

For their part, the scientists in the neurophysiology department assumed that more than a few instances of the horror had been covered up by flight crews. During one of the Skylab missions, astronaut Bill "Lead Belly" Pogue got sick, and though the crew saw to discarding the evidence, they forgot about the on-board tape recorder that documented the episode and the cover-up. Pogue had been renowned for being inured to any of the torture devices dreamed up to make people motion sick, but once in space, the lead belly turned molten. The incident speaks to one of the strangest and most baffling things about space motion sickness: Susceptibility to one form of it indicates nothing about vulnerability to another.

Toward the end of our training session, one instructor, Mike Fox, described the basic anatomy of the vestibular system housed in the inner ear. Various canals, sensitive to twisting and turning movements, activate a group of otolith organs that record information about those movements and send it to the brain. Motion sickness, said Fox, probably results from confusing and mismatched inputs emanating from these and other sense organs. The information just doesn't compute.

To demonstrate this supposition, Fox lugged into the middle of the room a steel chair resting on a vertical pole, which in turn was connected to a sturdy, round base. The device was a stripped-down version of the automated rotating chair back in the neurophysiology lab. Then, of course, the bastard picked me from the audience to ride the chair in demonstration of a few simple otolith-displacement tests.

It was all I could do to make it to the front of the room without falling to my knees. Fox gave me one spin, and the bearings on the damned thing were so good that I really took off. He had me close my eyes and point my thumbs in the direction I believed I was spinning.

Then he stopped the chair and sent it the other way. I suspect he didn't twirl me in the opposite direction after each stop, though, because everyone in the class was laughing when I pointed my thumbs. Then—and I will never forgive Mike Fox for this—he told me to make a gesture that seemed simple enough to an early motion-sick individual spinning like a dervish in a stainless steel chair. He told me to tilt my head and touch my ear to my shoulder.

I couldn't believe it. I yelled "A-a-a-a-ah!" like someone falling off a cliff, but I was really thinking, I can't believe it! The sensation rang bells and lit sparklers. The pain was astonishing, as if I'd torn all the muscles in my brain. I saw a white-hot bell rising on one of those carnival test-of-strength machines. It flew up past the Boomerang at Riverview, transcended the horror off Virgin Gorda, and topped out just past the hallucinatory ride to Ostend. The bell rang unbearably as NEW NUMBER ONE flashed on the marquee inside my eyelids.

As I wondered if I had the strength and wherewithal to get my hands up before egesting in front of the class, Fox stopped the chair and ordered me to open my eyes, look at the clock in the back of the room, and tell everyone what time it was. I saw only a black-and-white circular blur careening from one side of the room to the other. It slowed a little and I saw it was a clock, but for another half-minute it rolled around the room as I tried to visually chase it down and read the time. My classmates were hysterical. From the outside, apparently, it looked as if my eyeballs were bouncing in their sockets like pinballs. Who ever said motion sickness isn't funny?

THE ONE SURE THING INDICATED by scientific literature and by doctors working on motion sickness is that nothing much at all is known or understood. They've put rotating chairs in the shuttle and they've poured tens of millions into research, but they still don't really know what it is, who is bound to suffer from it, or how to cure it.

"One thing I can tell you for sure," said one researcher, "this disorder is very . . . depressing."

I'd never thought of it that way, but all in all I liked the idea. (The remark reminded me of the Vatican spokesman's statement after the Pope was shot in St. Peter's Square: "The Papa, he's-ah depressed.")

Most people know that several available drugs modify the symptoms of motion sickness. The ubiquitous sailor's patch loaded up with Transderm-V has actually been shown to help some sufferers of seasickness.

But the drug does have side effects, and most researchers admit they are bothered by not knowing why it works. The active ingredient, scopolamine, was used as a truth serum by the Nazis, and though I've tried it to various effects, I've always felt nervous for fear of ratting on members of the Maquis.

The good old counterculture has contributed at least two possible miracle cures: ingesting huge amounts of ginger until you burp, and using biofeedback to control the sensation. The NASA people won't even comment on the ginger idea, but an entire lab unit at the Ames Research Center has been working on biofeedback and autogenic therapy for ten years.

Though some Houston-based scientists scoff at biofeedback, the general mind-over-matter thesis does have a following. It's known that the driver of a vehicle doesn't get motion sick nearly as often as the passenger does, because the driver's brain is more fully informed of what's coming. One astronaut says he fought off motion sickness by using his "egocentric coordinate system": Whichever way the top of his head pointed was up, and when his crewmates got sick the first time they looked at someone while upside down in the shuttle, he was fine.

Mind over matter has always made a certain amount of sense to me as a layman and a lifelong victim because the one time I beat the horror, I think I *willed* it back into its lair. I was flying across the Rockies toward Denver in a small plane that was falling into every air pocket and catching every updraft the mountains had to offer. Before the roughness set in, I realized that my seatmate was none other than Clint Eastwood. I distinctly remember the interchange between the portion of my brain housing ego, self-esteem, and perception of relative manhood, and the section that wanted to completely embarrass me in front of Big Clint. But the vomit doctors from coast to coast all told me I was mistaken in my mind-over-matter theory. "It's a physiological response," one of them said. "If you were physically bound to experience all the symptoms of motion sickness next to Clint Eastwood, you most certainly would have."

Most experts are skeptical—not only about one another's work, but also about the possibility that they'll discover something new about the horror before their careers end. Neurophysiologists at NASA have motion sickness experiments scheduled for a spring 1990 shuttle flight, but several of them complain that funding has reached a plateau, and that a breakthrough might still be decades away.

Until then, you can try available drugs if you don't mind getting groggy,

and also "avoid soda pop before travel, avoid gum, empty your bowels before leaving, eat breakfast [though not banana-nut pancakes], don't drink the night before, get rest, do not have any psychological problems, and try to be real psyched-up." This list was given to me and the other test subjects as we left Houston to await our KC-135 flight. But as my anxiety about the flight mixed with a slightly queasy feeling on the plane home, I realized the tough, old fighter jocks and the scientists had failed to mention one other possibility—just don't go. I actually tried this particular remedy last summer when my cousin Jimmy invited me to spend a weekend on his new sailboat. Jimmy had just purchased the handmade Rolls-Royce of sailing ships—the kind on which Michael Douglas wooed Kathleen Turner in *Romancing the Stone*. But I said no, and sure enough, I didn't feel sick all weekend.

It wasn't really the fear of the physical consequences that made me ponder how much I didn't want to fly in the KC-135. It was just that I wasn't up for feeling like I wanted to die again, not even for the readers of *Outside*. Life has been particularly good lately, and somehow the idea of wanting nothing more than a sudden and painless death seemed to test even the limits of the existentialist's instructions to act and act again into the void.

So I really didn't mind much when a senior NASA official decided at the last minute that even though I was a qualified, trained, and medically certified test subject, I was still a writer—and therefore ineligible under directives spawned by the *Challenger* disaster.

THROWING UP IN A BOAT, car, or space shuttle seems to be such a pedestrian thing, a rote physiological response; something that should be consummately fixable in a world that has mastered the ability to repair an injured heart, attach severed limbs, and allow two-pound babies to grow to be adults. But it seems that the body's programming is simply not designed for certain kinds of movement at certain times. Or, to put it another way, it may be designed *not* to accept certain kinds of situations, as if this were part of a higher plan.

Eight years ago a psychologist working on the problem posited that motion sickness was actually a variant of some ancient survival-response to poison. The body can detect certain poisons and vomit them out most efficiently. This fellow contended—though he didn't say why—that motion sickness was a somewhat similar response. Without a vestibular

system, you wouldn't get motion sick, but as with rats—animals that never vomit and can thus build homes in rotating chairs and not care—you couldn't eject poisons, either. Other researchers think the mystery might be part of a larger neurological purpose that once protected early man. From an evolutionary point of view, the animals that stay still, that don't venture forth to eat or to chase mates during disturbing physical events, tend to be the ones that survive. I can certainly attest from personal experience that when motion sickness sets in, you do not want to eat or chase mates. Maybe some primordial impulse rises like an internal fire storm to tell you that thou shalt not have banana nut pancakes before hitting the open sea, shalt not ride the Boomerang, and shalt never, ever again strap thy backside into a rotating chair.

"There is only one sure cure for motion sickness," an old English proverb instructs. "Go and sit in the shade . . . of a church."

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