

Howling at the Moons



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A Tale of the Galactic Circle Veterinary Service

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by

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Lurid purple-leafed trees surrounded the clearing we had landed in, and the slivers of three moons hung in the dawning sky above us. In contrast to the peaceful beauty, fireworks of supernatural dread exploded behind my eyes as I stared at the creatures standing on the blood-red turf outside our *Galactic Circle Veterinary Service* spaceship. Zombies, ghosts, ghouls, demons, and vampires were the products of some authors' fever dreams; however, the sentient denizens of the planet Lupus IV were another story. They could change from their bipedal humanoid forms into hairy, four-legged beasts that resembled huge Terran wolves. They called themselves the "People"—I called them werewolves.

Two adults and one juvenile stood in the clearing. All three had unsettling bright yellow eyes and unclothed fur-covered bodies. The two adults had exuberant auburn manes covering their heads and necks, and rich glossy fur. The juvenile, a male—his gender not hidden by his fur—had an unkempt dull brown coat and little more than scruff around his head. He cowered when I looked at him, an unusual reaction for a Lupan. In their society, position, even survival, was determined by dominance. Size and strength were important, but no more so than appearance and force of personality.

The *Galactic Circle Veterinary Service* had returned to Lupus IV to pick up a native Lupan crew member who would travel with us. On our first visit, Furoletto Cohen—my best friend and medical technologist—and I had faced two medical disorders that threatened the survival of the People. One was an epidemic of mange. The resultant hair loss and scaly skin of affected individuals had upset the Lupans' natural hierarchy, tipping their power structure into chaos. Irrespective of their previous status, the infected pack members had been exiled for fear of contagion. As a veterinarian, I was well-acquainted with the treatment of mange caused by a variety of skin mites, but I had never had to deal with it in a sentient species before. The juvenile's pelt did not look like a recurrence of mange, however; his coat was sparse and dull,

but with no evidence of inflammation or hair loss that I could see.

“Good morning.” I stepped forward with my right hand raised. “I’m Dr. Cy Berger. This is my co-captain Dr. Roxanne Simon”—who also happened to be my wife—“and our medical assistant, Furoletto Cohen.” A translation of my words to Lupan—growls and barks, in this case—emanated from a small speaker pinned to my tunic. “We are pleased to return to your planet and meet with Healer.” He was the Lupan who would join our crew. I spoke not only to the three Lupans in front of me, but to a larger group who stood on a mound some twenty-five or thirty meters away, backed by the forest of towering trees.

The adult male Lupan replied. His growls and short barks were translated to Common by the ship’s computer through my earbud. “Healer has not helped. *You* must help, Captain-Doctor Cy Berger. Our son not what you promised.”

Oh, man. What the hell did *that* mean? Before responding, I glanced at Fur, all two-and-a-third meters and one-thirty kilos of him. He shrugged, and I turned back to the Lupan. “Excuse me? What the hell do you mean, *I promised?*”

Roxanne put a hand on my arm to restrain me, knowing my tendency toward impulsive rudeness.

“You fixed the People. You gave us mates”—the male glanced at the female Lupan beside him—“and pups. But this child”—he motioned to the juvenile with his dog-like muzzle—“*not* People.”

Other than the abnormal coat, the youngster looked normal in size and appearance.

The pup flinched from my gaze again.

What did Dad mean by ‘not People?’

“If you are worried about his fur, it could be any number of conditions—”

A sharp, untranslated bark cut me off. Dad thrust his dagger-toothed muzzle toward me. I rocked back away from the agitated Lupan. These were, after all, carnivores.

“Is not just coat. He not one of *People*.”

When Fur and I had first visited, the second problem that had faced the Lupans was more complex and unique—and less easily treated than mange. The sentient Lupans were all males. There *were* no females. A mutated gene on a defective segment of the Y-chromosome of the indigenous feral wolf population created the People. The mutation conferred both sentience and the ability to shape-shift to that animal. But when it occurred, it removed the wolf that carried the

defective DNA from the feral gene pool. Over time, fewer and fewer sentient shape-shifters were born. Since the gene was on the Y-chromosome, they were all male; there could be no sentient females. And it was taboo for a sentient male to mate with a feral female—the loss of status would have driven him from the pack. By the time we had arrived, there were no pups. The mutation rate in the feral population had dropped so low that the race was dying out.

As this all fled through my mind, I homed in on the Lupan's true meaning. "He can't shape-shift, can he?"

The father shook his head. "And not smart. Trainable, but not of People."

My heart skipped a beat and my once-high spirits took a nosedive. Had our efforts on behalf of the People come to naught? We thought we had corrected the genetic defect. Did our genetic "fix" ultimately fail? Had I been arrogant? My former arch-enemy, Rebbe Levi Schwartz, had accused me of "playing God" with the Lupans. Was he right? I thought I had saved a race. Instead, it looked as if I'd doomed them to ephemeral hope followed by slow extinction.

Stomach roiling, I motioned to the Lupan family. "Come aboard the ship. I want to examine your son."

Roxanne, who could read my expressions and body language as well as I could read others' emotions—I'm an empath—leaned toward me. "Take it easy, Cy. We need to know more before you decide to commit hari-kari." She knew I did not take failure well.

Our vessel was a space-faring veterinary clinic with all the latest equipment, however, medicine was still a matter of dealing with individuals, especially with nonhuman alien species. Our ability to diagnosis and treat alien disorders was possible because our entire galaxy was seeded with common precursors of life in the distant past. DNA, RNA, and proteins were the building blocks for most of the galaxy's life-forms.

We originally had solved the People's dilemma by cloning the mutated gene from the sentient males, and transferring it onto both X-chromosomes of ova from feral females. The ova were fertilized with sperm from the sentient males who already carried the sentience/shapeshifting gene, but only after I'd convinced the Alpha male that it would be a bad idea for the gene pool to use only *his* sperm to accomplish this. I had to show him images of all the female donors so he could choose which he would fertilize. Nothing like pushing a little alien

porn. The Lupans then had a self-sustaining population of sentient males *and* females no longer genetically-dependent on a rare mutation in the wild wolves. Or so we thought.

Roxanne, also a veterinarian, and Fur met me in the exam room. When we crowded in, the musky scent of the Lupans made me sneeze despite the ship's highly effective air filtration system. I had to look up at the two adult Lupans even though I was above average height, but Fur towered over us all. Fur's size and strength were advantages when dealing with large, obstreperous animals, as we often did.

My empathic sense registered the discomfort of the Lupan sire and dam, cramped into a small room and surrounded by the unfamiliar, gleaming stainless cabinetry, but I ignored it. I retrieved a stethoscope and moved toward the youngster. When Dad bared his teeth and growled, my pulse jumped, and I was quick to explain. "I'm just going to check his heart."

We had a case with a young dragon whose failure to thrive was due to a defective heart. The dragon's parents were very nervous about everything I did with their kid, and a nervous dragon is a dangerous creature. The werewolves were no less predators than the dragons, so I walked on eggs here.

I was not surprised when his heart sounded fine. We needed further tests, including an EKG and cardiac ultrasound, but I did not think the heart was the issue. Roxanne and I completed a thorough physical examination, finding nothing out of the ordinary, other than the poor hair growth.

"Can we take some samples from your son?" I asked. "It means sticking him with a needle to draw blood...and scraping his skin and the inside of his cheek."

"It won't harm him," Roxanne added.

The sire snorted, a sound somewhere between a sneeze and a rasp. "Blood, pain, mean nothing."

Lupans were a stoic species who ignored discomfort of any kind, but that did not go for Junior. He cowered into a corner when Roxanne and Fur approached him.

As an empath, I sensed the emotions of animals, and I could mentally calm a stressed beast, a useful talent for a veterinarian. I could read the emotions of sentient beings—including humans—but could not affect their mental state as I could nonsentient creatures. The assumption that Junior was sentient, like his sire and dam, was flawed. My empathic connection with Junior was much like the connection with a nonsentient animal. I sent out a mental feeler and found his

core of fear: he did not understand what we were doing. I tried to stroke his apprehension, to reduce it. His level of fright slackened, but not as much as it usually did when I used my ability. There was a core of intelligence there, but it was weak and hidden, yet not enough to keep my stomach from churning.

The downside of my empathic ability was that strong emotions of others caused me nausea, headaches, and vertigo. I had developed mental shields to protect myself, but they were imperfect, even when dealing with borderline sentients like Junior.

Roxanne spoke soothing words to the youngster and showed him the needle. When he shied away, she looked at me and said, "Come here, Cy. Let's show him it's nothing to be afraid of." She waved the needle at me. "Roll up your sleeve."

"You've got to be kidding. Is that necessary?" I preferred sticking needles in someone else rather than getting them stuck in me.

"If he sees me draw your blood, it will reduce his fear. Come on." Her emerald eyes flashed impatience at me.

I looked at Fur, who'd scooted closer to the door "You've got a lot more blood in you to spare."

He rolled his eyes below his bushy eyebrows. "Your patient, *you* deal with him."

I grumbled as I pushed up my tunic sleeve and let Roxanne draw a blood sample.

Junior straightened up, and poked his muzzle closer to the action. A drop of my blood from the tip of the needle dripped to the floor. He reached out, swiped the blood up with one talon-studded finger, and put it in his mouth. He removed the finger with a sucking sound, and gave the wolfish equivalent of a grin—lots of sharp teeth and a lolling pink tongue.

Some powerful emotions came through to me as visions. Pain stabbed behind my eyes as I saw myself lying on the ground, staring up at the young werewolf, blood dripping from his fangs. This kid was not all *that* far removed from his feral wolf ancestors.

I retched and acid rose to my mouth, and I had to catch the edge of the exam table to stay upright.

Roxanne placed a hand on my arm. "You okay, Cy?"

I shook my head to clear it. "Yeah. Just get the samples, please. Fur, keep the kid from biting Roxanne's arm off, would you? I'll be right back."

In the lavatory next to the exam room, I rinsed my mouth and tried to control my

runaway pulse.

When I returned, I said, “Let’s get scans of circulatory function and images of all the major organ systems.” I had an inkling of what the problem was, and if we did not get it fixed, we would have more than Junior after our blood.

Roxanne, Fur, and I sat in the ship’s commissary over coffee, but the brew’s acidity did not improve my upset stomach. I grimaced and put down my cup on the plasteel table between us. I leaned back into one of the chairs bolted to the deck and met Roxanne’s gaze.

“I screwed up. That youngster is the first intimation that my wonderful genetic fix is failing.”

Fur ran his fingers through his sandy beard as he spoke. “This pup doesn’t have all the characteristics of the fully sentient Lupans, I grant you, but that could be an isolated instance, a chance mutation of the critical gene. We haven’t seen any others like him.”

“Not yet, but the Lupans have been breeding like jackrabbits, turning out litters like crazy.”

“At least they’re having fun.” Fur smirked. “When we came here to begin with, there weren’t any females.”

Roxanne straightened her back and fixed Fur with a blazing green-eyed glare. “Not funny.”

Fur’s face colored.

“Explain,” she said to me. She had not been with us on our earlier journey.

“The Lupans had a segment of DNA that was inherently unstable, like the fragile X chromosome in humans. Some Y chromosomes had a fragile area that mutated to the sentience gene. I wasn’t careful enough when we cloned it. I *thought* that we had isolated the gene alone, but some of the surrounding defective genetic material may have been carried over as contaminants and been transmitted to the first sentient females.”

Fur spoke up. “Wait a minute, Cy. This was my idea to begin with, and *I* was the one who did the actual cloning. You’re too ham-handed. So don’t take all the blame.”

Fur had a point. He had come up with the idea to create the females, and he did the critical technical work. However, I’d signed off on the procedure. I was confident it would work,

so the fault lay with me, as well. “There’s enough blame to go around.”

“Would the two of you stop feeling sorry for yourselves?” Roxanne shook her head, tossing her short auburn curls. “You saved the People from extinction. If you made errors, let’s fix them, not moan about it.” As usual, she was the voice of reason.

“I think the defective chromosome segment has led to further mutation of the critical sentience-shape-shifting gene, inactivating it, at least in part. I’m afraid our young friend is only the first example.” That thought made me queasier. “He has some sentience, but it’s not full. The physical characteristics that go along with the werewolf change are also affected. The youngster’s coat looks more like that of the wild wolves.”

Roxanne frowned. “Okay, all the females and the young have the cloned gene on the X chromosomes, and that might be defective. But the males also have the gene on the Y chromosomes from the males who had already changed. They weren’t cloned. Why are they affected?”

“The original mutation was still on a defective chromosome. The fragility never showed up because they had no females to breed with.”

Fur pursed his lips and nodded. “So all newly bred males and females will be affected by the mutable gene, and their offspring face a slow descent back to nonsentience. What do we do?”

I stood and threw my cup into the recycler. “This is just theory now. We need to evaluate those samples. I want a full genome scan of the kid, all his metabolic panels, and a full endocrine evaluation. We have baseline DNA data on the original Lupans for comparison, but the physiology of the werewolf phenomenon is still a puzzle. It’s time to solve it.”

We met in the lab. Healer, the Lupan equivalent of a doctor, joined us. He was going to join our crew as an intern to learn more about medicine as the *Galactic Circle Veterinary Service* traveled the stars. He was an impressive specimen with a blond coat and curly mane.

I brought up the pup’s genomic scan onscreen. “This is his *shifty* gene.” We used that term as shorthand rather than stumbling over the tongue-twister *sentience-shape-shifting*. “And here’s the *shifty* from one of the original males. There are a couple of differences.” I used the onscreen pointer. “This sequence from the kid has an Adenine-Thymine rather than a Guanine-Cytosine.”

“Captain-Doctor Berger,” Healer rumbled. “Explain please basics. I watched instruction tape, but not full understand. My language improper.”

Roxanne smiled. “Imperfect. Your language is imperfect, not improper. But you are doing amazingly well in such a short time.” Since he would travel with us, Healer was making the effort to learn Common, so our translators were turned off.

I continued. “The information in DNA is stored as a code made up of four chemical bases: adenine, guanine, cytosine, and thymine. Most higher animal DNA consists of three to four billion bases, and they are consistent within species. The sequence of these bases determines the information for building and maintaining an organism. DNA bases pair up, adenine with thymine, and cytosine with guanine, to form units called base pairs. Base pairs and molecules of sugar and phosphate combine to form nucleotides, and those string together to form the double helix.

“Genes, made up of DNA, are the physical and functional units of heredity. They code instructions to make proteins. The People have about twenty-five thousand genes, two copies of each, one inherited from each parent. Genes that are different between individuals contribute to unique physical features, like coat color and size. When the *shifty* gene in the wild wolves mutated, the new form allowed those young to develop intelligence and shape-shifting. They became the People.

“There are several differences in the code between the young male we examined and the original gene.” I used the pointer to show those. “Essentially, the characteristics the mutated gene conferred on the youngster were not like the rest of the People.”

“I see,” growled Healer. “He look like wild pack. He not change shape.”

Roxanne added, “And while his intelligence is higher than the pack wolves, it is not to the level of the People.”

“Why this happen?”

“That’s what we’re trying to determine,” I said. “Fur, what do you have for us?”

Fur cleared his throat, and tugged at his beard as he spoke. “Most of the tests were negative. Blood counts, electrolytes, circulatory and major organ functions, all were within normal parameters for the People. But there was one anomaly that could explain the coat changes: the levels of sex hormones were off. The kid had higher estrogen and lower testosterone

levels. Those are important determinants of hair growth—not the only ones, of course, because even the females have more luxuriant coats—but they could account for the sparser, duller appearance in the pup. I bet wild wolves would show similar hormone levels.”

Roxanne took over. “Brain scans showed decreased functionality in the cerebral cortex: a less developed prefrontal cortex, that’s behind the forehead”— she pointed to that region on the monitor for Healer—“temporal cortex, behind the ear, and parietal cortex at the brain’s top rear. Those areas have been associated with general intelligence.”

I nodded. “The feral wolves have a smaller brain than the People. But what about shape-shifting? Did you see anything that might correlate with that?”

Roxanne’s excitement leaked to me as she spoke. Her emotions affected me more than most others, a function of our closeness, so I kept my shield up.

“I don’t know if this correlates with shape-shifting, but it might relate to the endocrine changes Fur found. The pituitary gland’s shape is off . . . here.” She pointed to a flattened posterior pituitary region. “We need more scans of other members of the People and of feral wolves. We need to find out if this is consistent and what it means.”

I mulled over the findings. We had pinpointed anatomic and metabolic differences in the young Lupan, but we needed to understand how the gene controlled those at a cellular and organism level if we were to correct it. And where to even *begin* understanding the werewolf shape-shift syndrome.

Roxanne looked at Fur, then at me. “Let’s go. Hop to it, guys!”

When I exited the ship the following morning, I took a deep breath of air untainted by the noxious emissions of industrialized civilization. Lupus IV’s atmosphere was similar to Earth’s with a bit higher oxygen content: the purple to red grasses, bushes, and trees were all effective photosynthetic oxygen producers. Evergreen conifer forests added to that. However, my feeling of well-being was shattered when I faced a cadre of Lupans baring their teeth and growling at me. Word had gotten around about the pup that had not fully made it to Peoplehood. At the

forefront of the crowd were six youngsters, three males and three females, all showing the same coat condition as the first pup. A quick empathic scan confirmed that they resembled him mentally.

A large Lupan with a magnificent black mane stepped forward. He waved at the youngsters. "You must fix."

Several of the other Lupans supported this with forward-thrust muzzles and sharp barks. A couple of the adults shifted from the usual bipedal, to the four-legged lupine form. It was something I would never get used to; the hairs on the back of my neck and scalp stood erect. Their bodies melted and flowed from humanoid to brutes that more than matched their werewolf moniker. Longer and leaner than Terran wolves, the domes of their skulls did not to change; they retained their intelligence in their lupine shape. Elongated narrow muzzles bore teeth even more prominent than in their bipedal form. The eyes changed not at all, piercing yellow stares that scared the shit out of me. I got the message: If we did not satisfy them that we could and would correct the problem that their offspring faced, we were dog food.

A couple of the affected youngsters tried to emulate the shape-shift of their elders, without success. Their flesh sagged and rippled as they dropped to the ground. After the aborted transformation, both pups voiced pitiful howls. Their sires and dams nuzzled them and licked their faces. The emotional agony of the adults and the youngsters staggered me.

Fur and Roxanne had joined me, and Fur grabbed my arm before I fell. He did not have to ask what was wrong. You could not watch what we had just seen and not be affected.

I fought off nausea and a splitting headache as Roxanne explained what help we needed from the Lupans. To counteract the effects of further mutations, we had to understand the nature of the change the genes conferred. The group in front of us, with normal adults and abnormal pups, was just what we needed for our sampling. Their hostility was due to their underlying fear, but they were willing to do whatever was necessary to help their offspring.

When done with drawing blood and collecting cells from the People and pups in the group, we took selected individuals into the ship for metabolic and anatomic scanning. Beyond that, Roxanne still wanted data from the feral wolves, so we made a foray to the wilds. We used trunk darts to subdue several wild males and females, and brought them into the ship for tests and scans. We released them with no harm other than a mid-day siesta.

“There’s no question,” Roxanne said. “The normal People have a much larger pituitary gland that’s smaller in the affected pups and missing in the feral population. In fact, the People’s pituitaries are way oversized for any mammal of comparable body size. Whatever the change mechanism, that gland is involved.”

Fur looked at Healer. “That makes sense because hormonal balance is critical in controlling hair growth, and the pituitary is the master endocrine gland that impacts all the other hormone producing glands.”

I nodded and explained further. “The pituitary controls growth: functional abnormalities can result in gigantism and dwarfism, among other disorders. The hair growth difference is likely only a side effect of the change. More important is the brain modification. The central nervous system and the endocrine system are integrally related, and they modulate each other, but the effects we are seeing in the People go far beyond anything we understand.”

“Typical hormones are not doing this.” Roxanne’s eyebrows drew together. “It would be helpful to examine a normal pituitary and isolate what it produces in an adult, but we are not killing off any Lupans to do that.”

Healer growled agreement to that.

I concurred.

Roxanne looked up at me, one lovely eyebrow arched, a glint in her green eyes. “Cy, do you think it is possible to cannulate the vein leaving that region of the pituitary?”

My stomach twisted at the thought of trying to get into such a tiny vein. “I can’t—”

Fur cut me off. “Cy, you did a heart transplant on a young dragon. We’ve got nanocatheters that can fit in vessels in any part of the body.”

“And we have the real-time scanning capability to direct the placement,” Roxanne added.

Acid rose to the back of my throat and I swallowed hard. I swore I would never again undertake anything like that heart transplant. This scared me even more. Back then, I had no choice but to do the risky surgery; the young dragon would have died without it. Here, I would have to work on a healthy Lupan volunteer with the chance of killing him or her. If that happened, I doubted *we* would survive.

I felt Fur’s hand on my shoulder, a gentle touch considering his size. “I’ve seen you do amazing things when the chips are down, Dr. Berger. You can do this.”

It was great to have someone believe in me. Now, if I could only feel the same about

myself...

Every adult of the People volunteered to be our guinea pig. Bravery was a treasured commodity among them, but even more was the need to protect the future of their children. Unfortunately, aggression was also part of their natural state, and they remained angry toward the humans whom they felt had caused the problem to begin with, even though the race would have died without our help. I knew we had one shot at this. If I failed, we would become permanent residents of Lupus IV—as fertilizer.

Healer overrode all other claims and insisted on being our subject. He felt he owed it to the People since he could not cure them himself. Roxanne managed the anesthesia, and Fur operated the scanning equipment. With the skullcap interface for the assisted robotic surgery unit on my head, I wiggled my fingers. The subtle rattling of the robotic digits sounded, as I had noticed before the dragon surgery, like rain—or blood—spattering on a tin roof. My clenching gut and pounding headache were not the best accompaniments to a delicate procedure.

I settled down as I inserted the catheter into a vein at the back of Healer's skull as close to the pituitary as I could get. When the nanoprobe entered the tiny vein, draining the pituitary gland, I sighed in relief. Fur started the microsuction apparatus that collected the blood. When done, he removed the minute vial of blood. It was not much, but it would be enough to analyze.

The most critical operation lay ahead, however. We had to wake Healer and, keeping him still, have him shape-shift. If the shift changed the conformation of the skull and brain region too much, the probe would break off and might lodge in a vessel, blocking blood flow. The cranial vault and, presumably, the brain were the least affected by the werewolf transformation in the adult, from what we could tell, and I prayed that the delicate catheter would remain intact.

Healer awoke and, at my signal, began shifting. A chorus of growls drowned out the thunder of my galloping heartbeat. I turned to a passel of Lupans that had entered the operating room unbidden and unannounced. I hadn't invited them, and their collective anger and fear rolled over me like a triple-trailer hovertruck. Their musk in the closed space did not help.

Roxanne shooed the Lupans out of the operating room.

I pulled myself together and looked back at Healer. The transformation was almost complete and, thank goodness, we had been correct. The anatomy of the cranium and brain did

not change. Fur continued blood collection for a couple of minutes then we shut down the machine. As I withdrew the catheter, my heart dropped back from my mouth to its preferred location in my chest.

Healer flowed back to his humanoid form and smiled at me, surgery lamps glinting off his ivory teeth. He pointed to the monitors on the wall. "Pictures, they my insides?"

I nodded. I did not have many words left; the adrenaline high left my knees rubbery.

"Interesting," he said.

I supposed that summed it up.

Roxanne, Fur, Healer, and I were crammed into the lab area of our ship. Roxanne went over results of the tests on Healer.

"During the change, there were amazing increases in growth hormones and factors that are found during development of the embryo and fetus. Other compounds were chemicals that can play a role in the breakdown and remodeling of tissues. All of those are logical if the body is going to reconfigure itself like it does in the People. But the real kicker is the number of different nerve growth factors present. I've never seen anything like some of them before."

"High levels?" I asked.

"Actually, no. Levels were quite low, but they are unique."

I blinked. "That makes sense. There's not much central nervous system remodeling in the adult shape-shift. I'm guessing that those nerve growth factors would be sky high during fetal development of the People. That would allow the full development of the brain and high intelligence."

Fur smoothed his mustache with his fingers. "So if the pups don't have a fully developed megapituitary gland, they don't have the molecules to either develop their brains or shape-change."

"Can fix?" My stomach rebelled at Healer's soft, emotion-filled growl.

I had to be honest. "I don't know. We have the factors isolated, and we have the capability to reproduce those molecules. We can inject the defective pups with high levels of the chemicals, but whether that will trigger the critical changes we want..." I shrugged.

"Must try. Future of the People at stake."

Fur unfolded his big body from his chair. “I’ll get to work on the synthesis.”

“There’s one more thing,” Roxanne added. “We need to reclone that original gene...*without* the surrounding defective genetic material. If we can get that clean, we can insert it into a benign viral vector and infect the remainder of the Lupan population. The virus will infect all their cells and incorporate the gene into their genome. We’ll engineer the new gene to be dominant, so it will override the negative effects of the old gene and any new mutations.”

“Great idea, Roxanne. That will ensure that all future pups born to the People will have a functioning *shifty* gene that won’t mutate.” Leave it to my wife to fix what I screwed up in the first place.

By the time Fur had enough of the chemical factors synthesized, Roxanne and I had the gene incorporated into a virus and ready to inoculate. With some lavender-leaved cottonwood-like trees for shade from the fierce sun, the entire population of Lupans—several hundred now, about half females and a dozen normal young—lined up on the blood-red sward. It eerily reminded me of vaccination clinics I had conducted for rabies and distemper in dogs on a few out-of-the-way planets. We were done within the day. I was sure that this would correct the long-term genetic problem, but the results would not be evident for at least a breeding cycle.

The bigger test was the chemical injections of the pups who had not reached sentience. There were twelve of them in all, six males and six females. The factors might not work in half-grown pups, or they might even be toxic. If either occurred, we might never leave Lupus IV. The overwhelming angst flowing from the parents and onlookers had my stomach in knots and my head pounding like a bass drum. A flash vision of the three of us, organs and limbs scattered amidst a sea of blood, did not help. My hands trembled as I slipped the needle into a vein of the first male pup and turned on the injector. It pulsed small, metered doses of the chemicals into his blood over the next several minutes.

My lungs did not want to work, but I finally gasped, then took short gulps of air. Was there any hope for these youngsters? Irrespective of the overall genetic cure—or of our remaining in one piece—the fate of these twelve pups that had never made it to sentience seemed to me the most important thing in the galaxy.

A slow wave of movement rolled under his skin, like the swells of a peaceful ocean. The

rolling increased in magnitude and frequency, and his skin started to blur, to melt. His muzzle and legs lengthened as his fur grew denser. A hint of a mane formed around his head. Most importantly, as his muzzle changed, his head seemed to swell. I wanted to reach out with my empathic talent, to help somehow, but wisely demurred.

The transformation slowed as the tide of change came to a close. The pup sat up, shook himself like he was shedding water from his fur, and gazed into my eyes.

What I saw gave me a monumental case of goose bumps. The intelligence in his eyes, and that I sensed with my empathic ability, was every bit as high as the rest of the People. The pup was not quite as large as his sire, but he would now get there. He locked gazes with his father then went through a full transformation to the lupine form and back. He sat on his haunches while his pink tongue lolled out the side of his mouth in a huge doggy grin.

I looked at Roxanne. Tears filled her beautiful eyes and trickled down her cheeks. We had done it. These pups, who had been relegated to never being a true part of their community, could now take their place among the People.

We repeated the process with the other eleven pups. The shape-change that had always filled me with unreasoning, supernatural fear now became a thing of resplendent beauty. All of the treated pups shapeshifted from humanoid, to lupine, and back. The look of intelligence in their eyes was unmistakable. Sires, dams, and pups sniffed and nuzzled one another, and spoke in low growls and barks.

The entire pack of Lupans turned toward Fur, Roxanne, and me. They raised their heads to the three silver moons that had risen into the evening sky and howled. Not the pitiful howl of the unfinished youngsters, but a cry of unalloyed joy.

Their tsunami of emotion flooded my brain. For once it did not hurt, as my own response was one of inner joy and fulfillment. To the accompaniment of their music, my wife flowed into my arms and we breathed deeply, knowing that, once again, the *Galactic Circle Veterinary Service* had made a difference.

About the Author



Dr. Stephen A. Benjamin was born and raised in New York City. He received his A.B. degree from Brandeis University, and his D.V.M. and Ph.D. degrees from Cornell University, and he's a board-certified veterinary pathologist. He has been a university teacher, researcher, and administrator, and is currently Professor Emeritus at Colorado State University's College of Veterinary Medicine. His interests in human and animal health are reflected in most of his short stories and novels. He lives in Colorado with his wife and enjoys traveling, especially visiting his family, fishing, golf, skiing, cooking, and writing fiction.

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