



*"I spend my days shoving monkeys into vacuum. You can't hear 'em scream, but it's a good thing they do, or their lungs could explode."*

# Vacuum Monkeys

David Hoffman-Dachelet lives with his family in Minneapolis surrounded by other writers whose talent makes him weep with jealousy. If you look hard you can find recent stories in *Tales Of The Unanticipated*, *Andromeda Spaceways Inflight Magazine*, and *Rabid Transit*.

The first line of "Vacuum Monkeys" was written in an ugly, angry funk one day at work. David calmed down enough to write out the story, but that angry mood remained to color (read: dominate) the story. He'd previously read a few articles on explosive decompression, (Geoffrey Landis has a particularly useful website) and figured that if we were ever going to make the leap into space, somebody would have to be doing the research. After living with James's stress for a while, David's job didn't seem so bad after all.

I spend my days shoving monkeys into vacuum. You can't hear 'em scream, but it's a good thing they do, or their lungs could explode. I've seen the video of *those* tests, with the monkeys' mouth and nose duct-taped shut, and I've got one word of advice if you ever find yourself in hard vacuum — exhale.

Then find some pressure in a hurry. We once had a chimp that stayed conscious for seventy-four seconds in the suck before passing out. Of course, even if BrownBag (I know it's a bad idea to name them, but the little ones are so cute), had lived to the three-minute mark the protocol called for, he'd have suffered damaged soft tissues, embolisms, hypoxia, and GI tract ruptures (for those of you who care, you can't make a monkey fart on command, but sticking a tube up their ass works pretty well to release the pressure.)

For humans, you've got about ten seconds before passing out. If a conscious friend is around to help out, you might have about forty-five seconds before any *permanent* damage is done. If you don't mind living with severe brain damage go ahead and take as long as two minutes. The good news is, that despite popular belief, your blood won't boil. Arteries are elastic enough to maintain blood pressure without rupturing (as long as the heart is beating.)

I admit it, there's blood on my hands. It's research-sanctified, instantly sanitized and vacuum freeze-dried (which makes it kinda crunchy), but it's blood. Innocent blood. PETA hasn't made it up here to Luna, but they'd shit if they did. (Actually, shitting isn't a big problem. Peeing, however, is. Pee freezes. Often while still in the



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urethra, which can cause some serious problems — we had to rename one male chimp survivor "Cauliflower" after a particularly dramatic event.)

I'm comfortable with the work I've done. Hell, every post-grad space-researcher I know stuck on Earth says they'd kill to spend time on the moon. When I explain that that is exactly what it takes, they laugh, like I'm joking. I'm honest with anybody who asks me what I do — we owe the damn monkeys at least that much respect.

As is often the case with scientific research, sometimes the unexpected is revealed. There's an exposure time, roughly between twenty- and forty-seconds which changed the monkeys. Subtle changes. Changes not measurable on a single one of the very advanced diagnostic tools we used.

I first noticed the phenomenon when I was strapping down a three-year-old rhesus, "Longfinger," for a repeat twenty-five second exposure. First time in she'd struggled, eyes showing white, nostrils flaring, literally scared the shit out of her. The second time she sat still and looked me in the eye. She blinked once and looked away. She lasted seventeen seconds before passing out. When she regained consciousness I tried to look into her eyes again, but they'd clouded with micro-ruptures. She'd gone blind. Twenty-five seconds was a short exposure for that effect, but not unheard of. Longfinger reached up and touched her face. She turned her hand out towards me, then slumped on the table and died.

That inept idiot Doctor Singh listed "non-specific cause of death" on Longfinger's autopsy. The party line on non-specs was that they were anomalous. We'd been directed to track non-specs as footnotes, but separate them from the main data. That didn't trouble me so much until I realized they *were* the main data.

After Longfinger, I was better prepared to witness it. At the instant a liquid freezes into a solid it exists in both states at the same temperature. Lower the pressure enough and you can achieve a triple point, that temperature at which a substance can exist simultaneously as a solid, a liquid, or a gas. Longfinger's final gesture made me think that somewhere in the twenty- to forty-second exposure range, was the triple point of consciousness.

We had not witnessed it because our diagnostic tests are only designed to measure the physical — the temperature not the state. If our liquid monkeys changed into gas right before our eyes, we'd have no way of quantifying it.

That didn't invalidate the data we'd already collected. It just needed re-interpreting. The brain-mapping work was extensive and easy to access. Watching a brainscan of a two-minute vacuum exposure was like watching a blackout hit a major city as the power grid shut down in area after area until the landscape was totally dark. Dead. A couple dozen people, including me, had analyzed years of that data, carefully noting that diminished function as product of brain damage, on average, started appearing in test subjects exposed to longer than forty-two seconds. Forty-two seconds. It took three years (and twenty-seven-hundred forty-eight dead monkeys) to come up with that number. Now, thanks to us, when some construction grunt slices his suit open on a jagged spike of rebar, he'll have a good idea exactly how quickly he is screwed.

Science is all about what questions you ask. The study's significant questions had always been, "When do the bad things start happening to bodies in zero-pressure?" A temperature question.

The evidence for a state of consciousness change was subtle, but I found it. Spikes in the cerebellum we'd ignored as adrenal. Blooms on the medulla which looked like pain. Fear flooding the cerebrum. I don't blame everybody else for missing it.



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Who the hell knew what enlightenment would look like anyway?

Retrieving a replacement for Longfinger down in the control group storage area further confirmed my hypothesis. The place was, well, a monkey house. Psycho little primates screeched at my entrance and rattled their cages for attention. They leapt across their cages in the low, lunar gravity, crashing into the sides with rattling thuds. As I paced the aisles searching for the ID-number on the randomly selected replacement subject, arms and hands thrust through the wire mesh trying to grab at me. Finally I found #F22, Lot-68-2062, Rhesus.

She shrank to the back of the cage and held tight when I went to retrieve her. I pinned her to the wall with my forearm and grabbed her by the scruff of the neck with my other hand. She arched her back and squealed, but I pinched her hard, just under the clavicle, and she quit squirming so I could shove her in the canvas "monkey tote." Monkeys are like kids, you've got to establish control early or they take advantage of you. Though genetically and physically identical to Longfinger, a name for #F22 didn't come to mind.

When I shoved a shivering #F22 into Longfinger's cleaned out cage, the other test subjects, all of whom had undergone at least one exposure to vacuum, watched me calmly. We measured every behavioral aspect we could think of. I guess nobody thought to put "freaking out when somebody enters the room" on the protocol. Once I started to look, the evidence was everywhere. The monkeys had transcended into a higher mental state.

I'd skipped the Friday team meeting the last few times, and Delacroix notes demanding that I attend were getting more shrill and more frequent. I figured it'd at least be a good place to mention my findings. Until I saw the damned agenda. Delacroix had planned another session of her favorite game: "beat-up on Doctor James Hanson".

It started when I walked in and Delacroix, Baxter and Singh were sitting around a metal table laughing. They're all a bunch of backstabbing gloryhounds. If they spent as much time on research as they did playing cards in the campus community-room they might even have a chance to receive the Nobel they so busily plotted about.

"Ah, James. Welcome." Said Delacroix. "Thank you, as always, for staying up so late to meet with us. Shall we begin?" At least they quit the chitchat when I'm around.

"First up is the quarterly LAT reports," Delacroix said. "Arlington e-mailed me complaining that they haven't received one in over a year. Is that true James?"

"Probably. I'm already doing the work of six grad-students, I don't have time for bureaucratic hoop-jumping." I least we were on familiar ground.

"None of us do, James. But this one's important. The Live Animal Testing Reports allow us to remain a self-monitoring program. If we lose that, life becomes a lot more difficult."

"I thought the whole point in hiding out in this shit-hole isolation ward was to avoid regulators," I said.

"We're here because the facilities are the best for our research. The low-profile it affords us is a minor part of that equation." Delacroix sipped from her water bottle.

"The real issue here is all these *non-specs*, James. Frankly they worry me."

"Why dump that on me. It's Singh's fault we can't get a decent autopsy."

"James, Doctor Singh has noted, appropriately so, that a variety of factors have contributed to a marked increase in test subject mortality. Don't mistake his reluctance to jump to conclusions as anything other than good scientific practice."



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"That doesn't seem to stop any of the rest of you from jumping to conclusions about my work."

"James, this isn't about your work, it's about the reality of working with live test subjects. When unexplained deaths happen it raises a lot of questions, and I don't want anybody to think we treat our subjects carelessly."

"And it's *not* careless to put an oxygen breathing soft-tissue organism into zero-pressure," I stood, too quickly in the low gravity, and smashed my knees on the heavy metal table.

"James, why don't you hear her out," Baxter said. He lifted a giant meaty hand, as if to grab me. It's unclear to me how they justified launching his enormous ass into space when they wouldn't even let me bring along my dog.

"She's accusing me of abusing the test subjects, and you want me to listen to that crap." I said, not sitting down.

"Nobody said anything about abusing the subjects." Singh slapped the table. "Why can't you listen?"

"Doctors." Delacroix spread her hands out on the table and took a deep breath. "Let's not get side-tracked from our common objective of getting good data. Doctor Hanson, to what do you attribute this high number of anomalous deaths?"

"I..." I almost shouted: *Species Transcendence. Some experience in the vacuum has lifted the little buggers from their mean animal state.* But, ten minutes after I told Delacroix that, I'd be headed down the gravity well to Earth. "I'm not sure. Could be any number of factors combining." It should have been a safe answer. If Delacroix hadn't been on the rag.

"James, I need to ask this." Delacroix paused and took a deep breath. She looked at Baxter and Singh before continuing. "Have you done anything which might bias the study..."

"No."

"...or compromise the validity of the findings."

"No."

"Have you abused the subjects?" Singh asked.

"Fuck you, Ditmar." I almost punched Singh's smirking face.

"Dee, that was inappropriate." Delacroix sighed, she leaned back in her chair shaking her head.

"Why?" Baxter said, his voice, normally high-pitched, came out like a whining schoolgirl's. "Isn't that's the whole point of this discussion? Why pretend that we haven't all witnessed Hanson inflict some bit of casual pain on the subjects. God knows he threatens the rest of us with violence on a regular basis."

"If I weren't here you sanctimonious idiots wouldn't even be able to figure out which end of monkey eats and which end shits. I have a spotless twenty year record of working with live test subjects and I'm not about to throw that away, because you scientific midgets don't know how to interpret data." I returned Singh's smirk. It was almost as satisfying as punching him. "I'm sure if you looked hard enough, the answers are there. I'm leaving."

"James. The LATs?" Delacroix said. "We need them."

"Two days." All they really cared about was the signature line on the affidavit page. Filling out the forms would only take fifteen minutes to cut and paste my care log into the form, but I didn't want Delacroix to think it was too easy.

"Two days is acceptable."

As I fled to my room I heard Singh snort out, "Well, that went well." The three



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laughed, no doubt already breaking out the playing cards.

I knew I couldn't trust the three stooges to actually make a profound scientific discovery, so that left it up to me.

At this point, I figured the monkey's probably deserved, hell, *expected*, better treatment than ordinary animals, so over the next week I brought them treats. There's no such thing as fresh fruit on Luna, or I would have smuggled in some bananas, but it turns out the monkeys were total chocolate sluts. They'd do anything for a little nibble. I blew my entire eight-ounce monthly allowance in under ten minutes. Shit, after a lifetime of nothing but carefully measured food pellets and water, anything sugary or fatty made 'em as happy kids at the circus.

I tried a variety of ways to communicate with them, but they remained inscrutable. They'd accept my gifts, but huddle in the back of their cages to eat. I came closest to a breakthrough when Booger bit me. I'd been re-attaching his water-bottle and he'd gotten too close. I shook a backhand at him but he dodged away, then unexpectedly moved in and nipped me on the finger. I was so startled I flipped him backwards. Booger bounced off the wall and stood defiantly, staring at me. Daring me to make another move.

I knew then how a father must feel when his teen son finally grows into a man, angry at the defiance, of course, but proud. Booger, and all his brothers and sisters were on the verge of just such a change.

I wept when Booger died. For an entire thirty-five seconds of full vacuum he stared straight into the video-camera, asking a reproachful "Why?" with his eyes.

The monitors dutifully recorded his heart stopping, followed quickly by the cessation of brain function. "For science," I answered to the screen.

I re-pressurized and ran to him, cradling his icy cold head in my hands. Singh, listed him as a non-spec, but I knew the real reason. Booger's specific death made that clear. Booger was done being an ordinary monkey. He didn't want to return to his cage. His future, all our futures, waited in the great vacuum of space.

Delacroix blamed me for Booger's death. She woke me up and made me come to her office. She didn't say anything, but turned her monitor for me to see. She had video of Booger biting me, but the angle was bad, so all you could see was Booger flying backward into the wall of the cage. "He bit me."

"After he bit you, did you alter the test schedule to punish the subject?"

"No. I..." She wasn't ready to hear the real reason — That I'd rewarded Booger with an opportunity to lead us all into the vacuum.

"Interfering with the subjects puts the results of the study at risk," she said. She tapped the screen, watching video of me strapping a struggling Booger into the test chamber. "Maybe you need some time away, a trip to Armstrong Station, to regain your perspective. "

"Perspective," I said. "I'm the only one here with any damned perspective." She was trying to cut me off from the research. If she wanted to play her petty political games and squeeze me out, she'd have to play a lot harder. "Care for the subjects is part of my resume. I made a perfectly acceptable modification to the regimen. If you'd like, I'll show you my notes." I stared at her, daring her to call my bluff.

She didn't, immediately, but said, "The extension of your fellowship requires my approval. At this point, I'm unlikely to grant that. I will, of course, give your application a full review, and I expect you to submit your notes at that time." She



turned her chair quickly back to the monitor, over-rotating in the low gravity. I hoped for a minute she'd tumble out, but she regained her balance and snapped the video off.

I had two months. Hell, I'd just begun to identify the phenomena of Vacuum Transcendence, and now I needed to complete the work on describing its function in two months.

I needed direct experiential data.

The breath ripped from my lungs as I vomited air out my mouth and nose. The vacuum wind tore my shirt open. Burning cold flamed across my bare skin. Pain pierced my head, easing slightly as my eardrums ruptured. To conserve oxygen, the rapid-decompression chamber was small, but the walls became hard to see. Then disappeared altogether.

I regained consciousness on the floor. The roar of the vacuum still echoed in my ears. Gritty warm air scratched its way into my lungs like an alien intruder. Each painful breath required a conscious effort to complete.

My vision cleared enough to make out the octagonal pattern on the rubber mat. The pattern didn't tessellate, and the make-up squares among each group of octagons was off-center, throwing the whole thing inelegantly out of kilter. Despite the fact that this was the only type of rubber mat in the entire research complex, I'd never once noticed that flaw before. Typical though — a multi-billion dollar facility filled with inferior product. Part of my brain made a mental note — *Heightened awareness of surroundings*.

I know it's bad practice for the observer to participate as a subject in research, but sometimes, direct sensory experiences are necessary to understanding. This is especially true in animal studies, where one can't conduct subject interviews. As I reviewed the tape of my twenty-five second vacuum exposure, I was able to correlate my experiences with my years of study. I remember the adrenal surge of fear. The brief chemical clarity of mind. From the moment the lock cycled I don't remember taking a single deliberate action, yet I acted with seeming purpose. Just before I passed out, I stood up. I spoke, though I have no memory of what I might have said. A message of enlightenment which I couldn't yet decipher.

I'd passed out at the seven-second mark. As I watched myself crumple slowly in the Lunar gravity, I tried to relive that clarity, regain the moment. I'd been close to something — if only I'd stayed conscious I'm sure I'd have the answer to the monkey's advance. My head rolled away from the camera and on the image I noticed a bloody blossom growing out of the side of my head. I reached up and touched my ear. I pulled the crunchy, strawberry-sized clot free, and warm, liquid blood dripped onto my shoulder.

I never heard Delacroix enter the lab. I didn't even realize she was there until she spun my chair around. Her face was bright red. Her mouth moved in furious silence.

I smiled at her. I was too close to the answers I sought for her posturing to bother me now. She reached to grab my shoulders and brushed her hand against my bleeding ear. She pulled back, staring at her blood-smearred fingers. She backed to the supply cabinet and pulled an alcohol swipe from the box and wiped at her hand. Her mouth continued to move as she used five more towels folding each neatly and shoving them in the bio-haz box.

She bounced out of the lab, in a hurry to implement her silent threats. The monkeys

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and I, we calm survivors of the zero-pressure void, watched her leave. We'd evolved beyond her petty academic gamesmanship, and though the scientist I am wished for time to fully analyze the zero-pressure experience, time was a luxury I no longer had.

In her haste Delacroix had left the bulkhead door ajar. I pulled it closed. There wasn't any way to lock it, but a chair leg jammed into the top and bottom release bar would slow anybody down. Our lab was in an isolated module, removed from the rest of the research base because the designers were terrified of a decompression accident. At the slightest hint of a pressure drop, the whole module would seal up tight to keep out intruders.

The monkeys watched me with calm expectation. #F22, a thirty-five second veteran now, reached through the cage, beckoning, signaling. She wanted freedom.

I went up the rows opening cage doors. There was no mad rush to freedom, no monkey games. Final proof of their transcendence. Instead they conducted a careful, tentative investigation of their new condition, carried out in perfect, contemplative silence. I'd created them as research tools, born to die in vacuum. They'd entered the vacuum, lived, and returned to enlighten me.

The tiny pressure chamber would never hold us all, but if I could override the safety features, it wouldn't need to. I planned to turn the entire lab into a large scale experimental decompression chamber. It took me a couple minutes of experimenting to discover that a needleless syringe stuck into the reinforced latch braces was the best tool to fool the safety sensors into thinking that the inner and outer doors were closed. I jammed a towel in the hinges to keep the door from closing when the pressure dropped. The monkeys milled about, waiting.

The longest depressurization the computer would accept was nine-thousand-nine-hundred-ninety-nine seconds, not quite three hours. I started the cycle.

Usually the chamber depressurized instantly. The volume of air in the lab was several orders of magnitude greater. It gave me time to savor the experience. I noticed the wind first, as air rushed through and out the chamber. A warning light flashed, and there should have been a siren, but none sounded. The monkeys, excited at last to be joining me, started climbing the cages and leaping about.

Moved by intuition, or insight, or some new preternatural awareness, I turned to look at the main lab lock door. Delacroix, Baxter, Singh and several others stood in the open lab door looking in. Baxter, the largest of them, gripped the edges of the door. I raised my arms, welcoming them. Beckoned them to join us.

The wind whipped through me. Baxter started forward, but Delacroix grabbed him and pulled him back. They were afraid of the vacuum. They were not ready. The lab door shut and sealed.

We were alone, we fellow pilgrims on the further path. Scientists on the edge of discovery.

A rush of escaping air carried us back into the void to finish our journey.