

SURVIVAL TRAIT

By Kip Cassino

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The shot was from an odd angle, deep in three-point territory. Even so, Adlai Copley made it easily. Nothing but net. He loped to the basket, retrieving the ball for another shot. He'd hoped for a pick-up game to join, but the gym was almost empty. Just as well. He'd have a good practice session and time to think.

Tall and lanky at six four and one hundred ninety pounds, Ad had loved basketball since his introduction to the sport in grade school. He had lettered in high school and started for a fairly good college team, but knew the pros were beyond his reach. Besides, he had to make room in his life by then for an even greater passion: microbiology. Now, thirty years after earning his Ph.D., Ad had no regrets. He was tenured at a good school, got a chance to teach the young grad students coming up, and still had plenty of opportunity for the research that kept his knowledge fresh and his mind sharp. At fifty-five, he looked pretty much as he had in his twenties, except for a small bald patch and an equally small pot-belly. Jill, his wife, fed him much too well. Their boys ate everything in sight but never seemed to gain any weight. Both were thin and tall, like their father.

He decided to practice foul shots for another half hour or so, then shower and head home. Adjusting the thick horn-rimmed glasses that had become his trademark around campus, Ad planted his feet at the head of the key. As his metronomic repetitions put shot after shot in the net, his mind was not on his game. Instead, he was thinking and rethinking events in his lab during the past few days.

The grant was important for his school. He had written much of the proposal himself. Obesity was a stubborn epidemic that affected people in every part of the nation at every age. It showed no sign of seriously abating. Ad's work was designed to study the microbiology of the problem—to develop solid, baseline data at the sub-cellular level on its mechanics, triggers, and drivers.

The rats which would be used for Ad's initial tests had arrived two days ago. He had chosen Sprague Dawleys over the more widely used Zuckers, because of their ease of handling. There were sixty in the batch delivered, which he divided into three equal groups. The first would be a control, fed and cared for normally. These he labeled "A." The "B" group would be systematically over-fed to provoke obesity. Rats in the "C" group would be starved to death. Plans were to begin the experiment the next day. In the meantime, the quiet little creatures were fed, watered, and put in their cages by Ad's lab assistants.

The tall scientist got an unwelcome surprise when he arrived at his lab the next morning. Rats tagged for the "A" and "B" groups were acting normally. Several of those designated for starvation were not. They had gorged themselves on food, consuming far more than was normal

or expected—pushing their way past others to devour their food as well. Ad grimaced. This wouldn't do.

He called the supplier to ascertain that he hadn't received rats modified for another experiment by mistake. He was assured that hadn't happened. After some thought, Ad decided to make lemonade from the lemons he'd been handed. Group "C" would become the obesity provoked sample. "B" would be starved instead. This would require some paperwork, and some reassignment of lab staff. He got that done and left to conduct an afternoon seminar. The work would begin the next morning—a day late.

This morning, he had arrived at the lab to find yesterday's curious activity repeated, with a twist. Today it was the "B" rats who gorged themselves, while the "C" rats all acted normally. He called his lab manager, Mindy Voss, to his office. The young post-grad, as short as Ad was tall, quickly joined him. "We're not being spoofed by any of the crew, are we?" he asked her. Ad knew grad students could be pranksters. He'd had some fun with his profs as well, when he was in school.

"I thought of that too," Mindy said, shaking her blonde ponytail. "So I checked. Nobody's laughing. Everybody is as puzzled as we are."

"Well, we've got to get to the bottom of this. The work is too important, and we're already two days behind schedule. Let's set up three of the little culprits for dissection. Make it A10, B13, and C5. The "A" rat will be our control. Start the comparisons this morning, if you can. I've got two classes, so I won't be back till after lunch. Then I'll have a look myself. I'm particularly interested in any brain abnormalities."

By the time Ad got back to the lab, all three rats had been laid open and Mindy's examination was well underway. Every organ appeared normal, with one exception. The thalamus of the "B" and "C" rats—the groups that had shown the gorging activity—showed a swollen, discolored area. This was the brain structure that perceived pain. Had the rats been abused or mistreated in some way? What could cause the swelling? Was there a genetic problem?

Lab rats are often bred to exhibit abnormalities of one kind or another. Sometimes Mother Nature injects her own mutations as well. Right now, anything was possible, and the need for answers became more acute as the minutes ticked by. Ad called his supplier again. After a brief conversation, he express-mailed three more rats back for their examination. His contact promised to have results of their analysis back to him the following day.

The frustrating afternoon had a curious conclusion. As he was walking to his car, Ad was accosted by Asher Brockman—head of the university's physics department. The normally mild mannered scientist wore an uncharacteristic deep frown. "Playing on my side of the street, Ad?" he rumbled. "I'd think there's plenty of biology to take care of, without screwing up my work!"

Brockman's facility was on the opposite end of the large building that housed Ad's lab. What was the man talking about? "Calm down, Asher," he said. "I'm certainly not doing any physics experiments."

"That's not what my sensors show," the smaller man replied. He seemed to boil with anger. "For the past two nights, my detectors have been flooded with Cherenkov radiation. It ruined some important work we're trying to do. We tracked down the source. It's your lab. I'm going to see the dean about this in the morning!"

"Asher, I assure you we're not generating radiation of any kind. Let's figure this out rationally. Come to my lab in the morning, first thing. Bring all the staff you want. Give the place a good going-over. If there's something going on that I'm not aware of, we'll get it fixed."

Early the next morning, before his own staff had arrived for work, Brockman and two of his staff stood at Ad's office door. "Let's get started, shall we?" the stout Israeli said, nodding over his shoulder to his companions.

Ad nodded his accord. "Take as long as you like, Asher. My folks have already been told not to get in your way. Just try not to break anything, please." The three men got to work immediately, using a variety of radiation detection equipment to scan every corner and closet of the big laboratory. Three hours later, the silver-maned physicist sat in Ad's office shaking his head.

"I have to apologize, Ad," Asher said. "It's just as you say. There's no radiation, certainly no neutrinos being generated here. Yet there has to be! We've triangulated the path of the particles that hit our equipment. The source has to be here." The stakes were high. Brockman's equipment was part of an expanded continuation of the famous Borexino project. His fifty-foot detectors were buried in the building's basement, scouring the heavens for neutrino emissions. Collaboration with Sandia Labs and several universities was at risk—not to mention the significant funding that went along with it.

"I know how you feel," Ad said. "I've been having some unexplainable problems of my own. I've got an idea. Maybe my lab is involved in your difficulties after all. Maybe the source doesn't operate until late at night."

"How could that be?" Asher asked. "Are you saying the source is somehow able to move—that it's mobile?"

"I don't know, but I'm a big believer in Occam's Razor. Do you have any sensors you could leave here for a few days? Set them up in each corner of the lab. If the radiation occurs and originates here, we'll be able to pinpoint exactly where it came from." Brockman was puzzled and still largely unconvinced, but without any better ideas to offer he agreed to the plan. He and his assistants set up their sensors and left.

Mindy slipped through the open doorway. “We got the results back from our supplier,” she said, waving a copious sheaf of paper in her hand. “Nada. They found no abnormalities, although two of the rats had a swollen thalamus area as well. They said they see that every once in a while. No further explanation.”

“How’s the rest of the sample behaving?”

“Same as yesterday. The A’s and C’s are calm and normal, and the B’s are trying to eat everything in sight—including each other.”

“Are we following protocol?”

“Yep, just like we planned the other day. Overfeeding C’s, starving B’s. Every one of the little angels is in its own private cage.”

“Good. Tonight may be very interesting.”

“What do you think will happen?”

“I don’t know. The timing is too close for coincidence. Somehow, the aberrations in our rats have to be connected with Brockman’s radiation problem. Maybe whatever is causing our rats to gorge enters the lab at night. Maybe it’s radioactive. All conjecture at this point, but we may know a lot more in the morning.”

Ad instructed Mindy to place stop-motion cameras around the rat’s cages, focusing on the B sample. “Brockman’s not the only one with sensors,” he said. “Maybe there’s a visual component to whatever is happening. If there is, we’ll record it.” As he closed up shop at the end of another frustrating day, Ad wondered what surprises the next morning would bring.

After a fitful night with very little sleep, Ad arrived bleary and over-caffeinated to his lab the next morning, more than an hour before work typically began. To his surprise, Mindy and several lab assistants were already there. Before he was finished pouring himself yet another cup of coffee, Asher Brockman and his assistants arrived as well.

“I guess none of us got much sleep last night,” Ad said with a wan smile. “Might as well get to work. Asher, we took the liberty of mounting some cameras. They’ll show a visual record of anything your sensors have picked up, and we can match the time sequences—if anything happened.”

Both groups went straight to work. All the sensors and cameras were examined carefully, with the same result. Nothing had happened in Ad’s lab during the night. All the mice had acted normally—except for the B’s, of course. They continued to try to gnaw on anything they could find to eat. Everyone involved remained puzzled and frustrated.

After Brockman and his team left, Ad called Mindy to his office. “Let’s chop some logic,” he said with a wry smile.

Mindy frowned. “Where is this going?” she asked.

Ad rose from his desk and stepped to the white board which took up one wall of his office. He picked up a marker. “Let’s follow the events that have taken place so far, in chronological order,” he said.

Turning to the board, he began to write:

Tuesday → Mice received, assigned to groups. C to be starved.
 → C’s begin gorging overnight. Brockman reports radiation.
Wednesday → Groups reassigned. B to be starved.
 → B’s begin gorging. C’s back to normal. Brockman reports radiation.
Thursday → Lab checked. No rad source found. Monitors set to record overnight activity.
 → No overnight change. No radiation measured.

“Is that accurate, from your viewpoint?” Ad asked Mindy.

“Matches what I’ve seen,” she replied.

“O.K., so what happened—or didn’t happen—Thursday night, that happened on Tuesday and Wednesday?”

“Let’s see. The way it looks to me, Brockman reported radiation on the nights after the days we assigned groups of the sample to starve.”

“I agree!” Ad said. “So it comes down to this: did the radiation cause the gorging? If that’s true, what caused the radiation?”

“I don’t know. There could be outside variables ...” said Mindy, shaking her head.

“Stick to what we know—what’s on the white board.”

“OK, if I’m limited to that, the trigger was our assignments.”

“Exactly! So, let’s try this hypothesis: whenever we assign a group of the rats to starve, an unknown source of radiation causes some of the affected rats to gorge. Or—possibly—their gorging causes the mystery radiation. Either way, we can prove whether or not it’s true.”

“How?”

“Just like this: as of Monday, we’re starving all of the rats. Tell your staff to give them all the food they want, starting right now and through the weekend. On Monday, we’ll remove any food left from their bins. From then on, all of them just get water.”

“That blows the experiment sky-high. What do you think will happen?”

“If I’m right, there will be plenty of gorging among the rats this weekend—and Brockman’s sensors will light up like Christmas trees. Don’t worry about the experiment right now. We may be on to something much more important.”

Ad left that evening and forced himself to put whatever was going on in his lab out of his mind. After all, it was the weekend and his family expected more from him than distraction. He took his boys to their soccer games, escorted Jill to dinner at their favorite restaurant, took the family to church and brunch, and cooked burgers on the grill later Sunday afternoon. All through it, he was his normal, gregarious self. No one in his home noted any change, except his wife.

“You’re trying hard, Ad, but you can’t fool me,” Jill said over cocktails Saturday night. “There’s something eating you. You might as well tell me about it.”

Gratefully, Ad outlined the odd events of his past week. “There’s something big going on,” he concluded, toying with a now empty martini glass. “Jill, I can feel it.”

His wife put her hand over his. “Darling,” she said, “I didn’t marry you for your basketball. Thanks for making time for me and the kids. Monday can’t come fast enough for me either. Please let me know what happens.”

Ad was up and out very early Monday. He knew most of his morning would be spent in staff and faculty meetings, so he wanted to get to the lab as soon as he could to see what—if anything—had happened to his now compromised experiment. As he opened the lab door, he was not surprised to see Mindy, Brockman, and several more people there before him. Everybody started talking at once.

“Three-fifths of the rats are gorging,” Mindy exclaimed.

“An extremely unusual cascade of radiation,” Brockman announced, talking over her.

Smiling now, Ad held up his hands. “OK, OK!” he said. “I’m excited too! First things first. Asher, can we see the output from your sensors? Mindy, we’ll need the video from the cameras as well. In my office, please. As soon as you can.”

Before an hour had passed, everyone was ready and crowded into Ad’s office. He looked around the expectant faces who mirrored his own excitement. “Asher,” he said nodding to his left, “let’s start with what your sensors found.”

The physicist cleared his throat as he rose from his seat. “Shortly after two this morning, all of our sensors measured a dramatic cascade of Cherenkov radiation from multiple sources, tightly focused, emitted from the cage array closest to the center of your lab. We checked these against the phototube readings of our scintillators. They are congruent, and they compare well to the readings received previously.”

Mindy spoke next. “This morning, at 2:05 AM, There was a momentary blue-white flash of light in the rat cage area. Our cameras picked it up clearly. Immediately after that, ten of the

“A” rats and twelve of the “C” rats commenced gorging activity—along with nine of the “B” rats that had already been overfeeding. This activity continued until all food was removed from their cages.”

“Asher, was there anything unusual about the radiation signatures you captured?” Ad asked.

“Well ...yes, although we’re still checking our equipment,” the physicist replied, shaking his head. “The initial readings can’t be right.”

“What do they show?”

“Oppositely charged particles—a Lorentz violation. Can’t be right.”

Ad slid a copy of a science magazine across his desk. “Did your readings look anything like this? Double images, coming and going?”

Asher nodded. “Then you know what it would mean ...”

Ad smiled. “Tachyons,” he said, slapping his hand to his desktop. “It would mean that our little lab rats are sending messages back through time.”

“Ad, that’s impossible,” Asher shouted, rising from his chair. “What you’re talking about takes equipment, particle accelerators. Show me where you’ve got one hidden!”

“I can’t show you, not yet, Asher. But give me a few days. In the meantime, listen to a hypothesis. Starvation is a horrible way to die. Excruciatingly painful. Maybe, just maybe, nature has evolved an early warning system to help these animals avoid it.”

“What could that possibly have to do with tachyon emissions?” the physicist asked, shaking his head.

“Just for the sake of argument, suppose some of these mice were able to generate tachyons ...” Ad began.

“Incredible!” Brockman interrupted, “But meaningless. Even if they could, the particles could only exist for a fraction of a second. There may not be enough energy on the planet to send it two or three weeks into the past, Ad. It’s a mare’s nest.”

“Not if it operates as a cascade,” Ad said. “Not if the animal’s reception a fraction of a second earlier causes it to generate another signal, over and over, as far into the past as it can ...”

“The anti-telephone!” Brockman exclaimed. “Scientists have discussed it for decades, but never among laboratory rats.” He shook his head again. “No. It’s outrageous. Impossible.”

“Follow the logic,” Ad insisted. “We say a specific group of rats is going to die of starvation. We’ve changed their future. That future is telling them what’s coming: death by starvation. They gorge to prolong their lives, if they can.”

“How would these little animals generate such a signal?” Mindy asked.

“I’m not sure, but a good candidate might be the cerebral cortex,” Ad said. “If a magnetic pulse were sent along it, through the layers and convolutions, there might be enough distance ...”

“The thalamus!” Mindy exclaimed. “Of course! That could be the pulse target—the reason we’re seeing bruising.”

“Think of it,” Ad continued, “millions of signals, each moving back in time less than a second, from a dying animal through its antecedents. An undeniable warning from the future.”

“I can’t imagine it,” Brockman said. “It’s something out of pulp fiction.”

“In any case, you can expect more of these radiation events, I’m afraid. We’ll have to work up some kind of shielding.” Ad considered what it would take to keep the Cherenkov radiation he’d be producing from Brockman’s equipment. In his mind, his next experiment was already taking shape, as was the paper which would follow it.

A single nagging thought marred his excitement. He pictured his sons, both whippet thin, against the ugly tapestry of worldwide obesity. In times of famine, he knew that obesity becomes a survival trait. He wondered how far back in time a larger, more complex human brain might carry a bleak message of starvation. What disaster could be lurking in humanity’s future?

Joylessly, he set to work.

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