

TOM SWIFT  
And His  
NanoSurgery Brigade

BY  
Victor Appleton II

Made in The United States of America

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Leo L. Levesque and Michael Wolff, both with multiple novels available on **Amazon.com**

...and the man who got many of us started with his reimagined adventures, Scott Dickerson, whose works may be found at **www.TomSwiftLives.com**

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THE NEW TOM SWIFT INVENTION SERIES

# Tom Swift And His NanoSurgery Brigade

By Victor Appleton II

Already having conquered several of science fiction's more difficult problems, Tom Swift is faced with a crisis that will test his abilities nearly to the breaking point.

An incredibly close individual has been stricken with an inoperable tumor inside his head. The tumor will kill him in months, or an operation might do it sooner.

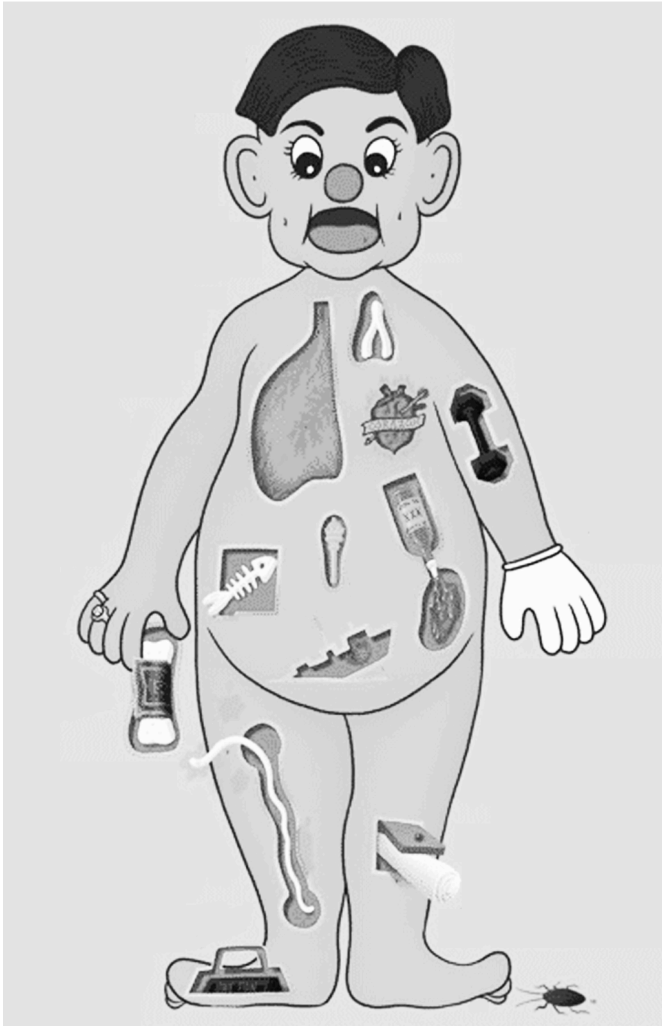
When Doc Simpson proposes an impossible task, Tom, who is mentally fatigued almost to the breaking point, finds that he must rally if there is anything to do to save the man. But the doctor himself refuses the concept of treatment Tom comes up with when he finds out that what the inventor proposes is more like playing a living video game than serious surgery.

Will it be possible to convince him to let Tom—an unskilled surgeon at the very best—perform the life-saving procedure?

And, can Tom rally his emotional and physical strength long enough to make the operation a success?

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This book is dedicated to John Spinello, who created *Operation! The goofy game for dopey doctors*. It was that simple drawing of a man and electric tweezers that first made me consider becoming a surgeon at one point. I knew, instinctively, that it would be much worse to mess up in real life (and that a red light didn't come on in a patient's nose and a buzzer sound from somewhere else) but that didn't keep me from studying as much about medicine and the human body as I could. So, John, this one's for you.



Tom knew it was going to be so much more difficult than a simple skill game might lead children to believe!

**Chapter 17**

## TABLE OF CONTENTS

CHAPTER		PAGE
1	Reflection	9
2	Trouble On the New Road	19
3	Check, Check, Check and Oops!	29
4	Flight Delay	39
5	The Ladies Depart	49
6	The Truth Sinks In	59
7	An Early Idea	69
8	Slowdown	77
9	Launching a Wild Idea	83
10	Oh, My Goodness... It's You!	93
11	Plans To Rebuild the Builder	103
12	Nano Surgeon Mark I	113
13	It Takes a Heap o' Testin'	123
14	Nano Surgeon Mark II	133
15	Test Run With So-So Results	143
16	Calling All Game Boys (And Girls)	153
17	Not Some Goofy Game	163
18	Prep and Practice Continues	173
19	Nano Ninja Knives in Action	183
20	Following Through With a Promise	193

## AUTHOR'S NOTE

Well, I threatened that it might come to this (see my Author's Note in book 15). The higher up in numbers these novels go, the more and more tapped I become trying to keep the things our young inventor is doing, fresh.

Okay, when I put my mind to it, this isn't all that tough. But I do feel an obligation to not be a plug-and-play author like at least one mystery/action author I might name who has a lot of books that are practically interchangeable. Just turn John into Jack or Mary into Marie and move the action from Prague to Budapest, etc.

Not so for our Tom.

That is why in this story he will be, "going where no person has ventured previously," or words to that effect I think I once heard... somewhere.

If this story bears any slight resemblance to another story involving a vaguely similar subject is isn't because of plagerism, it is because there really are just seven or eight true stories and everything else is a variation on that. Don't believe me? Check out *The Shop Around the Corner*, *In The Good Old Summertime*, and *You've Got Mail*, and many other movies, and the play *She Loves Me*. Or, any Disney movie that doesn't feature Flubber or a dog with rabies that must be killed. Oh, was that a spoiler for anyone?

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Copies of all of this author's works may be found at:

<http://www.lulu.com/spotlight/tedwardfoxatyahoodotcom>



My Tom Swift novels and collections are also available on Amazon in paperbound and Kindle editions. Barnes and Noble sells Nook ebook editions of these same works.

# Tom Swift and His NanoSurgery Brigade

## FOREWORD

An incredible book, written from a spectacular-looking but badly acted movie, was once authored regarding an important man whose life may only be saved by the radical application of shoving a miniature submarine in his body complete with a tiny crew of scientists and doctors.

But, it was not originally written by Isaac Asimov. It wasn't even his story. He merely wrote the novelization from the screenplay. So, get that one out of your head. Also, it was originally meant to take place in the 19th century and be an homage to Jules Verne-style stories. But, Hollywood happened...

Long story short, it was fascinating to think you could take billions of atoms and shrink them down by factors of thousands. The science behind that is bunk. As in, it'll never happen.

But, cue a great inventor and mix in a dash of current and future science surrounding nanotechnology—proven to be possible—and then take a left turn at the basic story, and you have a new Tom Swift novel.

One where the science of “just a few years from now” mixes with fantasy and comes up with a story that is both satisfying as well as very much a Tom Swift tale.

The only thing missing is Raquel Welch. Or, someone who can jiggle like her.

By the way, at one point this book was supposed to be called *Tom Swift and the Reconstructed Man* (using the *Operation!* motif) but as my previous book was *Reconstructed Planet*, well, something had to change.

*Victor Appleton II*





## CHAPTER 1 /

### REFLECTION

TOM SWIFT, twenty-four year old inventor, sat in the mostly empty control tower that perched atop the Administration Building at Swift Enterprises. The company was owned by his family whose holdings now included Enterprises, the original concern known as the Swift Construction Company, the Citadel in New Mexico, Fearing Island—their submarine and rocket base off the coast of Georgia—and the new Swift MotorCar Company. And, not to mention not one but two space outposts in Earth orbit, a space elevator in the Galapagos and a colony on Mars.

None of those were on his mind at the moment.

It was coming up on six months since his death. He had watched the horrible sight himself and knew that nobody ought to be allowed to see their own demise. It just wasn't right.

Basically, he had used his latest invention to save the life of the person who meant more to him than any other. It meant that he had used a barely stable time machine capable of just a single setting; what was inside when it was energized went back in time exactly twenty-three hours, fifty-nine and a half minutes.

Unfortunately, whatever item that was—for all intents and purposes—disintegrated as it neared its proper time point.

Be that solid object, gas filled balloon, or even a human.

In under three seconds of meeting its own time track, gone. Wrenched apart molecule by molecule, atom by atom.

And, he had been there to see himself go *poof!*... to die.

It was the most disconcerting thing he ever been part of.

He hated it! He never wanted to make a decision like that ever again but knew he would if the circumstances were repeated.

Just weeks later he became involved in the long-distance visit to, and witness of the destruction of, a newly discovered planet outside of the orbit of Pluto.

Working farther out than any human had ever traveled from Earth he and nine others, including his best friend and brother-in-law, Bud Barclay, had managed to reconstruct the planet after it had been knocked apart in a collision with Haley's Comet. It had been close; they managed to figure out the secret of planetary reconstruction and get the job done with only hours to spare

before it would be too late to head home. Their supplies of food and air would have been exhausted before ever reaching their destination.

With a new baby son, Barton, at home with his wife, Bashalli, Tom had nearly given up. Family did things to a man—or a woman for that matter—that gave new meaning to the word “responsibility.”

He had not told Bashalli how close it had been nor how terrible it made him feel. All he did was assure her he was not going back out into space, at least no further than the Moon or Mars where Enterprises had the active colony, at any point in the near future.

But, such adventures had been a large part of his life. Now, he wondered if he would be able to keep that promise.

As he sat just looking out at the scenery of the four-mile-square facility that was Swift Enterprises, trying to reflect on things, his mind was locked in despair. What held promise once had to be destroyed, and he had to give the order.

His wife, Bashalli—the one whom he traveled back through time to save—was never to be told what happened. In fact, only Tom, his father, Damon, and his best friend, Bud Barclay, knew the truth. By silent agreement neither young man would ever say anything about the event. They didn’t even come up with a code name for it, just in case it needed to be referenced.

Unbeknownst to Tom at the time, Bud had also been there, in the shadows, to see Tom get torn apart atom by atom. What he failed to see was that the other Tom—and nobody knew which one that was—had lived, saved Bashalli and the baby, and returned to Enterprises the following day.

The sound coming from the disappearing version of Tom would haunt Bud for the remainder of his life.

As the last of the direct sunlight began to move across the farthest runways of the company grounds, Tom spotted a light flashing to the south. There was no light tower or anything else down there requiring a flashing light, especially a white one. He leaned forward and reached under his chair pulling out an oddly shaped device looking something like a cross between binoculars and a video camera.

He swung the Digital BigEye unit up to his face while he moved over to the window. As he adjusted for the distance and moved the zoom in, Tom could see the light was a wing light on a small single engine airplane.

That was a signal and it could only mean trouble.

Either the aircraft was sending out the visual equivalent of an SOS legitimately, or the plane was another ruse by someone out to cause damage at Enterprises. This happened more times than anyone cared to admit and had led to the creation of a veritable armada of flying drones to patrol the skies over all Swift companies.

He tapped his TeleVoc pin and subvocalized the words. “Main tower.”

“Tower here, Tom. About to call you and Security.”

“That flashing light on the incoming plane?” Tom asked.

“Roger. Three drones have been dispatched. I just hope they get there in time. Whoever that is, they have been losing altitude for over a minute and I can’t see how they can make it here without help.”

“I’m on my way over,” Tom said. “I’ll call Security for you. Concentrate on getting the drones attached to that plane!” He raced downstairs to the ground floor and out one of the side doors.

For years, Enterprises had been encircled with as many as sixteen small, autonomous aircraft capable of disabling and bringing down any incoming aircraft that did not have permission to land on any of the nine runways that criss-crossed the property. These newest ones were built like Tom’s Attractatron mules, called by some his *Space Battering Rams*, that used repelatrions to fly and Attractatrons—strong beams that could lock onto objects—to hold them in an unbreakable grip. The original mules currently raced through space keeping any debris that might hit the Earth’s surface from ever getting the chance. Their job was to grab, move and fling away rocks, ice chunks and even errant satellites.

These drones could work in groups of between three and five to grab anything incoming and to drag it to wherever the Swifts wanted it to go.

Unmanned aircraft now went directly into a thick-walled bunker built into a hillside six miles from Enterprises until they could be studied.

Manned aircraft, and it was assumed this one was, would be brought into landing on a special pad in the far southwest corner of Enterprises, now surrounded by a fifteen-foot Durastress and concrete wall. It had earned the nickname of ‘the corral.’

Gary Bradley, the number three man in Security answered Tom’s call. His two bosses, Harlan Ames and Phil Radnor, had gone home a half hour earlier.

“I’m calling out the forces, Tom. They will converge on the corral in about four minutes.”

Tom signed off and ran the final fifty feet to the base of the active control tower. He hit the elevator **UP** button three times signifying that it was an emergency. The doors opened seconds later and he felt the pressure of the quick rise to the control room above.

“Mules four and six have a lock, skipper,” the control room manager called out to him, “but number three overshot and is in a sharp turn.”

“The others can hold the plane, can’t they?”

“I’m pretty sure one has a body lock but the other appears to just have a wing tip. I’d hate for them to tear that plane apart accidentally.”

Tom pondered the situation. “How long until the third drone gets back around?”

“About sixteen seconds.”

“Have it try for a distance lock as soon as it is on a stable course.” That was possible, but it was also a gamble. If one of the first drones did only have a tenuous grip on a wing and the third drone got a good hold on the body, the Attractatron forces might rip off either the wing or the tail.

“She’s coming around... almost on course... and... got it!” called out the technician at the drone control board.

“We’ve got a bail out!” shouted Tom as he swung a pair of the BigEyes he grabbed off a nearby table up for a close look. “His chute is out but he’s too close to the ground! Ohhh! He hit and I’ll bet pretty hard. Call dispatch and get a med team ready while a rescue helo gets warmed up.”

In less than five minutes the stricken plane had been lowered into the center of the corral and a medical response team lifted off in one of the Swift’s newest *Whirling Duck* helicopters heading for the downed pilot or whoever it was that bailed out. Unfortunately, the drones’ grips had not been aligned and the plane dropped the final three feet.

Tom and Gary were now racing across the grounds and down an East-West runway in a jeep to get out to the corral. Two other Security vehicles were in hot pursuit. Gary skidded to a halt two hundred yards from the wall. Tom knew this was the mandatory safety zone for him, his father, and any other senior executive of the company with the exception of Harlan Ames, chief of Security.

Two of the other men jumped from their truck and ran to the

wall and to a strange-looking device mounted on it. Giving the appearance of an ultramodern periscope, it was, in reality, an ultramodern periscope. But rather than looking into eyepieces, they watched a monitor come to life. On it in each of the four quadrants, were four views all around the plane.

One man tapped the screen in the middle of a view from the front and it began to zoom the periscope in. In seconds they could see the slumped form of the pilot.

Another panel inside the wall swung open and soon a small five rotor drone rose from a box along the top of the wall. It maneuvered all around the plane as close to the fuselage as possible. Its high-definition camera could see just about everywhere inside.

Only the pilot was visible, slumped against the yoke.

The Security tech pressed another button and the camera turned to infrared. It would be able to detect the heat signature of anyone hiding inside.

There was nothing anywhere in the plane that showed heat other than the engine, the pilot, and the seat where the other person had been sitting.

They signaled Tom and Gary who came over as fast as they could.

Showing them the visuals, the first tech reported, “Nothing inside other than the pilot. I’ve called for the medics. Can’t tell if he’s alive or... ummm, or not,” he finished.

Before long, the Enterprises ambulance arrived—complete with their newest Physician’s Assistant and medical school student, Debbie Bates, the girl who had once helped treat Tom when he had his head nearly bashed in. Only seventeen at that time, she astounded Doc Simpson and several doctors at Shopton General with her skill at sealing his head wound using just acrylic glue.

Tom introduced her to Doc who insisted on hiring her part time until she graduated high school, and then arranged for her entire nursing school bill to be paid by Enterprises. She had quickly distinguished herself as Doc’s number two assistant.

Tom had already made the decision to enter the corral as he jogged over. He and Gary were just opening the door on the pilot’s side of the plane when the medical team rushed in.

He acknowledged Debbie with a nod and a grin. She returned them and got straight to work.

“I’ve got a pulse,” she announced, pulling her stethoscope ear pieces out. “It’s pretty irregular. I think he’s had a heart attack.”

She began to rip open the pilot's shirt but shut it quickly. "Check that. *She's* had a heart attack."

A minute later the woman was on a rolling gurney, her ball cap removed, unleashing a torrent of red hair, and a defibrillator was attached to her chest.

One more minute after that and she was in the ambulance and was racing away to the Dispensary.

As Tom and Gary got into his jeep, the *Whirling Duck* flew overhead. It was going straight to the helo pad in front of the Dispensary. They left the other security men behind to continue checking the airplane and headed to see who the helicopter had brought in.

The *Duck* was already gone by the time they pulled up and ran inside. The Emergency room had four cubicles, and Tom could see Doc's back in number three as he hovered over one patient and Debbie's as she attended to the other person in the adjoining space. He wasn't surprised to find that Doc had taken the heart attack case while Debbie checked over the person who parachuted from the plane.

Looking over her shoulder he saw that the second person, like the pilot, was female and sported a head of red hair. In fact, as he looked more closely he had to question whether this one was the pilot.

"I think they're twins, Tom," Debbie told him as she felt along the woman's right side. Turning to a medical technician she said, "Splint that right leg then get her onto a SimpsonScope and give me a full body scan. After that, wheel her into MRI but hold until I get Doc to review her films."

In an instant, the tech and a young nurse Tom didn't recognize had the woman wheeled out and down a short hallway.

"It's great to see you back with us, Debbie," Tom told her as she brushed a stray wisp of hair from her face. "Do we get to keep you?"

She smiled. Over the several years since they first met she had matured into a beautiful young woman. Exceptionally smart she had finished high school after her junior year and had completed college plus her nursing schooling in just three more years. He noted a look of confidence in her face that added to her beauty.

"For now. The day after I got back Doc told me I get a three month vacation working here before he ships me out for Medical school. But, I'm enjoying it, so as soon as I qualify, I'm back here as Little Doc. The fun never stops!" She grinned at him.

“Tell me about these two women.”

She gave him what little information she had. From their IDs she knew her patient was thirty-nine and, as had been already considered, the two were either sisters or shared the same last name.

From the other cubicle, Doc spoke up. “If they’re twins, then it’s fraternal twins because they do not look exactly alike. Similar and if not for a shared birthday I’d say one was a year older than the other. Oh, and the pilot did have a heart attack.”

“At that young age?” Tom was astounded.

“Yeah. We won’t really know anything else until the scans are in. Did you want to hang around or have me call you?”

Tom considered his options. He glanced at his watch and knew he had to make a quick call to Bashali to let her know why he hadn’t arrived home.

“Give me a call at the house, will you?”

Debbie agreed to do that sometime in the next one or two hours.

On his way to his car he phoned his wife.

“Sorry I’m not there, Bash,” he told her before explaining the situation.

“It is all over the news. Stricken aircraft mysteriously drifted into Swift compound. Either one or a dozen armed or unarmed paratroopers bailing out. That sort of reporting. I figured you were involved and would call me when you could. Are you coming home any time soon?”

He had reached his car and was unlocking the door. “Literally climbing into the car as we speak. See you in ten minutes!”

After receiving the customary hug and kisses from his wife, and giving their son a kiss on his forehead, Tom began telling her about the strange airplane emergency.

“But, if she was only thirty-nine, how could she have had a heart attack?” she asked him.

“There have been cases of people much younger. High school age kids dying on the football field, even. Mom and dad took a cruise when Sandy and I were younger and came back telling us about a seventeen-year-old boy who had gone into a strip club in Puerto Rico. He saw a lot more than he had ever seen, got overly excited and his heart stopped, and it was only due to a local doctor who’s office was right next door that he was saved.”

Bashalli was astounded by this news. “How is that possible, Tom?”

“Birth defects, injury, drug abuse and even illness can put a lot of strain on the entire body. When it’s the heart involved...” he shrugged, “who knows?”

She sat in deep through for several minutes. Finally she looked up into his curious face.

“Do you have anything wrong inside that could make you have a heart attack?” Her lower lip was quivering and it made him want to hold onto her.

But, he looked into her eyes and told her, “Nothing that I have ever been told about. Doc is very exact when he examines people. That’s how he discovered Harlan’s little heart problem and finally got him in to have those stents put in. So far I check out just fine. So did you *and* our son after Bart was born.”

For the rest of the evening it seemed to Tom that his wife was spending a lot of time either thinking about something, or looking at him.

As they were climbing into bed she finally asked, “Would Doctor Simpson give my father, mother and my brother, Moshan, examinations?”

“Well, if I ask him to, sure. Why?”

Bashalli bit her lower lip. “My grandfather and two uncles all died from heart attacks. All three were under fifty years old.” A single tear rolled down her left cheek. “I don’t believe my parents have been to a doctor since we left Pakistan, and that has been over fifteen years ago. And my father is—” her voice choked up. Tom knew that Mr. Prandit had just turned fifty-six.

“If you think they will go willingly, I’ll set things up tomorrow, first thing.” He was about to lean over to kiss her when the bedside phone rang.

“Tom, it’s Debbie. Doc left with the heart patient for Shopton General ten minutes ago. She needs to go into the operating room to repair a tiny aortic tear. I was about to leave when I remembered we promised to call you. Sorry it’s so late.”

“That’s okay. So tell me about them both, starting with the pilot.”

She detailed a number of things, several of which he had to stop her and ask for a “civilian definition” of a term. The pilot had suffered a moderate heart attack but was doing as well as could be expected. Doc was taking her to the larger hospital because they had the facility to perform the necessary surgery to repair the tear



that was causing her to bleed into her chest.

“The one who jumped regained consciousness. She said they *are* twins from a small town called Fremont out in California. They have been flying their plane all around the country for fun.”

“So, why did she jump out?”

“Her sister told her to. They had engine troubles. She’s the younger one by about ten minutes and says she defers to her sister in everything. By the way, their names are Jen and Jan Jensen. Some parents...! Their mother is Janice and the father is Jerry. Jen is the pilot of the two of them. So, Jan said they both had parachutes but Jen told her to bail out and she would join her. Didn’t turn out that way. She blacked out too soon. All in all that probably saved her life. Good things the drones got the plane. The concussion of hitting the ground in even a rough controlled landing would have ripped the aorta apart like a wet tissue.”

After another minute he thanked her and told her to go home.

He related the news to Bashalli and she smiled. “I am glad they will live. But, please talk to Doctor Simpson tomorrow about my family. While you are at it perhaps you could make appointments for Mother and Father Swift and even Sandy and Bud.”

When he asked why the sudden requests, she shrugged and shivered. “I do not know, but I am having a very bad feeling about this. Promise me you will call him?”

Tom kissed his wife on the forehead and then on her nose and finally on her lips.

As they drew apart he stated, “I promise, Bash. First thing.”



## CHAPTER 2 /

### TROUBLE ON THE NEW ROAD

“I THINK that is a great idea, skipper!” Doc declared as Tom stood in front of his desk at nine the next morning. “In fact, your dad is past his due date and as he has just crossed the fifty yard line as of his last birth anniversary, it is time to up the ante, so to speak, and start being a little invasive.”

He explained that on top of the standard poke, peek and sample of the annual physical all persons at Enterprises received, and the slightly more complete one anybody with a pilot’s license got—including Damon Swift—it was time for additional blood work and a full body MRI scan as well as screening for such things as cancers.

“How do you want me to handle the situation with Bashalli’s folks? And, more importantly, her brother.”

“Bash told me this morning she will plant the seed with her mother who will work on badgering the men. She believes both Mr. Prandit and Moshan will give in within a couple days and then she will have them contact you. My mother-in-law is going to be the tricky one. Bash tells me her mom likely has not been to a doctor since the exam she had to take to get a resident’s visa to move here and we’re talking up to sixteen years or so. There is the cultural thing about men touching women to get her over.”

When Tom left and walked back to the Administration building and the large office he and his father shared, he felt a little spring come into his step that he had not felt since returning from the planet Eris and the reconstruction job.

The secretary who handled everything possible and generally kept Enterprises running smoothly, Munford Trent, noticed Tom’s body language and commented on it.

“You look like a man who finally learned to relax, Tom. It suits you. By the way, your father is at the automobile factory. He and Charles van Van deGroot are readying for the opening ceremony for the second manufacturing line over there. He asked that you join them if you got here before ten.”

Tom spun around on his left foot and walked back down the hall, calling out, “Thanks, Trent,” as he disappeared.

He climbed into his car and drove around the main building cluster heading for the connecting ramp that led under the south runways and wall of Enterprises, through a high-security tunnel

and back up into the grounds of the Swift MotorCar Company. A parking place was waiting for him with his name on it next to the newly completed main Admin building. Prior to this structure going up, all non-assembly workers had offices inside a giant inflatable structure similar to the ones the Mars colonists lived in. That had been removed and the shining surfaces of the all-glass outer wall caught the morning sun.

Special glare reducing coatings meant the sunlight gleamed but did not blind as it reflected making the building practically glow.

Tom walked across the parking lot and into the side door of the assembly building. Fifty-seven men and women worked on line number one each shift and were busy putting together the Swift 100 Coupe as quickly as possible. He climbed a set of stairs and over the top of the line, coming back down between that line and the new one that was currently undergoing a series of test builds to ensure both the newly transferred employees as well as the actual line were working smoothly.

Damon was standing next to a medium build dark-haired man he recognized as the plant manager, Charlie van Van deGroot.

“How’s it going?” he asked as he came over to the two older men.

“Good morning, Tom,” Charlie greeted him. “Your dad just spotted a point where we can make a little improvement and get one set of parts onto the line without having to cross over the first line. Other than that things are going very well. I hope you and your lovely wife will be ready for the dedication and opening of the line day a week from Saturday.”

Tom smiled. “Bash has had her ‘special dress’ picked out for more than a month, Charlie. Her only hope is that the champagne bottle doesn’t explode like the one she used to open the new Space Station Beta two weeks ago. I was certain we had ordered a non-carbonated bottle, but when she cracked it over the corner of the outside station end it exploded and covered her suit from head to toe in sparkling wine.”

Damon added, “Then, it froze on her and she was miserable about it until we got her inside and wiped off. She thought she’d ruined things.”

Charlie laughed. “Not to worry. We are using a special breakaway bottle made from a kind of starch that will hold up to having some sparkling water inside. The last thing we want is for sticky wine to get on things.”

The three men walked from one end of the line to the other stopping at a few spots to watch as the test crew assembled the

three cars currently widely spaced on the track. These, like the ones used on the initial line, would already have been built, disassembled and rebuilt many times in the weeks of testing that had gone on. With each rebuild the speeds got faster and the reaction times of the team quicker. Everyone who would work on this line would have the opportunity to build each and every part of the car by the time the line opened for business in a few days.

“So, did you invite me over just to watch things, or is there anything I need to do to get ready for the big red button push?”

His father looked slightly uncomfortable as he stopped and faced his son. “The truth is the ceremony might need to be slightly bigger than we all want it to be. You will recall that the President of the United States, no less, attended the inaugural opening of the plant and even gave a speech?” Tom nodded and looked both cautious and curious. “Well, in favor of allowing as many news agencies to have people here we sort of shorted our own Government folks, and there are about thirty Senators and a slightly larger number of Congresspersons who have been asking, in their friendly demanding way, to get invitations and all to sit right next to you or me.”

Tom groaned. It wasn't that he could not put up with the political maneuverings and seniority-pulling aides, it was that Bashalli was wonderful addressing small crowds, such as the twenty or so on the invite list; on the other hand she tended to become overly self-conscious in front of larger groups. And, now that she was still fighting to get the extra “baby weight” off, she was even more hesitant about appearing in front of people.

But, she really did want to be part of the ceremony.

“I'll ask Bash and see if she still wants to do this. If not I'll stand in for her or maybe Sandy might want to do it.”

Damon shook his head. “No, Sandy has already refused saying that she would rather die that step on Bashalli's toes on this. It's your wife or you, son.”

With that settled, or at least pending, Damon asked Tom, “Can you think of a good reason my beautiful daughter-in-law would call my wife—you will remember her as she is the one who gave birth to you—about one minute after you left your house this morning to tell her she fears for my life?”

Tom could not stop himself from laughing. “She is worried about all our hearts now she found out about the pilot who nearly died in that plane yesterday.”

Charlie said, “I heard the engine conk out as it flew overhead and the emergency sirens, plus the unmistakable shriek of one of

the drones doing an emergency turn. What happened?”

Tom told them both about the sisters and the heart attack.

He was about to comment when Damon held up one finger to stop them, then reached under his collar and tapped a small circular pin hidden there. It was his TeleVoc communication and security pin. He silently mouthed the word, “Answer,” and then stood, nodding periodically and subvocalizing a few times before tapping the pin again.

“Isn’t that interesting? It seems our company’s own Doctor Gregory Simpson is also thinking about my health and suggest that I bring myself and my loving family, you included, Tom, to his offices over the next few days for a series of tests. How do you suppose *that* happened?”

Another small groan escaped Tom’s lips. “That would probably be because I promised Bash I would go see him first thing and he agreed that it is about time for us all to have our annuals.”

“Starting with you,” Damon said pointedly. Seeing the look on Tom’s face he was about to ask what was going on, but he knew that look and also knew it meant this could not be spoken about right now.

“Okay, we’ll table that for now. Charlie needed to ask you what you think about a small situation.”

“Fine, put me on the spot to change the subject of your physicals!” Charlie said with a slight smirk. “We have a forthcoming issue... no, it is more of a challenge, Tom. You know our resident watchman down at the Pottersville transfer yard?” He meant the old train switching yard that now functioned as the point where all automobiles from the plant plus some products coming from the Construction Company were transferred from the private cargo train running from auto plant to station made their way onto large carrier trains for shipment all over the U.S. and Canada.

“Sure. Why?”

“Well, our watchman, Jonas Grumby, wants to retire and travel. Between his railroad retirement annuity, Social Security, and the stipend we pay him, he’s put together a fairly good investment portfolio and wants to spend some of it, and some of his life, traveling around the country. So, our *opportunity* is in finding someone else, or erecting a high-security fence around the place. Your dad and I are split on this, so what’s your opinion?”

The young inventor thought it over a minute before answering with, “First, I hope there is some way we can help Jonas

financially without endangering his retirement or Government checks. Then, I know that even with him down there, he can't be on constant watch and there have been a few instances where we've had attempted thefts. I guess I'm in favor of a fence. I believe we can make it unbreakable and uncuttable, plus I seem to recall there is a little-used law here in New York that states it is permissible to electrify a security fence when there is more than a million dollars worth of inventory or livestock inside. I'd say our daily numbers stand somewhere around that."

Damon smiled and Charlie shrugged.

"I was hoping to keep the job open in case Jonas returns. The man kind of grows on you."

"He can still come back and take up residence inside the fence any time he wants," Damon stated. Turning to Tom, he said, "So, that takes care of business. Can you give me a lift back to the office? Our very own super chef, Chow, brought me over this morning but headed back when I told him you were coming and might take pity on an old man by supplying a return ride."

"Come on, old pensioner. Let's get going. Nice to see you again, Charlie, and I'll talk the large crowd thing over with Bash and get back to you first thing tomorrow."

As they closed the car doors, Damon asked, "So, what is it I am not supposed to discuss with you?"

Tom's hand stopped an inch from the button to turn the car on. He sat back. "It's about the Yesterday Machine. Two things. First, I've decided to send the time anomaly back. Nothing we do changes the basic twenty-four hours time and destruction of nearly everything that we put in. That's the second part and about Bash's insistence at all of us having physicals."

When he said nothing more for a minute, but did start the car and head for the underground tunnel back to Enterprises, Damon cleared his throat.

"Okay, Dad. The thing is I'm not certain I want to find out if there is anything going on inside me. Heck, I don't even really know which me I am. The one who went back first or the one who was already there. Which one died? Which one lives?"

Even though he realized this was a serious matter, Damon laughed. It was a gentle laugh but it startled Tom.

"Son, whatever happened, the truth is that there is a Tom Swift *here*. And, barring the revelation that you now have your heart on the right side of your chest or something else is backwards or upside down, I think it is safe to say you are you. Just that. I also

think it is wise to have Doc verify that, even if we have to swear him to our little secret group.”

“You’re right, Dad. I’m being silly, and I know that. It’s just that I’m the one who lived through it and the one who was there when the other me was torn apart right in front of me. It’s been a hard memory to live with, is all I’m saying.”

They had just come out of the tunnel into the Enterprises side of things. “Stop the car, please.” Tom did. Damon turned to face Tom. “Okay, let’s get one thing on the table. I’m not supposed to tell you this, but you are not the only one that saw that final few seconds in the existence of the other you. Bud was out wandering around feeling tremendous guilt for allowing you to use the machine and was at the far end of the alleyway when you grabbed the other you and then it all happened. He turned and ran. He was admitting it to me that next day when you walked into the office as if nothing had gone on. I was afraid he was going to pass out.”

“Poor, Bud. He’s never said a thing to me.”

“And, he won’t. He is truly the best friend you could ever have, Tom. A friend who is willing to hold onto that terrible moment so you don’t get reminded of it. Perhaps he’ll tell you someday, or perhaps not. Just never let him know I told you. So, now you both have something extreme to live with.”

Tom started the car again and drove them around to the Administration building parking area. As they were getting out, the younger Swift said, “I think I’ll go home to surprise Bash for lunch. I’ll mention the larger group thing for the car ceremony so I can get back to Charlie today.”

“Good, and I’ll call your mother, first, and then Doc and set up appointments for us both. She will have to inform your sister but I think it best if you prime Bud for Firestorm of Indignation Sandra as soon as you can.”

With a grin Tom began walking in the direction of the hangar cluster more than a mile off to the east. It was in Hangar 6 Bud kept his small office. Tom knew he would be there until about noon and a brisk walk seemed like something he really needed at the moment.

He arrived twenty minutes later to find Bud reading a flying journal. He dropped the publication when Tom came in and sat down.

“Hey, skipper. What’s the latest on those two girl aviators?” Word had spread about the previous day’s incident.

“From what Doc told me earlier they will both survive. The



pilot needed a heart operation to repair a tear inside he chest, and her sister will be in a waist to knees special wrap until her pelvis cracks—five of them I hear—start to heal, and she gets her left knee rebuilt to fix the ACL rip she got on impact.”

Bud nodded. “As long as her right little toe survived I guess everything will be okay!”

“Yeah. Listen, I hiked over here to give you a heads up.” He told his friend about Bashalli’s self-imposed mission to get all members of both sides of the family, or at least all local ones, in to see the doctor.

Bud scowled. “Hmmm. The thing is, and I’m not at all against physicals, but I had this years’ first level, second and sport certification exams just five months ago. I suppose I could go back and have the basic third class exam, but I really don’t need to do that one. Why this all of a sudden?”

Tom suggested it was a combination of her concern for her extended family in general, “But a lot has to do with her feeling the pressures new mothers feel. Once she heard about our drop in guests, she sort of went into a mini panic mode. It’ll pass, but the one thing she is really right about are her own parents and Moshan. It turns out none of them have had a physical since the got here to the U.S.”

“But, Bash—”

“Once we got married I’ve had her in front of Doc as often as she is supposed to, and especially during and just after the pregnancy. She’s fine, but there is a family history of heart issues. Deaths.”

Bud promised to listen with an open mind and to try to put down any resistance on the part of Sandy Swift Barclay.

“I’ll just remind her that she needs to keep up those certifications and this is us getting ahead of the curve for once.”

He offered to give Tom a ride back to the main building area, but the inventor said he’d rather get in the rest of his walk.

“Besides, ever since we got back from the Eris rebuild mission I’ve felt cramped. The *TranSpace Dart* is a great ship, but by day five I was feeling like I wished the living space was about twice the size we built, or that we could have gotten by with a crew of four or five and not the full ten we had.”

Bud grinned. “It was, come to think about it, slightly cozy in the cramped and no privacy meaning of that term.”

The ship had been engineered to provide for the power to operate her at the speeds necessary for travel to such far-flung

areas of space. Bud was correct, though, that it stretched “togetherness” to the limit.

The walk back was slightly more leisurely than the one out, so it took nearly twenty-five minutes. He arrived at his car by 12:09, stopped to make a TeleVoc call to his father to verify it would be okay to head home for the rest of the day, and climbed into this car and drove to the main gate.

“Leaving for a meeting, Tom?” the young guard asked.

“No, Davey. Heading home. Too many things to do there now that I’m back in town for a while. Have a quiet afternoon,” he wished the man as he pulled onto the two-lane road running in front of Enterprises.

He decided to take a non-direct route home. Not the old dirt lane he used to walk when living with his folks; that road had been widened, paved and now had too many houses springing up along it to be quiet and relaxing.

It was certainly safer than before, but not as empty. Instead, he headed along the main road until reaching the first intersection. He turned left onto a narrow lane called Horseshoe Pond Road and then took a right on the newest road a half mile farther along, Cypress Lane.

This road had been built as a fire department access road to get trucks out to places such as Enterprises and the small private neighborhood the company owned up the hill from the main gate. It also allowed for small cars and personal trucks but nothing larger. Paved but really only a lane and a half wide, it featured numerous turnouts for cars to pull into if a fire truck—with ultimate right of way—were to come along.

He had already passed the large, green, water storage tank sitting in a small clearing in the forest and was daydreaming when he heard the sounds of a siren coming from around one of the few curves in the road. Spotting the nearest turnout, he pulled over and waited. He was waiting for a full minute before he shut the car off and listened carefully to the siren.

As he had thought, it was moving, but didn’t seem to be coming fast. That meant somewhere farther down the road he would find it, but *where* was another question.

Starting the car again he put it in gear and pulled back onto the road. The curve was a quarter mile ahead and he could easily reach it before any truck came along, even if the one with the siren picked up speed.

The car slipped neatly around the curve but Tom shoved his

foot onto the brake pedal and nearly to the floor when a large truck—most definitely not a fire truck but one more like a semi with trailer—was bearing down on him.

Desperately he looked for some place to pull off the road, but the truck was just passing the next turnout spot.

In another six or seven seconds it would be on him, and for some reason the driver either didn't see him or *didn't want to avoid an accident!*



## CHAPTER 3 /

### CHECK, CHECK, CHECK, AND OOPS!

TOM SHOVED the gearshift into reverse, popped the clutch and stepped down on the accelerator. The car shot backwards as he spun his head around so he could see where he was backing up. He didn't dare look forward or he would lose his sense of direction and most likely crash.

He did start leaning on the horn hoping to get the attention of someone, especially the driver.

But he needn't have bothered.

The driver of the truck wasn't in the vehicle with the siren. That belonged to a Sheriff's Department car that was following the truck. Knowing he had been speeding down a road only cars and fire vehicles were allowed to use, the driver had been racing along trying to outrun or block the deputy he could see in his rearview mirror and not paying any attention to what was in front of him.

Tom heard the big truck as it left the road, lost traction as it headed over the short gap of the drainage gutter and the almost explosive noise of it hitting a stand of trees.

Tom slowed and took a quick look.

The truck cab was tilted precariously, smoking, and its trailer had jackknifed. He stopped and started forward again. Reaching the scene of the accident he first made a call to Enterprises to dispatch one of the airfield's fire trucks before leaping onto the road. The deputy was also on his radio but seemed completely unsure what to do about the actual truck.

There were no flames, yet, but more smoke was beginning to billow out from the engine of the rig. The cab was tilted at a sharp angle with the driver's door facing the ground. No driver could be seen inside, but Tom figured the man, or woman, had slipped under the dash.

"Come help get the driver out," Tom yelled at the stunned young deputy. "Now!" he bellowed as strongly as possible. It did the trick. The young officer seemed to snap out of a trance and raced forward.

They pried the door open and the driver nearly fell out into their arms and to the ground.

His face was bloody and his left arm was obviously badly broken. Tom only hoped his back was not damaged. If it was, their

moving him now—important as the first small wisps of flame came out from the engine compartment—might paralyze him.

As carefully as possible they lay the man down on his side. While Tom ran his hands over the man's arms, shoulders and back, he told the deputy to get the fire extinguishing box from his trunk.

"The keys are in the ignition," he told the young man who must be just out of high school.

When the deputy returned he had a small suitcase with **FOR FIRES** stenciled on the top.

"Is this it?" he asked.

"Yes. Now, I need to have you hold this man's head in exactly the position it is right now. Do not let him twist or move. Understand?"

"Uhh, y-yes sir!"

With the driver mostly immobilized, and the sounds of a legitimate fire truck coming from the direction of work in the distance, Tom opened the case. Inside were eight containers that looked like stylized plastic Mason jars, each with a pull tab taped down on the top.

He grabbed two of them giving the pull tabs a good yank as he ran around to the upturned undercarriage of the truck. These were placed inside the compartment, one on each side of the heavy diesel engine, before he stepped back.

Five seconds later a whooshing noise could be heard and foam came barreling out from the wheel wells, from under the truck, and through the radiator grill.

"That will take care of any fire," he assured the deputy, "for at least ten minutes until either a city or Enterprises truck arrives. How's our driver?"

"While you were behind the truck he opened his eyes and tried to raise a hand. I told him to keep still or I'd twist his head and kill him like in those kung fu movies!"

Tom's eyes rolled and he shook his head. He'd have to talk to the Sheriff about the sort of training in public behavior his deputies received.

The Enterprises truck arrived a minute later with the city truck and an ambulance following just fifty seconds behind that.

Two more Sheriffs' cars, now accounting for all three in the county, arrived. While one senior deputy took the younger man's statement, Tom spoke with the Sheriff.

After relating the story as far as it had concerned him he was told he could go home.

“Thanks for having the stuff to kill any fire. I overheard Deputy Jimmy telling my other deputy the truck was about to explode in a huge fireball.” He raised his eyebrows and also rolled *his* eyes. “Kids!” he declared under his breath.

Tom decided to not mention the “kung fu” remark. His thoughts were more along the lines of, *Was I ever than young and stupid?*

Bashalli was happily surprised when Tom came in the front door but her nose wrinkled at the smell of the diesel fuel that had gotten on his pants. He told her the story and she declared him to be a hero.

She fixed them both lunch but fed Bart before they sat down. As usual, the baby was eager to eat, especially now he had reached the stage when jars of gooey food were being added to his formula diet. His favorites seemed to be the pureed beets and the carrots. Tom thought it must be because they stained clothing the most.

Knowing what was to come as soon as he had taken his last spoonful, Bashalli had already changed into her permanently stained “Bart Barf” shirt. Sure enough. As she was patting his back while he lay over her shoulder, he let out a little burp containing that last swallow of food, and it hit her shoulder and ran down her back.

There was a rainbow of trails of such foods down her back by now.

Tom could only smile and wipe off her shirt as best he could. Doc and their pediatrician both said this would happen on and off for another few months.

Once the baby was down in his playpen and happily banging a rattle against a pop-up learning toy, she brought their sandwiches out.

He told her about speaking with Doc Simpson. She smiled brightly and explained how she had packed Bart up and gone to visit her mother. While “Grandma P” was busy cooing and tickling Bart, Bashalli had explained that the entire family was due for their checkups, and that Doctor Simpson, whom they all respected and liked very much, would do the exams but only if he could schedule them all within the week.

“Certainly, Bashi,” her mother had said before stopping and trying to think what it was she had just agreed to. With a shrug she returned to playing with the baby.

Bashalli was a very intelligent woman, so she had brought a small recorder and had the entire conversation in the memory chip. She played it before she left and reminded her slightly shocked mother that she had readily agreed to the checkup.

“Tell father and Moshan they must also do this!”

It took the combined efforts of Bashalli, Tom, Damon, Mary and even Doc to get Moshan and his father to even make appointments. Mrs. Prandit was hesitant herself until Mary invited her for coffee and explained the situation.

“There is really nothing to worry about. If everything is fine, then you will have the comfort of knowing that. If there is anything amiss you will be able to get that attended to.”

“And, you do this *every year*?” her guest asked in amazement.

“Every year of my life since I was about three. Before that, mother had me at the doctor’s office every time I sneezed or bumped my knee. Really, it will be fine. You will have to change into what is called an examination gown, and Doc will respect your privacy, but he will need to touch you. I trust that will be okay? It really is necessary.”

Bashalli’s mother lowered her eyes and nodded. “Yes. It would be forbidden back in Pakistan, but,” she took a deep breath and let out a sigh, “I am not in Pakistan any longer and so I must adopt...” She stopped and looked at Anne.

“Perhaps the better word is *adapt*?” Anne offered.

“Yes, I must adapt myself to the ways of my *now* home.”

They strategized on how to talk the men into going and came up with the idea that if she told them she was going first, they might see it as a challenge to their masculinity and would order her to go after they did.

I didn’t work out quite that way, but the end result was that within the week all three had been examined and all three given clean bills of health.

When her mother told her of her exam and remarked, “Did you know that the doctor touches you?” Bashalli just rolled her eyes.

“Yes, mother. And, how did you imagine he would ever be able to tell if you are healthy or not without touching you?”

“I thought you had told me your wonderful husband once created a magic machine to look inside a person. I thought they would use that.”

Bashalli described as best she could how the SimpsonScope could use various sound and magnetic waves to let surgeons see



inside a body, but that it did not give an estimate of a person's health, only of damage inside.

Disappointed, Mrs. Prandit gave a resigned sigh. "I suppose that now you will tell me how I must do this again in one year's time?"

"If it will make you feel any better, I shall go with you next time and allow him to examine me first."

Mr. Prandit came home from his exam beaming. "I am in the perfection of health," he announced. "All they discovered is that I had something called a wart between my big and second toe on my left foot, and he gave me an injection and cut it off right there. I must now wear sandals for two weeks and need to use a solution he provided to clean between my toes for a week, but I am fine. There was nothing for you women to worry over."

Moshan was not so lucky. A low grade infection discovered in his blood test indicated that his appendix was in danger of becoming enflamed and not for the first time. Doc scheduled him for a follow up blood test the next day.

As she was telling Tom about her family's health, she asked him, "If Moshan needs his appendix to be removed, will Doctor Simpson do that or will he need to go to the Shopton hospital?"

"Probably the hospital, Bash. Why?"

"Nothing, I hope, but he trusts Doctor Simpson. New doctors might, ummm, bother him."

Tom laughed. "I'm certain Doc can be there for when he gets the injection to put him to sleep, and then come back a couple hours later when Moshan is waking up."

She put her arms around his neck, squeezed him and gave him a kiss.

"Thank you."

"Hey, if I can get a nice reward like that for everything I do, I'll always do nice things!"

She looked at him seriously. "My family's history of heart problems seems to have halted, for now, and we have everyone's results except for your father. I hope Father Swift is just as healthy."

The following morning a knock came on the office door and Trent poked his head in. "You have a visitor, Tom. A lovely visitor and for once I do not mean your wife or your sister."

As he ducked back out and opened the door wider, Anne Swift came in.

Tom jumped to his feet and came around the desk to hug her.

“Hello, Momsie! What brings you to Enterprises? I thought you’ve said the place to far too big to be enjoyed and you like to stay away?” He grinned at her.

She did not return his grin so he ushered her to the conference area and got her into one of the large, overstuffed chairs.

“What is it?” he asked.

“Probably nothing,” she said. “It is just that we all have our results from Doc, all except your father. Doc says there is something he wants to take another blood test for. And, as a biologist myself I know that you generally get enough blood on the first draw to perform more tests than necessary, so I’m a bit worried over them wanting another sample. What can it be?”

“I don’t know, but I can call Doc and find out.”

As he started to rise she placed a hand on his left arm and stopped him. “No. Don’t. I’m sure I’m being silly about this and it is something like indications of a return of the malaria he contracted years ago when we went on that rather unsuccessful camera safari. It was back when you were, oh, I think around four and Sandy was three. It wasn’t pleasant, what with the headaches and the nausea. Right now the only thing he’s complained about is a headache and some muscle stiffness. That must be it. A lot of people never fully get the recurring type and we never did have a ten year follow up blood exam. Rats! Now I wish we had. I hated him hurting like he did back then.”

Tom placed an arm around his mother’s shoulders and she leaned into him, sniffing but not crying.

A few minutes later she straightened up and gave him a small smile.

“If it is malaria coming back at least today’s drugs are more effective and can knock it right out of his system, and this time forever!”

As soon as she left the office he picked up the phone and called Doc.

“It’s Tom. My mother was just here telling me you need dad to give more blood. Are you starting a collection?”

Doc laughed. “No, but my cloning experiments are all but complete and I just need a little more DNA... actually, everything looks good in your dad except for some of his blood work.

Normally I'd ask to have the test performed on the same samples, but those were discarded too early so I need more. It's probably nothing, but his persistent headaches this past month are bothersome. I just want to find out if there is anything organic."

"Like his malaria?"

"Well, while I've seen no indications of a recurrence over the years, it is always a slight possibility and one I need to discount officially. Don't worry, skipper. As I said it is probably nothing."

Nothing more was said and Tom didn't bring up the subject when his father came in that afternoon. But, there was some news.

"Tom, the Observatory here with their megascope and the Callipus telescope up at the new Space Station Beta—and one of these days we need to give the station a better name than that—have been keeping an eye on Eris II. After your rebuild it seems to have settled down but something rather amazing is happening."

Now intrigued, Tom asked, "What?"

"It appears to be growing a ring!"

Now, Tom laughed. When Eris had taken its beating from the former Haley's Comet, and he had rebuilt it using its own former moon of Dysnomia as a brand new core, he had thought the phenomena of rings might be a possibility. The old core had shattered into such small pieces, and each one had a magnetic charge that would cause it to be repelled from the planet. He believe the gravity might pull some of the small bits back and repelling magnetism would keep it in orbit, forming some sort of ring.

"That's great!" he exclaimed. "I knew that was a possibility, but figured it might take many years to form. Have they said how large a ring?"

"Well, knowing how far away it is, and what little available reflected light there is, it is difficult to determine, even with the megascope, but Bob Jeffers at our Observatory says it could be a thousand miles wide and seems to be stabilizing starting a few hundred miles above the surface. And, the reason they are fairly certain it is a ring is that the signatures they are receiving show the planet growing in size that is disproportionate to the available materials out there."

They talked about what a wonderful thing this was and how it might advance astrophysics by leaps and bounds in their understanding of such matters.

"So, the reason I bring all this up is that Bob was asking if there is some way to send the *TranSpace Dart* back out there for a good

close-up study? With him in it, of course.”

The *Dart*, a four-finned pyramid-shaped ship had been created for Tom’s trip out and used one of the most phenomenal forms of locomotion: a black hole! Clutched in the iron-fisted grip of Tom’s Attractatron, the small hole—only a few feet across—played a physics game with the ship. As it tried to suck the ship into its gravitational field, the ship held itself back. The result was that the hole pulled the ship while the ship pushed the hole away and together, once given a starting nudge with the ship’s repelatron, they accelerated and could achieve near light speed on their own, but had broken that barrier by a small percentage using the repelatron at the back of the ship for give them an extra shove against Mars and the asteroid belt.

“Sounds interesting, but I’ve promised Bash my traveling days are over, at least for now. Same with Bud. But that doesn’t mean we can’t outfit a new crew for the mission.”

The possibilities were discussed and for the following two days Tom worked on a list of changes to the ship to make it better suited for another adventure that far away from home. There had been some shortcomings discovered on their two trips out that he very much hoped to correct and/or add before she ventured far into space again.

Currently the ship was out at Fearing Island laid down so she ran parallel to the ground, and sitting in a special cradle. She was tall enough and light enough that the possibility of being tipped over by seasonal gale-force winds needed to be considered.

Work inside the fuselage was still taking place with the first order of business being the addition of more fuel tanks for the maneuvering rockets. With precious little to push against using repelatrons that far out, the large ship had to rely on chemical rockets to maneuver once it had stopped its flight.

Next was the elevator to take the crew up to the flight decks. It had been built to accommodate two persons at a time and was the one and only point of exit for the ship. This had proven to be a handicap, but the haste in which the ship was constructed had pretty much demanded this approach. Now moved inside the body rather than running half-way up inside one of the fins before twisting ninety-degrees and entering the body, it was nearly finished as a five-person elevator and airlock totally inside the main hull.

And, a second airlock had been added just under the bottom of the three living levels. It, too, had ample room for five people at a time. Now, the ten-person crew had two egresses to use anytime they needed to exit the ship.

Other changes included more frozen food storage so a one-month trip could be doubled if necessary along with additional supplies of oxygen for breathing and a new type of CO<sub>2</sub> scrubber Tom devised that used electrostatic energy to yank those dangerous molecules from the air packing them together into small pucks that could be recycled once back on Earth or ejected into space.

And, that meant the need for the older, swappable chemical scrubbers was removed freeing up a lot of storage space.

The crew would still top out at ten, but they would be better able to manage extended trips.

He left on Friday feeling quite happy about the changes.

When he arrived in the office on Monday, Tom saw that his father had something serious on his mind, and he asked what it might be.

“Tom. I need you to sit down and listen carefully.” They sat in the conference area of the office. “Now, Doc says that your mother is in excellent health, your sister, even though she put up a fuss over having the exams, is in fine health as is Bud. We all expected that. In fact, if Bashalli was worried about my heart she need not have bothered. All tests point to a very healthy and strong organ.”

He stopped and Tom had a sudden sinking feeling that what his father said next was going to be bad news.

“From my toes up to my nose I am a picture of health. However,” he paused again before taking a deep breath, “he says there is a growth inside my brain. A tumor. It isn’t anything to worry about right now, but it is so deep it is not in any position to be operable. But,” he looked at Tom as if telling him to not say a word, “from several blood markers he says it *will* grow and will eventually paralyze me, perhaps even stop my ability to breathe on my own. Several years, or so he believes, but inevitable if it is one kind of cancer. Treatable to some extent if it is another type of benign tumor. I have to go to Boston for a few days of tests to determine what we are up against.”

“Dad—” Tom choked up. “I mean, what can I—”

Damon laughed. “What can you do? Just invent some sort of completely impossible sub-miniature rooter system to snake in there, grind the tumor into little pieces, and managed to carry them all out so they do not take hold and grow many other tumors in other places.”

He saw the look in his son’s eyes. “Listen. I don’t mean to

minimize this. It is serious. But I do have time. And, the odds are about fifty-fifty as to which of the two tumor types this is. Let's wait for the results."

JEN AND JAN Jensen were transferred from Shopton General Hospital to the Dispensary at Enterprises once Jen was well enough to be moved. The round-the-clock staff would only have the two women to watch over at night—barring any Enterprises’ employee mishap—and Doc Simpson believed that his expertise in using the *SimpsonScope* would let him spot any troubles long before they got out of hand.

Jen had been sedated to make the trip easier on her, but Jan was wide awake and adamant about getting out to see the state of their airplane.

“We spent just about our last few dollars on that plane,” she tried to explain to the nurse taking her blood pressure.

“I understand that, miss, but unless you lay still and stop getting worked up I’ll never get a good reading and we’ll both be here going nowhere. Now, calm down.”

Once an accurate reading had been made the nurse suggested Jan lay back and relax until the doctor came in.

“Doc’ll be about ten minutes; he’s giving your sister a check over. In the mean time, can I get you a newspaper? Magazine? Soft drink with a sedative?”

Jan was going to say something when it struck her what the nurse had just asked.

“Did you say a *sedative*?”

With exaggerated innocence the nurse stated, “Why, no. Is that what you think your heard me say? I asked if you wanted a soft drink but it would be a *decaffeinated* one. Strange that you think you heard something else. Hmmm.”

With that the nurse left the room.

Doc arrived nine minutes later and hushed her until he had listened to her heart and lungs.

“They sound very good. How’s the pelvic pain now the soft cast is off?”

She tried shifting her rump on the bed and the pain struck like a series of ice picks being jabbed into both sides.

“I see from the wincing it isn’t much better. Now, I can give you something quite strong to take that pain away for a few days, but it

will also mean I can't get you up and moving for those same days. Personally, I'd like to get you up, even down to the next room to see your sister, but the decision is up to you. We can deaden the pain a little, but not seriously halt it unless we use those powerful drugs."

Jan thought it over for a minute while he lifted the edge of her sheet and examined her left hip, the side with three of the cracks and fractures. His skilled fingers found the most tender places and she gasped with the discomfort each on target poke brought.

"Get me into see my sister for a few minutes and then knock me out, Doctor. I just need to sit with her and hold her hand and tell her how much I love her and don't blame her and—"

When she paused to take a breath, he lowered the sheet and stood up over her. "Right. Let me fetch a syringe full of a special, almost magic, local pain reliever to get into that hip before we even think of moving you. I'm not going to do the other one because the cracks on that side are more behind you, well under your gluteal muscles and those are too thick to let enough of the drug get deep inside. I have a long-lasting pain patch to put on you back there that might get the med in far enough over the next day or two."

In spite of her pain, Jan looked at Doc and asked, "Are you trying to tell me my bottom is too large?"

He smiled at her. "No. In fact it is my professional opinion that both you and your sister have very nicely proportioned backsides. It's just that my guess is you do a lot of exercise, maybe on a stair climber or you go hiking, and you've built up the muscle layers so strong they want to work against you right now. But, saying that, those same muscles probably kept you from suffering even worse damage with that hard landing you took."

She couldn't argue with his logic; until recently she had been an avid hiker and cross-country skier.

"How is the knee feeling? We had to repair the ACL a little. Not as much as anticipated but you did give it a bit of a tear."

"It's stiff and sore right now. But, no real sharp pain."

"Good!"

The injection began to take effect within minutes. The nurse returned and assisted Doc in tightly wrapping her hips in a wide, stretchy bandage to keep things as immobile as possible without an actual cast. After a quick check of their work she was helped from her bed into a wheelchair and rolled into the next room.

Taking her sister's hand, she said, "She looks so frail."



“I’ll frail you, Sis!” the woman in bed said. She opened her eyes and looked at her younger sister. “They told me you made it but would be out of commission longer than me. Then, they knocked be out and cracked my chest open. Don’t know about you, but if I’m the one in better shape, why do I hurt so much and you sit there getting wheeled around by a cute doctor?”

“Thank you for the compliment,” Doc said, “but your assessment of the chest *cracking* is incorrect. Using the best of modern surgery techniques, we only made two small incisions and hid those in a place only you and someone you love will ever need to see. The pain is a cracked rib you got when the plane was set down on the tarmac and you hit the controls.” He smiled and left them alone.

“I am so sorry, Jan,” Jen started to say, but her sister placed a finger over her lips.

“Shhhh. Not a word of it. You did something amazing that I don’t think I could have. You were having a heart attack and still you got us close to civilization. I waited too long before I bailed out hoping you would go out the other door at the same time. I hit pretty hard and have fractures in my pelvis and hips, but you’re the one with the heart issues.”

“The beautiful doctor didn’t tell you, but he told me I had a small heart defect that has been there since birth. Too small to see without the right equipment, and he has all the right equipment.”

Jan looked at Jen lying there. “You actually look a bit better in the face than you have for a few weeks. Better color. Please don’t tell me you’ve been in pain all this time!”

When Jen failed to answer, Jan squeezed her hand and started crying. A minute later Doc came back in holding his tablet computer.

“Stop crying unless you are still in pain, and take a look. I had one of the technicians around here do a thorough inspection of your plane and send me these.”

It got the attention of both women. On the screen were about twenty small photos. When one was touched it increased to full screen. They showed everything about the airplane from propeller to engine to cockpit to landing gear.

“As you can see there is some damage to the gear, and that happened about the time your ribs hit the steering yoke, but our people are removing that and rebuilding it better than before. And, no charge but only because you are both going to be my very best patients, ever. Right?”

They nodded in unison.

When she was taken back to her own room and sedated, Jan felt much better about their situation. Although it was putting a bad delay on their last vacation together—

She put that thought from her mind. It was too late to do anything about it, anyway.

In all, they would remain in Shopton for another two weeks before Doc said they would be able to travel. Even then, Jen would need to have a thorough flight physical before she could be allowed to pilot their plane again.

Jen, her basic heart problem taken care of, was up and out of bed just five days after the heart attack and operation. There was a small amount of residual tissue damage that would have to be managed with medication, and the possibility of another operation later in her life, but she responded well to the insertion of a stent in one artery to widen the blood flow and to remove a small clot that had formed in there and the fix to the aortic tear.

Her sister's hips and pelvis were another matter and Doc told them both the road to zero pain was going to take more than a month.

“That does not mean you get to sit or lay around all that time. In fact, we are removing your pelvic wrapping today and getting you on your feet right after that. Short steps using a walking frame at first but you'll be back to walking unaided within the week, barring complications.”

“Will I ever be able to do the Tango, Doc,” she asked with a slight grin.

“Could you before?”

“Well, no, but I was hoping...”

“Right,” he smirked, “along with, ‘Doctor, Doctor, it hurts when I do this.’ ‘Then don't do that!’ and other famous Vaudeville routines. We play this day by day and by the end of this week you are going to dislike me for pushing you so hard, but it is really the only way for your body to overcome the aches and get your muscles back into shape for walking. So, you take a nice little nap and then someone will be in around five to get you up and make you walk up and down our beautiful hallway. Be sure to stop and admire the small shrine I have built to all the times I've patched up Tom from one accident or attack or another. Makes fascinating viewing!”

He left her and she settled into her pillows. She wanted to think

things over but she was asleep in about thirty seconds.

During the week the Jensen girls were recuperating, Moshan Prandit entered Shopton Hospital to have his appendix removed. It was early enough in his current flare up they performed keyhole surgery taking it out via his navel. He was in and out in one day and bragged of his strength in overcoming such an insignificant infliction for the entire following week.

Tom spent most of each day researching several things. He wanted to understand the structure of the human brain, especially the blood vessels, so he might appreciate where his father's tumor was. He also looked heavily into modern medical procedures concerning operating in and around the brain.

Those weren't exactly encouraging. The brain was such an unknown area of the body and so infinitely difficult to get anywhere inside of without damaging other parts, that he almost gave up. What did give him some hope was a paper by a neurosurgeon who had gained some successes in operating on small tumors close to the surface of the frontal and parietal lobes, the areas controlling motion and perception.

Using ultra-thin probes he had managed to maneuver between the more vital tissues, inject a chemical therapy agent into the tumors, and later suction the internal matter from the tumor sac. He left the outer sac inside the brain, but now devoid of the tumor cells about half the patients had no further growth or regrowth and most of the other half responded well to overall chemotherapy.

A few had died and a few had some small level of brain damage, but the successes were significant.

He and Doc had several discussions about the viability of snaking a tiny flexible tube up into the lower portion of his father's brain—the area where the tumor sat was high in the temporal lobe on the underside of the brain—via one of the major blood vessels.

“From what I can see in the illustrations and even some of the more gruesome dissections, where dad's tumor sits is still at a point just before the blood vessels get to be microscopic and only a couple blood cells wide.”

Doc nodded. “That's true, but the vessels of the brain are very thin and fragile. That's why people with high blood pressure can have a stroke and not have vessels, say, in their torso that are just as narrow split open. And, the last thing you want to do is puncture one up there and cause him to suffer a brain bleed.”

That conversation sent Tom off on more research.

When they met the following afternoon, the inventor asked, “What if I could create a mini-tube complete with a camera-like sensor up front with a nice rounded tip, a light source of some sort, and the ability to move the head around to turn any corners necessary?”

Doc looked at him and shrugged. “What about the rest of the tube? You can’t just drag it along roughing up the inside of the vessel.”

Tom was silent for a while before a thought came to him.

“I believe I can computerize everything so the, let’s call it the *snake* for now, so the snake head makes turns and the body knows how much the head moves and so when each part reaches a turn point it follows that same motion.”

They both went silent while the doctor thought about this. When he spoke, it was with some slight tone of hope.

“If you could do that, if you could make a snake that signals the rest of its body where to move, where to turn and even where to twist, that could go a long way to making an operation like your dad *might* need safer. Remember, though that we still don’t know if an operation is required sooner rather than later. Sure, the tumor may be benign, but it needs to be reduced so it doesn’t block blood flow. But, if it is not benign, it needs to come out soon. Perhaps five or six months, tops. So, I am happy you are being proactive about this and trying to come up with something. But,” and he stood up, “having stated that I can’t see a totally successful outcome. We can always go in and take the tumor out; it is just a matter of what your father loses in the process. A lot of processes happen around and in that area of the human brain. Keep me up to date and I’ll do the same.”

He left Tom feeling no better than he had before.

Bud found him still sitting in one of the conversation areas of the cafeteria an hour later. Even though there were plenty of employees around, they had all seen the look on Tom’s face and left him alone.

Bud sat down without a word and waited for Tom to notice him.

“I do see you there, flyboy,” he said a minute later turning his head to face his friend. “Sorry, but I’m worrying something pretty significant.”

“Care to share?”

With a sigh, Tom nodded, but said, “Can’t do it here. Come one.

Let's go to my underground office."

They got up and headed for the doors. Outside, the sun was shining—not typical for Shopton in early November—and it was comfortably warm.

The walk was done in silence with Bud understanding that Tom needed to be the one to start talking, and that would only happen once he felt comfortable. *This must be something pretty bad*, he thought to himself as they approached the small building that housed the stairs and elevator down to the floor of the hangar where Tom's *Sky Queen* resided when not in use.

The elevator doors closed and the small room began to descend.

"Dad's in trouble, Bud," Tom blurted out. "You can't even tell Sandy this, okay?" Bud, seeing how serious Tom was, nodded. "Okay. He has a brain tumor and it doesn't look good." The elevator doors opened and they stepped out, walking across the wide floor. Both, mostly out of pilot's habit, patted the underside of the nose of the giant aircraft as they passed under it on the way to the office door

Once they had taken seats, Tom continued telling Bud about the kind of tumor being unknown at present, but it was in a bad position and would need to be attended to at some point or it could cause brain damage and even his father's death.

"I don't know what to say, skipper. You and I have been in a lot of scrapes and we've come out of them mostly in one piece. We've rescued your dad on more than one occasion as well. Something's got to happen to let you fix this. Right now all I can do is be a sounding board for you. Let you get everything out without any judgement, you know?"

"Yes, I do, Bud. The problem is I can come up with all sorts of ideas... they just aren't practical for working inside the brain. There are too many unknowns and too many things to break in there, each one mostly necessary to make a person who they are."

"I don't know if this is even a proper thing to ask you, Tom, but if it came down to his life or, oh, his voice or ability to walk or something, you'd chose life, right? He would as well, I think."

Tom shrugged, something he caught himself doing more and more lately.

"The truth is I think dad would rather go out as he is now and not linger on as someone different. This is going to kill mom."

"And, Sandy! But she hears nothing until you say so."

They talked about the things Tom had found out and come up

with. Bud liked a lot of them but could see some of the issues Doc had mentioned.

“You know you can count on me to do whatever I can. Just tell me, Tom.”

“There is one thing I’d like to do, but it involves heading up to the new space station. I think tomorrow morning we should take a fast trip up and talk to one of the medical researchers who has taken up residence there. I believe her name is Dr. Alicia Jones. Maybe she can answer a few questions about the viability of trying an operation in low or even zero-G.”

At seven-thirty in the morning, Tom and Bud flew off in Tom’s Toad heading for Fearing Island and the waiting craft that would take them up. One of Tom’s small line of saucer-shaped space vehicles meant mostly for use going no farther than the Moon, it was voice-controlled, repelatron powered and had the advantage of being able to dock using its flat bottom against the docking ports of the station so no suits would be required.

They climbed the steps built into one of the three landing legs, closed the hatch behind them and were airborne in three minutes.

The trio of drive units built into the feet of the landing legs could swivel enough to push the ship at an angle so it practically knifed through the air and into space. An hour later the giant tube of what many were calling Space Station Beta loomed into sight and ten minute after that Tom had the ship align itself to come in for a docking.

Small Attractatron units built into the space station grabbed the ship and gently pulled in into position, matching its slow rotation. A green light lit up on the control station and they left the ship via the airlock located between the three legs that remained withdrawn into the saucer.

They half walked, half floated out onto a platform that ran in a circle around the entire end of the station. At more than four hundred feet across and four times that in length, it was a monstrous structure. Close to the hub of the rotating cylinder gravity was practically nil. The nearer you got to the outer hull the more apparent gravity you were subjected to with about three-quarters Earth normal being felt by anyone standing on the surface.

Fifty feet away was an elevator that they took “down” to the surface. They were met by a somewhat severe-looking redheaded woman in a standard physician’s white jacket and black slacks. She shook their hands and introduced herself.

“I am Dr. Jones. First, I want to thank you for the opportunity to take up a one-year residence here in Beta. My research is most important and you Swifts are the only ones who recognize the vital need for this sort of environment. I have only one request and that is for a moveable research lab, something I can have on the surface or move up to the center for low to no gravity situations. Is this possible?”

In spite of the tense situation back at Enterprises Tom had to laugh.

“Well, first, it is nice to meet you and thank you for taking time out for this. Second, you are very direct about your needs, so I hope that will carry over to our discussion. As for your moving room, I’ll have a talk with the station commander. I’m sure we can find one of the cargo elevators that can be repurposed for you and dedicated to your research.”

“Good,” she said turning and heading off down a straight path toward one of the many buildings. “Come,” she called over her shoulder.

Tom and Bud hastened to catch up with her.

Their stay at the station lasted just half an hour. Without mentioning the exact patient, Tom inquired about performing delicate operations including ones inside the brain at the station. Dr. Jones had no good news for them.

“You see, any time you are talking about operating inside the circulatory system, you must have gravity. Our bodies expect it and you would get pooling of blood in any vessel you cut into without it. I am sorry to tell you, but I do not believe any patient would benefit from being operated up here at our reduced gravity and certainly not at zero gravity. That might cause untold complications!”





## CHAPTER 5 /

### THE LADIES DEPART

THEY RETURNED to Shopton discouraged, but as Tom stated on their flight back from Fearing, “I’m not giving up; we simply eliminated one small possibility.”

“And, ninety-nine to go?”

“Ninety-nine, nine hundred or even nine million, Bud. We are just getting started on this, and something Doc told me gives me a lot of hope we’ll succeed. He said, ‘It isn’t a matter of the tumor not being the kind you can’t operate on, it is just the tricky location.’ I intend to find a way to get to that location so he or some surgeon more familiar with the human brain can get dad’s tumor out.”

“I like your attitude, Tom. I only wish there was something I could even vaguely get my brain around or lend a hand at, but this is so far beyond anything I’ve ever even heard of, well...”

Tom gave him a pat on the shoulder. “Flyboy, we are both out of our league and not even in the parking lot of the ballpark yet, but I’ll just bet at some point I’ll need you there beside me. It always works out like that. We just have to wait and see where we both fit into this thing.”

They had been walking from the Barn where Tom parked the Toad back to the Administration building. As they reached the side doors Tom usually used to get inside he stopped.

“What day is it?”

Bud checked his watch before replying, “Thursday, the twenty-first. Why?”

Tom turned and headed toward another building.

“Come on. Our lady guests are supposed to be leaving today and I wanted to give my goodbyes and well wishes.” He picked up speed and Bud hastened to catch up with him. They reached the Dispensary building a few minutes later and went inside.

“Have the Jensen girls left yet?” he asked the receptionist.

She shook her head. “No, Tom. They’re in with Doc getting a final look over, but I don’t think he has them disrobed. Please knock first, though.”

He grinned at her and the two walked briskly down the hall until they reached Doc’s door. Tom gave it a small rap.

“It’s Tom and Bud. Can we come in or would that cause embarrassment?”

The door was pulled open and Doc stood there, his stethoscope hanging from his ears. Jen was sitting on the exam table buttoning her shirt and Jan was in a chair next to the desk.

“No, come on in. I’ve always wanted to see how many people I can cram in here and still get anything done.”

Tom came in first followed by Bud who closed the door and stood with his back against it while the inventor went over to the desk.

“How are the two of you feeling?” he inquired.

“No, no, no. That’s my line of questioning, Tom,” Doc said trying not to smile a little. “These two are doing so well it’s all I have to offer by way of my expensive medical training. Just hang on two minutes and then you can ask them what I already have.”

He went back to listening to Jen’s neck, checking her pulse. A moment later he pulled the earpieces out and let the scope hang from his neck.

“I would love to take full credit for both of you, but the truth is that you two are in pretty good shape and there seems to be nothing I can do to hold you here, as nice as it has been.”

Jen smiled and stood up. “We’ve enjoyed it as well, but we are a couple weeks behind on our schedule.” She looked at her sister and a little worry seemed to cross her face. Tom picked up on it but Doc was making a note on a piece of paper on his desk and didn’t see it.

“You people have been incredibly nice and I only hope once the trip is over and we sell the plane it will be enough to repay you for the care.”

Doc looked at Tom who gave him a tiny head shake.

“Nonsense,” the medico told them. “We would have been here anyway so taking care of someone rather than sitting on our collective thumbs didn’t cost us much of anything.”

“But, my operation—” Jen protested.

“Paid for in traded time. No actual money changed hands,” Doc explained.

Tom added, “You keep your plane, ladies. You’ll want to use it again and again even after you finish this trip.”

That comment brought a tiny sob from Jan. When they all looked at her she gave weak smile and explained, “Just the

emotions of the moment I guess. You have all been so nice to us, I —” She couldn’t get anything more out and practically fell into her sister’s arms.

The men, not knowing what to do or say, left them alone and stepped out of the office.

“What’s going on, Doc?” Bud asked in a low voice.

With a shake of his head, Doc Simpson answered, “I have absolutely no idea, Bud. It might just be the emotions of everything. We might never know unless they tell us.”

The door opened and Jan and Jen stepped out, now both with red but mostly dry eyes.

“Sorry, Jen explained, “but when strangers save your life and then treat you like family, the tear ducts are going to overflow when it gets time to leave. We just can’t think of anything to say other than we love you guys!”

The each gave Doc a kiss on the cheek making him blush before going into the back offices to say their goodbyes to the nursing staff.

Tom and Bud met them at the front and drove them around to the terminal where their plane was waiting for them.

“What the heck!” Jen said on seeing the state of their plane.

“Like it?” Bud asked. “Tom had the undercarriage replaced with something sturdier and more streamlined. Ought to give you about ten more knots in the air.”

The two women turned to Tom, quizzical looks all over their faces.

“You see, what with the damage from the hard set down and all, and remember we did tell you we were rebuilding that, I figured we’d fix that little deficiency for you. Besides, if we just replace it with what you had you might damage *that* one day. This way, you can rest assured you won’t have future problems.”

He explained about the new Durastress gear along with the narrow-profile wheels and never-flat tires that were standard issue on all *Pigeon* aircraft.

“All in all they drop the weight of the airframe by seventy pounds so along with the speed increase Bud mentioned, you ought to get slightly better fuel economy. Anyway, I only wish things with my father hadn’t gotten in the way of spending more time getting to know you both. You can’t know how it is, but trying to do the best you can for a loved one is very time consuming.

Jen looked at Jan who nodded but said nothing.

Like with Doc, the ladies bestowed kisses to both Bud and Tom on the cheeks before taking a once-around check of the aircraft.

“She's pre-flighted, batteries charged and fueled up for you,” Tom called out knowing that a good pilot will never take someone else's word for things.

Checks complete they waived and climbed into their seats.

“Clear!” came the call out the pilot's side window and the two young men stepped back giving her a thumbs up sign. The engine turned over and caught almost immediately. This earned them another quizzical look as the engine had never been that easy to start before.

What Tom had not told them was their batteries had been replaced with long-lasting, more powerful Swift Solar Batteries and their spark plugs replaced with special plugs used in Swift aircraft.

The ladies blew them each another kiss and the plane revved a little before moving forward and to their left.

“Nice gals,” Bud stated as the plane taxied away from them and they could hear each other again.

“Yes. I hope they swing back by here before they head home. Jen said they might but was a little cryptic about their timeline.”

After waiting for the plane to get off the ground, they got back into Tom's car and headed for the Administration building.

Tom returned to his office and had been sitting for a few minutes before an idea came to mind. He called up the local phone directory on the computer, found the business he wanted and dialed the number.

He explained to the man who answered who he was. “I was wondering whether you had the new computer-guided router system at your company?”

“Uhh, no we don't, Mr. Swift. See, the basic plumbing here in Shopton is pretty straight forward so we've never found the reason to invest in that sort of expensive system. Sorry. Do you have a tricky sewer problem out there at your facility?”

“No, it's just a point of curiosity about how well they can be driven or piloted or whatever the term is. Oh, well.”

“You know, I do believe an outfit over in Rochester did buy that system a year or so ago. Made a real fuss over it and all. If you like, I think I have their name and even the man who owns the place. Gimme a second and I'll pull that card.”

When he came back a minute later he gave Tom the man's name and the company number. Tom thanked him, hung up and

dialed the new number.

“Gunderson’s Plumbing and Rooting. Gus Gunderson speaking. How may we assist you with your sewer or rooting problems today?”

Tom introduced himself and inquired about the new system.

“Absolutely. You name the location and we can have that van at your door in less than an hour, sir.”

“Actually, while I will gladly pay you for the time, I don’t have a need for the equipment other than to see how it works. Swift Enterprises has a possible use for something like that system, just not for what you do with it. I could call the company in Chicago who make it but hoped to be able to get about an hour with it closer to home. Is that possible?”

“Swift Enterprises? You’re way the heck over north of Albany, aren’t ya?”

Tom agreed they were and told him where Shopton was.

“Oh. Well, I can’t have the unit out of the area for that long, so I probably can’t help you. Unless you want to come over here. We try to not have any regular appointments after four in the afternoon so it would be back after that most days. Just emergencies after hours.”

They agreed Tom would come over the following afternoon for a demonstration. When he told the man what he was willing to pay, there was silence at the other end of the line.

“Listen, Mr. Swift. I don’t mean ta tell you your business, and there’s a lot of guys who’d gladly shut their mouths and take all that money, but I don’t work like that. I also don’t rip off night and emergency customers with triple this or quadruple the other thing. So, if you want to pay me half that, we will both sleep nice tomorrow evening. Okay?”

With a chuckle, Tom told him that would be fine. “And, Mr. Gunderson? Thank you for your honesty.”

Bud was not going to be available so Tom asked Hank Sterling to come with him. The big Engineer gladly accepted and met him at the Barn around three o’clock.

The flight over took under an hour and they took a taxi from the private terminal at the airport to the small community of Greece to Rochester’s west.

Gus Gunderson was a fairly large and jovial man given to perspiring. He wiped his right hand on a mostly clean cloth before shaking their hands and took them inside the commercial space

his company occupied.

“Trucks one and two are out on regular calls and I kept the new one here in case you got in early.”

Seeing the spotless condition of the truck Tom told him, “You really didn’t have to scrub your truck down for us, Gus. We might be more into the electronics but neither of us are afraid of a little honest dirt.”

Gus laughed. “Naw. Didn’t do a thing we don’t already do. You work with computers, right? Well, don’t ya need ta keep things pretty clean around them?” When Tom and Hank both nodded, he added, “Just like with this. Only the head unit gets handled by a person. It does all the work of dragging the rest of the line in and we sit fat and happy,” he looked down at his bulging midsection, “and let it do all the dirty work. The unit even has a self-washer as things get reeled back in. Let me show ya.”

He gave them a tour of the entire truck. Sure enough, the head unit featured retractable treads that would pull it in or back it out of a pipe. Then, every ten feet was another tread unit to assist in the smooth operation. Each drive pod, as they were called by Gus, acted independently of the others with the computer managing all motion.

“Up in the head ya got a real powerful light source, the camera that can look at things in regular light and also that infer-reddish light, and those pull back into the head when the grinder needs ta be deployed.”

He demonstrated everything on the floor of his shop and then asked for a little assistance to pull over a ten-foot length of PVC pipe.

“Got that filled with muck at one end and we’ll use it for the rest of the demo.”

The head unit was picked up and moved to a few feet from the opening and set back down before the three men returned to the open side of the truck. On the monitor Gus centered the crosshairs and they saw the pipe come closer as the head used its treads to move to it, and then it was inside. The light came on and they could see the dirt and leaves Gus had stuffed inside.

Both Tom and Hank were fascinated to see how the camera drew back and the picture went blank for a moment before the view came back on showing the head had pierced the “plug” and was showing them the light at the other end of the pipe.

“All we do then is hit the recall button,” he said pressing a blue button on the control panel, “and she all comes back in. Like I

said, the hose and the head unit get rinsed off before they come into the back of the truck and we go away with everybody happy.”

Tom asked about any manual maneuvering capability and Gus shook his head.

“No, not with this rig, but I hear they have a pricier one that you can drive around like a little truck.”

Tom and Hank thanked their host and Tom handed him an envelope with the agreed on fee. Gus shook his head and handed it back.

“Listen, you took the time to fly over here from where that little place your company is so I figger you’ve already paid a lot of bucks for my twenty-minute demo. Besides, I got to meet the famous Tom Swift. So, I appreciate the offer but like I said on the phone, I do business a little different than most guys.”

Tom smiled at him. “Okay, Gus. But let me warn you that I might accidentally set this envelope down over on that bench on the way out. If I do and you happen to find it, and see the address on the outside, you have the choice to send it back or accept it for your time. And, we do value your time on this. Just don’t let it sit around so somebody else finds it and thinks it might be theirs.”

Gus smiled and shook Tom’s hand again.

As they flew out Hank asked if Tom got what he came for.

“Yes and no, Hank. I can see the possibility of the unit but it is probably the more expensive one Gus mentioned that is more what I need to understand. Guess I’ll either be flying out to Chicago or perhaps I’ll just request their brochure.”

What he received a couple days later was a video disc with a one-hour sales and demonstration piece along with a very nice full-color brochure. It gave him a little more information and a little hope that some sort of miniature version might be built.

When Doc saw the video he had to agree there was something to the concept.

“Of course that just grinds away at the plug and then lets it wash through, where for any operation inside a brain we’d need to pull everything back out, but I get the point. If you can use that as a starting point I would say look further into that, but don’t go whole hog until we get back all the test results so we know what we’re looking at.

Tom promised he would only do some basic additional investigation until that point.

\* \* \* \* \*

The weekend came and went with Tom working nearly nonstop on a design for a tiny version of the roter system. The more he tried to come up with an all-in-one solution the more he realized it would not be viable to do with a single tube solution. One would need to become at least two, but the first, what he thought of as the visual head, could be that head unit on a thin and very flexible cable. It would be the eyes of the system where a second, hollow tube would contain the grinder piece and would use light suction to pull everything back down the tube and out of the body.

It left him with the need to do what he'd agreed to with Doc, namely find a way to control the line and the tube so they didn't drag over blood vessel corners and angles doing damage of their own.

But, he had promised Bashalli he would spend the weekend with her and little Bart helping get ready for Thanksgiving the next Thursday.

It would be held as was tradition at the home of Damon and Anne Swift and this year would include the Prandits.

Bashalli had agreed to bring a traditional Pakistani dish featuring tidbits of lamb along with a fragrant fig and cinnamon sauce, and she had been worrying over the recipe for days.

"What if Father and Mother Swift do not like it?" she had asked more than once.

"Have you ever found anything my parents won't eat and comment favorably on?"

She could think of no occasion when that happened.

"Fine, then it will be perfect."

"But, what if my mother and father and Moshan do not think I did a good job of making it?"

"Then," he told her looking into her nervous eyes, "I have every faith in your family to not say anything at the table. If they do, then we tell them they must cook it for the next get together so we can compare."

She agreed, but was still very nervous about the impending meal.

Tom heard people outside the big office door talking but could not make out what was being said until his father's voice said a muffled, "Thank you, Trent," and the door opened.

"Ah, Tom. Glad to see you here," Damon said as he headed for the conference area and took a seat. "Please join me. I have some



news.” He did not sound happy about whatever it was he needed to say.

Tom had a sudden urge to run. He knew his father’s voice and the tone he was using spoke of bad news rather than anything good. He stood and came over, taking the seat next to the older inventor.

“I’m not going to like this, am I?”

Damon put on a wry smile before shaking his head a little. “No, you are not going to like this news. However, I want your assurance you will take it for what it is worth, read nothing into it, and don’t pester me for details I do not have. Promise?”

Tom felt tears welling up in his eyes but nodded. “Yes, sir.”

His father took his left hand and held it in both of his.

“Doc got the results of the blood tests. It takes quite a while for them to find anything meaningful, but it is fairly conclusive. The tumor growing in my brain is the bad type, is inoperable as we’ve known, and it will eventually kill me.”



## CHAPTER 6 /

### THE TRUTH SINKS IN

WITH A horrified gasp, Tom suddenly felt so sick he nearly threw up. His father held his hand until the feeling passed, and son and father sat in silence for many minutes.

“Can you tell me if Doc had anything good to say?”

“Well, he said I should have at least five months before the thing grows to the point it begins restricting blood flow in my brain and I begin showing signs. It will be dizziness at first, slurred speech and the cognitive deterioration. After that he has no idea what the progression for me will be.”

“How is mom going to take this?” Tom’s voice sounded like a little boy’s.

“She and I have had a few discussions this past week. She is a wreck, but you know her. She won’t show it to others. All she has said is she wants me to stop everything else and concentrate on finding a way to get the tumor out.” He let out a small laugh. “I can’t shift her from the notion that I can do absolutely anything, and what I can’t, you can.”

More silence set in until Tom spoke again.

“Then, tell her I’m going to find a way. I have no big projects now and will not take anything on. There has to be a way to get into a blood vessel and remove a tumor. But, in the meantime, can’t you have chemotherapy or radiation to minimize it? Or, one of the gene therapies tailored just to you?”

His father’s head shook. “Chemo drug therapy will slow things down but make me pretty sick so I would be of little help to you or the company. And, let’s be realistic, if I am not going to be here I have to get things in order with the Government and all our contracts. Radiation is out because things are too deep and it would kill a lot of healthy brain cells so even if I survived, I’d never be me again.”

“And, the gene therapy?”

“Doc’s looking into it, but this cancer, and let’s not fool ourselves, it is a type of cancer, has not previously been known to be affected. He did hold out one hope for a new class of drugs that use a type of deep sea algae extract, but it needs to be injected directly into the tumor. And, the tumor is not in a position to cooperate with that approach. Oh, and this does not get discussed

until after Thanksgiving dinner. Understand?"

Tom nodded. With just one day to go this news would kill any sense of celebration. Besides, as Damon reminded him, things had lasted this long and could stand to be "off the table" until after the coming weekend.

Not a word was spoken about Damon's condition on Thanksgiving. Everyone had a great time and far too much food was consumed.

Moshan regaled them with his version of his heroic fight against his appendicitis and how he came through the operation so well they had sent him home immediately. Of course everybody knew he had remained in his recovery room for about ten hours before being released, and had spent the following three days at his parent's home with an ice bag over the affected area, but they let him have his victory.

Bashalli's "Figs and Sheep" dish was a hit with her father taking two helpings and even eyeing the last portion in the dish until his wife elbowed him and told him, "You do not require any additional helpings of anything. I will need to run you around the neighborhood several times when we get home just to settle what you have already eaten!"

He laughed and Anne took the dish to the kitchen, placing the last of it in a small container and setting it aside for him to take home.

"What with everything that has been going on I am afraid we let the car company go ahead and open that new production line without appropriate fanfare," Damon told them as dessert was being dished out. "Bashalli, dear? Are you ready to give your speech and do the honors, albeit a half month late, this next Friday?"

She nodded but asked, "Are you still expecting to have many people from Washington D.C. to come up for this?"

When he told her they were, she shuddered a little but smiled and told him, "I will be ready. My speech is only about four minutes long. Do you believe that will be enough?"

"Of course. Anything of any length will be most welcome."

"Fine, then I am ready. Tom assures me the bottle will not spray all over my dress as did the one in space. That was very scary when it covered my helmet and froze and I could not see anything."

"This is going to be behind a clear shield," Tom told her. "It'll all be contained. You'll do great!"

“Bashalli is a brave woman,” declared Moshan. “I do not think I could stand in front of a crowd of people like she does without wishing to turn and leave as quickly as possible. I am quite proud of my sister!”

“And yet you deal with many people in your cafe each and every day,” she reminded him, although his compliment had made her blush a little. “I would tell you that you might do the same thing, but you have a talent for making pastries and I can speak in front of people. Usually not this many, but I do it gladly.”

Sandy looked at her sister-in-law. “You know, Bashi, when you and I held those tours up at the lunar colony you were great. Forty or more people at a time and you even cracked a few jokes with them. You’ll be fine and I’ll be right there in the audience cheering for you.”

“As will we all,” Anne said giving Damon a special look.

“Here, here,” he said to the group.

After the Prandits left, Sandy and Bashalli helped Anne with the dishes while Tom, Bud and Damon remained in the living room.

Bud was hesitant about asking for any information, but as they sat he said, “Sandy is all over me to find out everything...” Damon smiled at him and said there was not a lot to tell.

“We will know more next week, Bud, and then Anne and I will take a day or so to digest that and have you four over for a tell all. I promise that will happen. Just ask your wife to curtail her built-in curiosity for a few more days.”

They came back to the Swift home on Tuesday night. Sandy was a nervous wreck and nearly refused to leave her father’s side until dinner.

Even then she slid her chair over so she would reach out every minute or so and touch his arm.

“If you don’t stop that I’ll never get enough food into me to have the strength to tell you all what is going on,” he admonished her.

It didn’t help as she failed to move even a fraction of an inch farther away.

“Fine, have it your way. Has everyone eaten something? Good. Now here is the truth as I know it today.”

He told his sad audience what sort of tumor it was, where it was, how it could not be operated on without doing other brain damage, and what that might be if attempted. He said he had

many good months to look forward to and was not giving up.

“Tom is working with Doc to see if there is a way to cheat the system. Of course any fool with a knife could go in and take the thing out and keep me alive for decades, but at what cost? No voice or ability to walk are possibilities, as are never being able to understand what is being said to me. I would be able to smile and nod, even work to some extent, and nobody would need to wipe my nose for me, but I would not be me any more. So, if there is a way and we can find it, then we try for it. If there is just no way, then please live the fullest you can and let me live the best I can until I no *longer* can.”

It as a tough speech to hear, but everyone knew Damon was determined to live if at all possible, and it would be as Damon Swift.

Because it was still early on Damon was fully active at work even spending three straight days completing the final test check list for a new satellite he had been instrumental in building.

Tom was a bit surprised at the vigor of his father until Doc explained that the tumor was dangerous but slow growing.

“He probably isn’t experiencing anything from it other than those headaches of his. Might not for a few more months. That’s good, but it is also a little bad. I need you to be careful about this, but try to get him to start slowing down a little. Talk to Trent and see if there is anything that can be shuffled to some department heads to begin taking a little workload off him.”

Tom felt very uncomfortable in his new role. He was used to action and adventure and spending time inventing. As he told Bud:

“It’s bad enough to come home from the Eris trip and promise Bash I’d not go out on anything dangerous for the time being, but now to find myself balancing between what I can do for dad and what I need to eventually take away from him... I really don’t like it.”

“I’ve got a little ‘get out and do something’ itch myself,” his friend admitted. “Don’t get me wrong, I enjoy having all this time with Sandy, but yeah... I’m starting to miss the adventure of it all.” He stood up and looked at Tom.

“I guess we look on this as one of our more tame adventures. We’ll find something to get the blood flowing, my genius friend. You’ll probably come up with some way to get us into trouble along the way.” He grinned at Tom who, for the first time in about a week, returned the grin, although a little grimly.

At home that evening Tom explained to Bashalli, “I wish there was something I could do right this minute to make dad better.”

“Did you not tell me there may be some sort of special tube you can build to pull his tumor out?”

“Yes, I did say something like that because Doc and I have been discussing that possibility, but the more I research the brain the more cautious I’ve become on that.” He tried to explain about the rubbing on the inside of any blood vessel and the damage it could cause but she was unsure of what it all meant.

“Come out to the garage. I’ll show you.” Out they went and to the small workbench Tom had in the back. He started by taking a piece of pine wood about one inch square and a foot long, and cinching it into his vise. Next, he pulled a roll of heavy packing twine out from a drawer and snipped off a three-foot piece.

“Okay, Bash. Watch this and think of the twine as my tube and the edge of the wood as the inside corner of a blood vessel.”

He began to saw back and forth with the twine wrapped around each hand and only ten inches between them. Very soon the friction began to cut into the edge and within a minute he had gouged a groove nearly a quarter inch in the wood. He pulled the twine away and she gasped.

“Oh, goodness! You cut the wood with string?”

“Uh-huh,” he said putting the string in the drawer before tossing the wood back into the small box of scraps he’d taken it from. “That friction is exaggerated here, but even down at the tiny size I would need to go, a lot of things that seem smooth to us are actually very rough. Smooth as glass is a saying that is very wrong. Glass looks smooth to our eyes but is rough under a powerful microscope.”

They headed back into the house. “So, what can you do?”

“If I can find something that is smooth enough or discover or make a coating that will act as a friction barrier, sort of like oil in a car engine, then I can proceed with the tube approach. Otherwise —” he left that sentence unfinished.

She suggested they go for a walk around their neighborhood. “I know it is dark, but it is still mostly pleasant, and I feel the need to not sit the rest of tonight.”

He agreed and while she went up to put on a light jacket he bundled little Bart up in a slightly heavier one and got the stroller out.

Their neighborhood streets were well lit and the area large enough to provide a good one-mile walk around the perimeter. As

they walked and pushed Bart, he made excited noises about the experience. He loved being outside. But, within fifteen minutes the excitement wore off and the relative darkness lulled the baby into slumber.

They took a second swing around the housing area before heading home. On that part of the walk they talked in low tones about little Bart's future.

"Do you believe you had the best education since you finished school by the age of fourteen?"

Tom had to think about that before giving her his answer.

"While I think I missed out on a lot of the social part of high school, and was sort of thought of as the genius freak by the older kids there, as far as an education goes, mom and dad did a fantastic job of challenging me and making certain I learned far more than school would have taught me. So much so that the one time I did look into college down at Grandyke at age fifteen, they told my folks flat out that they could not teach me anything. Why do you ask?"

"Because Bart had his first set of 'how is your baby doing compared to others' test yesterday. At a little over six months they told me he is at the very top of the range for ten to twelve month olds when it comes to, ummm, I think they called it space awareness?"

"Maybe *spacial* awareness?" Tom suggested.

She brightened although he could not see it. "Yes, that was it, spacial awareness and mechanical comprehension."

He stopped so she did as well. "Did they tell you what that means?"

"Yes. It means he can figure out what piece of a puzzle fits into which area just by looking at it. They told me nearly all children until they get to about two years old have to try different angles with the pieces, Bart picked one up, looked at it, turned it a little and the put it right where it was supposed to go and did it time and time again."

Tom was excited about the news. "That's great. Right?" When she didn't immediately answer he repeated, "Right?"

She let out a sigh. "Perhaps. They said he might need to have a more active learning environment starting soon. They asked if we were financially able to get by on just one income so the other parent could be home to give Bart more challenges and get a head start on his education."

Now, Tom understood. "Meaning they were asking if you would



be willing to quit your job and stay home with Bart?”

“Yes. Pretty much. That is once they found out who you are there wasn’t a question which of us ought to stay home. And there is one thing more. I actually think I want to stay home with him. At least for a couple years. But, if you do not believe that he should be pressed forward too early then we need to talk about what else to do.”

They had reached their house so the discussion paused until they got inside and got Bart in his sleepers and laid down in his crib.

Sitting back downstairs in the living room, they picked up the conversation.

“If Bart is like I was and leans at an accelerated rate, then I would not want him to be as frustrated as I was in school. No third grader should be in a position of knowing more than the teacher is able to teach in certain subjects. I mean, I was reading at a seventh grade level by the start of third grade and the school didn’t have the material for me, so they just let me read whatever I wanted and then couldn’t test me on it because I was reading science journals.”

“Then, is it okay with you if I tell the ad agency I will be leaving at the end of the month?” Her lower lip was quivering, a sign of her nervousness at his possible answer.

He kissed her lip and nodded. “Sure. If you are certain that is what you want, then yes.”

Bashalli looked at Tom with wonder in her eyes. “Why are you so good and understanding?”

“You make me that way, Bash. That, plus the way mom and dad raised me. Let’s hope we can do the same for Bart.”

Later as they lay in bed with Tom reading an online article about microtechnology in the operating room, Bashalli rolled toward him and placed one hand on his chest.

“Tell me truthfully, Tom. Will you be able to do something to save Father Swift? I so want Bart to get to know his grandfather and I believe that relationship will be important in our son’s life as it has been in yours.” She looked into his eyes trying to find the answer she wanted to hear.

He set his tablet computer on the bed next to his hip.

“The absolute truth is I have no idea, Bash. I intend to do everything in my power to find the best and safest way to get that tumor out of his head, but if I fail, then I am going to have to abide by his decision as to how he wants to live his life. I hope he would

accept any little success that may give him more years but without concrete knowledge about what that life might be like, I have no idea what he will choose.”

A tear cascaded down her right cheek and drifted onto the side of her nose where it hung near the tip. Tom reached up and wiped it away causing her to break down into sobs. She buried her face in his chest and cried for several minutes.

Finally, she propped herself back up and wiped her own face.

“I want your permission to talk to Father Swift to tell him how important I believe his life is and how I want him to fight for it. Can I? Should I?”

Tom’s eyes roamed over her shoulder and looked around their bedroom. He thought, *I wouldn’t have this life if it had not been for dad. I hope I can give my son the same sort of solid family life.*

To his wife he said, “If it were me in his position, and I have tried to put myself there to understand what he must be feeling, I would treasure having my daughter-in-law, a woman I love like my own daughter, *and he does*, Bash, I would want her to come tell me those things. So, yes.”

The next day Bashalli had a talk with her boss at the Shopton Advertising Agency. The woman was shocked but understood all her reasons.

“Of course we don’t want to lose you, Bashalli. You’ve excelled in everything we’ve thrown at you and this agency would not be where it is today without you. Promise me one thing. If you decide to change your mind, even if it is a year or two from now, give me a call. If there is a way to bring you back in I will find it.”

“I will be here until the end of the month and promise to do everything I can to finish what I have now and help train whoever will come in to take over.”

After that she headed for Swift Enterprises where she had earlier arranged for a private meeting with Damon Swift.

He was on the phone when she arrived so Trent suggested she take a seat on the sofa across the outer office from his desk.

She did and sat there more nervous than she had been an hour before when giving her notice. The cup of tea Trent had provided her went untouched except to be used to warm her icy cold hands.

When she was ushered into the office her legs nearly collapsed when she saw Damon. Still strong and tall, he smiled at her and her resolve to give the speech she had been practicing nearly gave way to panic.

She rushed to him and wrapped her arms around his waist giving him a hug.

When he finally managed to extricate himself and invited her to have a seat, she just spilled out everything.

In the end he was extremely touched by her honesty and told her so.

“You and Anne ought to form a club,” he told her with a gentle smile. “The two of you want me to fight this even if it means taking an early risk. While I’m all for risks, I believe in your husband, my son. If anybody can come up with something to take this thing out of my head, and more importantly, leave me with still being who I am, it is Tom. I love and trust him as you do. Let’s give him our support and see what he comes up with.”



TOM WASN'T as inclined as his father toward taking early risks. There were just too many items sitting in the "Unknown" column and so dratted little in his "These things I know" one that he was getting frustrated.

In fact, topping his list of frustrations was the sheer unknown quality of the actual tumor, how it might have gotten there, how it grows and even how fast or slow it would go. All everyone could say was it would cut off blood flow eventually and be fatal at some point.

It was a type which so little was known because it was so infrequently found in a location where it could be treated or operated on and, at least in part, removed so that living tumor cells could be examined. In the majority of cases, the patient passed away and the families just wanted to get their loved one buried or cremated and so if any tissue was recovered during an autopsy, it was nearly always dead tissue with few answers to give.

Doc kept apologizing to Damon and to Tom for his lack of knowledge until Tom poked him in the chest with his index finger and said, "Listen, Doc. You are not an Oncologist. You are a general physician. Best I've ever heard of or had the honor of having work on me and I owe you my life twenty times over it seems, but this is beyond you so stop telling us how sorry you are. We don't expect you to have the answers. It's just so irritating that nobody else, not even the so-called cancer experts, can shed much light on this."

After that discussions were more productive.

Anne Swift was more surprised than just about anyone when she found an obscure medical journal entry from Germany in their *Deutsches Ärzteblatt* that covered five specific facts known about his tumor type and even provided ample information regarding unsuccessful drug attempts at control or eradication.

Three of the most popular chemical therapies that were currently under trial in the U.S. had failed miserably in German tests as far back as six years. One showed some promise in controlling the tumor, and had been able to shrink more than sixty percent of them in tests, but had a nasty side effect of burning out neurons and brain connections for several centimeters around the tumor. Besides, to be effective it had to be

administered directly into the tumor and that had meant shoving a needle through other, perfectly good brain tissue.

The fifth drug was inconclusive but a footnote stated that while there was some early signs of shrinkage, within three to five months the tumors started growing again and so trials had been halted.

All Damon said regarding that was he was happy those could be discounted so he didn't have to go through any of those problems and Tom and Doc could concentrate on other things.

When the dedication ceremony day came, Damon was there looking like a man without a care in the world. The car company grounds and the area outside the fence had been swept and surrounded by Secret Service agents, although that didn't automatically make Tom feel safe. He had some experience with renegade Federal agents kidnapping him and even trying to kill him in the past so he was more than a little vigilant all the time he and his family were there.

Fortunately, Harlan Ames of the Security department had about twenty of his own men and women spread all around the facility and grounds keeping eyes on the crowd and the Federal agents.

"Don't worry, Tom," he'd said as he pointed up where he inventor could see a few of his drones circling high in the sky. "We're covered for pretty much all possibilities."

The Vice President was kept in a side room under guard until it was time for the actual ceremony and his speech. Unlike many politicians, both he and the President believed strongly in "shorter is better" when it came to public addresses, so his speech would take just about the same length of time as Bashalli's. Short speeches meant he could memorize them and did not require the "prompter" screens so frequently seen when a politician gives a speech.

She was also in that same room and was thrilled as well as being nervous enough to the point she was forgetting even the first word of her address.

Seeing her distress, he invited her over to sit next to him, and told her she had nothing to worry about.

"I find that if I already know my speech, and can concentrate on just one individual out in the audience," he told her pointing at an imaginary person in the distance, "it just comes sliding right out," he told her. "You'll do just fine, Mrs. Swift."

The event soon began as the other Washington people settled down—they had each been trying to get “the best seat in the house” ahead of the others until the Vice President took a look out the door and shouted out, “Simmer down, boys and girls!” His unmistakable voice had the desired effect. In a minute everyone took seats and the people began to quiet down.

Along the first production line, which had been shut down starting a half hour before the ceremony, the line workers stood waiting. This ceremony was getting in the way of producing some forty cars and they were becoming anxious to get back to work.

Charlie van Van deGroot took the stage, welcomed everyone and gave a quick description of what the following hour would have in store.

“We have addresses by four people, all of whom have assured me they intend to be brief but meaningful, followed by small group tours of the facility for anyone who has not been here before, or even those who want to see it all again, and then a short reception over in the clear area to my right where someday we will have our third line. But, let’s start with the man in charge of everything around here, Mr. Damon Swift.”

It took nearly a minute for the applause to stop.

Damon smiled at the crowd and spoke about the success of being the newest car manufacturer in the country and suggested that such success was down to both the employees, who were thought of more as friends and valuable assets than merely people collecting a paycheck, and the speed at which all Swift companies could come out with new products.

“We know what we can do and we know what we need to learn to do other things. I believe where we might have the advantage is that we have such an incredible talent pool in the people we employ.”

Tom was introduced and thanked everyone for coming, but opted to make no speech.

When the Vice President climbed the back stairs of the platform, everyone stood to honor his position.

“Sit down, especially you from the other side of the aisle who wouldn’t stand up for me in real life unless you figured it’d get you another vote.” He smiled and so did they but it was obvious the major parties did not gladly honor each other.

He spoke of the hope that other companies and even the Government might someday find the nerve and determination to operate in the same mode as the Swifts.

“They see a problem or opportunity and they do it. They do not have endless committee meetings and tack on all sorts of unnecessary things to bog down a project. They do not bicker internally and work contrary to the absolute spirit of cooperation. Heck. They are even wise enough to tell us when we are absolutely wrong about something we want them to do and then show us what it is we actually need. I wish we got that sort of push back from all our contractors.”

After he walked off to another good round of applause Charlie came back out and introduced Bashalli.

“Mrs. Swift will break the ceremonial bottle over the production line for us today, but she has a little something to say before that. Please give her your full attention.”

When she got to the microphone and the applause tapered off, she set her speech down and looked out at the crowd as the Vice President suggested, and focused on one person, her sister-in-law, Sandy Swift Barclay who smiled encouragingly at her from about twelve rows back.

“When I married into the Swift family I had a very good idea I was in for something unusual and thrilling. Both Tom, my husband, and his father, Damon, are the sort of men you only read about in books. They work very well together as well as separately. They take the time to know each employee and can greet nearly everyone by their first name. The Swifts respect the people who work for them, the people who work with them, and also the people out there who can broadly be called, the customer.

“This car company is an incredible place. It rose from scrub grass and dirt in record time. Ask anyone working here and they will smile and tell you they’d do nothing else. Some of them,” she looked over at the idle line workers, “would probably be happier if we weren’t here right now so they could build more Swift cars.”

There were cheers and some laughter and calls of, “Yes,” “Tell ‘em, Mrs. Swift,” and “Right on,” from the workers.

“I know for a fact that the cars coming from the first line over there,” and she pointed behind her to line one, “have saved lives. Statistics might be used by some companies or people to change things or hide things, but there are two people here today who both would have died while testing the first of the cars when they were forced off the road by an attacker and into very bad crashes.”

She looked at Sandy and also at Bud sitting next to her. Both nodded. Their lives had been spared by the solid construction and restraints of the test car.

“I have no doubt that the facts and figures coming in showing



this is also the case out in the public are true and that someday, perhaps one or more of you will find you are alive thanks to one of these wonderful cars. So, it is my privilege and honor to dedicate this second assembly line in the name of safety, and in the name of the Swifts.”

She moved to the side of the platform, grabbed the wrapped bottle and swung it into the open end of the containment case. Sensing its entry the door snapped closed before the bottle shattered against a raised metal post set there for the ceremony.

More applause came along with a few, “Bravo,” and, “You tell ‘em, Bashi,” calls from the area around Bud and Sandy.

Charlie came back to invite everyone to take any of the five guided tour groups that would leave at five minute intervals, and to take advantage of the food and beverages Chow Winkler had set up just behind them.

Damon gave Bashalli big hug which she did not want to let go of for over a minute. When she did she went up on tiptoe and whispered in his ear, “I love you, Father Swift. Please tell me you will be better.”

“With people like you and Tom and Anne and Sandy and Bud behind me, I fully intend to.”

People only began to leave two hours later. Half an hour after that, the crew had cleaned up the area and the line was starting back in operation.

Before his Secret Service agents ushered him back to his limo, the Vice President came over to Tom and Bashalli. He shook their hands telling her, “You did just fine, Mrs. Swift. If everybody in the Senate and House had your ability to speak directly and without a bunch of pauses and those horrible non-words they throw in when they can’t come up with anything intelligent to say, you know, the ums and ahhs and errs, then sitting in the Chamber each and every day wouldn’t be such a terrible punishment for having been elected to this position.”

He winked at her.

“Well, I have to get back to D.C. It was a pleasure to come up for this. Congratulations on the success.”

With that he was gone.

That evening, as they were having dinner, Bashalli was still beaming.

“Did you hear him? The Vice President of the United States

told me I did a good job?” She continued to be amazed.

Tom smiled as she spoke.

“If this motherhood thing doesn’t suit you, then perhaps you could go on the road as a public speaker?” he said, teasingly.

Her face changed and she looked at him. “Never. I am very happy being your wife and Bart’s mommy. But, I will practice in front of him and maybe he will pick up on how easy it is.”

“One of the top fears, public speaking,” Tom reminded her. “That along with finding yourself in a disaster you can’t control, personal attack on you or a loved one, and fear of waking up in the middle of the street, totally naked.”

She shuddered but said, “Those I can understand. It is people who are afraid of small insects and spiders, or dogs or even other people that I cannot.”

“Well, whatever, you really did a great job today, Bash. Impressed dad a lot. He took me aside part way through the reception and told me how touched he was by what you said. Said he now believes he wants to fight this even more than ever before.”

“I am very happy to hear that.”

One of the many things Tom began to consider was coming up with an autonomous robotic probe that could navigate up through the blood vessels into the appropriate area and inject a drug cocktail directly into the tumor.

“It might not kill the tumor cells, Bud,” he explained as they ate lunch in the big lab in the Administration building, “but it could target the actual site and lay down the drugs right where they are needed.”

“Sort of like those surgeries where they inject tiny radioactive pellets into certain cancers that kill from within?”

“A bit like that, but Doc tells me that radiation is out for now. It might be a last resort thing later if this grows out of control, but there is so much other damage that can do in the brain we both want to avoid it for the time being.”

The flyer took another bite of the lasagna Chow had brought for them and chewed thoughtfully. “Okay, so what does this portable syringe look like?”

“That’s anyone’s guess, but let’s toss around a couple ideas. I’ll start. First, it needs to have a tiny brain or at least be directed by low power radio signals. That means an antenna of some sort.

Next, the body needs to hold either some liquid, or as you hinted at, the radioactive pellets, perhaps a semi-solid dose of medication inside that can be implanted when the time is right.”

Bud nodded. He was beginning to come up with a mental picture but didn’t want to interrupt Tom at this point.

“Go on,” he urged.

“Okay. The device must be able to move around yet hold on when necessary. We are talking active blood flow where this will go and we might not be able to stop or slow down, but this isn’t a situation where something that swims or mimics swimming will work. It will have to feature legs that can sort of pull it along. Is this making sense?”

Bud placed his fork on the side of his plate. He nodded.

“Yes, it is. The problem is I’m picturing a small robot that has a sort of a rounded tank for a body with a number of tiny legs and a couple antenna.” He blushed. “What is in my mind looks like a ladybug, I’m afraid. Sorry.”

That made his friend smile. “Yeah, I can see that,” Tom admitted. “Maybe we are talking something that swims, after a fashion. Something like a mini-torpedo. The long body could hold the inner workings plus the medication, and the head could be a combination of sensor and something to open up the side of the tumor before the pill or whatever gets shoved in.”

“Sort of far-fetched, huh?” Bud asked.

“More than a little, Bud. But, it is early days, and like I said we are just talking possibilities.”



## CHAPTER 8 /

### SLOWDOWN

TWO MONTHS came and went with only minimal progress at Tom's end. Damon had been working mostly at full, normal speed but the headaches were taking their toll. About one out of each five work days he needed to spend in quiet with no distractions or irritations.

As Anne told Tom one day when he came to have coffee with her, "Your father is starting to visibly hurt, Tom. As a biologist I know there are drugs and therapies to help him, but he is so averse to being 'kept drugged,' as he puts it, that he suffers. His wife feels, however, entirely at a loss and wants to break down and cry on someone's shoulder."

Tom looked at her and could see how hard his father's illness was affecting her. Her smile had gone soft and there was no joy behind it. Her eyes seemed haunted.

Damon's tumor was, like most major diseases suffered by an individual, also suffered by those closest around him or her.

"Have you talked with Doc Simpson lately?" he asked.

"Greg is a wonderful man but like most doctors he is stuck with the, 'Here, take this for what ails you,' pill approach. He gave your father some sleeping pills that he refuses to use because it makes it hard for him to wake up before about nine in the morning. Ditto pills for me. Not the same ones because I don't need the added pain relief, but I've never been a big one for taking that road."

Tom thought a moment before suggesting, "How about I ask Doc to check dad into the hospital for a few days of tests? You won't need to take care of him for that time and can get a couple night's sleep and the doctors can perform a few of the newer tests Doc wants, and it will give dad some care and pain management."

Anne put a hand on Tom's arm. "If you tell him to do it, he will. If I suggest it he will find excuses. So, yes please. Give your mother a little help. It isn't right that the child becomes the caregiver, but I'll take a couple days off at this point."

It was an old story. When Tom's grandfather, George Swift, had been near the end of his life, he had practically refused to allow his son and daughter-in-law to take care of him. Tom recalled one particular flare up he had witnessed.

"Balderdash, Damon. Kids don't coddle their parents. Just

leave me be and I'll get better. I just need you and Anne and the kids to stop fussing over me. You'll see."

That had been three days before his heart gave out. Damon had been angry with himself for not insisting more and it took several years for him to forgive himself.

Now, Tom was about to rub salt and lemon juice in that particular emotional wound in his effort to convince his father to slow down.

When he began with, "You're not going to like me very much for mentioning Grandpa George's last few days, but..." and that was about all it took.

Damon went from angry and defensive to contrite and agreeing in about five seconds. He was a brilliant man who knew immediately when he was licked.

"Fine. What am I supposed to do for two or three days? And, please do not tell me it will be any longer than that."

"Doc tells me he wants to ship you off to Boston to have a couple head shots and a bunch of blood and reaction tests run. If we send you down late today you will be there until Friday and then home for a quiet weekend. At home. Not here. Home. Get it?"

His father held up his hands in surrender. "Okay. Your mother could probably do with a break from me anyway. Take me to the airplane and get me to Boston before I come to my senses and change my mind."

Doc accompanied Damon and Anne to Boston at three that afternoon with Bud at the controls of Tom's Toad.

When they returned it was about six but Tom was still in the big office.

"Your father is in very good hands, Tom," Doc said. "Two of the most eminent physicians at Boston General, their Chief of Neurology and Chief of Oncology, will be working directly with Damon on this."

This was surprising news. "How did you manage that?" the young inventor asked.

"Well, let's just say that words like 'cap' and 'feather' were mentioned along with bragging rights once this is released for public knowledge. They both jumped at the chance."

Those days did a few things, all of them seemingly helpful.

For Anne, it gave her three nights of rest. She even gave in and took the sleeping pills Doc had prescribed on the first two nights. It was a body and mind recharge she had desperately needed.

For Damon he came back with some additional test results only

possible given the newer and higher-level scanning equipment that was available in Boston. The most notable was Doc now had a two hundred layer scan of the entire area of his brain where the tumor was and where it would grow into. It showed the major blood vessel, the left middle cerebral artery, was totally clear of any plaque or clots; only the growing tumor was starting to block blood flow.

That scan also provided Tom with a detailed and very complex look into the circulatory system of the human brain. The number of vessels large and small was staggering.

More importantly, Doc received a written evaluation that included suggested use of a blood thinner in conjunction with aspirin.

If made him smile. It wasn't that often a small town physician found him or herself ahead of the big city experts.

The new medicines had been started in Boston and were continued in Shopton. The immediate effect was that Damon now felt constantly light-headed and had to be careful to not stand too quickly. But, his headaches diminished. They did not vanish completely, but he had judged them to be about a six on a one-to-ten scale before and they were down to a two within five days.

And, he was, to Anne's relief, able to get to sleep most nights more easily than he had in two months.

On Monday Tom entered the office to find his father sitting at his desk with a smile on his face.

"Good morning, Tom."

"Morning, Dad, Why the happy face? Did you get some better medicines in Boston?"

"Not yet, but possible in a week or a month if they can get me into a drug trial. No, what I am smiling about is something I spotted at the hospital."

He explained that the magnetic resonance imager they used on him was a brand new type.

"You've been in one before so I am sure you remember the great racket they make." Tom nodded. "Well, this one was practically silent. I didn't even have to wear earplugs. But, the thing that has me smiling is what I saw sitting next to it. They had a Durastress tank full of liquid helium from our own wells. Right on the side, 'A Swift Product from Helium City.' Made me kind of proud. It turns out the purity of our liquid helium allows them to pump it through under lower pressure and that transfers less sound. Couple that with a better insulation and you have a

machine you could sit next to and read without being annoyed.”

“That’s nice, but tell me about this drug trial,” Tom urged him.

“Fine. It appears that a pituitary tumor drug, one that cuts hormone production, might be effective in the short run to slow down the ‘build more cells’ signals in the tumor. They are cautiously optimistic and if I am approved Doc should get a shipment of the experimental drugs in a few weeks or so. It could give us all a few more months of leeway to get your brain op snake right.”

Tom held up his right hand showing that he had his fingers crossed.

Bashalli was startled out of her thoughts when her desk phone rang. Seeing it was her private line, she smiled and eagerly picked up the receiver.

“Hello, oh wonderful man I love!” she cheerfully said into it.

There was a second of silence followed by a chuckle and a voice she recognized but had not expected.

“Hello, Bashalli. While it is nice to be greeted like that I will assume you were expecting, perhaps, the younger of the Swift men and not me.”

“Hello, Father Swift. No, I usually only have calls from Tom on this line, but it is nice to hear your voice,” she replied trying to sound less worried than she suddenly was.

“Did I catch you at a bad time?” he asked. “And, I thought the idea was you were going to be working from home during your transition to unemployment.”

“No. Not at all. I was just sitting here trying to come up with a little tag line for an advertisement I am preparing for one of our customers. It is not easy to find exciting words for a funeral home.” She sighed. “As for the transition, I am still here one full day a week while they search for my replacement. I believe it will be only a few more weeks.”

He chuckled again and the sound made her feel more relaxed. “The reason I called is you enlist your help with a little something.” He outlined a problem he was beginning to see in Tom and asked for her assistance in trying something.

“Can you just sort of turn off his alarm clock a few mornings? Nothing too obvious, or so I hope, but enough times over a few weeks to give him a little extra sleep time?”

She promised him she would do it that very night.



Months later Tom would not be able to recall how he managed to sleep in at least once every week or so. She would smile and tell him he probably had not set the alarm subconsciously because he knew he needed an extra hour or two, and he always shrugged and accepted that reasoning.

Doc called Tom the next day to ask him over to the Dispensary for a chat.

“There are a couple reasons I wanted you here, Tom, the first is to see how your blood pressure is doing what with everything going on and whether you’ve had any of your stress headaches.” As he rose and placed the cuff around Tom’s upper arm, the inventor admitted to a few morning throbs.

“It usually goes away with an aspirin or two. And before you ask, no, I have not refilled that blood pressure medicine you gave me a month or more ago. I feel fine.”

Doc shook his head. “At a pressure of one-forty-two over ninety-five, your pressure is too high. It is not dangerous right now, but it is almost certainly what is causing your head to hurt. You go back on the medication immediately or I’ll pull your pilot’s certification. How’s that for a threat?”

“Pretty effective, I’d say,” the young inventor glumly admitted. “Okay, so does the Enterprises’ pharmacy have the pills?”

Doc went to his desk and pulled out an orange plastic pill vial. “Just happen to have them right here. Knew you were going to answer my call and figured you were going to have the high pressure. These are a new type with a pair of meds in one pill. Pretty effective from what I read, so I need you to keep up with them for a couple months before I recheck you. Oh, and stop the aspirin for now, please. But, speaking of aspirin, I have a little news for you on that front.”

Tom pulled out one of his new pills, took the offered cup of water and swallowed it.

“What is it?” he asked placing the rest of the vial in his pants pocket.

Doc returned to his desk and sat down. After picking up a folder he pulled a two-page report from it and slid it across to Tom.

“That, in case you care to read it, is a new finding by a rather well known research hospital in Maryland regarding aspirin therapy and certain types of tumors. Before I discuss that, I need to tell you we have every indication that the one thing I feared, this being the sort of brain tumor that comes from the spread of

another cancer somewhere in the body, is off the table. It tumor is totally on its own, which is, in one sense, very good. But that means we can't try anything another cancer might respond to.

"Now, to the type it is and that report. I won't bore you with the long name, it begins with 'Oligo' and is a lot longer than that, and this is type three, the malignant sort, but it keeps itself contained. As we know its growth will cut off the blood vessel it seems nestled in and that has to be halted. That report," he said pointing at the pages in Tom's hands, "covers the use of blood thinners to maintain easier flow past the growing blockage as well as daily aspirin to slow the growth."

Tom leaned forward, excitement showing on his face. "That's great, right?"

"That is fair to good and certainly is encouraging news, but it is anything but great. The combination thinner and aspirin will make it harder for blood to clot if Damon cuts himself, and if he is injured internally, he could bleed seriously and even fatally. He will have to take things nice and easy until about two weeks before any time we might need to take drastic measures and go try to cut the tumor out. The washout period for the drug is about twelve days meaning it will still be affecting his blood for that long."

"What about the possible drug trail dad mentioned?"

"It is a long shot to get him in and then he still might only get a placebo. I'd rather not risk that. It's best to start this now and deal with that if and when we get to it."

They discussed a few more small details before the medico added, "Your dad is going to need to stop his daily exercise program. No more running, no weights and even at home, he must take the stairs slowly from now on."

"So, in order to slow down the tumor, dad also has to slow down?"

Doc nodded.

"Well, that's not going to be easy on anyone!"

"I believe you will find he is getting a little tired these days and may even take to the slower life style without much fuss. Encourage him without nagging is the goal. The trick is going to be getting him back into exercise mode once we cure him."

Before Tom left the office, Doc took his blood pressure one more time. As he suspected the excitement over what simple aspirin might do had raised it a little, but it was not dangerous to the young man. It was the *later in life* issues Doc hoped he could avoid.

## CHAPTER 9 /

### LAUNCHING A WILD IDEA

FOR MOST of his first week home, Damon had troubles with his 'go slow' life. He grumbled and groaned about it, but knew deep inside it was necessary.

The light-headed results of the drugs and aspirin leveled off within three days and with that came a renewed energy.

"It's like I was in a little fog and it cleared and the sun came out," he declared to his wife at dinner a few evenings later.

"That is the blood thinners, dear. The increased flow is bringing more oxygen to your brain and you are thinking back at your old speed. Just don't get any wild ideas."

After a moment, he asked, "So, my loving wife, and Doctorate holder in many fields of Biology, why are blood thinners not prescribed regularly to the elderly who have symptoms of dementia? Wouldn't it make them think more clearly?"

Anne set her fork back on her plate. "I think the side effects, the same ones Greg Simpson told you about with bleeding issues, and even terrible bruising, could put the elderly at more risk. Picture how many of them have falls as it is, and then add into any injuries they sustain the internal and external bleeding problems and I believe you have a lot more deaths than people you help. But, it is one thing researchers might look into. I might even bring up the question at that medical symposium you talked me into agreeing to speak at next month."

Damon was still thinking about it when he and Tom had coffee—or in his case decaffeinated coffee now that stimulants were off his menu—together in the large office the next day.

Tom mentioned some of his conversation with Doc, the part regarding the potential need to go in at some point to remove the tumor and take whatever chances there were.

"Yes, you and I have talked about it and Greg has mentioned that and I have told him if there is a chance that I can come out of such an operation with my mind intact, even if, oh say, I have to roll around in a wheelchair for the remainder of my days, I am coming to the opinion favoring getting it over with sooner rather than later. I am not at that point, yet."

"I'm hoping some inspiration will hit me before that," Tom said. "Doc did tell me if I could make a steerable tiny tube to go in

there without disturbing the blood vessel or any part of the brain other than the tumor, and find some way for it to snip bits of the tumor off, then suction them out, he could see convincing a really good neurosurgeon into taking a month or so away from their practice to learn how to operate that way.”

Damon looked at his son through slightly narrowed eyes. “Not close so far?”

The younger man shook his head and sadly replied, “Not at all. The problem is the tube needs to be about as small as a thin-gauge needle, be hollow enough inside to carry away more than a cell or two at a time, and flexible enough to be snaked in and around. Then, everything behind the head of the thing must wait until it reaches a point where the head does a maneuver and then mimic that, but not earlier or later so nothing drags along the inside of the vessel.”

Damon reached over and placed his hand on Tom’s right knee. “I have confidence, Son. Right now the terrible thing is I have so much to wrap up... in case the worst happens, that I can’t be of much use to you other than a sounding board. But, feel free and any time, day or night. Except at night when your mother will answer the phone and tell you there is no way she’s going to wake me up.” He grinned at Tom who returned it.

By afternoon Tom was feeling dismal again. Nothing he could think of or any research he could manage to locate showed any progress had been made in nanotubes other than those which were stiff and straight. Even then, molecules such as alcohol or water could be passed through them with relative ease, but something as big as a bundle of tumor cells, even just a fractional piece of the overall growth, would be difficult without applying a great amount of suction. Perhaps far too much to be safe.

He toyed with the idea of making the end of the tube razor sharp and continually stabbing it into the tumor, giving it a small twist to break the cells away, and then sucking it out in a continuous operation almost like liposuctioning fat from a person’s belly or sides, but had to give that up. Briefly he considered a rotating auger to bore into the tumor like a sewer roter but that, too, had to be dismissed.

Bud found him sitting up in the empty control room atop the Administration building.

“Thought you’d be up here. I tried your TeleVoc and there was no answer, so I reasoned, where would Tom be that has a blocker circuit?” He pointed to the floor as he took a seat opposite Tom. “Here!”

“Yeah, I’ve been here an hour trying to get over the feeling I’m letting dad down.”

He told the flyer about his latest research dead ends and even his concept of a tumor rooter.

“Well, it’s too bad you can’t put people under some sort of beam and miniaturize them like in that movie. All except for them having a bad guy on board and that whole suddenly running out of time and starting to grow again stuff. The girl in the tight-fitting wetsuit would be nice, though.”

Tom thought to explain how it wasn’t possible but could see his friend was only trying to lighten the mood. He knew it was an impossibility.

Bud’s face went serious a minute later. “It is too bad there is not way to build something already that small. Sort of a self-contained machine that can bite off bits of the cells, pack them away in some sort of tank and then come back out with it all.”

Tom sighed. “Yes, if only.”

The two best friends sat in silence, each cocooned in his own thoughts, for nearly an hour before Bud tapped Tom on the arm. “I need to go now, but you have to let me know if I can do anything other than give you foolish ideas.”

With a nod, Tom made that promise and Bud disappeared down the stairs.

Tom remained behind going back over Bud’s words. *Something to bite off bits of the tumor cells, pack them away and get them out.* He started picturing a minute set of train tracks running into his father’s neck and from there into a vein and up to the site of the tumor where a very tiny arm with pinchers on it was chomping away at a lump of gray cells, swinging around and dropping their the deadly cargo into a hopper that soon backed out on a side railing to be replaced by an empty hopper car.

Knowing he was now thinking in the realm of foolishness, Tom stood up and headed down the stairs. On the way down the hall a tall figure came out a door. It was Jackson Rimmer, Chief Counsel for Enterprises.

“Ah, Tom. I need to talk to you a moment. Nothing you can’t already imagine, but a few i’s to dot and t’s to cross.”

Inside his office he slid a short stack of papers across the desk.

“Those,” he explained, “are the company ownership documents. Both your father and mother wanted me to have you sign an Emergency Transfer Action addendum allowing us to temporarily pass full management and ownership directly to you

without dissolution of the company and all the paperwork to reassign it back to the various members of your family, not to mention the amount of unnecessary taxes that would mean paying. This simply puts your name on everything so there is nothing to do in case... well... in case.”

Tom slid it back to him.

“Dad is going to live and I am going to see to that,” he stated without any hint of uncertainty. “Those will not be necessary because I won’t need to take over.”

His look spoke of defiance but Jackson didn’t take it any way other than the inventor’s positive feelings for his father’s future.

“Okay. Not today, but if your dad tells you to sign them, please come on up. These cover the same things that would happen via his will and the Swift Estate Plan in case of his demise, but handles things with him alive but unable to lead. They’ll need to be witnessed and notarized, but that will take sixty seconds.” He could see Tom’s jaw tightening. “Listen, Tom. We all are pulling for you and Damon and hope it all works out. Medical miracles happen all the time and there is nothing in my mind keeping one of them from happening here. Those papers don’t actually force anything to you, just let you ease into the position without a split second hesitation. It is the same form you will need to sign when your father announces his retirement... and let’s just say that should be a couple decades from now.”

When Tom got down to the office, Trent intercepted him for a moment.

“Your father is in a rather tricky discussion with the government representatives of Brazil. It seems they’ve reached the point where they’re ready to launch their first homegrown rocket since that terrible explosion eight years ago, now with the satellite your father helped build, and they are demanding he be in attendance for the launch. He is, I believe, trying to get them to understand that he cannot and might need to send you.” Trent now looked plaintively at Tom. “If he asks you, you *will* go, won’t you?”

Tom didn’t like the thought but he nodded. “Sure. Can I poke my head in and let him know I’ll cover for him?”

“Yes. In fact just open the door and give him a thumbs up sign. He’ll know we’ve spoken. And, Tom?”

“Yes?”

The secretary looked at him with gratitude written all over his face, “Thank you.”

The young inventor gave him a smile and turned for the door. Opening it, he leaned in and held up a thumb. Damon looked up, saw it and smiled mouthing the word, "Thanks."

"So, Mister Minister, I have just received word that my son, who knows more about spacecraft than I do, stands ready to come down for the launch. Are we agreed that is acceptable?" He listened and then nodded. "Fine. Now please understand this has nothing to do with my feelings for the program, it is purely one of a family matter so pressing that I simply cannot attend. I appreciate your understanding. Goodbye."

Tom stepped into the office letting the door close behind him. "I hear that you are sending me out of town just when I need to be here to work on coming up with a solution to your health." He tried to grin but failed.

"It isn't that I don't want you to be here, Son, but face it. You are working yourself ragged, I have been placed on travel restrictions by Doc Simpson for the duration, and our contract with the AEB, the Brazilian space agency, calls for me to be there for this launch. Thank you for doing this."

"Isn't the launch scheduled for this Saturday? Five days away?"

"It is and they wanted me there the evening before for a banquet. I was to bring my aide de camp, as it were, so I suppose that means you can take Bud with you if you like."

"Probably the only thing that will make this bearable, Dad. So, yes I will go and yes I will ask Bud but only if you call your daughter and tell her his attendance is mandatory. She'll give in to you and not give me grief about 'taking her Bud' away from her."

Everything was set and Tom picked out a small crew of people to take along on the Friday morning trip.

Hank Sterling, Swift Enterprises' Chief pattern maker, Engineer and one of the best pilots they employed other than the team of test pilots like Bud, readily agreed to the trip as did pilots Zimby Cox and Red Jones.

Chow proclaimed himself to be "Rarin' ta go and lookin' forward ta getting down there and pickin' up a bunch o' Brah-zill-ee-an eee-sentials," from their vast array of foods.

The *Sky Queen* was brought to ground level the afternoon before and the portable aircraft washing rig was employed to give her a good cleaning. This was needed about three times each year to remove dirt, bugs and things that settled on her wings and body amounting to over eighty pounds of materials and providing a smooth surface for air to flow over.

The trip was not to be direct as the airspace over the Eastern Caribbean was full of storms. They skirted things by crossing the Gulf of Mexico just to the east of Mobile, Alabama and heading on a mostly southerly course until they reached Costa Rica, Then they were able to turn to a course taking them directly toward the airport at Alcântara, Brazil's space launching facility on the coast.

Because of a history of explosions going back several decades—accidents mostly caused by poor quality materials and lax handling of dangerous fuels—it had been decided that the observation for this launch would be from a point eight miles to the west of the facility situated north of the airport. A viewing building had been constructed on the top of the hills that featured an all Plexiglas front and roof for maximum view-ability by those in attendance.

The dinner held in the small town was a subdued affair given the lack of successes in the past. Launch failures and aborts outnumbered successful flights by a factor of two to one.

Tom and Bud were the only members of their crew allowed to attend the launch, and knowing they would be far away Tom suggested they bring along several pairs of Digital BigEye binoculars.

He and Bud each had one as did the Launch Director, Hector Salvio Ramirez, and the nations' Vice President, Janita Juarez.

"These are amazing visual aids," the Vice President commented as he focused on the launch tower.

"Yes. Without them we couldn't see much, and even with regular binoculars it would just look like a tiny swarm of tiny people and equipment all over the launch pad," Bud stated.

Tom was feeling a grin coming to his lips when Bud's words sunk in.

*"A tiny swarm of tiny people and equipment..."*

He felt a shudder run through his body and he nearly shouted. That was it. That was the secret. Don't try to go into his father's brain with a huge pipe; go in with a tiny swarm of tiny people, or robots, and tiny equipment!

His mind was racing over the possibilities so much that a full hour later he barely noticed the rumbling, vibrations and sight of the rocket as it lifted off, headed up into the air, arced out over the Atlantic Ocean and disappeared into the cloudy sky on a very successful launch.

It was only when the Launch Director vigorously shook his hand and the Vice President let out an excited yell that his



attention came back to the present.

Both young men accepted the thanks and enthusiastic suggestions this was the first of a new era of successes they could all share. It lasted for nearly twenty minutes before the Vice President stated she needed to return to the capital that everyone calmed down.

Having seen how both the important dignitaries had reacted to the Digital BigEyes, Tom made a present of them before he and Bud were returned to the airport.

“We cannot thank you enough, Señor Swift,” the Launch Director told them as they left the limousine. “If you would please inform your father we were saddened to hear he could not be here and hope whatever your family emergency is that it is over and things return to normal for you all. As I stated in the viewing building I believe this signals the start of an ongoing relationship between Brazil and your company. Please tell everyone we will shortly be in communication.”

After the *Sky Queen* rose from the runway and made its turn to the north, Bud asked Tom, “So, what was it that had you not even seeing the launch. And, don’t tell me it was nothing. I’ve seen you off in your own private land of Inventorville before and this was definitely one of those times.”

Chow came forward bringing mugs of hot soup and some sandwiches made from a local cured pork for them before Tom could say anything.

“That was some great shoppin’ we had in old Al-can-terror town, I’ll tell ya. Got perhaps a hundred pounds o’ this pork and a lot more stuff as well. That rocket shore made a noise, didn’t it?”

“It did at that,” Tom told him. “Later, Bud will tell you all about it and maybe even show you the video he took on his BigEyes.”

“Right,” the dark haired flyer said. “Loads of smoke and some nice fiery rocket exhaust and then it sort of leapt into the sky. Come on back in twenty minutes or so once we are on autopilot and I’ll show you.”

“Thanks, Buddy Boy. I’ll do jest that!” With that, Chow turned and headed back down the corridor.

Bud turned back to Tom. “So, go on,” he urged.

“Well, it might come to nothing, but you said something back there that got me thinking along a new line for dad’s tumor operation.”

Bud’s forehead scrunched up as he tried to think what he might have said. He knew he sometimes made an offhand remark that

keyed into some deep thought processes in Tom's brain. Many had led to advances and successes. This time, he could think of nothing very wise or smart, so he asked what it had been.

"When you were looking at the launch team down at the pad through the BigEyes you said they looked like a swarm of tiny people and tiny equipment. Remember?"

"Oh, that. Yeah, kind of. Why is that significant?"

"It is significant because it made me think I've wanted to approach dad's problem the wrong way. Doc got me thinking about one method and I wasn't looking much beyond that. Rather than attempting to come up with a steerable tube to go in and suck the tumor out, or a small grinder and suction tube combination, what I should have been working on was a way to get a bunch of tiny people and equipment in there. Or, rather, tiny robotic equipment."

Bud smiled. "You mean like in science fiction stories where someone creates a million nanobots that invade a computer or take over the good guy's left leg and force him to kick other people?"

"Sure, Bud, only no, Bud. Nanobots, yes. Evil intentions, no. And not by the millions and not even as small as those sort of things you've read about. In fact, I need to make these small enough to get in there without problems, but large enough to actually do something."

"Okay, I'm following this, I think, but what will they do?"

Tom paused while he turned them on a more direct course for home and put the giant jet in autopilot. He also buzzed back to the lounge and asked Red and Zimby to come forward to pilot the rest of the flight. Then, he and Bud headed back to have a seat.

"Now, your question about what they will do is a very good one and I can only answer that in a general sort of way. But, basically they will work their way in under their own power, nibble away at the tumor and digest or destroy or carry away all of the bad cells until the entire thing is gone."

It required more than ten minutes for Bud to digest this information and come up with what he hoped wasn't a dumb question.

"Do you believe something like a tiny army of nibblers can get everything and not take stuff they aren't supposed to? Even then, and I'll assume your answer is, 'Yes, Bud, I do believe that,' what happens to the nanobots once they are finished? Do they march back and come out or do they just let loose and drift through the

body until they get filtered out of the blood and eliminated?”

It was Tom’s turn to ponder for a few minutes. He started to answer once but stopped, thought a moment more and then opened his mouth.

“First, yes I do or at least hope they can get everything. I think as long as tumor tissue looks different than the good tissue and cells we can grab it all. But getting them out? Hmmm? They are probably going to be too big to just let float through the system. At some point the body would see them as invaders and try to get rid of them with a lot of white blood cells as if they were an infection. Not good.”

“But they couldn’t because the nanobots would not be organic so they would just attack and attack and attack?”

“Yes,” Tom replied ominously, “and who knows what that might do to the rest of dad’s body. No, Bud, if I find a way to build them I’ll have to find a way to get them back out or they could cause more trouble than they fix!”



## CHAPTER 10 /

### OH, MY GOODNESS... IT'S YOU!

TOM KNEW that the available manufacturing equipment at Enterprises and the Construction Company were scaled for large items. Even the smallest of electronics would be gargantuan to his requirements. It worried him to think that the very robotic operating equipment he had conceived would never be able to hold the proper electronics to perform anything other than the simplest of maneuvers and work.

He and his father met in their shared office one afternoon to discuss his plans.

“Do you believe that micro-technology is going to allow you to create operating robots that will do what the neurosurgeons claim to be impossible?”

Tom nodded. “Yes, I do. You see, every one of them claims they do not have the ability or the tools to do such an operation. But, not a single one of them can state with total certainty that the operation is impossible. Just that it is mostly a matter of timing. ‘It is too early for technology to give us what we need,’ is the general explanation.”

“Okay. Let us suppose you can find the right equipment to help you build these tiny operating robots. It’s going to have to be incredibly small, you know.” Tom nodded. “Fine, so you build mini-bots and then what? How do you ever think you will convince the medical community to let you train a neurosurgeon in the techniques of operating using an unproven and unapproved medical device? Did you plan to bring someone in for a six-month course and use up a lot of small animals? You know I could never agree to that, don’t you?”

“Yes, I do and I agree with you. What I’m hoping to do is convince Doc that he is the logical operator and that between us and the available information in the medical community we can come up with what you called the mini-bot that can mostly work on its own.”

Damon shook his head. “Physically impossible to build that small and work in some sort of intelligence. I’m afraid you have to be practical, Son, and go for something small yet remotely controlled by a skilled operator. In fact, even my aged and addled mind can foresee the need for several different bots. First there is the video bot, then the cutter bot and then one or more carrier

bots to take away the bad tissue. Even a medicine bot to set a chemo-charge there to get any residual bad tumor tissue.”

He shook his head.

“I’m impressed with you as a son, as a man, and as an inventor, but you may need to face up to this one being beyond all possibility. This isn’t Asimov’s *Fantastic Voyage*, you know!”

Tom nodded, but had to correct his father. “Asimov didn’t write it, Dad. He did the novel after the movie. Based on the screenplay.”

Damon looked at his son. “With you taking an attitude of correcting everything that isn’t exactly right, I guess I have to revise my assertion that this *might* be impossible. With you at the helm this might be nearly possible. You do hear that I said *nearly*, don’t you?” Tom nodded again. “Fine. Only I want you to have a poster of that made and hung on your walls. Let it be your daily mantra. It may be possible but there is always a chance it won’t work.”

With the impossibility of creating a machine to miniaturize full-size things, Tom began researching his other options. Building miniature robots was, he already knew, not something he could do in house. But, what if there was a way to build a miniature factory?

Even, he considered, build a small-scale factory that could build an even smaller one to build an even smaller one to build the final product.

It was a fascinating concept.

It was a concept he ran past several department heads the next morning in a meeting.

“Well, Tom, I can see the first downsizing working, but can you find materials to go even smaller? Polymers are still fairly thick chains of molecules.”

The young inventor had to agree, but proposed one possibility: “Graphene.”

That got the attention of everyone.

Strong even in single molecule layers, it had been used in numerous applications, even in building the world’s smallest electric motor just a few molecules wide. While that was small enough to possibly operate the robots, it still left the rest of the workings in limbo.

“Your final stage of build might need to be under an electron microscope, you know?” one of the people stated. “And, as much

nifty stuff as we have here at Enterprises, we do not have one of those.”

Tom smiled. “Ah, but I happen to know a woman who sometimes works for the FBI who knows the people who replaced the original electron microscope in her facility with a more advanced one a few years ago. I believe she might be able to get that old relic out of storage and here if I ask her nicely.”

Everyone smiled. They knew Tom’s mother, Anne, had secretly worked as a molecular biologist for that agency for nearly two decades. Now that her work was declassified, mostly, if anybody could arrange for a delivery of the older equipment, she might be that person.

The meeting broke up with several of them tasked with the research of any available manufacturing equipment, or even a company that could be paid to do the work, for manufacturing every-decreasing-sized equipment necessary to develop micro, or nano, robots.

Days passed and then two weeks before Anne was able to tell him the old electron microscope had, regrettably, been taken apart several years earlier.

“However, the good news is I’ve talked our new chief agent, the replacement for Quimby Narz who has taken a year of leave to take care of a health issue. She tells me that the agency is open for a straight trade. She will authorize the microscope be on loan to Swift Enterprises for a period of six to eight months in return for five SimpsonScopes, one for each of their facilities. I hear that after the initial orders were fulfilled your father agreed to halt production until more orders backed up a little. I am asking... your mother is begging you to get Jake Aturian back into building those and the first five go to the FBI.”

Tom agreed and made a call.

“Why, sure. Anything for Damon. So sorry about his condition, Tom, so anything we can do over here, just ask. I believe we can get those first five cranked out in about a week using a lot of spare parts we did make in case of any breakage in the field. In fact, let me call you back in an hour with a good time estimate.”

When it came, it was fantastic news. Not only were there ample spare parts, there were three complete units in storage.

“Tell me where those go and I’ll get them out tomorrow!”

And, when Anne contacted her FBI manager, the woman was floored.

“Golly! I thought we’d be in for months of waiting, Anne.

Listen. I have a proposition. We have a brand new scanning EM coming into the DC head office day after tomorrow. I just checked. I can have that rerouted to your husband's company right now and have it there in that same time. I don't know what the use is, but the DC folks just sort of had the budget and ordered it to sit around until they could figure what to do with it. This, as the saying goes, is *it*."

That taken care of, Tom met again with the department heads. One by one they detailed the few companies they had located who might have something to offer. One of them, out in Wyoming, came up on all but one list.

It was still before eight in the morning in the Mountain Time Zone, so Tom waited until noon his time to make the call.

Five minutes on hold and he was about to give up when a very pleasant female voice came on.

"Hello? Is this Tom Swift of Swift Enterprises?" she inquired.

"Yes, it is. With whom am I speaking?"

"Oh, somebody who understands proper grammar. I like it. My name is Phyllis Clarke. I am the Industrial Sales Rep for ALShoCorp. I would love to send you brochures on any of our products and also would love to invite you to come see our plant any time of your choosing. I have to tell you that having a potential client like Swift Enterprises would be so wonderful that I could come out to see you if that works."

"Well, Miss Clarke—"

"Sorry to interrupt, but is it Mrs., not Miss."

"Oh, well then Mrs. Clarke, I believe I would like to come see you at your earliest convenience. I want to take a good look at what you are making and see your facilities for building one product in particular, your ASC-2900 SubManufacturing Plant."

"Ah, well as it happens I am free tomorrow, that being Thursday, and all day Friday, but I am out of the office in Europe most of next week."

They agreed Tom would fly out the following morning and she would have one of their ASC-2900s ready for a demonstration.

"Good. I'll arrange to rent a car and see you around your noontime."

"Nonsense. I'll have the corporate limo pick you up. When you radio in, tell the flight controller you need to park in front of 'long hangar.' That is, by coincidence, their one and only long hangar. They'll know where to direct you. Then, have them call me."



The trip to Wyoming provided Tom with more than a few chances to sight see out the side of the Toad's cockpit. Stretching below him were Great Lakes and one thing making him laugh: his Transcontinental BulleTrain was making an east to west passage. He toyed with the idea of reducing speed to pace the train and dropping down for a greeting to the locomotive drivers, but his appointment at the potential new supplier was approaching so he poured on a little more speed making it to four hundred fifty knots and quickly was five minutes ahead of his schedule.

A very fancy limo was waiting to take him to the company and his meeting with the woman he's spoken to on the phone.

"Any questions about our fair city?" the driver inquired as they reached the highway.

Tom thought about it. "Not really. Casper, Wyoming, population about sixty-three thousand at the last official census. Sits on the North Platte River. Has been an oil boom town, a banking center and even hosted some of the uranium craze of the nineteen fifties. Now home to several large manufacturing companies including the one we are heading for." Seeing the eyes of his driver in the rear view mirror, he added with a grin, "I read up on it before heading out this morning."

They drove to the southeast along a highway listed as Wyoming Route 20.

"Okay, I do have a question for you," Tom finally said as they reached the community of Mills. "I understand about keeping airports away from the places people want to live, but isn't yours a bit far out?"

The driver laughed. "Yeah. And since the company is on the opposite side of town it's a real pain, but a lot of years ago the plan was to expand the city out that direction. Didn't work out like that so we ended up with an airport twenty miles away from anywhere. Oh, and we'll be hopping from this highway over to the freeway at the next intersection. From there it's just another five minutes."

They arrived at the front gate, more a kiosk with a pair of bored-looking men in "rent-a-security man" uniforms. The one who rose as they approached waived them through.

AlShoCorp was a collection of five medium-sized buildings on the east side of town, and more in a community called Evansville than in Casper. As they headed for the Administration and Sales building his driver suggested a nice place for dinner should the inventor be staying in town that evening.

Tom got out, thanking the man both for the pleasant drive and the restaurant idea. As he turned to the building the front doors opened and a rather beautiful raven-haired woman about his age came out. She had a very nice smile on her face and when she got close she greeted him.

“Hello, Tom. Long time no see.” She reached out wrapping her arms around him giving him a small kiss on his right cheek.

When she stood back and saw his confusion and embarrassment, she laughed.

“You don’t remember me, do you?”

Tom shook his head. “No. Sorry, Mrs. Clarke. I’m afraid that I don’t.”

She laughed again and turned back to the building. “Well, let’s go inside and I’ll tell you why you ought to, but won’t hold it against you if you don’t. Our lives intersected only briefly and that was about half a lifetime away.”

Inside, they headed for an elevator and took it to the top, or third, floor of the building. Down the hall to their right she stopped and opened a door for him.

“Welcome to the nicest office in the company.”

He looked around as she came in behind him. It was a beautifully appointed and professional room. She indicated a trio of comfortable chairs to the right of what must be her desk. They sat down.

“Now, before we get into anything remotely like business, let me fully introduce myself. When we spoke on the phone yesterday I said my name is Phyllis Clarke. Or, it is, by the way, but when I knew you it was under my maiden name, *Newton*.” She stopped to watch his face.

It hit him like a ton of bricks. His face went from curiosity to shock to pleasure in the course of about two seconds.

“Oh my goodness, it’s you! Phyllis Newton. Oh, wow. Sandy is going to hate me for not suggesting she come out. You two were the best of friends back when you were... umm, was it about the time you turned fourteen you moved?”

“Shortly after my birthday,” she replied, smiling sweetly at him. “Please, Tom, call me Phyl. Oh, and Sandy and I keep up a little, so I know that you are married, have a young boy named after your famous grandfather several times removed, and are deliriously happy. I hope that is right. I know I am.”

They spent a half hour just catching up and laughing over how

much she had changed over the years.

“You used to tell people I was all wet. Remember that?”

His face turning red, he nodded. “Yes. Thanks for reminding me what a jerk I was back then.”

She shook her head causing her should-length hair to swing around her face. “No. You were right. I was all wet and a miss priss and a far more concerned with my appearance and clothes that I was with anything else. Do you remember that final dance at the Shopton Yacht Club? The one where you arrived just before the last number? We danced and it was a slow one. You probably felt my heart slamming against my chest.”

He smiled at the memory. “I do. In fact I remember that you gave me a nice kiss on—” He stopped for a moment, touching his right cheek with his fingers. “You kissed me on the right cheek just like you did outside. Oh, man, Phyllis. It’s all coming back to me. And, I have a little confession to make. I might have thought that you were a little, umm, different, but I discovered a few weeks after you left that I kind of liked you. That was my very first kiss from a girl, even if it wasn’t on the lips.”

“Mine, too,” she told him, “kissing a boy. Now, before we look into each other’s eyes and realize we both made a horrible mistake and end up driving off into the sunset, I think we need to get to the reason you came all the way out here.”

Her company turned out to be the perfect source for the micro-manufacturing equipment he needed. In fact they had a new line coming in about a year that would be constructed by the already downsized “MicroMax” line of equipment. It would come too late but the inventor knew he could take the current equipment—capable of reducing the building process by a factor of nearly one thousand—and create what he needed.

“I think I can make your equipment go even smaller than you have it rated,” he told her.

“Can I ask, and I only do because of our history, what it is you hope to make that is very small?”

He told her about this father’s brain tumor.

She was horrified about his condition and told Tom she would expedite any changed he needed.

“Actually, Phyl,” he said using the short version of her name as she had suggested earlier, “what I need to do is take your equipment and build something else so that I can eventually create a series of nanobots. In the end I need to come up with robots that can operate inside the small blood vessels of the brain

without doing any collateral damage.”

“How small?”

“Small enough that if you placed them next to a grain of short white rice it would take ten of them stacked one atop the others to reach up to the top.”

She sat back, stunned at the very thought. “Can you do that with our equipment?”

“If everything you have told me and everything your brochures and website say are absolutely correct and not hot air and market-speak, then I believe yes.”

The rest of the afternoon was spent touring their facility and talking with a few of their technicians. One change Tom felt he would need to make was discussed and they promised to implement it before the manufacturing line was boxed up and shipped to Shopton in the following weeks. It had to do with the use of graphene.

“Not one of our usual materials,” the Engineer had said, “but not impossible. So, plan on it.”

Things wrapped up about six and Phyllis suggested they go have dinner and then Tom could come stay the night with her and her husband, Jeremy.

He called Bashalli and told her what was happening. She laughed after hearing about Phyllis. “Well, of course I know about her. Sandy told me you would run into her. I think it is very nice of her and her husband to put you up for the night. I will not feel bad about having you sitting in a cold and dull motel room.”

Dinner, picked up by Jeremy after a phone call from Phyllis, was Wyoming-style barbecue'd beef brisket and pork ribs. The conversation was mostly about what Phyllis was like as a teen and Tom paid her compliments but admitted he was a little too busy with his new work responsibilities than girls at the time to notice a lot.

“Well, Tom. Then I thank you for not taking her. When we first met in our senior year of high school she was still a little hung up over the fact she'd danced with and kissed the famous Tom Swift!” He smiled to show there were no bad feelings.

The next morning she drove Tom to the airport. There, she scooted around a small barrier and into the area where he had parked his Toad. He gave her a quick tour of the jet which impressed her so much she asked for the name of the Sales Director at Enterprises suggesting her company was in the market for a small corporate jet and the current lot were either too

cramped or too expensive.

He offered her a short ride but she had to beg off for an upcoming conference call.

Before she left she stepped up to him and looked into his eyes. "I want to tell you that it has been a distinct pleasure getting to re-know you, Tom Swift. And, I would love to come out to see you and Sandy and your wife, who sounds lovely, and your son someday soon. And, I want to see your father. Before you try to use anything you build to operate on him if possible. I also want to do one other thing, and please do not read anything into this other than calling it unfinished business."

She took his face in her hands and gave him a soft, yet mostly chaste kiss on the lips.

Nodding as she drew back from him, Phyllis grinned. "Thought so. I really should have been less a prude way back when. Well," she sighed, "I'll be seeing you, Tom!"

With that, she returned to her car and drove away leaving him slightly light headed with a grin on his face.



## CHAPTER 11 /

### PLANS TO REBUILD THE BUILDER

NOTHING available from Phyllis' company was off-the-shelf and just ready to ship. It was going to take nearly a month for the machinery to be constructed so that it could build what Tom wanted.

The problem was going to be that what he wanted, and what they could deliver, was not the same thing. Certainly, once it had been properly outfitted and configured, the "Manufacturing Unit In a Box" could build small robots. It could even build them as small as about a half inch in total height. That was tiny by just about anybody's standards. The level of fine parts tooling and assembly was fantastic and even Tom was surprised at how little he had known about their equipment until now.

However—and he hated *however* situations—even one-quarter of an inch in height was about thirty times to tall for his needs.

Doc Simpson had simply shaken his head when he heard about the unit. He believed Tom might be grasping at straws but hoped the young man had "something up his sleeve."

Bud had questioned the logic of making the purchase of the machine, even if it was from an old friend—of sorts.

Damon had questioned the sanity of spending over two million of the company's dollars buying something that could build something to build something else that might kill him rather than heal him if it were injected into his head.

It seemed that everyone in the limited group of people who were informed about Damon's condition questioned Tom's decision to place the order.

Two people who knew about the machinery order, but had yet to be let in on the reason for it, were not questioning Tom's intention at all.

Hank Sterling and Arv Hanson met with him the day before he signed the purchase order. He had all the AlShoCorp information regarding the machine and gave them an hour to review it before he asked one question.

"Can that thing be used to make a small version of itself?"

He left them alone to go back through all the information and even gave them Phyllis' phone number so they could contact her about some specifics of the operation of the unit.

When he came back into the room they looked at him and nodded.

“Yes. As long as we can either take it apart and scan every piece, or get 3D scan files of every piece in there, which we doubt even your friend could arrange, we can have it make each and every small piece necessary to make something on a factor of about one-tenth this size.”

It was all Tom needed and the purchase went through.

That was, however, only the start of the process. Phyllis couldn't provide the individual components specifications, but she did manage to talk her father into releasing a full set of engineering notes and technical drawings, including old-fashioned exploded diagrams, of the unit along with the complete operators/customizers manuals that typically were only available to Government purchasers and then only on a strict need-to-know basis.

“I think you need to know everything about the unit even if you can't share the exact nature of what you plan to do with it, Tom,” she had told him on the phone when he called with the request.

“I can tell you in broad details, Phyl, if you want to know.”

She thought a moment and said, “No, Tom. Old time sake and all that, I trust you. Give my love and good thoughts to your mom and dad and tell Sandy I said I'll come out *someday*, and soon.”

Everything she promised arrived three days later in two medium-sized boxes. The documents were in eleven three-ring binders, each one about three inches thick.

It all went to Hank and Arv for review.

Several days into their study they called in an expert who dropped by for an hour meeting and stayed the entire day with them. Everything she saw in the documentation and even the professionally-produced sales videos they showed to her fascinated her.

She was back with them the next day and the day after that.

However, with the weekend came the reality of her other projects so she made a promise to them.

“Give me ten or twelve days which I understand we all have what with the unit not arriving for at least three more weeks, and I will arrange to be here on a permanent basis until we get the project finished.”

It was great news as she was the one person Tom had told them he might need to pressure a little because her work load was quite



heavy at present, and she was loathe to hand off most work to the people around her. It wasn't that she didn't trust them, it was that she had been raised to believe that once you are given a task you and only you finish it!

Tom and Phyllis spoke about twice a week checking up on small details she needed and on the schedule he needed.

To that she had to tell him about a possible short delay.

"I hate to tell you this but the company that's been supplying us with the interim processing computers, the ones that handle the individual processes rather than the overall running of the unit, have had a setback. I'm sure you saw the news two days ago with the fire they suffered. TerraComp out in North Carolina?"

Tom had seen the news but had no idea they were a supplier for AlShoCorp.

"How bad?" he asked.

He heard her sigh. "Well, I'm trying to work with a couple of our other customers who are in the line ahead of you. One says they can wait an extra week so I can take two processing units from them that have not been installed but the other refuses to even discuss it and has threatened legal action if we miss delivery by even a day. I don't know what to do, Tom. We did sign the contract and we have never missed a delivery before."

While she could not legally tell him who the customer was she did hint at the sort of things they produced and Tom took a wild guess.

"Out of the country?"

"Well, yes."

"Hmmm? Europe or there about?"

"Yes, Tom, but you know I can't—"

"Wales?"

There was silence at the other end.

"Cothi-Terfel?"

"I never told you that!" she stated, but her tone told him he'd hit the nail on the head. That company, manufacturer of miniature historic steam engines that were collected the world over, currently used several technology products from Swift Enterprises.

"Phyllis. Please contact their Managing Director, Daffid Driscoll, and tell him that we have a vital need for our unit to jump the line over theirs. Ask him to call me to work out a deal on

our next shipment of mini turbine pumps in return for them not threatening you over this.”

She called back the following day astounded at the result of her call.

“I was really feeling bad about this, Tom, but Mr. Driscoll heard it was for you folks and assured me his Purchasing people would be told to lay off the threats, and that he didn’t need any extra considerations from your because, and he told me this in confidence, he believes he is stealing those pumps from you folks as it is!”

With things back on schedule he spent time looking through the programming guide that came with all the other documentation.

It was any old computer language and one he was familiar with. He would be able to adapt the three operational programs to do what he wanted to, or at least get a good start on it before the unit arrived. It would only be once set up and running he could test the code and make what he knew would be perhaps a hundred code adjustments.

At six he was sitting in the underground office reading a part of the programming guide once more when he heard the *ding* of the elevator bell. As his eye continued to scan the current paragraph his ears listened for Chow’s boots to come clomping across the floor and the sound of his cart, the one with the wobbly wheel that nobody had ever been able to fix properly.

Bud stated once he believed it *had* been fixed and the cook had missed it so he had most likely run it into something to bend the leg a little again.

Tom stopped reading when he failed to hear Chow, but did hear what sounded like several sets of feet including one or two wearing high heels.

When he looked up it was to see his wife, Bud and Sandy coming in the door. All were dresses casually but nicely.

The flyer looked either guilty or resigned and the ladies determined. In Bud’s right hand was a suit bag.

“Tom,” Bashalli said to him. “We have come to make you go out, just this one evening, and have dinner and take me dancing.” She looked so nervous about interrupting him he got up, came around the desk and gave her a hug.

“How long has it been?” he asked knowing he wasn’t going to get out of the evening.

She whispered, “More than a year.”

“Far too long, brother dear,” Sandy stated. “Give him the bag, Bud and you,” she pointed at her brother, “get in that back room and change. Shower, please, before putting on the nice, clean shirt and slacks we brought.”

An hour later they were in Tom’s Toad flying toward Oswego and one of their favorite restaurants located on the waterfront of the lake. A very private table had been arranged and the foursome had an excellent meal of prime rib and baked potatoes, roasted vegetables and a shared dessert of a slice of eight-inch-tall lemon meringue pie large enough for six or even seven people!

Tom felt tension melting away as he stepped onto the dance floor with his wife and took her in his arms. They remained on the floor until the small combo took a break before headed back to the table.

“The reason we brought you out, Tom,” his sister told him, “was because daddy said it was time for you to tell us what exactly is going on. I mean, we all know—” she stopped as emotion overtook her for a moment. “We all know the score, so please tell us you’ve got something going. He seems to believe so.”

Tom leaned in as did the others and he gave them a brief description of what he had in mind. Without giving the deep details he told them about having a new self-contained manufacturing machine coming that would help him build a small group of specialty robots that he hoped would be capable of performing the delicate operation.

“The crazy thing is that the actual operation is straightforward. Any relatively adept surgeon could perform it except it is nearly impossible to get to the spot without doing some damage. I don’t think Doc and I can handle it alone, and he is in charge of getting some very well qualified neurosurgeons on board with us for the actual procedure, but a lot of the control will need to be by computer.”

“And you can do that in your sleep,” Bashalli declared with the assurance of a wife who has ultimate faith in her husband.

They danced a few more numbers before paying their bill and taking a taxi back to the airport. The Toad sat waiting for them, but Bud noticed a shadowy figure darting away from the back of the plane as they pulled up.

He jumped from the taxi as it slowed to a halt and raced off shouting for the person to stop.

“Pay the driver,” Tom shouted as he sprang from the cab and raced off after his friend.

“You ladies just sit here in the cab. Go ahead and lock those doors back there and we’ll sit here until your men come back. Uhh, should I call the police?”

“No need to,” Sandy told him as she was already dialing her cell phone. Oswego wasn’t a very large city but the airport was a mile or so outside the downtown area and it took the two police cars almost five minutes to arrive.

In the mean time, Bud and Tom chased their prey around the private side of the airport as the man dodged in and around a number of the planes and small private jets parked there. After passing one such jet they halted; the person was no longer to be seen.

Bud made a sign to Tom indicating he believed they had just run past their target and so the each circled back as quietly as possible around that last aircraft.

Tom bent over in time to see a figure spring up from under the fuselage and run the other direction.

There was a yell, a muffled “*oofff*,” and then Bud called out, “Got him!”

Tom ran around and found his friend straddling a black-clad body that was trying to break free, but Bud’s larger and more athletic body had him pinned.

It was about this time the sirens could be heard, so Bud told Tom to go flag them down.

“I’ve got him good, skipper.”

A moment later four strong arms grabbed the runner pulling him upright. A flashlight beam pierced the darkness catching the... well, now they could see it was a teenage girl with very short hair. She blinked and looked defiant.

“What the heck is going on?” Bud asked on seeing the girl’s face.

“That’s what we’d like to hear,” the older of the police officers said. “So, little girl? What were you doing around all these nice airplanes?”

“What was she specifically doing around ours?” Tom asked.

As handcuffs were being applied to her arms she shrugged. “Didn’t do anything. Just looking.”

“Yeah... right!” another officer told her. “Now, tell us what you were up to.”

Another shrug. “I was just looking in that plane. I saw it fly in

earlier as it came over my house and was curious. It's different. There's no law against being curious, is there?" She was getting belligerent and Tom realized this probably *was* a case of simply curiosity that got out of hand.

"What's your name?" he asked in a quiet, calm tone.

"Molly. Molly VanCamp. You go look and tell 'em. I didn't touch anything. Well, okay, I touched the plane but just to see how it felt. Please?"

"Officers? If you could *gently* escort our young friend here back to my plane I think we can take care of this."

With a few grumbles—Oswego police didn't have a lot of exciting things happen on a regular basis and were looking forward to an interrogation and arrest—they walked her back to the Toad.

Sandy and Bashali were standing there having paid and dismissed the taxi.

"It's a girl!" Sandy stated seeing the prisoner.

While Tom and Bud inspected the jet the ladies tried to calm the girl and the police officers.

"Nothing appears to be fiddled with, officers," Tom stated. "Do your folks know you came over here, Molly?"

She now looked worried. "No. Oh, please don't call my dad. He'll go crazy. I'm already grounded. Please?"

The young officer who had taken her identification came back from his car. "She's who she says, sergeant. Seventeen with no record other than one previous report of her prowling around this airport. Last summer."

The older man looked at Tom. "Do you want to press any charges?"

"No. Let her go." He turned to the girl. "Molly? If you are so curious about planes, why don't you try to get a summer job once school is over here at the airport? Most airports hire one or two teens each year to fuel planes, check tires and such. Sometimes you even can pick up extra money washing planes for people. I think the going rate is around twenty dollars for a small plane and thirty for a small jet. Better to be here legally and making money than in trouble. Right?"

The cuffs were now off and she chaffed her wrists. "Yeah, I guess so. Thanks, mister. Uhh, do I know you?"

He shook his head. "Probably not unless you've seen me in the papers or on television. My name is Tom Swift."

Molly's eyes went very wide as the name sank in. "Oh, golly," she moaned. "I never thought I'd... I mean I didn't know you were... oh, golly..."

Sandy put an arm around the girl's shoulders. "I think we might ask these nice officers to drop you off to your house tonight, and tomorrow I'll call the airport manager and ask him to get you a job application. Oh, and I'm Tom's sister, Sandy Swift Barclay. I think they can put your energy to good use working here rather than running away from my husband and brother."

"That was a very nice thing for you to offer, Sandy," Bashalli told her as the Toad headed back to Shopton.

"I don't know why, but young, blond, excited about airplanes and actually kind of cute once she smiled. Reminded me of someone. Not sure who."

"Look in a mirror when we get home," Bud told her.

"Oh, yeah." Sandy replied.

The evening seemed to revive Tom so the next morning he dug into his programming with a lot of renewed energy. By the time the equipment delivery was announced he believed he had nearly everything attended to.

A Swift cargo jet was sent to Wyoming to bring back the five shipping crates and the two-man assembly team.

It was agreed to set everything up in the large workroom Arv called home, and a place had been cleared nearly three times the size required.

The two technicians were eager and got right into the process of unpacking and checking everything. It all seemed to be in good order so they started to put the machine together. It was a process that took the rest of the day but they ended up with a rectangular device some eleven feet tall, eighteen feet long and six feet wide. The operator's station was located near the end of the assembly line where finished goods or even just parts would eventually exit.

"We have a program to do a test build, Mr. Swift," the first tech told him. "The machine comes with copper, aluminum, and two kinds of plastics but it can take just about any material that can be melted at up to eleven hundred degrees. Oh, and I was told to tell you the, umm, graphene stuff works as well. They added a laser module to heat that. We bring out aluminum and a UVC impervious PVC plastic. The test uses them both. Can we get started?"

"Well, first tell me how long it takes. I have about ten people who are itching to see this in action, but if it is going to be a ten-

hour process I'll wait a little.”

The tech laughed. “No sir. It will take three hours in total so...” he looked at his watch, “well they can either come over at seven or we can put this off until the morning. Is there someplace we can stay close by?”

Tom told them they would be taken up to a guest house for the evening.

“So, does it shut off on its own at the end or does it need to be attended to at all times it is running?”

“It's pretty much a press START, check the computer readouts to see everything is going right, and walk away. It shuts off on its own, but we like to be here for the entire first test. We can do another run of the same thing in the morning for the others if you like.”

It was agreed to do the first test now and a second one starting by about eight so everyone could gather at ten forty-five to see the end result.

The test went as smoothly as the techs said it should and they were driven up the hill for the night.

The next day Tom called the people who needed to come see the unit, including his father, Doc, Hank, and a few others. Arv, being in his space, was already there.

They all arrived half an hour early in their excitement to see the new machine.

The technicians gave a thorough description of the process including how the individual parts created by very precise 3D printing modules inside, were assembled as the product moved along its assembly line until everything was complete.

As the finish time approached they gathered at the exit point. Everyone watched and clapped as a fifteen-inch model of an old-fashioned biplane came out. One tech inserted a battery in the bottom and clicked a switch. The propeller turned and the flaps moved up and down.

Damon turned to Tom. “Well, I am now impressed, Son. What's next?” he asked as soon as the technicians left.

“Next, I have this machine build an exact replica, a smaller version of itself, one small enough to build my nanobots at the right size to do the operation.”

Damon chuckled. “You're going to have the maker build a *miniature* maker? Wonderful! Just make certain to impress me even more than I already am when you get going with your plans

for that new little marvel.”



FIVE WEEKS were needed to make and construct the smaller version of the manufacturing unit Tom had purchased from Phyllis' company. It took only a matter of four days to make the parts, but the disassembly, scanning of everything and reassembly before they could begin was not a quick and easy thing.

Linda Ming, Swift Enterprises resident expert in miniaturization, came back into the picture as they started. Although technically she was Arv Hanson's senior assistant in the model making department, her work demanded that she keep separate offices on the top floor of the same building. Now, she was going to move into one of the spare offices arranged around the perimeter of the large workroom area.

"As I promised, Tom, I'm ready to go... except I mostly deal in electronics. This is mostly physical, moving parts."

"And lasers and micro-magnetic shapers and a lot of stuff that is up your alley. I wish I could tell you why this is so important, Linda, but I need you and I need you to trust me when I say this is company critical."

She agreed and then devoted at least twelve hours a day over fifteen consecutive days to the project.

The first test was not a success and she and Arv spent another entire day taking one area apart. They found the problem with a slightly mis-made part, had the AlShoCorp machine build a new one, and then reassembled it all. The next test went very well, but Arv wanted to make additional refinements.

"I have to beg off from here unless you really need me, Arv," she told him. Then, pointing at a device she had been using for the smallest of the work, she told him, "I've put on a new larger pair of actuator gloves on that mini-Waldo machine. Your giant hands can now work as delicately as my tiny ones do." She laughed and showed him how to operate the machine that took normal human movements at one side and made them as small as the miniature manufacturing machinery they were building required.

With her Waldo unit he worked five more days making and changing out components he felt were too rough or had tolerances too loose for the work needed.

Tom looked in on the progress several times a day, generally standing well behind everyone and not making a fuss over being

there. Sometimes it worked and he managed to slip back out unnoticed, but on a few occasions work stopped and he was invited to step forward for a close-up inspection.

Only twice had he made a suggestion or request and Arv—and Linda when she was there—had readily agreed to them.

On the next to final day Arv stopped working on the finite magnetic grip emitter alignment and took off his magnifying headset.

“First, I have to say this adaptation of the Digital BigEyes technology for close-up work is amazing, skipper.” Tom was proud of that headset. As Arv suggested it was based on his combination binocular precision lens and video enhancement device. This one, though, was strictly for close-up viewing of tiny things. More a wearable microscope it let the user see things as clearly as if viewed through a powerful microscope and even to zoom in on things when necessary by simply thinking of the need. He had included some of his TeleVoc subvocalization recognition into the set.

“You sound like a man with some questions, Arv. Go ahead.”

“Okay,” the model maker took a deep breath. “How are you going to control what we build in this thing? As far as I can tell there is no way for even this to miniaturize electronic control circuits.”

“You’re correct,” the inventor admitted. “I have been toying with the idea of using radio frequency-specific materials that will, well, I suppose you could say they would twitch when excited. Twitch one type and the legs move up the down. Twitch another and the cutter head we’ll put on the final models moves back and forth, or snips down like scissors. Whatever, as long as I can find those appropriate metals, or ultra-miniature crystals as I’ve been thinking about the past few days, there will be no need for electronics inside the bots. All that will be outside in a large computer.”

The more he described the process the more Arv could picture how the nano surgery bots would work, and he liked the concept.

When Tom left he went back to work with renewed enthusiasm.

The truth was he had been worrying about the control aspects so much it had slowed down his work speed, but he caught up with where he hoped to be just four hours later.

Tom was sitting at the desk, leaning back and staring at the office ceiling when the phone rang. He remained leaning and

simply swiveled his chair around pressing the intercom button.

“Yes, Trent?”

“Tom, there is a call coming down from the main control tower on the hill. Line five.”

“Thanks.” He pressed the appropriate button and said, “This is Tom.”

“Upper control, skipper. The FAA folks upstairs just called down to tell us an SE-11 is inbound and they’ve vectored it for a south to north landing. We’ve picked them up and they’ll be handed off the lower control in about fifty minutes. The pilot has asked that someone meet them to bring them to your office. Expecting someone?”

Now, slightly alarmed, Tom swung around and sat up straight. “No. What do we know about them? If they haven’t identified themselves by the time you’re ready for hand off, call Security.”

“We know they are squawking proper IFF from one of our most recent deliveries and are on a filed flight plan coming from Wyoming.”

Tom instantly relaxed. “Oh. Okay, I think I may know who they are. When they radio next ask if they are carrying a passenger named Clarke. Then, call me.”

*Well, well, well,* Tom thought. *If seems that Phyllis is on her way. I wonder why she never called to tell me?*

Ten minutes later the control tower in the middle of Enterprises phoned.

“Tom? We’ve just had an inbound jet handed off with the request we call you to say, yes. Passenger Clarke plus one pilot are on their way. Want them at the civilian terminal?”

“No, can you direct them over to park next to the Barn?”

“Will do. ETA on ground thirty-nine minutes.”

He thanked the controller and hung up. Next, he TeleVoc’d his sister in Communications.

“Sandy? Can you meet me at the Barn in a half hour?”

“Sure,” her voice came in the middle of his head. “Any hints why?” she asked with hope in her voice.

“Nope. Just that I think you are going to like what you see. Remember, thirty minutes.”

He wasn’t surprised in the least when he walked up to the open-sided hangar twenty-five minutes later to find Sandy had already been there for ten minutes.

“Tell me, tell me, tell me!” she insisted, grabbing his right hand and tugging on it.

He smiled but shook his head. “No, but if you look to the south you may see an aircraft on final.” They both turned and could see a small aircraft coming over the open area to the south of Enterprises. It soon disappeared behind the main building cluster but the sound of its engines being reversed and revved to slow them to taxi speed reached their ears a few seconds later.

Sandy was practically bouncing from foot to foot as they waited. Finally the small jet taxied around the buildings and turned in their direction.

She immediately composed herself in case this was an important visitor. Besides, anyone coming in a Swift jet had to be a good visitor.

The pilot looked at Tom who pointed to a spot in front of them, and the jet quickly spun to the left and came to a halt.

“Who is that?” Sandy asked seeing the two people in sunglasses sitting in the front seats.

“Wait and see.”

The woman waived at them and smiled.

“Pretty,” Sandy stated. “Probably built as well. Should I warn Bashi that you’ve got a female visitor? Did you bring me out here to chaperone?”

He said nothing, waiting and counting silently to himself. He reached nine as the canopy raised and seventeen as the woman rose and stepped out.

By twenty-one Sandy let out a squeal and raced forward.

“PHYL!!!”

“SANDY!” came Phyllis’ answer as the two old friend ran to hug each other.

Tom let them have a couple minutes knowing he would be “extra baggage” until they had a chance to wind down and take a breath.

“Hey, Phyllis,” he greeted her as he walked over to the two women. “Welcome to Enterprises. Uhh, I didn’t know you were coming. Not that it isn’t great to see you, but things are a bit tense around here right now.”

She bit her lower lip. “I’m sorry, Tom, and to you as well, Sandy. I wanted to make it sort of a surprise until Jack, my pilot, suggested we needed to notify everyone so your security drones

would let us in. Anyway, I came to see you both *and* your folks. It's been years, and..."

Her voice choked with emotion. "Well, you know." She took a deep breath. "Okay. Better now. Anyway, this is also a business trip. When you purchase a product from our company we support you to the max. We've had a nice breakthrough in our downsizing software and I came prepared to swap out the control and memory modules. You should see an additional thirty percent miniaturization now with an even smoother finish."

Sandy, wide-eyed, swung around to Tom. "Did you hear? Isn't that what you said you needed?"

He nodded and smiled. "It is, and Phyllis Newton, uh, Clarke, you may be a godsend!"

"So," Sandy said looping her arm through her old friend's, "tell me about this hunk you married..." and they began to wander away.

Tom went to the Toad, introduced himself and helped the pilot unload a buffed aluminum briefcase and two small suitcases.

"That's your new modules in there," the pilot, Jack, said. "Uhh, got a john around here?"

Tom pointed to the enclosed space inside the Barn. "Second door from the right. I'll wait for you and usher you to Security where Mrs. Clarke is heading. You both need badges or our guards will be hunting you down in a few."

As the man hustled to the bathroom, Tom TeleVoc'd Security to tell them he was with an authorized visitor and they would be there in five to seven minutes.

Once they were all ready, the four headed for the Dispensary. Damon was having a "not so good" day and was in one of the private rooms. He recognized Phyllis immediately, sat up and even swung himself off the bed to receive a warm hug and a small kiss from her.

"My goodness. Phyllis Newton. How are your folks, uhhh, Ned and Helen, wasn't it?"

"They are both good. Mom decided to fill her post Phyllis-rearing time by getting her teaching credentials, and dad is running the old company that moved out there. We're known, these days, as AlShoCorp, short for Albany Shopton Corporation, our two original locations. He's taken us from barely noticeable to Fortune 2000 status. They are bugging me to give them many grandchildren, but I hear Tom and his wife beat us." She stopped as he sat back on the edge of the bed. "Tell me truthfully, Mr.

Swift. How are you doing?”

She heard Sandy do a little gasp, but Damon smiled and patted the mattress next to him. “Sit.” When she did, he was very truthful with her.

“I have a nasty tumor in the middle of my brain, nobody in the world believes it can be taken out without making me a vegetable, but with your incredible equipment Tom will be building tiny robots to go in and try to do the impossible. The first model is still a bit on the large side, but he has used your manufacturing system to build a miniature version of itself and that shows great promise.”

She smiled and told him about the new control module and the additional downsizing they could expect.

“Wonderful! Then I have every expectation to be able to come out to Wyoming for a visit by this time next year. And, that’s a promise!”

She patted his hand. “I know it is, Mr. ... is it okay if I call your Damon?”

“I’d be honored.”

“Okay, Damon. Then I will make restaurant reservations for one year from tonight. You and me. I seem to recall Swift summer dinners on your patio included steaks. Well, we have a marvelous steak house I’ll take you to.”

“That, pretty Phyllis, is a date this old man will keep!”

After saying goodbye, she and Tom headed over to the shop run by Arv Hanson, where her company’s equipment had been set up. Sandy and Jack left to go up the hill to the housing development owned by Enterprises to get him settled into one of the guest houses.

After making introductions, Tom and Phyllis pulled the old modules from the manufacturing unit and replaced them with her new ones. A quick check brought up all green lights.

He showed her around the back side of the unit and the small version of itself sitting on a sturdy workbench. She was amazed.

“So, if you are using this machine to make that smaller version, how can you build a control module for it?”

Tom smiled. “We don’t. We tap into this one, bypassing everything in the original unit. The controller gets fooled and really doesn’t care. I’m hoping this extra downsizing will carry through in the same way. We don’t need a smaller secondary unit, just better results from the one we made.”

Arv spoke up. "I'll set up an overnight run to see what we end up with. By nine tomorrow we'll have the answers. I'm assuming you still want to go for about sixty percent of what we've managed so far?"

Tom agreed. "Thanks, Arv. Couldn't do this without you."

By the time Sandy caught up with them she had already set up a dinner with Tom, Bud, Bashalli, Phyllis and herself. Jack said he had too much flight logging to do. She'd tried to get her mother to come, but Anne Swift begged off saying she needed to spend the time with Damon.

Dinner at the wives' favorite Italian restaurant in town was a hit with Phyllis who kept the conversation going with all the tales of how her life totally changed once her family moved away from Shopton.

"You remember that darling poodle skirt you gave me as a going away present?" she asked Sandy.

"Golly. I'd forgotten all about that. You sure did look great at that last dance," and she looked at her brother before mischievously adding, "the one when *you kissed Tom*."

Every eye went to Bashalli to see what her reaction would be. She wasn't at all jealous of her husband so she broke out into laughter and soon asked, "How was he back then? I ask because the first time we kissed he was a bit uncertain."

This made the three women laugh at *that* thought.

Bud slapped high thigh and stated, "At last! Something Tom wasn't naturally great at. Jetz!"

Bashalli, seeing the pained look on his face, came to Tom's rescue. "But, he is extremely good at it now. And, at least I did not have to climb into his lap, grab his face and make him kiss me. Right, *Bud*?"

She hit the spot with that. Back when Bud was sixteen and Sandy had turned fifteen, she had been allowed to wear makeup, pantyhose, a bikini, and date. With her sights set on Bud, and Bud alone, she'd expected they would start kissing right away. His hesitance had been around her being the sister of his best friend.

She soon put an end to that notion.

The five all had a good laugh over such memories, but Tom was worried that Phyllis might tell them she had kissed him out in Wyoming. It was nothing he was ashamed of, but he had not told anybody about it, especially Bashalli.

However, Phyllis was a true lady and never mentioned

anything about it.

Before time to leave, Tom and Bashalli invited Phyllis to stay with them, as did Bud and Sandy, but she told them she had several reports to write that evening and needed to make three calls to Europe to find out about three of the company's newest accounts at a very early hour.

"Besides, I can't abandon Jack all by himself. So, if someone can drive me to wherever this guest house is, I need to get to work. Having said that," she smiled warmly, "if anyone is up for an early breakfast, I tend to get up by five, so I'll have my calls finished before seven. Believe it or not, Sandy, I'm no longer tied into a long morning beauty program. In fact, it takes me twenty minutes start to finish and I'm ready to go."

Sandy promised to pick her old friend up at seven-thirty.

Right at nine that next morning Tom and Phyllis walked into Arv's workshop to find the man sitting on a stool with a slightly stunned look on his face.

Fearing the test had failed, Phyllis walked over to the two manufacturing units, the ones Tom had said were now dubbed Senior and Junior, and checked them over.

Tom stood in front of Arv who finally looked up.

"We did it," the model maker whispered so low only Tom could hear him. Then, in a louder voice, he repeated it. "We did it, skipper. By golly, that little machine and the new control gizmo did it!"

Phyllis heard that and rushed over. "Did it? Did what, Arv?"

He pointed at a microscope sitting on a side table. "I invite you to be the second person in the world to look into those eyepieces, Phyllis. Then, of course, Tom gets a go. Go ahead... check it out."

She walked to the table, pulled her black hair back so it would not swing in the way and bent over.

When Arv commented, "It's absolutely beautiful," Tom misunderstood and stared first at his friend and then at the backside of Phyllis, finding that he couldn't disagree. "That little thing that came out of the plant is one of the ugliest things I've seen outside of nightmares and the movies, but it is a thing of true beauty."

Now understanding what Arv meant, Tom blushed slightly as the two walked over to join her. She stood up, a smile on her face.

"I have no idea what that is supposed to be, but it is moving



like a little monster. And, I can't believe the smoothness of the finish on it. Is that the graphene?" Arv nodded. She gave Tom and then Arv hugs. "Our company had never come up with the notion to have one machine build and control a small duplicate of itself and then use it to build things this small, but on behalf of ALShoCorp I'd like to offer to license that idea from Enterprises."

Seeing that she was serious, Tom shook his head. "It's just an idea, Phyl. All we did was take the thing apart, 3D scan every piece, and then tell the machine to make everything in one-twentieth scale. Then a very nice woman who works to miniaturize things around here helped Arv assemble the small unit. There's no need to license that idea. It's yours!"

"Well, at the very least your three-year service and upgrade agreement has just turned into a lifetime one. And, no arguing, okay?"

Tom took a look in the microscope. On the platform under the lens sat a small oblong object. It looked a bit like a tiny squid with eight legs wiggling at one end and also a bit like an octopus had backed down onto the upper end as there were another eight, longer tentacle-like arms closer to what he knew to be the top.

"I've only set the emitters to alternate movements. Nothing coordinated yet, but the darned thing works!" Arv's voice had gone higher with his excitement.

"The Mark I nanobot is alive and running," Tom declared. "Now, all I need to do is find a way to give a small team of these a good testing and then we go into refinement mode."

He felt a tap on his shoulder, so he stood back up. "Yes, Phyl?"

"You will pardon me if this is company secret, but what is that tiny thing supposed to do? Or, once you get your refinements made, what is the ultimate goal?"

Arv had been let in on the secret of Damon's tumor, but was one of only about twenty people at the company who knew. With a couple of his assistants working at their own benches he tilted his head toward the right wall where his office sat. "I think private is called for," he stated.

Inside the office, and all sitting, Tom told Phyllis, "You know about dad's tumor, and that it is inoperable using normal procedures, well the plan is to build a small team of nanobots that can be directed to perform the impossible surgery he needs."

He described how he hoped the nanobots would function. She was amazed and told them her father would be thrilled to hear about this.

“That is so hush-hush I can’t emphasize that nothing about this leaves this room, Phyllis.”

She noted his use of her more formal name and understood the gravity of the situation. “Nary a whisper, Tom. Not even to my father until you give me the go-ahead.”

“Good. Because in less than two months I have to make my nano surgeons work and also create some sort of controller so that our company doctor and I, and perhaps another surgeon or two—if we can find and train them—can go in and cut away fractional bits of the tumor, carry them back out and dispose of them. If we do it thoroughly, get everything, then it should put an end to dad’s problems. Doc tells me that even getting seventy percent of so will give dad another two or three years before we have to try again or that medical sciences might have caught up to us. If, however, the medical community at large gets hold of the news they might try to put a stop to us. I can’t let that happen.”

She took a good look at Tom and one at Arv.

“What you are trying to build and accomplish is more important than just saving Mr. Swift. It will have worldwide implications. I want my company to help you however we can. I don’t know what that is right now, but we’ll be ready.”

She looked at Tom who had a thoughtful look on his face.

“The me Tom remembers from way back is long gone. Until I was eighteen my world revolved around being obsessive about my clothes and appearance. That’s who he remembers. I was also quite the gossip. Then, I became obsessive about boys and men. Since I turned twenty-one and graduated it has been only one man and my father’s company. I believe this is something new I can obsess about and help push when the time is right. I guarantee you that if you pull this off, and need a company to dedicate itself to building your tiny surgeons or a specialty machine to build them for whoever needs them, and whatever control device you come up with, AlShoCorp will become as obsessed with making that all happen for you, and the world, and representing you, if you want us to.”

Tom had the feeling that if anyone could do it, Phyllis Newton Clarke could.

## CHAPTER 13 /

### IT TAKES A HEAP O' TESTIN'

THE STRAIN on Damon's body was beginning to show. Tom noticed it one morning when he took a good look at this father's face. Lines, previously too thin to see except up close seemed to be deepening and his hair that had been only slightly grayed at the temples was picking up more and more scattered gray hairs all over his head.

The result was a little disconcerting as it made the fifty-year-old man look at least ten years older.

When he was at work Damon spent more and more time in the office and less out and around.

To hide the gray hair he had it cut even shorter than he normally kept it explaining to the few who inquired that he had developed a skin condition on his head and this made applying the medication easier.

It was about this time Tom became aware of an increased pressure from the Swift Observatory and even a few of his employees to mount a return visit to Eris.

"After all," Slim Davis, who had not been on the first expeditions but was ready to go now, "some of us haven't had the chance to see what all the kerfuffle was about, and then there's the astronomy guys and gals who really want more details on that growing ring I hear the planet is sprouting. Red, Zimby and I all want to go as do people like Duanne Dimmock and some other intrepid individuals."

"Name me two of those." Tom challenged him good-naturedly.

"Well, there's Stefanie and Deke Bodack. There's two for you. She told me she wants to go study the vulcanology history of a planet that is sort of inside out and all mixed up and Deke is itching for a good space adventure." He leaned in and confidentially told the inventor, "His mother and her mother want to invade Shopton for a month of grandmothering and both of them would rather not be around for that. She told me to tell you, let me see, what was it she said? Oh, yeah. 'Tell Tom that if he doesn't send us out together I'll never let him get within fifteen feet of me without jumping in his arms and smothering him with kisses.' She said that with an evil sort of grin, too."

Tom laughed. Stefanie Bodack, originally Stefanie Brooks, had helped Tom on several occasions and risked her life more than

once. She was technically a dwarf with only her legs being shorter than normal, but was tops in her field before she had married Deke and the two had come to work at Enterprises (Deke as their newest test pilot) and the Swift MotorCar Company (Stefanie was their chief quality assurance specialist).

That wasn't her field but as a young mother she preferred it to digging under ground in small vessels and getting stuck, as she had on at least two occasions.

With two small children now, they had settled into life in Shopton and as valued employees with ease.

"Okay," Tom told Slim. "Get me a crew roster and also check with the team out on Fearing to see if they are ready to raise the ship again. I guess all things can't come to a standstill while I spend all my time on one project."

While it had not been officially announced to the company, word of Damon's illness had been leaking out. Everybody wanted to do whatever they could to keep things moving.

Giving Tom a little salute, Slim walked off to do as requested.

Tom and Bud flew out to Fearing Island for a quick check of the progress on the *TranSpace Dart*. She was less than a week from being ready and fully stocked for a new flight. Outside she looked the same, but inside Bud spotted the differences in the lower crew level. For one, there was a ladder down through a new hatch into the brand new airlock. Also, one of the acceleration couches had been removed along with one of the individual cabins on the middle deck. Tom had decided one fewer crewman would be worth the added space.

They flew back to Shopton after Tom checked with the project manager and got his assurance they were actually a day ahead of schedule.

"Send us the crew a day ahead for a quick orientation and she'll be ready to go."

"What's on the agenda when we get back, skipper?" Bud asked as they were taking off for home.

"Testing, testing and more testing. I have the nanosurgery bots to test and could use a hand coming up with a set of simulations to use. I know you're not an engineer, but if you could do a little research for me picking out, oh, maybe ten delicate operations we could try."

"Okay. Can I make things up?"

That was an unexpected question.

“What sort?” Tom asked cautiously.

“I’m not sure right now, but I’ve been thinking if we could teach the computer to make decisions on the fly that are not what is expected normally...”

“Wow. That’s a couple steps ahead of where my brain is at the moment. I suppose the answer is yes, but within reason. Don’t go having an imaginary tumor exploding or mutating because that isn’t *anything* like we’ll encounter.

“Got it!”

In its own way Bud’s task was harder than Tom’s, but the inventor’s included many days of fine tuning the workings of the first set of nanobots.

At first their motion was clumsy. The upper eight arms moved in a jerking fashion that couldn’t give them much headway. The gripper legs at the back could open and close when ordered but trying to get material back to them was nearly impossible. Things did not progress much for several days until he hit on the idea that at least one of the arms needed to be able to grip onto whatever the cutters severed and then swing it down along the body to the feet. But, how to do that?

Going back to the first impression these were creatures from the ocean his brain began picturing numerous creatures, but a lot of them were crustaceans and the one thing they had in common were pinchers. Claws.

His experiments soon pointed to a simplicity of motion where a clawed arm, as he thought of it, could curl upward to take hold of whatever the severing arms at the front detached. As the arm curled up the claw opened. A small change in the signal twitched the claw into a closed state gripping the small piece of tissue on which he was experimenting.

Another change in the state of that arm curled it back down where it just reached to the base of the nanobot.

Click and the claw opened again releasing the piece where it was immediately clutched by the feet.

It was simple and it was something he realized he should have been considering from the beginning and apologized for it.

“This is all new territory,” his father told him when Tom admitted to what he believed had been an unnecessary delay. “Show me the book or report that says what order to think about things and I’ll take pity on you. Until then just be glad it came to you when it did. Now you have the ability to move beyond where

you are.”

Tom had to admit his father was correct.

“When do I get to be as wise as you are?” he asked.

Damon laughed. “Wise? If I were wise I would have written out a list of things for you to do, what order they ought to be accomplished, and then we’d all be celebrating the success of an operation that would have taken place a month ago. Wise my aunt Fanny!”

Tom went back to work in a better mood than he’d been in for a few weeks. As was usually the case, advancing along any line of endeavor for him was an attitude builder. And, the claw-enhanced arm plus his father’s talk had buoyed him up several notches and given him added energy to move forward. And, it worked. In a few days he had also tackled the matter of independent movement of the maneuvering arms. By using and crossing multiple magnetic waves he could produce three different movements in opposing pairs.

Testing was a never-ending process, though.

On and on it went, day after day with Tom, Arv, Linda and even Hank making small but meaningful changes.

Tom began thinking of the nanobots almost as having some sense of life. It was especially sad for him to look at the petri dish that held all the discards as well as the early models. In all there were more than fifty in there, most of which would never see another moment of use.

But, from a purely historical point they were a treasure and he intended to have them arranged and mounted under a special camera and added to Doc’s small museum of medical oddities. This included a few glass syringes that were more than one hundred years old along with the absolutely huge needles used back then, a scalpel dating back to the Civil War, an early type of stethoscope looking more like a double-ended funnel, and others less recognizable items like an arrow remover and a bone saw no sane person would ever have used on a fellow human.

He was in the middle of performing a test on the bed of his most powerful microscope where he tried controlling five nanosurgery bots at one time when he heard Bud enter the large lab. Setting the controller to the side and flicking off the computer circuit he spun around and greeted his guest.

“Glad to have you here, Bud. I was just about to fail at something and need some assurance from a friend.”

“Okay,” the flyer said coming over and grabbing a second stool.

“You are doing just fine and only think you would not have been doing whatever you were trying to the very best of your capabilities. How’s that?”

“Unconvincing, but thanks. So, what brings you here at this time of day?” Only then did Tom look at his watch. It was just flicking over to 12:35.

Bud cupped one hand to his ear. “If you listen carefully you will hear the dulcet tones of two heavy boots clomping down the hall from the little kitchen at this end. In other words I made a promise to a wonderful and very attractive woman who says she believes she is still your wife and worries you are not eating right. I told her I would make you eat something at a decent time.”

Tom was about to smile when a knock came on the door and it opened to reveal their favorite cook.

“Wahl, hey there, buckaroos. Whatcha been lookin’ at in that mic-roo-scope ya got next to ya” Chow asked as he wheeled his lunch cart into the lab and started uncovering their lunch.

Bud looked at Tom for guidance. Normally he would say something to tease the older man, but this was no laughing matter. Tom saw his expression and spoke for them.

“I am looking at the prototype of a very small robot that I hope to use to perform operations on people that even some of the best human surgeons can’t get to. It is called, officially, a computer assisted human guided nano-surgical robot, or nanosurgery bot for short.”

Chow took off his ten-gallon hat, set in on one side of his cart and walked over to the two young men.

“Kin I take a looksee? Never heard o’ nothin’ like it an’ I’d be mighty happy ta see one fer myself.”

Tom stepped to the side and let the cook bend over the dual eyepieces. “Give the scope a second to find your eye focus and it will automatically adjust for you.”

When the nanobot was in clear focus, Chow let out a whistle. “Golly. Ugly little tank, ain’t it?”

Now, Tom and Bud laughed, with the inventor saying, “It certainly is, Chow. Ugly but once it is finished and running I hope it will be an incredible new tool.”

Chow stood up, scratched the top of his bald head and looked bothered about something.

“Okay. We agree the feller isn’t a beaut, but how the heck is any doctor gonna work that doohickey? I know some ladies as got tiny

hands, but that..." he looked at the platform on which the nanobot sat, "I barely kin see it with my eyes. These giant sausages I got fer fingers'd squish it somethin' fierce!"

"That is why Tom is setting it up to run mostly from a computer, with a real surgeon standing by to give it basic directions," Bud offered.

Chow looked at Tom who nodded.

"Okay. Mebbe that's the truth, but that ain't big enough ta do anything. I mean, if'n ya put that next ta, oh, say a wart like the one I got on my right heel, it'd barely measure up. How's it gonna remove something that's twenty times its size?"

Tom suggested the cook sit with them while they ate and he could explain things. Without mentioning his father, Tom told Chow that there are places in the human body, such as inside the heart or the brain, where it is either impossible or potentially deadly to try to cut into so the surgeon could address the problem.

"So, this little thingagummy'll go into a person's brain and cut out a blood clot, huh? I say that 'cause I got a friend who had a stroke a month or so back and his wife tells me it was caused by a tiny clot in one o' his brain arterilleries."

Bud couldn't keep from laughing.

"I think Bud is being rude, Chow" Tom said, "but the word is *arteries*. Arterilleries are guns and things like that."

"Oh," Chow said looking sorry. "Buddy Boy, I'll give ya a pass on that one. My goof. So, what's the scoop on that thing?"

"Well, if you mean what is next, that would be testing. This isn't even the smallest I need to go. In fact this is about two times larger than the final bot but I need to do a lot of testing to see if I can completely control the thing using a computer, or if I need to be actively involved, or even if it can be managed without computer assistance."

Chow looked back at the microscope. "Kin that thing fix bunions? 'Cause I got a right painful one on my left foot. You could use me ta test your little robot, huh?"

"Sorry, old timer, but bunions are well taken care of by foot doctors and laser surgery these days. You'd only be off your feet a week instead of a couple months like it was a couple decades ago. No, this one will eventually need to go into a person's brain."

"Okay, then ya kin put it in my brain, son. I trust ya ta just take a look-see around and not jiggle any memories o' mine. I'd guess it takes a heap o' testin' ta get somethin' like that right. Anythin' I kin do ta help." He looked so serious that Tom felt tears coming to



his eyes.

He quickly wiped his mouth with his napkin and ran it over his upper face so the cook couldn't see how emotional his offer had made Tom.

"Sorry, again, Chow. Like I said this one is far too large. But, I sincerely do appreciate your confidence in me. If ever there's been someone to offer to help in just about anything, other than Bud, it has been you since the day we first met."

"Wahl, the offer stands. When ya get that on a diet and smaller, I'll be right thar ta help! Only wish it could do my bunion. Hurts like the dickens today."

Tom laughed. "Chow, go see Doc and tell him to schedule you in to the podiatric surgeon in town, Dr. Franks. As I said, you'll be off your feet for just a few days and I hear the surgery is done while you are awake, doesn't hurt much other than a bit of an ache after the fact, and will set your foot right in no time!"

Chow picked up his hat and bowed at the waist sweeping it close to the floor. "Mighty nice o' you ta offer, Tom. My wife, Wanda's been after me ta get it fixed so mebee I'll go see the Doc this afternoon. Thanks!"

With that he pushed the cart from the room forgetting to take their empty dishes with him.

"How about that, flyboy? Talk about an unexpected offer. Good old Chow."

Bud tilted his head and looked askance at his friend. "Tom. You may not know it but just about every employee at Enterprises would offer the same thing. You and me included if it were for someone we know and hold in high esteem with their life in the balance."

Tom had to nod at that.

As the next few days wore on, further test builds got the size down smaller and just about to the perfect point, and Tom was getting excited about the progress being made.

It was about this time the return trip to Eris for the *TranSpace Dart* and her new crew was ready to leave. Tom felt it best for him to be on Fearing Island when that happened and so he and Bud flew out on Friday morning.

The *Dart* stood on its tail pointing into the sky looking ready to leap at any moment.

Someone thought it would be funny to make this an official inspection and launch and so the crew, all nine of them, stood in a

straight line between the fins where the elevator was located.

As he and Bud walked around the right fin and its large, round reactor pod stuck on the tip, Tom chuckled and Bud let out a whoop on seeing the line. It was like something out of a comedy sketch.

There stood Zimby Cox, Red Jones, Art Wiltessa, Fred Peterson, Duanne Dimmock, Stefanie Bodack and Deke Bodack, Bob Jeffers from the Observatory, and their payload specialist, Jerry Sumners. Slim Davis had a family emergency and would be unable to go on the flight even though he had trained for it.

Other than Zimby at five-foot-ten, the next four stood tall at over six foot one inch and the last three—except Deke at six-six—were about six feet even. But right in the middle, standing on tiptoe and still only making it up to four-foot-eleven, was little Stefanie. The funniest thing is they had put her in a full-size spacesuit so the legs and arms were all far too long to fit her.

She flung her helmet back and asked in a loud voice, “Did they tell me the truth that the suit would shrink in zero-G and I’d get taller, Tom?”

Keeping as straight a face as he could, which wasn’t all that serious, Tom nodded as he walked up to her. “Why, yes, cadet. It is also true that you will be asked to retrieve several buckets of heavy air and a left-handed screwdriver during the flight, and be told that eating camel eyes is a delicacy.”

“Good. Just as long as they don’t try the old, ‘It’ll work better if you take off your shirt,’ routine!”

Deke pulled her real suit out from behind his back.

“We got one fitted to the squirt, Tom. She looks darned cute in it, although...” and he looked down at her, “It really would look better if she did take off—”

He didn’t get the rest out as she kicked him squarely in the right shin.

“Okay you lot. Some of you have been out there and some not, but just remember that while you need to have fun, this is a serious trip out and back. You will need to help Bob take all the measurements he needs. Chow told me he put in some special treats for you to enjoy along with all the other great food you’ll have. I understand that you, Fred, have been designated as the crew medic. Just understand that there are some things you can do and other you cannot. There is nothing that says you can’t come running back at top speed if necessary. I guess the only other thing is to tell you to have fun.”

As most of them headed into the ship in a couple groups, Tom took Zimby and Red aside.

“You two are co-captains, but if push comes to shove it is Red as senior man who has last word. Okay?”

Zimby smiled and nodded. “Better the old man than me.”

Red looked into Tom’s face and asked point blank, “Will we be coming back and seeing your dad? I only ask because the scuttlebutt has it he is pretty sick.”

“A direct question deserves a direct answer, Red.” Tom spent a few minutes telling them both about Damon’s true condition and then said, “He has many months left so your food will run out before he is in much danger. He said to give you all his best and asked that you keep this to just you two if at all possible.”

“Lips and suits sealed, skipper,” Zimby said as they shook hands and headed into the ship.

“How do you think it’ll go?” Bud asked.

Tom chuckled. “With Stefanie and her feistiness, they’ll all be on their toes for the month they plan to be gone, flyboy.”

“And, if all else fails, she always has the shirt thing to resort to,” Bud said with a smirk.

They drove the jeep they’d come out to the ship in back to the safe zone and watched as the ship lifted on its large repelatron dish at the bottom of the hull. In less than a minute it was too high to see.

“Have fun,” Bud called out to the ship.

Half an hour later Tom and Bud were winging back to Shopton.



GETTING THE promised electron microscope had taken more than two months longer than expected so it had been unavailable for the initial run of the Mark I nanobots. But, with it in place and running in one normally empty office next to Arv's work room, Tom and the model maker were examining one of the bots.

"See that little defect?" Arv asked.

Tom had spotted the rough nob poking from one part of the head. It was moderately sharp on one side and would be dangerous inside any blood vessel.

"Yeah," he sighed, "I do. That's the sixth one out of seven with that. It's tiny by all accounts and ought to appear on them all, but we can't tolerate anything like that. So," and now Tom stood up looking at Arv, "what's our next step?"

The model maker was used to working with what he previously believed to be "miniatures," the scale models of Damon and Tom's inventions, but they were measured in inches, not microns. This new world fascinated him but it also frustrated him. Normally he would take a tiny file or buffer and remove the imperfection. Not so at this minute scale. If it came out perfect, fine. If it did not, there was precious little he believed he could do.

"I'm a little stumped, skipper. That area comes from one part that Linda Ming and I replaced when Junior, the downsized machine was built. Then, I replaced it one more time last week. I think it's time to call your old friend out in Wyoming and suggest they gave us a faulty original part. Without their exact specs for it all we have to go on is the one they built into Senior over there." He hooked a thumb at the full-sized manufacturing unit.

The inventor took a deep breath. "I think you're right, Arv. Let me go back to the office and give her a call. What was that original part code?"

Arv pulled a slip of paper from his shirt pocket. "Just happen to have that right here," he said handing it over.

When Tom reached Phyllis and explained the situation, she was astonished.

"Wow. I hope that if it really is that part it is just in your unit. We have more than fifty of them out there right now and orders for three in the line and a half dozen pending. I'm kind of at a loss

for what to do, Tom.”

“I know it is company policy and all that, but if we could get the original specs and computer drawings for that part I’m certain we could tell you exactly what might be the matter, Phyl. Is there any way?”

She sighed. “The things a woman does for the man she might have... well, enough of *that* sort of thinking! Can I call you back in, ummm, maybe half an hour?”

He said that would be fine and would be at his desk until then.

Damon came into the office. It was the first time he had felt well enough in the past week to do so. While he sat at his desk Tom got him a cup of decaffeinated coffee and watched as the older man used it to wash down two different pills Doc had him taking. One, his aspirin, was having less and less effect on him lately and would probably be halted in a week or so. The other was a new type of medication, still in testing by the pharmaceutical company making it, but Damon had been put on their trials list.

“How is that green pill working, Dad?” Tom asked.

“It is supposed to reduce swelling in the adjoining areas to the tumor to relieve pressure and promote better blood flow. So far, all it is doing is making my urine turn blue.”

Tom told him about the latest problem with the rough spots on the nanobots and was about to describe what might be done when Trent buzzed his desk.

“It’s Phyllis Clarke on two, Tom.”

“Hello, it’s Tom.”

“Hi, Tom. Okay, dad and I spoke and while I never knew this, that part has been suspect in at least one other unit. Our Engineering department has tried to make new molds for it and the same problem creeps in. So, he is authorizing me to send you the electronic files for that part. If your folks can find what we are doing wrong, we owe you big time!”

Tom replied, with some relief in his voice, “Phyl, if we can find the problem and it makes things better here, and for your other customers, all I’d ask is the part number be amended with DS at the end.”

She laughed. “Done, Tom. Tell Damon hello for me. I have to run. Oh, but where do we send the files?”

He gave her the private upload address and a temporary access code. “That code will only work for the next four hours, Phyl. I hope your people can react before then.”

“Dad’ll make certain they do. Bye!”

Tom updated his father and excused himself to go back to work with Arv.

The greatly scaled up drawings came through an hour later. Arv called over Hank Sterling and the two men poured over them even going as far as printing them out on three by four foot sheets of paper.

It was Arv who found the problem.

When he showed it to Hank, the big Engineer smirked. “You or I would have never okayed that design with that obvious goof, Arv. Let’s hope this is the only part they messed up on.”

Tom came over and they showed him how one side of the seventeen-sided part was missing a connecting line in the 3D wire drawing.

“That little missing line, maybe a millimeter and a half in the full size piece, is the culprit, skipper. With this fixed Arv will send it to his 3D printer and we’ll have the right part for the big machine ready in two hours. Give us a day to pull Junior open and get the downsized part Senior will then make and we’ll give the Mark I a go again.”

One day and one hour later Tom was called over to Arv’s workshop. The model maker stood in the door of the electron microscope room with a grin on his face.

“You did it?” Tom asked.

“We did it,” came the happy answer. “We also found one other missing line on their design but it is internal so we didn’t go to the bother to correct that and go back into production. I’ve noted both errors so you can send things back to them for correction. But, look at our little friend.”

Tom looked at the monitor of the view of the new Mark I nanobot.

It looked even better than the few of the first batch that had not featured the imperfection.

“That little change smoothed out the other corners at the back, didn’t it?” he asked.

“Yep, and take a look at the difference in the serrations on the cutting arms,” Arv suggested.

Tom moved the central focal point to the front of the bot. As Arv hinted, the serrations were sharper and more defined than he remembered. To check, Arv brought up a side-by-side comparison of an older scan.

“We both know if Bud were here what he’d say,” Tom said. “So, here’s to Bud, here’s to the fixed part and here’s to *Jetz!*”

Tom made a call to AlShoCorp from Arv’s phone.

“Phyl, it’s Tom. We found the problem. Two problems in the original design. We are going to send large printouts of the two spots, well marked, to you via overnight courier. Your folks will kick themselves a little but be able to fix the issue with no troubles.” He told her about the missing lines in the basic design.

She sounded happy when she replied that both she and her father had a bet on how long it would take the Enterprises people to find anything wrong. “I had less than five hours and dad said two days. Since you called me a day later I have to think I won. I can’t begin to thank you, Tom. Nothing anyone else is doing with their ASC-2900 is as fine as you have been going, but with the ability you’ve pointed us to where we can use one to make smaller units like you did, that goof on our part would have been found by lots of customers and would have hurt the company reputation. Thank you.”

Three days later, Friday, Tom sent Arv some changes to the nanobot. The design was primarily the same with one exception: the tiny extra arms behind the main grippers had been removed. They never would have been much use and with them gone control became simpler.

“We go with the Mark II early next week, Arv. All total I want ten of them. We need to prove that there is consistency in production.”

“I can have them to you by late afternoon on Monday, skipper,” Arv promised.

When he examined them, the batch was very close but still not as functional as Tom hoped.

As before, he and Arv went over everything classifying what had worked very well, what had partially worked, what had any negatives and anything else that was a failure.

This time there were no failures, and only a single item either man would hold as less than good.

“We are still having a little lag in the release time of the grabber legs,” Tom noted. “Unless we can speed that up we will be looking at an unnecessary hour over the eight hour operation. Doc still wants it down to six and I’m going for five.”

Arv thought this over a moment.



“Why five hours? Even to me I’d say that’s awfully fast.”

“Because, I don’t think dad can take much longer than that,” came Tom’s very serious reply. “Doc says his heart can take it, but I want to play safe. I’m even contemplating calling for this to be a two-operation procedure with a week or two in between.” He looked at the model maker with some concern, “What do you think, Arv?”

Arv’s cheeks puffed out as he let out a deep breath he’d taken. He also took the time to scratch his left eyebrow and chew on his lower lip.

“Your dad is a tough bird, skipper. He is plenty strong and has been as long as I’ve known him. Of course, you’ve known him longer, but you see him differently than do the rest of us. You’re closer. For my money this ought to be done in one fell swoop, and in the fewest *safe* hours possible. No hurrying, just being thorough and moving at best possible speeds. To that, I’ve had an idea about actuating those legs, and even the other moveable bits.”

He reached over and pulled out a notepad with a few drawing and a number of calculations on it. Tom started to look at them before Arv flipped that page back to reveal the one he meant to be seen.

“Those look like the magnetic resonator emitters we built in the 2900 machine,” Tom said. “The ones that will be arranged all around dad’s head.”

“They are, but do you see the difference?”

Now, Tom had to study them carefully. He had to admit to himself he didn’t know as much about the machine as Arv or Hank or Linda Ming did, so it took him a few minutes.

“Wait. Are those to scale?” he asked.

Arv smiled and nodded. “Yep.”

“But, they look too small, like you miniaturized them—” He stopped. “You did. You’ve made them about half size, haven’t you?”

“Forty percent size, actually. I haven’t tried making these, by the way, just came up with the concept. I haven’t figured out how to do them. Even Junior is at its limit for the downsizing of those. On paper, at least, these let the magnetic waves be tighter which means can vibrate the crystals in the body faster. Right?”

Tom had to think. The magnetic waves would be the same rate in the up and down frequency, but these new emitters could, in theory, send them out faster.

“Okay, I think this is worth a try. It is better than anything I can think of right now. How soon?”

Arv pointed at the 2900 Junior. “I don’t know, Tom. I was hoping that you might come up with some whiz-bang idea for it all.”

The two men pondered the problem. Arv was thinking of the practical while Tom was considering the fanciful. He raised his eyes to his friend.

“Arv. Please tell me if Junior is as small as we can go?”

The model maker shook his head as if trying to wake up. “Uhhh, in what way?”

“Well, in the way of this. Have we attempted to have Junior turn out some sub-version of itself capable of building things smaller yet? Single task, not multi-capable.”

“No. No we haven’t. That seems to be a tiny world where we will need to be seriously looking at other materials and nobody’s taken the time. What do you have in mind?”

Tom told him. The full machine, even the downsized version, could churn out thousands of different things. They agreed on that point.

“What if we have Junior build a manufacturing unit that only turns out your smaller emitters?”

Ave smiled. Now he understood.

“Right! All I need to do is figure out the exact machine to build, and then let the parts come on out. Linda Ming needs to be in on the assembly with her tiny Waldo mechanism and her skills, but... you know, I think we can do this.” He was practically beaming as he said that.

“Get Hank to help if you need him. The two of you seem to have an instinctive understanding of how that machine works. While you are building the new machine and then turning out the emitters I need to rebuild the setup for the operating room to allow for both the smaller size and a closer proximity of the array to dad’s head. Oh, Arv, it’s starting to come together!”

Another six days slipped by while the dedicated sub-machine was designed and Junior made the parts, then two more days for assembly. Nobody involved thought of taking the intervening weekend days off; this was more important and more exciting to them.

When Tom dropped by on the afternoon of that eighth day it was to find only Arv in the workshop close to the production

equipment.

“How goes the project?” he asked.

“The project concluded about ten minutes ago. Hank had to go attend to something he is making for the SE-11 cockpit upgrade and Linda has left for the little ladies room leaving me here with Junior Junior.” He pointed at a box only about fifteen inches on a side.

“We built that from the internal parts Junior made for us and Hank used his smallest vacuu-form machine to make the outer panels and internal supporting structure. We did a test run of a non-functioning emitter shell and it came out beautifully. We were going to call you in a little to see if you wanted to come witness the first real one being produced.”

“I do,” Tom admitted.

“Once we figured out how to make a reduced size portion of itself, we all believe in the future that ought to allow us to make a smaller purpose-built unit to crank out nanobots half the size of these current ones.”

“Great for the future, but these are just about the perfect size for what we need,” Tom remarked.

“Right. So, Junior Junior is ready to start making an emitter if you want to.”

“Want to? *Want* to? Of course, Arv. Let’s get to it!” Tom said, standing up. “Unless you need to wait for the others.”

“Nope. Here they are now.”

“Like our little box?” Hank inquired as he came over.

“If it works like Arv is playing it up to, then yes.”

Linda, generally a very quiet woman, was all smiles. “This is going to open up a whole new world of micro-manufacturing for us, Tom. In case you can’t tell, I’m excited.”

“Oh, it’s only written all over your face, Linda. Thank you, again and again, for your assistance in this. Dad sure appreciates it.”

Knowing it would require about one hour, once the machine had been turned on Tom left to go brief his father.

“I just wish I didn’t have to take time out for things like the Eris trip and a bunch of other little things,” he complained.

Mr. Swift placed a hand on his shoulder. “Son, personal feeling aside, Swift Enterprises and all our other companies do so many other things than just concentrating on one man’s illness. Life and

business must go on. Besides, who's to say that all those little things didn't go into resetting your mind a little so you could get to where you are today?"

Tom pursed his lips. "Okay, but we might also be ahead of where we are."

"I wouldn't worry about it, Tom. The few days you've taken out of this are meaningless in the overall scheme of things. You are moving ahead and I am getting myself mentally prepared for this. Let's just let thing go from here."

By the time he returned Hank and Linda had gone and Arv had the smaller emitter out and was connecting it to the test board.

"We'll know in a minute, skipper. Come over here and take a look in the microscope and tell me if you see a difference."

Tom stepped over and bent down to look. On Arv's count down to one he heard a click and the little nanobot began to move. It was the sluggish movement of the bot getting ready for action. Within three seconds the movement stopped and Arv asked if he was ready for a command.

"Yes. Open and close the legs about ten times," Tom instructed.

He sharply inhaled when the tiny legs of the bot flicked in and out, repeating the movement the requested number of times.

"Time?" he asked.

"You aren't going to believe it, skipper, but that sequence happened in about thirty-six percent the time as before." He let out a loud shout of "Yippee!" and slapped Tom on the back.

While Arv and the new machine built and tested the emitters for the final assembly, Tom completed the array frame for it. Looking like a collapsible child's toy version of a Hoberman sphere, the sort of ball that starts out tightly packed and with the slight pull on one point expands to more than ten or twenty times its original size as a collection of tiny interlocking pieces swivel and open up, the headset was going to allow space for enough emitters for as many as thirty nanosurgery bots.

The basic idea was to expand the ball so Mr. Swift's head could be inserted into the open side and then collapse it down so the emitters sat about a half-inch from his skull. This would provide optimum signal strength to reach the nanobots.

"Okay," Bud said as he came into the large lab down the hall from the office. "I got all tunnel visioned on flight tests this past month and here you go and create a whole nanosurgery brigade without me."

Tom, who had his back to the door in which Bud stood, hunched his shoulders. Bud was Enterprises' resident "namer" of inventions, most often with terrible pun names. He did not turn around as he spoke.

"I'll assume that you've just dubbed my surgery nanobots and so I will not try to fight you on this." He snorted and began laughing. "Nanosurgery Brigade! I love it."

"Don't forget how I love an intervening capital letter so let's make the 'surgery' start with a big S. If that is agreed then my work is done here," the flyer said as he backed out and closed the door.

Tom could hear him laughing most of the way down the long hall. The NanoSurgery Brigade was now the official name for the batch of bots that would perform Damon's surgery.



## CHAPTER 15 /

### TEST RUN WITH SO-SO RESULTS

WHERE THE first generation of nanosurgery bot had been able to perform just one thing, and that at the receipt of a specific radio wave, his second-generation bots had to perform several different things, including moving from place to place.

After setting aside his first idea to use radio frequencies his decision to use magnetic waves was proving to give very good results. Besides, with no room for electronics beyond a simple sensor to provide a version of sight, control by radio wasn't ever going to be feasible.

The issue was how to turn magnetism into function over a number of different bots. It would not do to have them all react to a single signal.

Bud visited the lab as Tom was attempting to subdivide the magnetic wave frequencies.

"Sort of like the Attractatron beams out at Eris, huh?" he asked.

Tom stopped. "How is that, Bud?"

"Well, we had a finite number of Attractatrons and all those waves shooting all over and you figured out how to make them work together rather than canceling each other out wherever they crossed or touched. I thought this might be something like that."

It had made Tom rethink several aspects of controlling the nanobots. It gave him added confidence that getting rid of the idea of radio control had been a wise decision.

He also knew the switch from radio frequencies to magnetic waves had been a good one when he found how to form the tiniest crystals tuned to respond to different waves of magnetism and built them into the next test nanobot. It not only worked but provided more specific and vigorous results. And, it all fit inside the newest shape of his bots.

Rather than simply being tiny cylinders outfitted with snippers in the front, his new models looked more like ultra-miniature sea creatures.

The body was about five times longer than it was wide with the head taking up the front twenty percent. That now held a tiny sensor that would act like the eye of the bot taking minute heat changes in and providing a simulated vision at the operator's end of things.

Behind that were the pair of hinged arms with serrated edges that could be used to cut into the tissue of the tumor. One of these had a forked end for stabbing into and holding onto things. Also coming from the bottom of the head unit were eight tiny fibers that were the mobility arms. They could be used to pull and push the bot forward and backward. One of these doubled as Tom's claw arm.

Behind that the body narrowed to about half the head width and included the tiny device to take the magnetic waves and turn them into electricity to operate the "vision" of the bot, four arms that could be extended outward to hold the bot into position, and at the very back here six tiny gripper legs.

Tom had decided to do away with the concept of several types of bots: the operating bots; separate visual bots; and the carrier bots. Now, this single bot design would do all the work with each bot cutting away a small portion of the tumor, transferring it backward to the gripper legs and then backing out with its deadly cargo.

Every computation he could perform told him the operation would still take nearly eight hours using a team of fifty and as long as fifteen hours with a more manageable team of two dozen bots.

Tom knew it as going to be difficult to impossible for Doc to get them five much less fifty operators, so he began to get very worried again.

"Son, if you want the opinion of the patient, I don't think either the operators or the man on the table will hold up that long. I'm thinking this either gets shortened to about five or even seven hours somehow, or takes place over several days and in small chunks, pardon the unintended pun."

"I don't want you to be put through that much time under anesthesia, Dad. Neither does Doc. I've got to find some other way to shorten things."

Taking his son's hand and giving it a squeeze, Damon told him, "Your mother had a suggestion last night. She asked why you didn't just do what you did as a little boy with your construction toys. Remember? You had a backhoe, a grader, a digger and a—"

"Dump truck!" Tom exclaimed. "I remember. I dug stuff up in the dirt pile at the side of the house and swung it around to put it in the truck until I had a full load."

He beamed at the memory.

"And, do you also recall your biggest complaint?"

The young inventor had to think about that. It was, after all,



nearly eighteen years ago. After a minute he shrugged. “No, I can’t think of anything. Did I want something else like a mini atomic earth blaster?”

They both smiled at that thought knowing that had it been within the young boy’s ability that is exactly what he would have come up with.

“No, what you wanted were a fleet of dump trucks so you could fill one, have a friend move it to the other side of the pile, complete with appropriate roaring and rumbling noises, and have another truck immediately ready to take on more of what you were digging up.”

Tom smiled broadly. “When you get home please give Momsie a big hug and a kiss from me. I get it. I need to create the equivalent of dump trucks and probably a half dozen of them that each bit of tumor can be shoved into via some one-way door and as one is filled it can back out of the blood vessel to the exit point where its cargo can be, hmmm... maybe lightly suctioned out of the carrier and out of the body all in one motion? Then, it goes back in for more.

“Those can be larger because they don’t need to be right at the tumor site but can hold back in the larger vein that’s just slightly inside the brain. It’s the one where we go in anyway an inch or so below the tumor site.”

Damon smiled at his son. “I wholeheartedly agree to that. But tell me again how you intend to control all of these without the ability to include radio signal receivers.”

Now, Tom smiled at his father. “Bud reminded me of the issues we had with the different Attractatron waves when we were trying to rebuild Eris. So, I did some experiments. I can outfit each nanobot with receptors that are tuned for as many as six different magnet frequencies. One for operating arms, one for the mobility tentacles, one for the claw arm, and one for the griper legs. That’s four leaving me with two extra.”

Damon nodded as he considered something. “How about sheer numbers of magnetic waves. What’s your theoretical maximum?”

“By outfitting some to use crossed waves, or multiplexed ones, I believe I can control as many as thirty nanobots at a time. You know what, we can do this if Doc can find the surgeons!”

With the concept of using crossing magnetic waves now understood, Tom decided to take a day off. Actually, his father practically ordered him to “settle down and decompress for a day or so!”

Realizing how near he was to breaking down, Tom agreed to take a three-day weekend.

“Good, then you can play host to a couple of lovely young women.” Seeing Tom’s astonished look and almost one of dismay, he added, “The Jensen girls. They phoned a half hour ago to see if they might drop into Shopton, using our airfield and parking spots, to come for a day or so to see everyone who helped with their rescue and medical needs. If you are serious about taking Friday off, well, that’s tomorrow and they *get* here tomorrow, and —” He left the rest unsaid.

Tom smiled. “Got it, Dad. Give me their ETA and I’ll meet them and chauffeur them around the campus.”

“Ten-thirty, give or take.”

Tom pulled up at the general aviation mini-terminal at twenty-five. A check from inside the comfortable welcome and meeting building to the control tower let him know the ladies had radioed in and would touch down one minute early.

Right on schedule he watched Jen set the landing gear down on the best part of the runway letting their little plane roll out and slow down before turning off onto the taxiway heading back to the terminal.

He was outside getting ready to reach for the door when the engine shut off and the prop slowed to a stop.

“Ladies. Welcome back to Enterprises,” he greeted them as they stepped out of the airplane.

“Hey, inventor man,” Jan said as she limped over to give him a hug.

He accepted it but stepped back looking at her with concern. “Didn’t we fix that all up nice and neat?” he asked

When she looked at the ground and said nothing, Jen came over, placed an arm over her shoulders and gave her a tiny shake.

“Tell him, Jan, of I will. I has to be said and the sooner the better.”

“Okay. I was going to try to bluff my way through this visit, but life is not so good for me. It has nothing to do with my accident or the great care I received. But, if you’ll give me a brief raincheck, I’ll spill everything once we get over to Doc’s office. I called him yesterday as well as he’s expecting us shortly.”

Tom’s car was parked fifty feet away and he offered to bring it over, but she refused. “Naw. I can walk, I just look like I’m in pain.”

“Which, she is!” Jen said giving Jan a stern look.

Tom let her walk to the car but parked directly in front of the doors to the Dispensary and had already TeleVoc’d the receptionist to have a wheelchair meet them.

Jan smiled sadly. “Nothing says lady in distress more than having a wheelchair meet her limo.”

Tom wheeled her inside and the three went straight to Doc’s office.

After greetings and a request for cold sodas had been placed, Doc got down to business.

“Okay, Jan. It is obvious there is something very bad happening in that hip or leg so tell me. Please be as specific as possible. I’m a doctor, you know.”

“I can name that problem in three letters, Doc. S-C-T.”

This startled him. “Spinal cord tumor?” She nodded. “My goodness. Intramedullary or extramedullary? I never saw it.”

“Started outside and has begun working its way inside the cord. Before you ask it is above where you would have scanned, it is not cancerous yet, *is* in the process of metastasizing and it is going to end up being terminal once it starts to spread in the next year. I have maybe two or even three years, but below waist paralysis will be visiting me in five months or thereabouts.”

The medico knew better than to lecture, so he simply asked, “How long have you known?”

She smiled warmly at him. “A year. It’s why Jen and I set out to fly all over the U.S. We finished the East and before we head back Jan suggested we stop off to see if you or Tom had some incredible medical breakthrough to toss at me.”

She broke down and began sobbing but held up a hand refusing any assistance other than a tissue Tom handed to her.

“I’m sorry. Moments of melancholy hit when the pain suddenly subsides for a brief period.”

Jen leaned over the desk. “Please tell me you can do something for her. Even if it is just pain medications. Because we are not locals anywhere this side of the country, all any doctor or hospital suggests is lengthy and expensive stays and tests and not even a steroid to reduce inflammation. We are both about ready to give up.”

Doc picked up his phone and dialed a number. “Fred? Can you set up the comprehensive exam room? I’m bringing in someone with a potentially inoperable spinal tumor I need to take a very

good look at.” He listened a moment. “Yes, the peekyscope as well, Fred. We’ll get her gowned and be in there in five minutes.”

“Peekyscope?” Jen asked.

“Yes. What Bud Barclay calls the SimpsonScope. You remember it. Four pronged octopus dangling over you when we looked at your chest.”

“Oh,” she remembered it very well. “Of course. I figured it was a bone thing only, looking far cracked ribs.”

He got up and opened a cupboard next to his office’s exam table, taking out a folded light blue garment. “We’ll slip out and you two get Jan into that exam gown. Tom and I will be back in a couple minutes. Come on, Tom.”

The men left and three minutes later Jen opened the door telling them Jan was ready.

The examination took about half an hour with Tom standing there, enthralled at the sight of the inside of her body as it was projected in the air above her using one of his 3D telejectors.

“I’ll send the vids to three spine specialist neurosurgeons in a few minutes. We’ll have a prognosis and possible course of action before end of day. In the meantime, I am going to give you several injections. Today you get something for the nerve pain and a bit of a new slow-release steroid for the swelling.”

Jen looked skeptical. She had watched Jan be in pain for weeks and hoped she might find some relief. “What then?” she inquired.

“Well, then you two go out and have some fun, visit some people, and then we get together at the end of the day. Can’t suggest anything else at the moment.”

He gave her the two injections into the muscle tissue in her lower back.

“Oh, and I added a tiny bit of a pain reliever so you ought to feel much better in about three minutes.”

She did.

Though she still had the limp, it was not painful as she, her sister and Tom spent the day going around seeing new friends and even visiting the Construction Company where Tom suggested they take a short flight, with Jen at the controls, in one of the newest *Pigeon Commanders*—a two-engine over-wing plane based on his SE-11 Commuter jet, or Toad as most called it.

It was a great flight and Jen took to the added engine like a pro, even though she was not officially rated for such an aircraft. Tom was and he was right there in the copilot’s seat in case she needed

him. She did not.

When they met with Doc at five, he had some news, most of which was only so-so.

The experts confirmed the diagnosis and the placement, and they were encouraging enough to say it appeared to have not spread, but was inoperable using current medical techniques.

“If you ladies will excuse Tom and me for a moment, we’ll leave you together. Be back shortly.”

“What have you got in mind, Doc?” the inventor asked in the hall.

The medico looked at his young boss. “What I didn’t tell the ladies is that one of my friends suggested that if she can be transported to a clinic in Germany, they have a new operating robot called MiKe-F, shortened from the German for miniature small operator, or *Miniatür kleine Fahrer*. It reduces the surgeon’s hand movements by a factor of twenty and has been used in trials to perform everything from reattaching optical nerves to removing tumors inside of kidneys.”

Tom shrugged. “I suppose, but...” He stopped. “Wait. Are you suggesting what I think you are?”

Doc nodded. “Probably. You can have the first five or six real nanosurgery bots ready in another week or so, can’t you?” Tom cautiously nodded. “Okay. This, quite literally, isn’t brain surgery, and the tumor is near the surface and a lot easier to get at. If she is agreeable I believe, as does my colleague, that if we can go in ultra-minimally and snip away at the growth, and get it out of the body or killed with the appropriate drugs, we can probably not cure her but give her years of better health and time for medicines to be perfected that could eradicate the rest.”

Tom wasn’t convinced it was time to unveil his nanosurgery bots but he agreed they should discuss it with Jen and especially Jan.

Doc barely got out the basics of his proposal when the ladies both nodded and practically shouted, “Yes!”

They discussed the fact it was going to take about a month to get to the point where the operation could be performed and so the ladies decided to continue their travels for part of that time.

Tom arranged with Slim Davis, Enterprises pilot and FAA-certified multi-engine and jet trainer to spend the necessary time getting Jen checked out and her license updated so he could loan them a *Pigeon Commander* to make their travels more comfortable for Jan.

By the following Wednesday she was qualified and the two ladies took off, circled Enterprises once, then headed to the south and west.

Every day starting with the previous weekend Tom and Doc had studied Jan's scans and mapped out how they would do the operation. And, Tom would need to be involved because, as Doc pointed out, he only had two hands and one brain unlike the inventor who seemed to have multiples of both.

A local veterinary neurosurgeon Doc knew was consulted and she offered to assist in training them via simulations. She sat in on numerous sessions where everything was performed in a computer and proclaimed the pair "ready to fly" at the end of three weeks.

"I do have some reservations about this," she told Doc, "mostly because it is going to involve a non-medical operator and a non-canine patient, but I cannot say with any certainty there would be any different result if this were to be performed by a crack medical institute trained pair or trio of the most highly qualified surgeons in the land." She let out a puff of air through her nose. "In fact, Greg, while I cannot be there to assist, legally, there is nothing I can find in the books about me being video conferenced in and suggesting a few things." She smiled.

So did Doc. "Emily, you are a jewel. So, do you think that Tom and I can do this using his nanobots?"

"Truthfully? It is a long shot. I do *not* believe you will kill the patient, but I cannot guarantee you will be ultimately successful. And, I caution you to get the heck out of there at the first sign of a problem. You will be navigating those tiny things around spinal nerves, ganglia, and ventral and dorsal roots to get in there. But, as I said, I will be available on video and direct telephone link."

When Tom heard about her offer he suggested they set up a telejector in her office and a TeleVoc router directly to Enterprises so she could "talk" directly with them both. On seeing a demonstration of the 3D images she would be watching and also after her first use of the TeleVoc pin, she was in love with the entire system.

The ladies flew back in with one day to go from sunny Florida and both now sported attractive tans.

On the day of the operation Jen was nervously pacing outside the operating room Doc had secured at Shopton General. Although they would normally not allow such an operation to take place, Jackson Rimmer, chief legal counsel for Enterprises, had discovered a loophole in the FDA regulations that allowed for one-

time experimental surgeries to take place in a licensed facility as long as minimal hospital staff was directly involved. This did mean they had access to a qualified anesthetist who would keep Jan pain free but conscious throughout, just none of the surgeons.

Tom had enhanced the SimpsonScope's zoom feature so they could see a close-up image of the tumor area. They would not see the actual nanobots on it, but a miniature camera roughly the size of a small white bean would be inserted next to the work area and give them a clear view of what they were doing.

Jan was an amazing patient throughout the operation. She was able to wiggle her toes and report sensation in her foot during the first ninety percent of the operation.

Then, in an unfortunate misalignment of the controlling magnets, one of the nanobots snipped ever so slightly into the side of the spinal cord outside the perimeter of the tumor and Jan, with a whimper, sadly told them she could no longer feel anything in her leg or foot.





## CHAPTER 16 /

### CALLING ALL GAME BOYS (AND GIRLS)

DOC POKED her thigh with the same no-feeling results. It was the same all the way up her outer thigh and across the back of it, She did retain feeling in the front from the knee up so he decided to finish the operation.

In all, even though Tom was in a deep funk over the misstep, they removed nearly eighty percent of the tumor, and most of that was the active portion. Some of the inner tumor had died and it was felt leaving that tissue to be absorbed into the body naturally was preferred over trying to get more out and perhaps doing additional damage.

For five days, recovering back in the Enterprises' Dispensary, Jan was in good spirits.

Tom felt dismal and could barely force himself to face her. Doc, too, felt terrible about the numbness, mostly because it was his pair of nanobots that had created the problem when he turned his attention to what Tom was doing for a second or so.

But, when they did go see her together on day two both men were astounded at her reaction.

They had begun apologizing when she burst out laughing.

"Tom... Doc, for goodness sake you two. Snap out of it! First you save Jen's and my lives when we nearly crashed and then you do something that will save my life yet again. *So what*, and I mean that; so what the heck if I have to be careful not to hit my leg into things or step on razor blades for the rest of my life? I may have a 'rest of my life' now and it's all thanks to you two. For crying out loud, but you two are pitiful if all you can see is the small inconvenience I'm left to deal with."

"But, we could have done better," Tom stated.

"Sure, and also you could have done lots worse, but you didn't. All I think from having been there is how hard you two were racing back and forth between your little robots and how the thought hit me you really needed a lot more people in there."

Tom had to admit it to himself, and to Doc, later. "We really needed about six operators in there, Doc. One person per bot and even then one more person to oversee the operators. I don't know what to do for dad, but somehow we have to get together a team of specialist operators. His operation is going to require at least

twenty nanobots and there is just no way I can be casually involved.”

“What can we do, skipper?”

Tom looked at him. “We either train a huge team or I figure out how to clone you at adult size and with all your knowledge ready to go!”

“Hey, flyboy,” Tom called out to his friend who was currently chest deep in the engine compartment of one of the oldest *Pigeon Specials* still at Enterprises. He grunted a greeting and held out his right arm indicating he needed one minute.

Just about when promised Bud backed out and turned to face Tom.

“Yeah? What’s happening? And, I mean with your little nano docs.”

Tom tried to work up a smile but was very worried and it showed on his face. Bud seeing this wiped his hands off and motioned toward his office tucked along the left wall of the hangar.

“Come on. I’ll get us both a nice lukewarm cup of yesterday’s coffee.”

It was piping hot and fairly fresh and Tom accepted his mug with a nod of appreciation.

“Thanks, Bud. I need the coffee and a friend's advice.”

“Best friend,” Bud corrected him. “First and always, or at least just a half step behind Bash. So, is this about your dad?”

Tom nodded. “Yes. But more than that, it is about the nano surgery bots, or nano docs as you just called them. I am at an absolute standstill over how to control so many of them. I’ve tried to make the computer controls as easy as possible, but there is still a lot of precision and practice that needs to be done, and then the time it is going to take...” He broke off.

Bud pursed his lips and tried to come up with something to say. One thought hit him but he shook his head and tried to put it out of his mind.

“What?” Tom asked having seen the head shake.

“It’s a stupid thought from a man who ought to know better than to minimize this issue in his own head. I’m sorry, Tom, but my feeble brain had a little gassy episode, if you know what I mean.”

“No, go ahead and tell me. Anything, even if it might sound crazy is better than I have right now. Between Doc and me we are about twenty people short and time is not on our side. One doctor he called said it might take him a month to learn to help, but he couldn’t take the time off.”

The flyer took a deep breath. “Here goes. Turn it all into a game and set it up as a massive multiplayer environment. There are millions of game fanatics out there, a lot with nothing but time on their hands, who would love a good challenging game. Some I know are sick to the teeth of shoot-‘em-ups and gang warfare ones and I’d bet there are a number who would jump at the chance to, uhh, well be dedicated, and probably paid, beta testers of something exciting coming down the pike.”

He looked at Tom and saw a blank face.

“Sorry. I know how stupid it all sounds—”

“No. Not stupid, Bud. Genius,” Tom replied softly. “With some help from our graphics folks, and with the environment already 3D, you’re right. Game players would jump at the chance. And, once they find out a man’s life is on the line—”

“Nix on that, skipper! These types want to have fun and avoid responsibility at all costs. That’s why they escape in these games. Tell ‘em the game simulates a possible real life scenario and tell them it all has to be accomplished as a team without any pause function, just as if this were a real operating room, and I think you can grab them. Tell them they might be responsible for killing somebody and they run and never look back!”

They continued talking about how to set things up for two hours, neither one touching their coffee.

Tom took copious notes on his tablet computer while they discussed some of what Bud knew about games and gamers.

“This is going to make Sandy angry if I get involved, skipper. She already thinks my one hour a night dedicated game time takes far too much attention away from her. But, as it’s her father as well as yours, I think you can safely rely on me to take a good shot at getting the team or teams together, setting up parameters and running them through a bunch of simulations until they are as good as anyone can get.”

Tom reached out his right hand and they shook. “Deal!”

He went straight to Doc’s office and gave him a ten-minute explanation of what Bud had presented, Doc sat there, nodding periodically and making “hmmmm” noises. In the end he leaned over his desk and stated, “No deal! I cannot turn over your father’s

life to a bunch of pimple-faced, obese game boys who live in their parent's basements, eat nothing but junk food and have no social skills. My answer is a firm *no*."

"Give Bud my heartiest congratulations and tell him I think it is a marvelous idea," Damon told his son at dinner that evening.

Bashalli and Anne were in the kitchen getting the meal ready and plated and the two men had briefly discussed Tom's latest advances. He quickly turned the conversation to the concept of making it a large-scale game.

"The only problem is that Doc thinks the idea stinks and is against it. Period, no further discussion."

"Well then, I believe it is time for the patient and the physician to have a heart to heart. I think I can make a good case for this as long as you are willing to concede the possibility it won't happen. And, by that I mean you go ahead on a parallel path to computerize it as much as possible and to drop the sheer number of live surgeons needed to perhaps eight or ten. I think the Swift bank account can stretch to pay those fine doctors for a few weeks of their time to learn the system and then perform the op. But, that isn't to say I don't believe Doc and I can't come to an agreement to do it the Bud way. Gee, but that last sentence had a lot of negatives in it, but the upshot is I want to talk him into it."

"Into what, dear," Anne asked as she and Tom's wife came through the kitchen door. "And who is it you will be convincing?"

Damon stated as matter-of-factly as he could, "Tom and Bud have had a brainchild that I believe might signal the start of a new era in medical care. I can't do it justice so I'll let him tell you, but the two of you keep quiet and hold any opinions to yourselves until he is finished. Okay?"

Both women agreed.

Tom got no further into his explanation than the concept of it becoming a game than Anne shot to her feet and let out a strangled cry.

"And, with that she will sit back down and do as her ailing husband has requested," Damon calmly yet firmly said, giving her a look that spoke volumes.

Anne sat and kept quiet, her face set in a rock hard scowl.

But, the more Tom talked and explained, the more her expression softened until at last she was smiling.

"Even though you have to convince Greg Simpson to sign onto

this, and I'm guessing you will prevail, I only have to ask if there will be a failsafe in all this?" she finally asked.

Tom and Damon looked at each other, with the older Swift asking what she meant.

"I mean, if you are turning loose a bunch of unknowns in your brain and one decides to go off script, what shuts that person out? And, how long before that happens? Before any damage can take place I would hope. No, I demand."

Tom spoke for them. "They will be actively watched over by both the computer and a gaming expert who can spot anything like that and temporarily shut down control of any one or more player's assets, as they call them these days. Plus, we are working in such a small environment it would take someone many minutes to get out of proper position and into some place they could be mischievous. They would get a warning from the game master long before that."

"How many times will they be able to practice this game?" Bashalli asked.

"As many times as it takes, but it is not just the one specific operation. Bud says for best results we need to set up several scenarios and let them practice each for a few days before changing it. They have to be adaptable to anything that comes their way. There will be no game reset on the actual day."

Dessert was on the table before anyone said much of anything else.

"Come on," Damon requested, "let's have this delightful cherry pie with smiles on our faces. For the first time in a couple months I feel as if somebody has set up a light at the end of a very long and dark tunnel.

"No, Damon, no. Please do not try to convince me on this. There is no way I can allow rank amateurs to operate inside your brain. No way!"

"Like Tom?"

Doc's bravado deflated immediately. "Damn. I was hoping you wouldn't play that particular card on me. Tom is different. He's like a super human when it comes to being able to think and do things. His brain is always set on gather mode and he retains just about everything he sees or hears. I'd trust him to do a solo operation on me. Heck, out by Eris he did just that."

Doc reminded Damon that he'd suffered a terrible rib injury and Tom had opened his chest up, repaired the damage and

sutured him back together in the tiny med room of the *TranSpace Dart*.

“He can do anything he sets his mind to, and you know that, Damon. Why would you trust any bunch of strangers, kids, for gosh sake, with your life?”

“Because that same son is going to be running the computer and he will have one of the best doctors around right next to him all the way.”

There was silence for a full minute before Doc sat back. “You are going to hear grumbling from me all the way to the end of this, but I will help make this a reality, and a success if there is one to be had. Just promise me this is the last surprise I get on this case. I’d hate to find out he is going to recruit only players ages ten and under!”

When Tom found out and then told Bud the plan was accepted and it was going to mean the flyer would have to stop his normal duties for the next month to six weeks, he jumped into the air and shouted with glee.

“I finally get to give back some of what you and your dad and family have given me over the years!”

Tom stopped, astounded at that statement.

“What? Bud, don’t you realize this is not an ‘I pay you and you pay me’ sort of deal? Over the years we’ve know each other you have carried more than your share. Every time I want to get into dangerous situation and you step forward telling me it is your job to risk your life, not mine, don’t you know how much that means? Golly, Bud, you are more family to us all than just Sandy’s husband. You’ve been my brother since we were sixteen. Dad and I are unbelievably touched that you came up with this solution to our big problem.”

Bud looked ashamed. “I know all that, Tom, and I probably shouldn’t have worded it that way, but I would not be half the man I am if it weren’t for the Swifts, all four of you, but especially your dad who has been the best stand in for my own pop ever. I just want to feel like I’m participating in all this to the highest level possible. So, let me rearrange a few things, get my work load off onto some of the other pilots who aren’t out at Eris and I can be yours all day, every day starting tomorrow!”

“Great. The Nanosurgery Brigade awaits your expert involvement.”

Bud grinned. “It’ll even be a bigger brigade once we get this team together. So, tell me how many and describe the skills I’ll

need to help look for.”

They sat down and talked about the need for at least twenty final players, but they might have to hire up to a hundred from which to glean those numbers.

“Can I suggest changes once you get creating the simulations?”

“What sort?” Tom asked cautiously.

“Well, things that don’t ring true to game play.”

“Boy, that’s a tough one. Doc’ll have problems with anything that isn’t true to what any operation would actually be, but if you can point out places where the simulations can be both accurate and better for the players, go ahead and speak up.”

Bud grinned. “Thanks. I think we’ll end up getting a better team that way. I’ll get with George Dilling to write up the help wanted notice, but I will hold off posting it to the major game discussion groups until you can give me a time to start the qualifying sessions.”

One week after her surgery, Jan and Jen got everyone to meet them at the base of the control tower where Jen needed to file their flight plan. There were hugs and kisses and well wishes all around. Ten minutes later Tom drove them to the small commercial terminal where he watched them climb into their plane, and fly into the noontime sun.

Tom spent the following week working with some of the best people in George Dilling’s Communications organization setting up what would be the master control room for the surgery and the game practices.

Looking part like a television production control room and part like a space ship control cockpit, the entire front wall was covered with flatscreen monitors. There would be one for each player showing exactly what their nanosurgery bot was “seeing” at every second as well as status info for each nanobot.

In the very back on a raised platform sat three high-backed and comfortable chairs each with a smaller monitor sitting at an angle low enough to not obscure the view of the front set of monitors. The two arms had multi-function joysticks to provide all the control for any of the bots that was required to be taken over from a player.

This was part of the failsafe that Anne Swift insisted on.

Doc would sit in the left one, the seat nearest the door in case

he needed to leave to go to the operating room, while Tom would take the rightmost seat. Bud's master controller seat was in between and about five feet forward from them.

He would be wearing a very special headset—one that Tom still needed to build along with the 3D sets for the individual players—and that would show him the exact display of the SimpsonScope that would be placed around Damon's head and neck outside the emitter array. With the microscopic focus the system now featured he would be able to see each of the players nanobots, the blood vessels and the tumor in better detail than any of them.

Doc also had the ability to pull on such a headset, instead of the one he and Tom would normally grab if a "takeover" was necessary.

The room had been soundproofed to the point where even a knock on the door was difficult to hear.

With Doc's help Bud had written a five-page description of the "game" and the qualifications the programmers were looking for in players.

"If nothing else, that length will keep the casual players and the people who won't take this seriously away. Those sort usually peter out at paragraph two in the instructions," he told Tom the morning he posted it to what he believed would be the appropriate Internet locations.

The other thing that would weed out all but the most serious was the three-page application to be filled in. In fact, that application had given him the most trouble as everyone else but Bud felt it was too restrictive and might end of getting them few if any applicants.

It worked out just the way Bud hoped and the list of people applying during the one-week open enrollment period came in at a healthy six hundred eighty-one people.

He and Tom went over the list first pulling out names of people who had entered strange, sarcastic or vulgar responses to anything. The list dropped by only three dozen.

Next they removed anyone who had failed to enter a birthdate—usually a sign they were underage—or had put one it placing them under the mandatory eighteen the Legal folks had insisted on.

Gone were nearly one hundred more names.

Doc worked with several programmers turning small scale operations into computerized scenarios. This involved mostly obtaining preserved specimens into which small groups of the nanosurgery bots could be placed to do such things as locating



and destroying blood clots, repairing tears in heart valves and things of that nature. Then, the computers were used to turn those operations into 3D scenarios that could be “played.”

By the time April first arrived the first six scenarios were ready, and the list had been reduced to two hundred people Bud had good feelings about.

Only the actual game play would tell anyone if these people had what it was going to take, or if they “just looked good on paper.”

Over the next three weeks Bud ran everyone through the easiest scenarios in groups of five to eight carefully noting everything that went very well along with things that did not go according to plan.

The scenarios were enhanced and made more complex based on what he saw, what the computers measured, and from numerous live feedback sessions with each group.

Group members were switched around to ensure each person could work well with a variety of others.

Glory hounds and know-it-alls were identified and taken off the active list.

In the end, and before Bud notified everyone there would be a two week hiatus while the more difficult scenarios were finished and loaded into the system, he had one hundred very good players, most of whom he believed had a very good chance to make the final cut.

The only one not truly happy about the progress was Greg Simpson who was putting more pressure on Tom to let him try to hire qualified surgeons.

“We could even take this out of the country, Tom,” he suggested. “There are a number of places where experimental surgery like this can be performed without governmental nitpicking.”

Damon had been brought in and his scowl at that idea put an end, temporarily, to that notion.



TOM SPENT every working day, including most Saturdays, at Enterprises. In spite of her desire to quit her job, Bashalli had agreed to work from home five to six hours a day three days a week, while they continued to try to find her replacement, so the baby ended up in remaining in “grandma daycare.” She brought little Bart to visit every other day as soon as she finished her work and had picked the baby up from either Tom’s mother or her own.

“I do not say this to make you feel bad, Tom, because it is only a statement, but Bart misses you. I do as well. He is not old enough for me to explain that he will miss the chance to know his grandfather if you do not work like this, but please do not overdo it. Even Father Swift thinks you are going to make yourself ill if you will not take a little time off.”

Tom sat back his chair. They were all down in the underground office and lab where he had been spending a lot of time refining his design and working to maximize the speed of the nanobots.

“I’m sorry, Bash. I love you, and I love Bart, but I’m getting so close and dad has started to get worse. He feels pretty weak most days and Doc tells me he’s had a few spells of shaking. I’ve got maybe another month and a half before time needs to be called and we operate with whatever I’ve got.”

He looked at the calendar. “May seventh. It’s already May seventh, Bash. Mother’s Day is coming and I haven’t had time to shop for anything for you or mom. Or your mom for that matter.”

“First, do you not realize that the act of trying to same a woman’s husband is more of a present than something from a store? Any good, loving woman would tell you that. Besides, I already purchased her a darling little bracelet I know she has been eying and signed the card. I have also shopped for my mother. She is receiving a day spa gift card from us.”

She set Bart on the desk and climbed into Tom’s lap, hugging him around the neck and kissing the top of his head.

“Like I said, I know and understand. And he,” she looked over at the baby, is *my* Mother’s Day present. At least for this year. Do not feel this will do anything to our family, but Bart finally has started calling for his ‘Da’ when it is time to sit down for dinner.” She pulled back and smiled at Tom. “I call out for the same man at night when I slip into our bed. It is nice that you do come home,

even if it is around midnight, and share that bed with me. I cannot sleep very well without you there.”

After they left Tom felt a renewed vigor and concentrated on one of the most difficult details of the nano technology: individual control. He had settled for a stylized game controller and was only trying to simplify things from it having three joysticks and six buttons. He needed to get rid of one stick and at least a pair of the buttons.

An idea of how to do it came to him and, at least in his computer model, and it appeared to work.

Within the hour of Bashalli and Bart leaving, he made his normal triplicate backups—one now going up to the new space station for safekeeping—and Tom left his office, got up to ground level and headed home.

Bashalli was surprised and more than a little pleased when he walked in the door well before eight.

Tom and Doc tried another real operation. This time it was on a dog that had been taken to the animal shelter with a bad cough with some small amount of bleeding that turned out to be a tear in its esophagus.

It lay on the bed of the SimpsonScope and they looked at what was in store for them. On the floating display both saw the tear as well as the blood vessel behind the tear that was causing the problems. It was already planned to insert the nanosurgery bots into the blood vessel about a half inch from the tear and maneuver them to the point where they would be used to first clean the ragged edges and then apply a series of small clamps Tom had built for the purpose. Looking a lot like the pinchers of an ant, the clamps were carried into the body closed and would be activated, like the bots, by application of magnetic waves.

As they began working the bots into position, Doc said, “I want this to be a real success, skipper. I’ve kind of taken to this beast and want to adopt him once we are finished.”

The dog’s heart rate had been slowed and his body cooled so the lack of ready oxygen would not harm the animal. They began the first of the trimming steps with two of Tom’s bots—each of the men controlled four—held the tissue while Doc gently snipped off tiny bits to make for a smoother fresh surface.

The process was completed on one side of the tear and they moved to the other.

“Damn!” Doc called out. “I just lost one of mine. The

circulation is carrying it away. Do we stop and give me time to bring it back?"

Tom shook his head. "No, I think it is better to go on and let his body eliminate the bot later. It is small enough to get filtered out in his urine so I'm pretty sure it won't cause troubles later. We have enough to continue on."

They went back to the trimming of the second edge and had it in good shape fifteen minutes later.

Tom took a moment to scratch his nose, and asked, "How are his vitals?"

Doc looked at the readouts, also part of the 3D floating display. "Good. We don't have all day but he is doing fine."

A few minutes later and the first of the clamps had been opened, set in position and closed. They continued adding them every half millimeter along the six millimeter tear until they reached the other end.

"Let's sit here a moment and watch," Doc suggested. "I want to see if his clotting factor is sufficient to start to close the in between gaps."

It was and exactly one-hour and thirty minutes after the bots entered the dog, they were taken back out. Minus, of course, the missing one.

A half hour later after Tom left Doc inserted a special scope down the dog's throat and sutured the tear. Two hours after that it seemed to be holding and there was indication of both the start of healing as well as some tiny inflammation. He carefully dried the area and coated it with an antibiotic and removed the scope. The dog would be allowed to wake up naturally from this point.

By the time Tom left for the evening he had received a report the dog was awake, wagging its tail and the cough was gone.

He felt a tremendous sense of relief both for the dog and for the progress the nanosurgery bots were making.

But, he knew come the following morning he would be making even more refinements. The loss of the single bot had shown a weakness that might be tolerable in the canine's torso, but would not be so in his father's brain.

With fewer and fewer public sightings of the older inventor, rumors began their inevitable march around Enterprises and even outside the company walls.

Tom and Damon were conversing about the operating robot

status when they heard a knock on the office door. Trent poked his head in before entering.

“I just wanted to let you know that I have overheard about five different rumors this morning alone, Mr. Swift.” He shook his head sadly. “While I tried to put down the worst of them, that being you had died and your body was being held in Chow’s deep freeze here in the Admin building, I’m afraid public opinion is growing there is something very wrong with you. I know it isn’t my place, but do you have plans for a company wide announcement? Soon?”

“Come in and sit with us, Munford,” Damon invited. The secretary wasn’t used to this sort of informality and looked uncomfortable as he sat on the very front edge of one of the conference chairs.

“Tom and I were discussing that just now. We would value your opinion.”

“Mi-mine? My opinion, Mr. Swift?” Trent looked from Damon to Tom and back again. Both Swifts were smiling at him.

Tom said, “Dad knows it is time as do I, but you have your metaphorical finger on the pulse out there, so what would you tell people. More importantly, how?”

Munford Trent was amazed. These were two men he admired and had always tried to support to his utmost, but he always had felt a secretary’s place was out front to do the paperwork and not as a decision maker or counselor. He was in a quandary how to proceed.

“Okay,” he finally got out. “This is very difficult for me, but as you have asked, here is my thought. A memo is not going to do it. An actual appearance, company wide is called for, but only if you are up to it.”

“Let’s assume that I am or can be.”

“Well, it is just about impossible to shut down the company and have an all-hands meeting, so I might suggest pulling out the big tent we sometimes set up near the front gate for events and inviting about a third of the employees. The rest will be asked to watch on the closed circuit video net here at Enterprises and also at the Construction Company, the Citadel, and even both space stations along with Fearing Island. We have done it three times since I’ve been here and I recall it only takes Facilities and Communications about twenty-four hours to set in action.”

He suggested a straightforward approach telling everyone of his diagnosis, but not his prognosis.

“Tell them Tom is designing a special new operating system that will revolutionize such operations and assure people you might be tired and unavailable, but you are still here, in charge, and have Tom to back you up. I would say to plan for at least eight of ten minutes if you can do that but not too much more. And, don’t answer questions. Let Tom do a few we might think of ahead of time, but you do the smile and wave thing and assure the masses you are alive.”

Damon asked him to set things up. “Let’s call it for four in the afternoon tomorrow. And, thank you for talking to us about this. Your input is invaluable at nearly all times. I just wanted you to know that.”

By the time nearly six hundred people gathered inside the large white tent, many people had Damon long dead and Tom would be telling them the company was shutting down, others “knew” that Damon was in space, his frail body no longer able to withstand Earth’s gravity and he was going to be saying goodbye via video, while a few took the stated reason for the meeting at face value.

Damon Swift wanted to address all Swift employees at one time and was about to explain his recent absence.

Right at the appointed hour he walked, as steady as he could force himself to be, up the stairs from the back of the small stage and to the podium and microphone. A tall stool had been set there and he sat down in it.

“As I look out over this gathering I am reminded of something Mark Twain once said responding to rumors based only on a cousin of his being ill, that being, ‘The reports of my death have been greatly exaggerated!’ That is not an exact quote but good enough for this occasion.”

There was a huge round of applause from the employees that he tried to quell. Finally they returned to silence.

“Now, having said that I have to tell you that I was diagnose with a brain tumor several months ago. And, as you can see I am still here. I have undergone examinations by our own Doc Simpson and have had my case referred to several experts in the field. I am not here today to tell you I am about to die. I am not here to tell you I am retiring and Tom is taking over. What I am here to tell you is that I am not entirely well, but a revolutionary operation is a month or so away and I have every faith I will come through and be here to address each of you many times in the future.”

He spoke briefly about nanotechnology and the incredible strides Tom was making.

“In fact, he and Doc have already operated on one young woman and removed a tumor similar to mine, but from her spine. Some of you met her, Jan Jensen. She is alive and walking thanks to Tom’s nanobots. And, those were the big ones!”

He waited until the murmuring calmed down.

“The ones he and his team are testing are so small you might not even notice it if you had one fly up your nose.” This got the intended laughter. “I’m going to let Tom tell you, ever so briefly and in broad details, what his nano robots will do. We will keep you informed from now on. It wasn’t that we could not trust you with the knowledge, it was that we really didn’t know where we stood until just a few days ago. And,” he stood up and walked around to the front of the podium, “as you can see, we *are* standing. Thank you!” He shook Tom’s hand as he returned down the back steps where Doc eased him into the back seat of his car and drove him away.

Tom spoke for about nine minutes telling the crowd how the bots would go in and nibble away at the tumor and transport it out of his father’s body.

“It isn’t going to be a short operation, but dad will remain awake during a lot of it to help us know if he feels any changes along the way. We all ask for your continued support and the loyalty Swift employees have given us in the past. Please do not respond to any reporters or outsiders looking for some sensational story. There is none to tell right now and speculation can come back to bite us all. Thank you.”

The next morning Doc Simpson came into Tom’s private office underground next to the Flying Lab’s parking position.

“Hey, skipper. I think I need to talk and you need to listen, but I’m probably just blowing off steam and it will be things you’ve heard from me or already know. Ready?”

Tom set the small model he had been examining down on the desk and sat back. When Greg Simpson sounded serious, he was, and it was best to let him get it all out. “Go ahead, Doc.”

More nervous than Tom had ever seen the man, Doc stood back up and began pacing around the front of the small room.

“Okay,” he finally began, “we all know your dad is an incredible man and one of the all time greats. And, that’s not what I came to tell you; everyone knows that. But, I need to start somewhere. So, you are also a great man. Destined to surpass your father in history, and that’s the way it should be. Fathers expect their children to do better than they did.”



Tom had been nodding but kept quiet. This was not the time to get Doc derailed; *just let him say what he needs to in whatever time he needs*, Tom thought.

“I’m not doing this right, so I’ll come right to the point. Asking a bunch of high school and college kids to come in and play a video game, or what they *believe* is a video game, isn’t the way to go about operating on your own father. My god, Tom. We’re talking about digging into the inner area of his brain. The man is not some goofy game with electric tweezers and a buzzing red nose!” He sat back down looking plaintively at Tom.

“I know. Really I do, Doc, but you told me that there is no surgeon, no matter how skilled, who can learn to operate the nano surgical robots in the sheer numbers they must be used. And, sixteen or more doctors? Impossible! But, sixteen or twice that number of players, highly skilled and motivated by cash rewards and even high-paying jobs in the industry they love? In a day and age where massive multiple player games are commonplace, and where these kids and adults, the ones I’ve heard some people call ‘vidiots,’ feel it is their obligation to work as a team for the single goal of winning the game, these are our only hope. I can design the nanos, I can even figure out how to build them and make full-sized remote controls look like game controllers with an interface that scales down movements from inches to microns, but even I can’t play the stupid game necessary to save my father’s life on my own!”

Tom shoved himself into a stand. In a stronger than intended tone, he said, “I know it is going to be so much more difficult than that simple skill game might lead children to believe! In my mind this is not a game, but a fight for my father’s life. Like any good fighter I want the best in my corner. I believe this team *is* that, but only as long as we have you to lead us.”

Doc also stood and Tom feared he would stalk from the office, angry at Tom’s outburst. But, Doc surprised him.

“Like you, Tom, I know. I’ve known since you proposed to build the nano-surgeons. I’ve known since you described everything you could do at that infinitesimal level of size and dimension that somebody with fingers that could kill if they so much as touch parts of the brain could ever do. And, I know that if it were reversed your father would be telling me to get the hell out of his office and let him get on with the business of saving his son.”

He looked at the man who wasn’t all that much younger; perhaps eight years was all, and he smiled.

“I have, in my short span of years as a physician, performed more operations and done more things medically than any other

doctor I know of. I'm not a surgeon and yet I've been in a man's heart. I've saved kidneys with a scalpel and sutures. I'm the first man to perform surgery to save a man's life up in outer space for crying out loud. I field offers on a daily basis to give this up to head this medical department or teach at such and such school, and I turn them all down because nothing... *nothing* compares to what I can and do here at Enterprises. It's all due to your father and to you, even though I'd prefer that half my practice didn't involve keeping you in nearly one piece."

They sat back down, looking at each other for more than two minutes. Finally, Doc reached over the desk. Tom shook his offered hand.

"I had to say it one more time, but I will stand next to you at all phases of this operation, and I mean that in both the medical as well as physical sense. I'll sit in, silently if possible, on all the next phase of practices. I'll provide you with any hints if I spot anything when we do this for real, anything that seems out of the ordinary needing to be worked around."

"Thanks, Doc. We picked a good group of people for the starting pool, and as the exercises, or levels for them, get more complex we are weeding out a few at a time who might not make the grade when the time comes."

Doc nodded. "For your dad, the time needs to come sooner rather than much later. We have about four weeks until that tumor has to come out or we face the possibility of permanent damage. Not to rush you, but that's the way it stands right now."

Tom told him he now believed his final nanobots and players would be able to perform the operation in about five hours. Six, if something unusual came up.

"Your dad can take that. Does our dark haired game master have an inkling of what his team of players can stand?"

That brought a rueful chuckle from Tom. "He tells me that unless driven away from their game consoles by the needs of a bathroom break, most of these people will forego food and sleep for a full day if the game play is interesting. About the only thing they have in common they will not give in to is lack of caffeine. Sodas by the six-pack or even the case are the norm with a lot of these more serious types sitting next to a mini refrigerator stocked with cans and cans of it."

"Will caffeine jitters affect the control?"

Tom shook his head. "I've programmed to ignore that."

That afternoon when the latest "game" started, Tom added a new aspect. From this point on the nanobots would need to fight

against the movement of blood. It is what would be encountered in the brain because Mr. Swift's heart would be pumping at full capacity since he would be conscious during the operation. He also added a variable on a random timer to change the viscosity of the liquid to represent warmer and colder blood if he needed to be sedated and his body cooled down at any point.

Everyone mastered the new part of the game with ease, even the young girl known on line as *LiliEvangeline* who had been among the slowest of the initial group to come to terms with constantly changing functionality. It had only been once the GameMaster—Bud—explained to the group as a whole that the way the final artificial world would work would be changed on perhaps a daily basis that it sunk into her she needed to adjust to the game and not complain about it.

It was all going to be a very tight timeframe to get to the point the operation could be performed. In the meantime, Tom also had to come to grips with one failure in the nanobots; they were unable to move quickly enough to perform all three stages of the operation: movement to the tumor's location; the team attack on the tumor that had various nanos moving in and away as others zipped into take their place almost on a five-second basis; and, the final killing of the micro bits of the tumor.

For that he now was happy he planned on a second type of nanobot, one that would act as the disposal unit for anything brought to it by the operating bots and his decision to back it into position making the round trip by each nanobot shorter. It had meant, however, a redesign of the body.

The problem now was he didn't think there was enough time to build enough of them. Not and meet Doc's unfortunately-named "Drop dead date."



## CHAPTER 18 /

### PREP AND PRACTICE CONTINUES

“HOW’S MY favorite son?” Damon asked from his hospital bed. Although still very much aware of everything going on, it had been deemed best to make him adhere to 24-hour bed rest until the operation could be performed.

“Hey, Dad,” Tom returned. “Son, daughter-in-law and grandson are all doing well. A bit stressed, but that’s how it is in these situations. Just so darned many things to do.”

Damon nodded. “I know. I only wish I could be of some assistance, but even without this,” he pointed first to his head and then the room in general, “I’m no expert in nano technology. That’s your thing. I’m just so thankful you are into this sort of area. Give me a satellite or even a robot kangaroo any day!”

Tom patted his father’s forearm as he sat on the side of the bed. “If I wasn’t an expert before, I am now. I’m guessing that Doc has had a few words with you lately?” he asked.

“Words, condemnations, pleas and finally this morning, acceptance and even agreement. It has to be difficult for a man so skilled to let go and trust someone he has had as a patient so many times, plus a lot of kids he has never met, with a human life. That team never will be told they are operating on a real person, I’m assuming.”

Tom nodded. “By the way, Bud tells me the average age of our finalists is about twenty-six. Not so much on the kid side of things. Still, they will never be told about you.”

“Fine. To my way of thinking, this needs to be kept as clinical and detached as possible. If I thought the players for my operation would find out they—” his voice went very quiet, “...if I thought they would hear they had been unsuccessful and I died, I can’t imagine how horribly that would affect them the rest of their lives. So,” he cleared his throat and spoke with more conviction, “your idea to keep this as a remote game taking place in a computer-generated alternate world is right. I think Greg sees that now.”

“Yes. He and I had a talk about it and I came to that same conclusion about him. He really is an incredible healer. This is just so new to us all.”

“Right. And besides, *after* this succeeds and the medical community starts rumbling and grumbling, I want your simulated world opened to real surgeons. Let them prove they can do the

same thing with the same few weeks of preparation. If they can't then I'll go on public record scolding them for being so churlish and immature about this. That is a promise I intend to keep."

Tom smiled and grabbed his father's hand, giving it a squeeze. "I look forward to standing next to you when you make that public statement!"

"Good. I'll use some of this rest time to write my speech."

After he took a look around the room—and Doc had allowed Anne and Sandy and Bashalli to decorate the comfortable room in the Dispensary to make it as homey as possible—Tom asked, "Is there anything you need?"

"Not really. With the reduced blood flow I have been sleeping a lot. My vision is still good, so if you have any interesting journals or even a good mystery novel for me to read, I might like that. I can only take so much TV and radio."

Tom promised to bring an assortment of books the following morning.

"How long until you and the team are ready?"

"A week at the very least. Doc and I just ran them through a simulation to clean out a major leg artery in ..." he made finger quotes, "*a male patient who was having major blood flow loss*. It was a three hour simulation and everything went really well. We keep working them into smaller and smaller areas and with one exception of a team member we had to replace a few days ago, every one of the three dozen finalists are doing great, work well together, and their comments tell us they have a great sense of accomplishment."

Damon asked about the one person who had been replaced.

"Bud showed me the profile. A young woman who is too close to having her baby to sit still for extended periods. She was probably not going to make the final cut anyway, but we did leave the door open to her for participating in future *games* once she has her child."

He could tell his father was getting tired so he excused himself and went back to the large office.

Bud dropped by an hour later asking how Mr. Swift was holding up.

"He's getting tired of waiting, Bud. And, to tell you the truth, so am I. I had a dream last night this was all behind us and things finally got back to normal." He shook his head in wonder. "I woke up feeling really good until I realized it had just been a dream. Give me some good news about the selection process and team

readiness.”

The flyer went to the conference area and took a seat, reaching for the remote control for the office’s 3D telejector system. “Take a look at the statistics and then I’ll answer your question.”

He showed the inventor screen after screen with team and individual evaluations and raw numbers. As he went along he described what they all meant.

“Bottom line is we have a great team that is just days and a few practices away from being finalized. What I’d like your feedback on is whether or not we keep a few extras on the primary team as standbys, even during the real operation.” He raised his eyebrows and tilted his head.

Tom leaned forward, his arms resting on his knees. “Doc and I talked about it and came to the same conclusion. We believe the team needs to be a finite one, just the twenty-four of them, with no extras. Doc and I will stand by in the extra seats in our control center ready to take over if needed.” He sat back in his seat. “The other people will be run through a computer generated operation scenario of dad’s procedure by you the following day to keep them interested in the process to see what half the number of people do to the timing. Then, everyone will be thanked and paid for their time.”

Bud looked bothered. “So, one real outing and that disbands my nano ninja knife team? Just sort of *poof*: thanks and all that now go away?” Tom thought he sounded a little angry at the idea.

Tom shook his head. “No. Doc thinks the whole setup can be computerized with only a bit more work and the team can continue to play. His hope is to convince the medical community this is the way to go and use them to demonstrate how easy it is to teach people to do this sort of thing for operations in the future. Not *people* people, *doctor* people. Your players will eventually be paid to teach others.”

“Okay. It’s just that I’ve come to like these guys and girls... a *lot!* They’ve given us their all for weeks and are a real asset. I’m glad to know Doc feels the same, finally. I was already pretty sure you do.”

Practice sessions were run each late afternoon to early evening. Tom had to smile when he looked in on one of them and believed he recognized it to be the same operation he and Doc performed on Jan Jansen. At the very least it was on a spinal tumor in a young woman.

He noted the team attacked it and had it successfully concluded in one hour, fifty minutes and not the twice that he and Doc

required on their nearly successful real operation. Of course, this time it was a group of eight and not just the two in the original case.

He was intrigued by how methodical this team was and concluded that they had a lot more practice than he and Doc had so they should naturally be a better surgical team.

It wasn't until two days after Bud's recap of the team members that what the flyer had called the nanobots came back to his mind.

*Nano ninja knives?* It was an interesting look into the flyer's mind. He was as worried over Mr. Swift's condition as Tom and yet his brain continued pumping out less than serious names for things. Although, this was actually sort of descriptive.

Like the famous Japanese warriors the nanosurgery bots would work unseen, quickly performing their duties and then would disappear into the night.

Or, back into a syringe and into a decontamination bath.

It made Tom wonder what else Bud might come up with before this was finished.

To fill in a little time, Tom designed a new type of multi-use emitter web that could be easily shaped around something such as a leg or laid across a back. It would not be of any use in the current operation, but if this was to ever be seen as a viable medical product it would be necessary.

Speaking of the emitters, Arv, with Linda Ming's assistance, had improved them slightly. They were no smaller than the ones being made by the 2900 Junior Junior, but now required less electrical power. That was a very good thing because the level of power and the attendant energy "bleed" or leakage into the surrounding air had been slightly interfering with a few of the nanobot maneuvers.

With each passing day Bud gained more and more respect for nearly all the finalist in his group. A few were weak in areas such as teamwork and had been thanked but dismissed in the weeks leading up to June 15th, his final assignment day.

He electronically gathered the entire group of twenty-nine in the final group and gave them a pep talk suggesting that, as if real life, some people excelled in certain things where others might not be as adept, but that this group made the cut down decision about the hardest thing he—or the unnamed game company he claimed to represent—had ever been through.

"If nothing else this trial period with you truly excellent players has shown us our suspicions about people wanting more than



bang, bang, shoot-'em-up skill games is a reality. We hope that our simulations have been realistic enough to engage you all. Now, I will be calling you each back personally to discuss whether you move onto the first go around of the final exercise in the next few days or if you will be in the second wave to tackle it. No matter what, please know that once we get this ready for commercial play you will all be lifetime participants at zero cost to you, and your feedback will always be welcome.”

Before he disconnected the whole team, a single player's electronic voice came through his headset. “Sir? If I can speak for the group out here I want to say it has been a privilege to be part of this. I almost feel like I've been operating on real people, it is *that good* a simulation. I don't know how you get those graphics down to our individual systems, and I hope everyone has been seeing what I do, but this 3D environment is incredible. Uhhh, what do we do with these headsets once this is over?”

Bud laughed. “You all keep them, of course. And remember you'll each be receiving a payment for your time and energies. And, there will be follow-up assignments for all. So, with that, please everyone stand by; I'll be with each of you shortly.”

Dismissing the five who would not be “playing” on the big day was hard but everyone took it well. Nobody knew for certain how many there had been or how many were being selected, so those not in group A took the news with good grace.

Several from the first group, the ones Bud knew were the best of the best, were invited to take part in both simulations. All readily agreed.

That second group would contain only sixteen members meant to see what the time difference would be with the smaller group.

The most asked question was when they would play the final simulation. All he could tell them was it would be within about a week to ten days and there would be at least five other practice sessions between today and then.

“We want you to be sharp but not tired when the big one hits. It will be an all-out attack on something pretty nasty and there will be no pausing for additional coaching.”

Over those intervening days he selected the one player he felt had the most leadership. Looking at his notes he laughed on seeing it was a young woman—the youngest of the team—from a small town in Alberta, Canada.

He contacted her personally, via phone, to discuss the added

responsibilities.

“As the game master here I can do a lot of things to lead the team around, but it would be preferable to have one among you who is right in there seeing this live and needing to make some decisions for the team. Any good surgical group has a lead doctor who calls the shots. While I am not suggesting that you bully the other members, I do think you are the best player we have, and I’ve already noted on a number of occasions some players talk to you asking your opinion. I just want to make it an official position. Okay?”

She had jumped at the chance but had to admit she was now nervous.

“I think I’ll be fine once things start, but thinking that I’m going to have some responsibility is a bit scary.”

Bud told her he was still going to be active so if she felt she was in trouble, all she had to do was say the word. “Let’s set the safety word putting everything back on me as ‘tag,’ okay? As is, ‘Tag, your it.’”

She laughed but agreed it was an easy word to remember.

Phyllis made one more visit to Enterprises arriving on June 18th. Again, she and the company pilot, Jack, flew in the SE-11 her company was now leasing but this time when Sandy met her she giggled that she had been learning how to fly, had piloted the jet for more than two hours on the trip, and now understood why Sandy thought it was the most wonderful thing ever.

Sandy raised an eyebrow and remarked, “Come on. *One* of the best things ever, Phyl.”

That made Phyllis blush and Sandy laugh.

Tom and Arv showed her the 2900 Junior Junior and she laughed and clapped at it.

“That is wonderful. We heard from one of our other clients they decided to make a small special purpose mini-plant using their full-size unit. I don’t think they actually downsized, just make a full size box that does one thing. You folks really take the cake. When this is over I’ll come back and pick someone’s brain about this so we can offer better suggestions to everyone out there.”

She was even more impressed when he showed her the fine control the emitters produced in the small machine could provide with the nanobots.

“I told you before and I want you to know I meant it. When the

time comes to show the world what wonderful things you have been able to do, and after your dad's successful surgery, anything either I or my company can do to help Swift Enterprises get the word out, or even build specialty units just to produce these things... whatever it is, we will be there with you."

"We appreciate that, Phyl," Tom told her. "But, let's get dad back up and safe before we start talking partnerships. Speaking of him, he asked whether you were going to come back out for a visit. You up to seeing him?"

She bit her lower lip. "How is he? I mean, is he... is he really sick?"

Tom shrugged. "He has good days and bad ones. I will warn you that his appearance has changed. He is sort of gray, face and hair, and has lost about twenty pounds so he looks a little gaunt. But, his spirits are up and I think it would mean a great deal if you could look in on him. Even if just for a minute?"

She smiled. "Of course I will. But I want you to know I've never been good at hiding my emotions. I could cry before the day's out. I'll try to not do it in front of him."

They headed for the Dispensary. Doc was standing by the reception desk when they walked in and looked up from a clipboard he'd been reviewing.

"Hey, Tom. Mrs. Clarke. I was about to go see Damon. Give me a minute and I'll let you know if he's, well if he's ready for visitors."

He walked off so Tom and Phyllis sat down in the lobby. It took Doc a couple minutes to come back but he was smiling. "He's looking forward to seeing you both. Go on in."

Damon was sitting up in his bed with the covers loosely arranged over his lap.

"Come on in, Tom. Nice to see you again, Phyllis. Still ready to take me out to that steak dinner when I come for a visit? I haven't forgotten your promise!"

"I am," she replied walking over and taking his hand in a soft grasp then leaning over to kiss him gently on the cheek. "About the only unknown is how you take your steak and what you like on your baked potato." She smiled at him although Tom could see it was a struggle for her to do so.

"Medium rare with a little butter and black pepper on top, and with everything on that potato. Butter, sour cream, bacon, chives and cheese. Only, no onions if those are on offer. But, speaking of tasty, you are looking very pretty today."

She gave him a small curtsy and replied, “Why, thank you, Damon. You...”

“No. Don’t try to flatter a sick old man. I know I look wretched so don’t try to lie to me. Just be pretty and put that smile back on your face.”

“I’m sorry,” she told him. “I’ve never spent much time around people in hospitals. You are just going to have to get all better with Tom’s help so the next time I see you you’ll be up and walking or even dancing. I seem to recall that you and Mrs. Swift were pretty good on the Yacht Club dance floor.”

He smiled at the memory. “Were and will be again. That’s another in a string of promises I intend to keep.”

She asked if he had seen the remarkable results of Tom and Arv’s work.

He had to admit he had not seen the final nanobot, “But Tom has shown me some video of the squiggly little things he intends to send in and they both intrigue and frighten me.”

After they excused themselves and walked out of the building, Phyllis paused and reached out to Tom to steady her.

“He looks so frail,” she whispered. “Please promise me you will make him better and soon!” She continued holding his arm.

“It’s my intention to do that, Phyl. And, possibly in the next five to seven days.”

Doc Simpson and Tom sat with Damon at his hospital bed. While he was now frequently in and out of complete awareness, today he was alert and willing to participate in the discussion.

“After listening to both of you talking about where we sit, or in my case lay, on this matter I vote for the day after tomorrow,” Damon told them.

“Why?” Doc asked looking curious rather than concerned. “We had sort of set things up for possibly three or four days from now. I hope you have a good reason, Damon and are not just picking a day at random.” He glanced at Tom.

“I believe I have a very good reason. Correct me if I am not seeing the very large calendar hanging on that wall over there, but is today not June 19th?”

They had to agree with his eyesight; it was the 19th.

Damon smiled. “Even I can see what the day after tomorrow is from here. Can’t either of you?”

Doc got up and approached the calendar.

“Ahhhhh,” he said seeing what his boss meant. “That is the first day of summer.”

“Correct, and I think that is a great omen. I might not think so tomorrow, but today my brain is relatively clear and I would like it to happen then, unless there is a safety reason.” He looked at the other two who glanced at each other before looking at him.

“There is no technical reason at all, Dad,” Tom said. “I believe Bud is ready to be the communication control and he tells me the team of finalists is solid and ready. He tells me he is about to go crazy from Sandy practically ordering him to make time go faster and get this done.”

Damon smiled. “And, I am so happy that he is the one who has to listen to her for the rest of his life, but please don’t tell her I said that. As it is your mother has been asking constantly why I am not fixed yet.” His head turned to face the physician. “So, Doc?”

Doc shrugged. “So, the day after tomorrow it is. Welcome to summer at Swift Enterprises!”



## CHAPTER 19 /

### NANO NINJA KNIVES IN ACTION

TOM, BUD, Doc and two computer technicians sat in the darkness of the control room. It was actually one of the larger conference rooms in the Communications building but it provided all the necessary computers, internet connections, space for the somewhat large bank of solid state hard drive storage boxes, a rack on one wall with twenty-four monitors arranged around one large central one, and seating for them all.

Bud was in the process of doing connectivity and communication checks with the twenty-four remote sites and giving some final instructions about the importance of the team working absolutely together and how this final test could run anywhere from four to seven hours.

“Everything is randomly generated and is based on individual and team performance, but mostly teamwork,” he was saying into his headset mic. “We are going to start in thirty minutes so all bathroom breaks must be handled before that. I hate to sound rude, but if you get caught short you will need to tell me at least three minutes before you need to hit the toilet, and then you can only have two minutes. Please make it back sooner or better yet, hold it!”

He turned around and gave Tom and Doc a thumb’s up sign.

Turning back to the monitors, he continued giving instructions.

“Don’t let Barclay know this,” Doc said in a low voice, “but he is very good at this. Natural leadership ability there.”

Tom agreed. “He is good, isn’t he? And, he took to the simulation like he’d been involved from day one. I’ve never seen anybody use the controller as smoothly as he does and get as much work from his nanobot, but he tells me he is probably fifteenth in the team as far as speed and ability. He did, however, pick us one heck of a great team.”

Doc nodded. He still had some reservations but with each practice session he had viewed live or later reviewed, his confidence had grown.

Tom hadn’t exactly been standing still. While the original plan was to have the small operating bots snip away pieces of tumor and then carry them about an inch to a waiting “dump truck” bot, he had developed a tiny suction device to meet the surgery bots half way to the trucks into which the surgery bots could place their

cargo. It would gently draw the piece from the back end of the bot freeing it to quickly return to the operating site. Then, this suction bot would gently put each piece along with some blood plasma—the only component of blood that was thin enough and fluid enough to enter the suction bot—into the waiting truck. Once filled each truck would be quickly transferred out to a waiting automatic syringe stuck into Damon’s neck and emptied.

The result of all this was the individual operating bots could get rid of their loads transferred in half the time because they needed to travel a shorter distance.

Now, rather than running two of the transfer bots with each one requiring extensive cleaning and sterilizing before it was needed back into the body, a second suction tube emptied the trucks and brought everything out where it would be collected in small test tubes, spun in a special centrifuge to separate all solids out for collection and testing, and the plasma chemically destroyed in case any stray tumor cells were left behind. Best of all, the tube did not have to go around any corners; it sat just before the first major turn in the target vessel.

It was believed the entire operation would remove less than four hundred milliliters of plasma, something Damon’s body would replace at about the same rate it was being taken away.

The most recent comparison of the game players’ skills and the actual operative tasks to be completed indicated the total time from start to deactivation of the players and notification of “End of Game” and “Success” to be four hours, thirty-seven minutes and a few seconds.

Tom and Doc scheduled it to take five hours but Doc would be in and out of the operating room in his Dispensary building throughout, and he and Tom would leave the control room to be scrubbed and in the operating room as the “game” neared conclusion so Doc could close up the incision and make certain their was no post operative bleeding.

Bud would take care of debriefing the players, complimenting them on a job well done—no matter what the outcome—and letting them know their payment for the testing services would be arriving via overnight carrier the following day.

He would not mention they had been operating on a live person, but had let Tom know he had heard at least two players questioning, “How real is this? Too real?”

Besides, once news was released that Damon had undergone a special brain operation—even without mentioning the nanosurgery bots—some if not all of them would possibly add



everything up.

As the time counted down to the ten minute mark, Doc left to make sure Damon was totally relaxed and chemically immobilized. He would remain technically awake during the operation so periodic checks could be made by asking various questions, but his body would be frozen in place so the magnetic emitters spaced all around his head could remain aligned.

“How are you doing, Damon?” he asked.

Blinking, the scientist and inventor let out a weak chuckle. “How do you think? I can’t move and have an awful itch on the underside of my nose I can no longer get to. Other than that I am quite relaxed from whatever was in that little injection cocktail you gave me half an hour ago.”

“Have you been going through your mental list of things to remember?”

“Yep. Five things starting with names, birthdays and brief descriptions of Anne, Tom and Sandy. Next, singing the three old television show theme songs from *Gilligan’s Island*, *My Mother The Car*, and *Mr. Ed*. Finally, the first two lines from the Gettysburg Address. And, I have to say I am so sick and tired of “Four score and twenty years ago...” I could nearly scream. How am I doing?”

When he looked into the horrified face of his physician, he grinned. “I know it’s four score and *seven*... I was just seeing if you were paying attention.”

Doc placed a comforting hand on the inventor’s chest. “You are doing fine and the team of operators is standing by, ready to go in...” he glanced up at the clock, “...nine minutes. I have to get back to the control room but I’ll be back about every half hour.”

“Great. Just one final things... no, wait, make that two. First I want you to know that no matter the outcome help Tom keep on improving these little bots of his. They are going to be the future of many great things. Promise?”

“Yeah. I do.”

“Good, and the second thing is, scratch my nose or I swear I’ll get off this table somehow and run you down with a truck!”

Doc rubbed the underside and even the top of Damon’s nose receiving a purr of contentment before he left.

Five surgical nurses would remain in the room for the entire operation attending to everything necessary and even talking to Damon every few minutes to keep him alert.

Doc got back to the control room to see Tom and Bud in conference, the headset sitting next to his controls.

“Got it!” Bud said picking it back up and placing it on his head. “Stand by, team. Four minutes. The game has been generated and is an old team favorite, and yes, it *is* brain surgery. It is a little more tricky than before since this is the final test, so listen up and keep alert throughout. Your patient has a tumor just below his thalamus. That is in the lower center of the brain, and a team of neurosurgeons has determined it to be unreachable for operation. If it cannot be removed it will kill the patient in about two months.

“For purposes of this game you have already been inserted at the lower edge of the brain and are sitting in a blood vessel that moves in a sort of wiggly pattern up to the tumor site. As we’ve already used the extracting tube this past few times I won’t go into that, just to tell you it works like always and that means quick removal of tumor bits and pieces. You only have to back your bot onto it. Two minutes to go.

“A word to pass along from the designers. You have excelled above many others to get to this point and exceptional work has allowed them to get the game to this point. Well done and keep it up. 3D glasses on now, please. One minute. I’ll give the standard five second countdown.”

He turned to Tom and gripped his forearm, shutting off his mic. “This is going to work, skipper. They’re good; they’re ready and eager to get the tumor. Sit tight and be ready to take any position if I give you the signal by flashing the red light on that monitor. “I’ll let that player know they have been put on autopilot for a few minutes to give them a chance to get their head back in the game. Privately so no others hear it.”

He turned back to the screen and re-energized his mic. “Okay Take deep breath, and... Five... four... three... two... one... go!”

They could see what each player could in their 3D glasses in the individual screens. As the nanobots started forward there was a bit of chatter between players as they got themselves into formation in very quick order. It was clear that the player calling herself *BanditoDoc14*, Bud’s choice as team leader, was considered by the others to be the de facto leader. What she said was generally accepted without any comment.

The bots moved at their steady centimeter per minute rate up the five centimeters to the operation site. The pictures they all saw were artificially colored with the primary one being a reddish pink to indicate blood, a much deeper red for the blood vessel walls and, once they approached close enough to make it out, an orangish-gray for any bad blood cells with tumor infection and a

lighter gray for the actual tumor.

Over the speaker in the room, they all heard the computerized version of *BanditoDoc14*'s voice say, "Okay. I've got something. Do we all see it?" There was a chorus of similar-sounding voices stating they all saw the target.

"I've got a chart here with just basic numbers, and I think I'm 17, so if you are 11, 12, and 13 please see to that rogue blood cell along the side of that small clot. Then, 1 through 6 get in there and snip the clot apart to see if there's anything else bad in there."

All were in agreement with the instructions and soon the remainder of the bots eased their way past the small clot of some thirty or so blood cells and around the final corner.

"That she blows!" came a slightly different voice coming from bot operator 20.

"No extraneous chatter," Bud warned them.

For the next twenty minutes the fifteen nanosurgeons arriving at the tumor began working away at the edges of it. As they started taking individual pieces back it was clear to see the extraction tube had been moved in close to the clot. In fact, the clot, about one five hundredth the size of the tumor was mostly gone. In another minute those bots would be able to add their might to the main target.

Doc left to check on Damon returning fifteen minutes later with a smile. "He's doing very well. Passes all memory tests so far. Not a guarantee at this point but signs are looking pretty good as long as we don't run into problems farther into the tumor."

By the time a full hour passed notable progress had been made on the tumor. At one point a small piece broke away from its operator and everyone sucked in their breath, but the vessel they were in ran back toward the extraction tube and the small sensor at that location showed it entering the tube. It was pure luck, but that seemed to be holding for them.

At the two hour mark the first of the small mistakes were made by gamer 19. He had to admit he had a bad hand cramp and snipped a small bit of the blood vessel.

Tom leaned forward to his spare operator position and took control while Bud told the player to just relax, that the computer would spell him for a couple minutes, but to massage his arm and hand and not grip the controls so hard.

Tom had to run the bot through one entire snip, grab and carry cycle before Bud turned thing back to the original player. The tiny bleed stopped by that point. He asked for reports, number by

number, of how the players were doing. Three reported similar cramping and were placed on rotation with Tom and Doc taking two of them, then Tom taking the third person a few minutes later when his first player signaled readiness to continue.

After a quick word between them it was agreed to spell each of the remaining players for a few minutes starting with number 1.

“You each get a reprieve for three minutes,” Bud told them. “I’ll call out each number and give a ‘mark’ when the computer has your bot.”

It worked out very well with *BanditoDoc14* requesting to be the last one to be spelled. Tom nodded agreement and Bud told her it would be fine.

It wasn’t until they had nearly seventy percent of the tumor, mostly the part sticking out into the blood flow, before Doc drew in a gasp and pointed.

“There. Left side where, uh number nineteen is. That’s a ganglia loop that shouldn’t be in the bloodstream. Bud, stop that operator!”

But, it was too late. The operator, so intent on the repeated cycle of locate, grab, cut and store for transportation snipped into about half of the ganglia.

Doc swore a might oath that sent an icy chill down Tom’s spine.

“That looks to be a basal ganglia, one that is responsible for some motor control. I never thought we’d see that, but obviously the tumor encompassed that and pulled it along as it protruded into the vessel.”

“Is there any way to stick it back together, Doc?” Tom asked. “Could we detail one of the bots to hold it and see if it can reattach or clot or whatever? Maybe clamp it together like we did in the dog?”

Doc wearily shook his head. “No. Over time that might reroute or regrow but for the time being I need to get over to see how your dad is doing. Bud, tell the team we had a small problem with a randomly generated ganglia and to be extra vigilant from now on. Don’t tell them we might be in trouble.”

While he left, Tom sat silent, feeling almost sick to his stomach with fear for his father.

Bud was smoothly controlling the players and sounding as if nothing wrong had occurred, but Tom could see the tension in his friend’s neck and shoulders.

When Doc finally returned forty minutes later the tumor was

down to only about twenty percent its original size. No further ganglia had been located and the team morale seemed to still be high.

“How is he?” Tom asked, nervous about what answer he might receive.

“He seems to be in good spirits, but his voice isn’t working. I can’t believe a single ganglia affecting voice was in that region. It is supposed to be three centimeters farther forward and nearly two centimeters higher in the Broca Area.”

Tom gulped. “Okay,” he slowly started, “what if he can’t get his voice back? Otherwise he’s okay, right?”

Doc sighed. “It’s hard to say right now. Broca’s Area also contains the part of the brain that recognizes speech and comprehension. Some movement we associate with speech, automatic movements like shrugging when we don’t know something are sparked in that region. Until we get him off the table and out of the induced paralysis I just can’t say. Not yet.”

The first thought Tom had was for the welfare of his father, but in his mind he now felt the weight of family opinion crushing down on him. What would his mother think or say? Sandy would be very verbal about condemning him for anything that went wrong with the operation.

Player 22 came on with news that his or her apartment building’s fire alarm had just gone off and had to evacuate.

Through stinging tears Tom moved forward and took that bot’s controls. With his help and Doc leaving to go to the operating room, the operation came to an end fifty minutes later. Tom had already backed his bot out and the others now attended to that duty as he ran from the room.

Bud issued his final comments and compliments to all and assured them they would be able to play for free in the future. Everyone signed off happy and satisfied but the young inventor had already rushed off.

Doc and the nurses were just waiting for the computer to pull the nanobots back to where they could be removed. It took another hour during which Tom went out to speak with his mother, Sandy and Bashalli who had been waiting in Doc’s office the entire time.

He entered and they immediately knew something was wrong.

“Tell us, Tom. Just tell us,” Anne Swift demanded in a quiet voice.

Tom came over and grabbed a chair, setting it to face the sofa

where the women sat, now hugging each other.

“The operation is over and dad is alive and awake. We got what looks like everything there was to get. Our team worked like champs and Sandy, you need to be especially proud of Bud. He was the rock that held the team together and saw us to the end.”

“But?” his sister whispered, no unable to hold back tears.

Tom cleared his throat.

“But, we hit a small snag. A part of his brain that had been trapped by the tumor and pushed into the blood vessel we were working inside got cut.”

The women all let our gasps.

“Now, it was one small thing called a ganglia.”

Anne, with multiple degrees in various fields of Biology, had taken numerous courses in anatomy in college and graduate school. “What one?”

“Doc said it is a basal ganglia that most likely comes down from something called Broca’s Area.”

Seeing the look of dismay on her face he knew she understood the implications.

“Doc says his voice has been affected and perhaps more, but it is going to be a couple hours before we know anything concrete. He is still in an induced paralysis. Once he is out of that we’ll have more information.”

“I want to see him!” Anne declared, standing up.

“As long as you scrub and gown,” came Doc’s voice from the doorway, “you can come in. But, I’d prefer it to be just you until we move him to a regular room.”

Anne looked at Sandy, “You go ahead, mommy,” she said. “After all, you’re a doctor and all that.”

Anne bent down, her tears spilling onto her daughter’s forehead, and kissed her there. “Do you now that is the first time you’ve called me ‘mommy’ for about eight years?”

She left with Doc leaving Tom with his sister and wife.

“Okay, Tom,” Sandy said getting serious and wiping her own tears away. “Spill it, Tom. Is daddy going to live?”

Tom nodded. “That’s what Doc says. What I didn’t tell mom and I think she knows it, but neither of you say anything, please, but that brain area I mentioned also controls speech recognition. He might end up perfectly fine and live a long life, but he may never understand what we say to him and may not be able to talk

to us.” Seeing the tears welling back up, he added, “But, as Doc said only time will tell, and we have to be strong for dad. Snipping that ganglia was totally unexpected and it was only right at the moment the snip was taken that it was ever visible. Nobody could have foreseen it being there until it was too late.”

He left them soon after and headed back to the control room. There, he was surprised to see Doc sitting in his seat, leaning on his hand, deep in thought.

Tom left him like that and sat next to Bud.

“Hey, flyboy. How is the team?”

“Good. They think it was an unqualified success. You ought to think so, too. Your dad is going to live thanks to you and our brigade of micro surgeons.” He stood up, looked down at Tom one more time, and left the room to go be with Sandy.

Tom moved through the video feed to the few seconds before the fateful cut and watched it. Five times. At no time did he see the ganglia until about a half second before it was cut. He tried to second guess himself.

Could he have written some sort of computer code to halt any bot about to cut into something unexpected? All he could come up with was the word, “Possibly.”

Tom turned from the computer monitor and his master control station and looked at Doc Simpson. “That’s it. That is all we could do. I am so sorry to let you down, Doc. I thought we had this in the bag.”

He rose, stretched and wandered out of the room, his shoulders rising and falling as he started to sob his heart out.





## CHAPTER 20 /

### FOLLOWING THROUGH WITH A PROMISE

THERE HAD always been a small but relatively dangerous chance that the operation would fail and the patient might die. Whether it was during the operation or later if the tumor could not be fully removed and returned, the result could be death. Damon had not died, but there was no way Doc could call his condition, post operation, anything close to a complete success.

Three days after the operation he could sit up and was feeding himself, and he only required minimal help getting out from and into bed.

He had spoken no words at all. He seemed to understand most of what was said only looking confused on occasion.

He did respond to his wife sitting next to him, squeezing his hand and weeping silently when he managed to weakly squeeze back.

While Anne wanted to be with him every minute she could, Sandy practically had to be dragged in to see him. Her vision of what her “daddy” was supposed to be did not mesh with what he now was and it was crushing her heart.

Ten days passed, and Tom finally decided the operation had to be admitted publicly. Already there were calls from Washington D.C. that had been handled by others and not Damon as would normally be the case. This had even prompted a personal call from Senator Peter Quintana, their friend and second senior member of the Senate.

“Where the heck is Damon? I know he’s been a little ill but is he on some extended vacation, the lucky duck!”

Tom felt he had to tell him the truth.

“Boy, howdy, I don’t want to tell you your business, but there are a few rabble rousers here in D.C. who are calling for an investigation and a halt to some payments until your dad pops up. Let me know what I can do, Tom.”

The members of the press were about evenly divided. Half of them were simply looking for what they believed would be a great story, no matter who lived and who died.

The other half seemed to be rooting for Tom Swift to get his comeuppance. Those reporters or agencies generally fell into the category of ones that had been called out—in general or as a specific organization—over the years for reporting non-events and for making up news about Swift Enterprises and the other Swift concerns when there was no news or story being shared with them.

The problem was that in nearly all cases there never had been a story, only unsubstantiated rumors, and the Swifts had forever maintained that they did not respond to unfounded rumors without knowing the source.

Today, over three hundred reporters, camera operators and sound engineers had descended on Enterprises to hear the Swift's side of this stunning story. Facilities had pulled the large white tent out from storage and set it up inside the main gate where electricity, water, and bathroom facilities could be also be provided. Inside, it was impossible for anyone to hear themselves, much less their colleagues trying for sound or video checks.

The newspeople filled about sixty percent of the space. Some of the rest held Enterprises employees and Security team members, and the remaining areas held people from the medical community.

It was these last fifty or so individuals who were the most dour-faced and smugly quiet. One of them was overheard by Phil Radnor speaking his mind.

“I hope they get the full measure of the law coming down on them. Imagine them trying to pretend to know what to do medically. Why, I'm even going to suggest their doctor, what's-his-name, Simmons? Yeah, Simmons, be hauled in front of the medical board and stripped of his license!”

As Phil struggled to not shout the man down, others in the group seemed not so sure of their position. A few had even sought the advice of legal counsel only to be informed they stood on the shakiest of ground and the Swifts were on pretty stable footing on this.

Behind a curtained area Tom and Bud stood waiting. Doc Simpson was pacing nearby and Damon Swift sat in his wheelchair simply staring straight ahead. Kneeling next to him was Jackson Rimmer, the chief legal counsel for Enterprises. If things got ugly and matters of legality were in question it would be Jackson who would step forward and inform the gathered group of the whats and what nots of the law.

“I'm feeling nearly sick to my stomach, Tom,” Bud admitted. “I

can imagine what you are going through, so if you want to cut and run, tell me and I'll step in for you. Just give me your speech and I'll deliver it so you don't have to face the pack of wolves out there."

The inventor seemed unreasonably serene as he stood there rehearsing what he would say.

Doc came over to him and set a hand on Tom's shoulder. "I want to tell you what a great thing we did, Tom. Your father is alive, even with his new difficulties, but he is getting stronger with each day. I also, before you say anything, have to apologize to you for every thinking your plan to turn the op into a game would be anything but a success. Your way is going to prove the tried and true method and very soon I might add."

Tom was confused. "Huh?"

"What I mean is that there is no advancement in surgery, no advancement in medicines without trials. Yes, as the saying goes trial comes with error, but that is how we learn and do thing better the next time. And, who knows. In the coming months, if I know Tom Swift, you will figure out a way to put an even more extensive surgeon bot in there that can reattach that ganglia."

Tom nodded and thanked his friend.

Finally, the time came, an announcement was made asking for silence and stating that Tom Swift would come out, make a statement and take a few questions but only ones regarding the actual nano technology and not the operation.

There was a smattering of booing, but the crowd did quiet down quickly. Tom pulled the curtain aside and walked up the steps behind the podium.

Camera strobe lights went off momentarily blinding him as if he had looked into the sun. He shook his head and stepped to the microphone.

"Hello. As you all know by now, my father, Damon Swift, was diagnosed with a form of brain tumor that is ultimately deadly. It grows at a steady rate and was located in an area of his brain unreachable by any current surgical technique."

A shout came from the back of the crowd. "Bet if you'd let a real doctor see him it could have been taken care of!"

Over the mumblings of some others, Tom shook his head and stated, "No. I invite you to stand up and identify yourself as well as your medical credentials to make such a statement." When the man shrank down and did not stand, Tom continued. "You are completely wrong. Six specialist in the field of brain surgery all

consulted on this, all shared their notes and feelings and the unanimous declaration from these four men and two women was that it was inoperable. Your press kits have their names and credentials, so unless you have a better medical education than they do, please keep your comments to yourself.”

He described the early steps taken to minimize the tumor, all to no success. He also spoke of the way in which Mr. Swift had handled the situation and how the patient, himself, had requested that some extreme measures be taken.

“That was when I designed the nano-technology robots we are about to put up on the large screens. Oh, there they are. Now for purposes of scale let’s add a single grain of white rice to the image.” A portion of a gigantic mountain of grayish white, rough-edged and very uneven material appeared next to the nanobot. The camera pulled out until you could see the entire rice grain, and barely still see the speck that was the robot.

The crowd sat in stunned silence.

“That is a real grain of rice and a real nanobot. It was determined by our medical experts that only something that small and insignificant could be introduced into the blood vessels of the brain and not cause collateral damage.”

Over the next five minutes he described the procedures for designing the bots and then for finding the best game players. This brought up many hands or shouted questions. He stepped back and waited until people sat down and became quiet again.

“First, the answer is no, we will not give you any names. We actually would prefer you keep this to yourselves as it is possible to do emotional damage to some or all of this group of young adults who were never told this was truly a matter of life or death. They dealt in a simulated environment and the computers simply mimicked their actions for the actual operation.” It was a lie but one agreed on all around.

Doc Simpson was called forward to address the group regarding the purely medical aspects. He spoke the lingo of the medical community and took no questions to explain things in layman terms.

“If your bosses did not send reporters versed in medicine, it is not our job to educate you. But, I’m certain from the faces of some of those practitioners of medicine here today they understood everything I just said. Thank you.”

He stepped back and disappeared down the rear stairs.

A shout went out of, “Show us Swift!”

Tom stepped back to the microphone. The shouting died away.

“Are you saying you want to see me again, or the man I call my father, no matter the outcome of the operation?”

Everyone suddenly found they had no desire to be the one to ask for a nearly dead man to be dragged in front of them for show and tell. But, one woman reporter Tom recognized as the chief reporter for the television program, *Washington Under the Microscope*, stood and bowed her head. She brought it up and looked into Tom’s eyes.

“If my colleagues will swear to keep their mouths shut and not turn this into more of a circus than it already is, may we see Mr. Swift? Is he, in fact, well enough to be here today?”

“Thank you. Mrs. Babstein. The answer is yes, he is well enough to be seen, but words have been coming hard to him since the op. I know he wishes to try to tell you all something, but I cannot promise it will come out correctly.”

He made a motion and the curtain parted, Mr. Swift was wheeled up a ramp next to the stairs and his chair stopped next to the podium. Tom pulled the microphone from its holder and took it around to hand it to his father.

Damon Swift looked into his son’s eyes and winked.

It startled Tom, and his face showed it. He leaned in and whispered into his father’s ear, “Are you okay to do this?”

He was startled again to hear a small chuckle. “Not only am I able, Tom, I am ready to follow up on a promise I made a few months back. So, please help me to stand and get me around so I can lean on the box.”

As he rose, so did the crowd. It didn’t matter what their personal or professional feeling about the organization, the man was someone to be admired and they let him know that with applause and calls of, “Go get ‘em!” and “You can do it!”

He made a ‘sit down’ motion with his left hand.

“Okay,” he started, his voice a little weak but steady and easily understood. “There are a bunch of you out there who probably thought you’d like to write the story about how one Swift killed the other through ignorance and foolishness. Sorry to disappoint that group, but this operation never would have gone through if it wasn’t an almost dead certainty. Pardon the use of *that* word.

“You see, we Swifts don’t deal with long shots or impossible odds if we can help it. So, and with apologies to my son and hopefully a get out of trouble free card for our Doctor Greg Simpson, I now need to inform you that mine was not the only operation undertaken by Tom’s nano-surgery robots.”

A swell of side conversations came and quickly went. Everyone wanted to hear what that last statement meant.

“Tom and his team set up a very strict method of selecting the best of the best game players out there, but we had to know if they could really do a full operation. And so, if I might have the following people join me on stage. Jerry Watkins, Jenny Fitzgerald, Nanette Quizenberry and P.J. Sullivan.”

The two men and two women who had been sitting in the front row to the right of the stage stood and came up the side stairs to join a smiling Damon and stunned Tom.

“Jerry had his right leg crushed in an accident as a teen and has had circulation troubles since. One of Tom’s scenarios, devised by Doctor Simpson,” he nodded at the physician, “was to enter a body through the groin, travel down the leg and remove a bunch of scar tissue that was keeping blood flow to under twenty percent normal. Today, Jerry’s leg is no longer in danger of amputation.”

Jerry obliged by walking around and showing he had full mobility now.

Damon did the same thing with the other three, briefly describing their problem and how a new scenario for each one had both tasked the players with learning new techniques swiftly and then operating on live subjects.”

He made a small motion to the left side of the crowd and Jen and Jan Jensen stood up and walked to the stage. Tom was flabbergasted as he had no idea they were anywhere near Shopton. What was more amazing was Jen was walking perfectly normally.

“I’d like to introduce two women who sort of dropped in on us about the same time I was diagnosed with my brain tumor.” He did so to a small smattering of applause, begun mostly by Enterprises’ employees.

He told about the parachute accident and how Jan had come to them with a problem that would have taken her life, just as Damon’s tumor would have killed him.

“Jan volunteered to be the first to be operated on, not by a team of skilled surgeons, not by a faceless group of people who believed they were playing a very advanced game, but by our company’s doctor and my son. Can you tell these folks how you are doing, Jan?” He stepped back and she took the podium where she looked out at the crowd.

“I was diagnosed with a terminal spinal tumor shortly before I fell out of the airplane my sister was piloting, and both of our lives were saved by Doctor Simpson and a very nice heart surgeon at

Shopton's hospital. Then, months later when we came back for a visit it was obvious to everyone I was in trouble. For my money, a medical miracle happened and Tom and Doc used their nanosurgery robots to get rid of most of the tumor. Oh, sure, there were post op complications and I lost feeling in most of my leg, *for a short time*, but that came back five weeks later."

She scanned the crowd and picked out the most grumpy-faced man she spotted.

"I am here today speaking to you, pain free and out of danger because of nanotechnology and shame on any of you who try to downplay what breakthrough this is! It was a team of doctors who told me my case was hopeless. Well, phooey on that! I'm living a full life now and not thanks to standard medical practices."

She turned, nodded to Damon who got back up from his wheelchair and the two ladies walked down and returned to their seats.

"All of them gave their full blessing and support to being used for these tests. All of them are back to what they ought to be at this point in each of their lives.

"What Tom did not know and could not be told was that some of his scenarios were not just in the computers."

Tom looked startled but then a grin crossed his face.

"As for my operation, and I especially want the medical people here to look around them. You'll find that the American Medical Association did not send a representative as some of you petitioned. In fact they outright refused to do so. You see, they already had given us their blessing to go ahead with the operations. Even if they had not we could just as easily gone to our private space station and performed the same operation there. The AMA specifically requested we remain Earthbound and to supply them a comprehensive video of the entire operation start to finish, and that includes the little "oops!" moment we had. The team got through that and so did I. So, you can grumble about it, but we received the same sort of permission each of you put in for when you want to do something experimental. The difference is that Tom's robots could not perform any dangerous procedures because of their programming and the operators were incredibly well trained. How many of you can say the same thing?"

"Finally, if there is question about using technology to save one or more lives, let me remind all you in attendance and watching or listening in that not so very long ago, doctors thought slicing into veins and letting a few cups of blood leak out was a good cure for everything from headaches to tuberculosis. And, learned men and

women of medical science used to treat some bad diseases with mercury or radium to poison the body so it forgot to be bothered by the main disease. Never mind that it killed them in another manner; the original disease had been conquered and doctors proclaimed themselves to be great healers!”

Most of the audience looked uncomfortable; the doctors for many reasons but mostly the reporters. They all knew the story they came for was not going to be the one they needed to write. And, with nearly the entire world able to hear the address live, there would be no getting around writing only the truth.

Damon thanked the audience, adding, “Happy summer, everybody,” nodded to Tom who help him get back around and into the wheelchair, and they left the stage.

Doc took the stage and answered about thirty questions regarding the techniques and other operations he foresaw as coming down the road soon. He told them any doctor who wished to take the training and try the simulation was welcome to sign up.

“You surprised the heck out of me, Dad,” Tom admitted once they were out the back of the tent and he was pushing his father across the tarmac to the Administration building.

“Surprised myself as well. Your mother will never be the same either. She was bending over next to the bed and I reached out this morning and patted her fanny and told her she still had Shopton’s loveliest legs. It seems I woke up late yesterday and everything was working again. Mostly. Of course I’m tired and will need some therapy, but after looking me over and testing my mental faculties, Doc says I should be back to normal, at least for me, in less than a month.”

Tom chuckled. “I also noticed that your hair is suddenly back to normal. Miracle?”

Damon joined his son in the laugh. “No. Your mother thought I needed a bit of sprucing up so she came in early today and colored my hair and smothered my face with some sort of cream gunk that is supposed to get rid of wrinkles. Not sure it I’ll keep all that up, but it was nice to feel the love coming through her fingers as she fixed me up.”

As the elevator door opened on the ground floor and Tom wheeled Damon in, he said, “I am extremely glad to hear that you are going to get back to *normal*.”

“No more than I am glad to be able to say it. Oh, and this as well. I love you, son. I’ve never been more proud and more relieved to have you as my boy. Do you recall me once mentioning an algae-based drug that needs to be injected into a tumor?” Tom



nodded. “Well, Doc says if you can create that smooth nanotube with one of your nanobots at the head to drag it into the area, he believes we can inject a small amount into the tissues up there to keep this thing from ever coming back. It might also become a new product from Enterprises. There are a lot of others it could save.”

Tom stood back and saluted. “Orders received and understood. I’ll get right on that tomorrow!” His face split into a big smile and the two men hugged.

“Oh, Dad? You need to call Senator Quintana and tell him you are back in action. He’s been more than a little anxious about you.”

Now, Damon saluted his son. “Will do, Tom. Will gladly do!”

“Thomas?”

“Yes, Bash?”

She snuggled her shoulder into his armpit even further resting her head on his chest and sighed. It was the one place she always felt safe.

“I am so very proud of you and what you did to save Father Swift. More than that, I am very proud of the two of you standing up to all those terrible jealous doctors who called for criminal charges to be filed over saving your father.”

“They really never had a leg to stand on, Bash. There are laws that protect people from being operated on by non-licensed individuals, and laws that keep non-doctors from being allowed to cut into someone except in an emergency, but there is nothing that says a patient cannot start working on themselves and turn things over to robots. Not yet, at least. It’s why we let dad inject the first sedative into his own IV line. He got things started then officially declared that he needed help.”

“Do you believe they will get the politicians to pass such laws that would have led to your father’s death?”

She could feel him shaking his head.

“I really don’t know. In one way I hope so and in another I hope not. The good thing is the patient not only pulled through but is really going to bat for the continued study and use of nano-surgeons in the hands of people most skilled at operating the robots, not operating as physicians. Right now that’s people like the gamers who pulled this one off.”

She lay there held by her husband’s arm a minute before sitting

up and looking down at him. “What is next?”

“Next? For the NanoSurgery Brigade?”

“No, for Tom Swift, boy—well, young man—inventor.”

He pondered what was on tap and could recall nothing very critical coming up.

“Not sure. Maybe you and I and dad and momsie and Bud and Sandy ought to leave Bart with your mother and the six of us take a nice vacation. I hear people recovering from illness take well to cruising. What about the Nile or the beautiful, blue Danube?”

While Bashalli thought this over and he closed his eyes, neither of them could anticipate that within a week he would take on a new project that would have him and several other brave souls in the middle of a high-flying adventure as he would be agreeing to come up with a personal flight system in *Tom Swift and His Thermo-Ion Jetpack*.

For now, he went to sleep feeling as if he deserved to be allowed to sleep in the next day until at least ten.

She didn't wake him until noon!



