TOM SWIFT

And His

Martian TerraVironment

BY

Victor Appleton II

Made in The United States of America

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THE NEW TOM SWIFT INVENTION SERIES

Tom Swift And His Martian TerraVironment

By Victor Appleton II

After Swift Enterprises loses out on a contract to build a settlement on the Moon—under suspicious circumstances—Tom decides to shrug off disappointment and turn his energies to a farther target: a self-sustaining colony on Mars.

Certainly there have been visits by mankind to the Red Planet before, but never in an Earth-like environment as Tom envisions. Enlisting the help of every Enterprises employee he can find, Tom hand-builds an incredible 1 million square foot structure that will house a colony of intrepid adventurers.

But, Mars is a devious planet, looking so similar to our own that people forget how treacherous it can be. And how inhospitable the outside world really is.

Is this a project that is one giant leap too far, or can Tom pull off a hat trick of scientific miracles?

This book is dedicated to people who will agree to be contained in a most probably too small spacecraft for more than an entire year so that they might be the first to set foot on Mars. What will they find that all the little rovers haven't? Who knows, but they will probably be the last great pioneers I will see in my lifetime. As I witnessed the first U.S. astronaut to be arced over the Atlantic Ocean, the first U.S. - USSR space handshake, and the first man on the Moon, I will watch each and every available moment of this forthcoming exciting advancement for mankind.

The incredible tri-winged jet streaked across the sky at Mach 2 without so much as a roar let alone a sonic boom… **PAGE 145**

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AUTHOR'S NOTE:

Before writing this ninth novel in my series, I decided that there was a lot of background in the early part of the story that would only bog down this book, but needed to be told. And so I wrote a novella titled *The Air That I Breath* (part of my *Newer Pocketbook of Swift Inventions* available at the URL below) that details the heartbreak of the Moon colony accidents. Yes. Accidents as in plural!

On surpassing 75,000 words in this book I looked the earlier story over and thought I ought to include more, but there was just no room or way to do it without slowing everything down.

I invite you to read the other story and many of the other novellas I have created over the past couple years. They tell the stories behind the characters and inventions that only get mentioned in passing in the old series and these books. Plus, if you are an adventurous cook Chow Winkler has written a pair of cookbooks with such things as Rattlesnake Stew and Armadillo Fritters.

Anyway, like our Tom I sometimes feel the frustrations of things not under my control. Things where I know that I have a better idea of how to handle things, or can see the bleeding obvious when those around me are blind to just about everything.

I hope that very little of my frustrations show in this book, but that Tom's do.

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Tom Swift and His Martian TerraVironment

FOREWORD

With the exceptions of extreme times and people who allow themselves to be bullied into inaction and a lack of spirit, most of mankind has been on the move for as long as we can find evidence of our existence. Some have been merely curious as to what lies just over yonder hill, while others have the thirst to conquer anything they don't already know about.

And, now that we—wrongly—believe that we know everything there is to understand about our own planet, we boldly strike out into the vastness of space. First in nearby orbit, then to our major satellite, the Moon, and soon to explore a comet or other close-passing planetary body and even on to Mars.

What, you might ask, is the point? What is so darned interesting about a reddish planet that we can barely see even on the clearest of nights? Why go there? Why not spend that money helping people right here?

That's an easy one. Just look around you. Amazing medical advancements have been made because we went into space. That iPod or smart phone or iPad you are holding—or at least coveting and hope to get at the earliest opportunity—comes courtesy of man in space.

We had to come up with small, powerful computers to help us get to the Moon and to survive. And, all that's within a few hundred or a quarter of a million miles. Just think what possible goodies are coming soon from even greater distances.

Victor Appleton II

CHAPTER 1 /
EVERY GOOD BOY DESERVES FAVORS

"ANOTHER NEW MINI-PLANE, Tom?" Bud Barclay asked his best friend, the young inventor Tom Swift, as they looked at the strange and fragile-appearing aircraft in front of them.

"Yes. And, this one has something special about it," Tom said giving his friend a sly grin. "Can you spot it?"

The dark-haired flyer took a closer look, walking all around the oddly small but recognizable craft. It had a normal pair of wings that ran though the middle of the one-foot wide boxy fuselage. There was a moderately low profile yet long vertical stabilizer and the typical elevators to either side at the back.

"Uh, it's got two funny little engines and those strange propellers. Is that it?" he asked, pointing.

Indeed, it did feature two small 3-cylinder engines, mounted about two feet out on each wing, from which sprouted a rear-facing propeller that looked more like a multi-blade desk fan than a typical aircraft prop.

"Nope. Well spotted, but not the important fact here," Tom told him.

"And, it actually flies?"

"Carrying one person weighing up to two hundred thirty pounds. Yes."

Bud scowled and walked around it again. Sitting on tripod landing gear with three 5-inch balloon tires, at its highest point it came just to his waist.

"Can I say that I give up and still keep my Junior Birdman status and special decoder badge?"

Tom laughed. Even his own father had required a full ten minutes before the slight tell-tales caught his attention. "Sure. And, I won't even tell Sandy that you failed aircraft recognition 101. Deal?"

Bud nodded. As one of the top Swift Enterprises test pilots, he was familiar with just about every aircraft in existence, even those believed to be secret or one-offs by their developers. "I give. Illuminate me, please, professor."

Tom walked forward to stand next to the small indented "saddle" area on the fuselage. "I want you to do me a favor. Close your eyes and stick your fingers in your ears for about a minute. And, turn

around. No peeking!"

As the flyer closed his eyes and plugged his ears, even dutifully turning away so he couldn't cheat, Tom reached down and pressed an almost invisible button on the plane's body. With a click, something released inside and Tom was able to grasp the nearest wing and fold it up, give it a twist and then fold it back and down. He repeated this with the other wing. A second button activated an internal motor and the entire 12-foot length of fuselage, and each of the wings, began to draw in on themselves, previously unseen sections telescoping into a now 3-foot bundle. The engines had turned and now sat partly recessed between the folded wings.

Tom reached down and picked up a nylon bag, slipped the compacted aircraft into it and hoisted it onto his shoulders, like a backpack.

"Okay. You can look!" he called out.

Bud turned and his face fell, his jaw went slack and he did a triple-take. "Wha—?" was all he was able to get out. He stood there, looking right and then left, then spinning around, trying to see where his best friend might have hidden the odd aircraft.

It finally occurred to him that Tom hadn't been wearing a backpack when the arrived, so Bud pointed at it. "That? The plane's in there?" he asked somewhat incredulously.

Tom smiled and nodded. "Yes. This is the prototype of my new seventy-pound collapsible emergency plane, or the Accordion Aircraft. It's sort of a long story, but do you remember me telling you about when my grandfather almost ruined the Swift Construction Company, and how dad saved things by finally building the folding car?"

Bud said that he did. In fact, the story was legend among Swift employees. While educated as a businessman, Tom's grandfather, George Swift, had no practical understanding of the nature of the company he had taken over when his own father had retired. He had no aptitude for engineering and little desire to learn. As a result, the once robust and growing company had suffered a series of setbacks, only kept "alive" through Government contracts. It had been the painfully protracted development of a folding automobile that had forced Tom's father, Damon Swift, himself a great inventor, to wrest control of the company from his own father, get the long-delayed folding car into production, and bring the Swift Company back from the brink of financial disaster.

"Well, I was rummaging around in the old archive storage building a month back and found the packing case with the only

remaining folding car we kept. You know what?" Bud shook his head. "I pulled the thing out, lubricated a few of the pinion points and got it unfolded. A little new oil in the crankcase, a bit of gas, and it fired up. Well, after I put a new battery in the engine compartment, that is."

"Neat. Can I drive it?"

Tom shook his head. "Sorry, flyboy. I drained the fluids, wiped it down and put it away. But," he added seeing Bud's disappointment, "once I get this finished, you'll be the first to fly her!"

Bud immediately brightened. "What can she do?" he asked eagerly.

Tom had to smile at Bud's enthusiasm. "She's pretty slow, just sixty-five knots at full throttle, but she will fly as slow as forty and can take off in about three hundred feet and land in under two hundred. She'll carry enough fuel for about three hundred miles at top speed."

"And, those little engines?"

"A variation on the Y-4 I developed last year," Tom replied. "These are W-3s… three cylinders in a W formation. They make fifty percent more power than an inline three-cylinder engine of similar size, plus fifty-three per cent more torque. Air cooled and each cylinder is about sixty-two cubic centimeters capacity, pretty high revving at eleven thousand rpm, and real fuel sippers. They have to move that fast to power the two-to-one gearing and turn those new fanpellers."

"Fanpellers?"

"Well, you saw them. What did they look like?"

Bud thought. "Oh. Fan-like propellers. Fanpellers! I get it! But, why?"

Tom laughed. "Why have propellers, or why the fan-shaped ones?"

"Okay professor smart guy. The shape. Why the shape?"

Tom slipped back out of the collapsed aircraft pack and set it on the ground. In less than a minute he had it out of the pack, fully extended as it had been when Bud arrived and was stowing the empty pack into a small cubby on the side of the body.

"Well, I've already said that the engines have to turn very fast and have a lot of torque. If I put conventional props on this, they would need to be over four feet tip to tip." He motioned at the low-slung aircraft. "Not going to happen for obvious reasons. And, before you ask, having longer landing gear isn't the answer. Even if I wanted to go that route, I'd have to beef up these engines to about twice their displacement to turn the larger propellers at anything close to the needed speed."

Bud, who knew just about everything there was to know about planes, jets and other flying objects nodded in appreciation.

"So," Tom continued, "I need to get the most propulsive power from props that *can* be used. That means using more blades, or blades that are turned to a greater angle or, as is this case, a combination of both."

"Ah, I see each prop has eleven blades, kinda like miniature jet turbine compressor blades. Right?"

Tom nodded. "Go on," he urged.

"Fine. So, the blades are each larger, or have more surface area, than conventional blades plus they are angled maybe…" he looked a Tom for some hint. Getting none, he ventured, "Uh, thirty degrees at the tips?"

"Twenty seven point five but close enough. What else?"

Bud looked closely at one of the blades. "Hey! They each have little ridges at three, no… four places. Now, if I had to guess, I'd say those look a lot like airflow vanes on a wing, designed to keep the air going straight back and not flinging out and off the tip of the wing, or in this case, the prop blade."

Tom clapped his friend on the shoulder. "Absolutely right, Bud. But, there's one more thing. Can you see it?"

The flyer took a closer look. "Holes?" he asked, unbelievingly. "Holes in the leading edges of the blades? That's…" he paused as he noticed something else. "That's pure genius, skipper. Unless I'm due for a new pair of spectacles, you've got hollow tubes picking up air in the front and flinging it out the back. Right?"

Tom gave his friend a big smile. "Yep. We scoop up an extra twelve percent more air, it gets compressed by the spinning motion of the blades, and goes out the smaller holes near the tips of the blades. All in all, these fanpellers provide a fifteen percent increase in airflow and at an eighteen percent greater speed, than larger traditional props up to even five footers!"

Bud looked at his friend, tilted his head to one side and casually asked, "When does this sky jockey get a chance to take her up?"

"If you have a spare few minutes, how about tomorrow?" Tom suggested.

"Just try to stop me!"

The following morning, when Tom pulled his car up at the Barn, the open-sided hangar sitting close to the main building cluster, Bud was already there admiring the small airplane.

“I see you’ve been sleeping here overnight to make sure I keep my part of the agreement,” Tom teased his friend.

“Naw. I only got here a few minutes ago… well, six fifty-three to be exact and heck, it’s only just gone…” he glanced at his watch, “oh. Nine thirty. Well, how time does fly when you’re anxious to do the same. Is she ready?”

“She will be in about ten minutes. I need to give the starter battery a quick charge. Have you had the chance to check out the controls?”

Bud nodded vigorously. “Sure have. Interesting, too. The handle in the left cubbyhole,” he said pointing at the near side of the fuselage, “works the vertical stabilizer. No pedals I see. Twist to the left and the rudder goes that way, and to the right for the opposite effect. Then the joystick on the other side controls the elevators and the ailerons. The one thing I don’t get is that knob thingie with the hole in it in front of that. In the right cubby.”

“That, Bud, is your throttle. Without needing to take your hand off the joystick you can put your index finger through the hole and either push forward for less fuel or pull back for more.”

“That… is… pure… genius!” Bud declared slowly and distinctly. “I guess the last thing is… what’s she called?”

Tom stood up from connecting the fast-charge cable and looked blankly at Bud. “You mean you haven’t already come up with a clever name for it? Oh, Bud. I… am… so… disappointed!” Tom mock-wailed, trying to match the cadence of Bud’s recent proclamation.

They both laughed.

“To be honest, I haven’t had any ideas other that the *Accordion*. But, that’s not really that good. Is it?” Bud looked anxiously at Tom. Generally, Bud came up with humorous or pun names for most of Tom’s major inventions and they seemed to stick, long after people forgot the official name of something such as Tom’s EnvirOzone Revivicators—large, floating ring devices that plied the skies over the South Pole, cleaning the air and replenishing the ozone layer. They were always referred to by Bud’s nickname, OzoNuts.

He continued. “I looked up accordion on the internet and came up with the official name, *Aerophone*, but that sounds too much like an inflight communications device. I’m kinda stuck. Sorry.”

They talked about how Bud would be flying and where he would test the little plane until it was time to disconnect the electrical cables.

Bud clipped the caribiner on a cable that extended out from the fuselage to his suit’s harness. Like another of Tom’s small planes it

would be drawn into the plane when he lay in position, and would act to hold him firmly to the plane during the entire flight.

Tom showed Bud how to twist the throttle halfway around in each direction to start the two engines. In seconds both were purring away, their props spinning slowly enough so the plane did not try to move forward.

Bud gave his friend a thumbs up sign, pulled on the helmet with its built-in radio that Tom handed him, and lay down. He felt the connecting cable withdraw and was soon snugly pulled against the top of the plane. As Tom stepped back, he eased the throttle out a little and lifted his feet up and against small foot pegs that had flipped out from the fuselage. The little aircraft moved forward and he soon had it taxiing toward the nearest runway.

Over Tom's handheld radio, he heard Bud's exchange with the control tower and a minute later the little craft was lifting off the ground for the first flight.

The flyer took it in a wide circle over the four-mile-square Swift Enterprises grounds before gaining an altitude greater than about three hundred feet. With the tower's permission, he pulled the nose up and was soon climbing at the maximum rate of three hundred feet per minute. Not much by most standards, but most aircraft had considerably more displacement than .375 liters.

Ten minutes later he came back into view, having disappeared to the north for a four-minute climb and coming back south as he descended. He landed with barely a bounce and taxied back to where Tom was waiting.

He shut the engines off and disengaged himself from the restraining cable. As he pulled off his helmet, Tom could see that his friend was both grinning from ear to ear and was about as white as a sheet.

"What's the matter?" he asked worriedly.

"That has to be the most invigorating flight I've taken in a long time, but you've got to do something about keeping the poor pilot on top of the plane!"

He explained that as he began his turn to come back, admittedly a moderately sharp turn, he almost slid off the plane. Only quick reaction had kept him from dangling over the edge of the fuselage. Even with the restraint connected and tight, the fuselage was just too slippery.

"Maybe add a non-skid surface. Anything to give me more purchase. And, some padding. Other than that, it was magnificent! Now, your test pilot has a related question."

"What's that?"

"What are you designing this for, if I may so bold as to inquire."

"Huh? Oh, the Australian Army has asked us to build eight hundred tiny planes to be used for evacuating areas when getting out by foot or even ground vehicle isn't possible or quick enough. They plan to use them on maneuvers out in the western part of their country. In the past three years they've had twenty-seven deaths of soldiers who got lost—some had no way to communicate where they were for whatever reasons, and others were dehydrated in the heat, and perished. The idea is that they either take a few of these along to send some troops out to get help, or to air drop them in large numbers to evacuate entire squads."

"Neat. Can I put in a special request to have one extra built for us? I mean for posterity, of course. I'd only take it out on weekends and in good weather, just to make sure it was still operating at peak efficiency, you understand."

"Oh, I *understand*, Bud. I understand!" Tom laughed.

After they put the little plane in the hangar and covered it, Tom and Bud went their separate ways with Bud heading across the field to fly a more conventional aircraft for a demonstration to a prospective customer and Tom going to the Administration building and the office he often shared with his father.

"Ah. You're just in time, Son," Damon Swift told him. "I'm expecting a phone call from the Department of State. I hear that they want us to assist them in writing a proposal for a new space project."

"What is it supposed to be, Dad?"

"Tom, if I knew that I'd be working a mind reading act in Atlantic City." He chuckled. "No. All I've heard is the typical grapevine stuff. 'Uncle Sam wants to do something up in orbit…' 'NASA has a new type of shuttle planned…' That type of information. Not solid but something just interesting enough to get my attention."

As he was saying the final word, the intercom buzzed. "That must be it, now," he said, pressing the button. "Yes, Trent?"

The somber voice of Munford Trent, the secretary Damon and Tom also shared, stated, "It's the State Department. A Dr. Feldsman. Line two."

Damon looked at Tom and reached to press the button. "Hello. This is Damon Swift. I'm here with my son, Tom. How are you today, Brian?"

"Hello, Damon. Hi, Tom. Hope the weather is holding off for you up in New York. It's absolutely doing the old cats and dogs thing

down here in D.C."

"Hi, Dr. Feldsman," Tom greeted the man who had once lived right in Shopton and had been a good friend to his father for years. "The weather is pretty nice right now. Sorry you're getting dumped on."

The man chuckled and said, "I'm getting dumped on in more ways than I care to tell. Listen, The reason for this call is pretty straightforward. You both know all about the Moon Colony One mistakes we made…" He let the statement dangle.

Both of the Swifts were painfully aware of the issues with the first permanent settlement on the Moon. It was a project that, for various political reasons, Enterprises had been blocked from bidding on. In actuality, they had been invited to submit a bid, but on a specified project that neither of them felt would be successful or safe. Their proposal had been on a completely different approach, one they knew could be completed in half the time, for two-thirds the budget and would provide twenty-five percent more living and working space.

It had been rejected for being what the authors of the Request For Proposal termed, "Improper adjustment and assumptions not consistent with the needs, requirements and stated goals of the project."

Not only was it a bitter pill to swallow—the project would have meant more than fifty million dollars in bottom line profits to Enterprises—but it ultimately had turned out to be disastrous.

For the newly installed residents of the base, that is.

One of the eight solid-construction buildings erected in the group received a ricochet hit from a meteor. It had collapsed killing eighteen of the lunar fifty residents. Tom and Bud had immediately flown a mercy mission to the base, arriving days before any Government help could even get off the launch pads, and had returned with eighteen body bags in the hangar of *The Challenger*.

"Yes, Brian," Damon said wearily, "we are most conscious of every aspect of that. Is this what the call concerns?"

Dr. Feldsman cleared his throat. "In a way, yes. Now, it hasn't been announced, *and we wish to keep it that way*, but they've had a second impact. It hit during the sleep period and was just a glancing blow to one of the hydroponics buildings, but they lost about half the atmosphere in that one before getting a patch completed."

Somewhat harshly, Tom stated, "All this could have been avoided, you know!"

Damon looked sternly at his son and shook his head, mouthing,

"Let it go!"

"I'm sorry, Doctor," Tom said softly. "It's more than a bit of a sore subject."

"No, Tom, I am the one who is sorry. I'm sorry that you and your father got snubbed in the first place. However, I and many members of Congress and certainly the President are grateful that Swift Enterprises didn't go public with the entire affair. If the American taxpayers had known to what extent the project cost over your bid, Washington D.C. would have seen a political bloodbath unlike any before."

"It isn't our place to tell tales, Brian," Damon stated flatly. "So, what *is* this call about?"

Feldsman cleared his throat again. "We want you to create some type of protective barrier for the remaining buildings. And, in about two years—and assuming that we can prove the success and viability of the colony to everyone's satisfaction—we will be looking to expand it. For my vote I want that expansion to go right to you. No bidding, no haggling and no pork barreling like the first stage."

Tom leaned forward, now slightly more interested more than he was annoyed. "What sort of protection?"

"I want to leave that up to you, Tom. And, you too, Damon. All I know is that the solid building idea was ill conceived and poorly constructed and—" He cut off and the Swifts could hear several voices in his office all speaking at once.

The aside conversations went on for almost three minutes before Dr. Feldsman came back on the line.

"Damon. Tom. We've had another disaster up there. It sounds like the patch to the damaged building gave out. *We've lost two more men!*"

CHAPTER 2 /

RECOVERY

THE HORROR of the situation hit the Swifts like a hammer. Tom flashed back to the loading of the body bags and the sad flight back to Earth. Damon instantly was assailed with all of the guilt and sadness and anger he had felt the time the Swift's Outpost in Space had lost a single crewmember to a meteor hit.

Recovering a moment later, Damon asked, "How safe is it to leave them up there?"

Dr. Feldsman gave out a very tired sigh. "It's a crap shoot at best. We could ask you to help us bring everyone home for the sake of safety, but then everything up there would grind to a halt; no ore would be processed so none of the permafrost below the surface would be harvested to support the hydroponics. Within a few days the plants would begin to die from lack of attention. Now, don't get me wrong here. I want those people to be as safe as possible, which means, according to common sense, that they are not up there. But the practical side of things is that abandoning the colony right now will probably spell the end of the project!"

"Then it is a good thing that I am not a politically-motivated man, Brian," Damon said with frank honesty. "Otherwise I'd hold a press conference and bring down the fools and idiots that run this nation of ours! But," his voice calmed down, "as I said I am not that sort of person. Tom and I will go up to the colony tonight to access the situation. I want one thing made very clear, however."

"I am almost afraid to ask, but go ahead."

"If we deem the structures to be unsafe, the Government orders the residents to come back to Earth with us until such time as we can fix all of the blunders their *chosen* contractor, Wingate Aero Construction, committed."

There was a moment of silence at the other end before Dr. Feldsman asked, "Can I get back to you in a half hour? I can't make that promise, but I have the ear of the man who can."

"Okay. But please impress on that man that each and every minute the Government stalls on this, the more lives you are likely to lose and the quicker the truth comes out!"

The return call came a few minutes past the half-hour, but it was good news for the Swifts. "The President has personally guaranteed that the order will go out to the colony in the next fifteen minutes telling them the decision to remain or leave is yours, and yours alone, Damon. And, considering what has happened, I can think of only a

few who might argue the point. Keep me posted, please."

Even before the call terminated, Tom had been on the phone to Fearing Island. As Mr. Swift was hanging up, he heard Tom say, "—so empty out the hangar, get that portable evacuation kit inside and allow room for something I'm bringing over. It'll take up a five by four footprint and is about six feet high. Thanks, guys. We'll take off around eight this evening."

Tom turned to his father and explained. "I've been tinkering with a new spray coating. It is full of nearly-nano strands of clear tomasite suspended in a slightly opaque polymer."

"Why ever have you been working with something like that?" Damon asked, very puzzled. It was the first time he had heard of it.

Tom smiled. "Do you recall the inquiry we had from the U.S. Navy about making their older frigates and destroyers more stealthy?" Damon tilted his head and thought, and then smiled back as he remembered.

"But, that was months ago. A year, maybe."

"Right. And I've had so much to do what with the Pluto thing and the black hole that it has been kind of on my back burner, but I have performed a few tests recently. I don't have the polymer right—it still reflects RADAR at too high a rate to be effective—but it might be right for what we need to do on the Moon. I want to give the inside of each building up there a coating. Since the polymer remains ever so slightly flexible I think it should be self-sealing in case of micrometeorite hits. Plus, it will tie everything together so that a glancing blow may not completely destroy another building."

Mr. Swift rubbed his chin in thought. "How much of the building group do you plan to spray?"

Tom picked up his tablet computer and called up a calculator. In a minute he looked up. "Each fifty-two gallon tank should cover the interior of one entire building. I have one. If I hurry the folks in the Chemistry department, they ought to be able to put two more tanks together before six. We can strap those to the porch on *Challenger* if there's no more room inside." He looked hopefully at his father.

Damon nodded his agreement and Tom got on the phone.

When the *Sky Queen* landed on Fearing Island, a team of workers swarmed up into the hangar and began unloading all of Tom's new spray equipment along with the three tanks of the substance he had been calling TomaCoat in his notes.

Along with a skeleton crew of two—in order to allow as much room for an evacuation as possible should that be necessary—they soared skyward two minutes before eight that evening. It was almost midnight, Shopton time, when they gently touched down five

hundred feet away from the colony cluster.

As they descended, the sight was almost sickening. Not only was there the naked space where the first building had been destroyed, but now a second of the rectangular structures was partially collapsed in the second row.

The three tractor-like vehicles used outside the colony for mining were lined up, waiting for their arrival. Once Tom shut off the repelatron drives, the vehicles moved forward. A man got out and headed straight for the lower access ladder while the others turned the tractors around and backed in as close as they could.

Damon and Tom met the colony manager, Frank Williams, inside the airlock. They all shook hands before a word was spoken. Williams made the first attempt.

"I think it is exceptionally crappy that you have to come back up for yet another disaster." Tears were brimming in his eyes. "This was another skipping rock thing. If we had only been allowed to set up three or four hundred feet further toward the middle of the facing side of that rock formation over there, they might never bother us. We're just so at the mercy of anything that wants to come hit us. These are good people, both the ones we lost and the ones we still have. But—" and he choked on his emotions. A minute later he still could not speak so Damon and Tom led him to the small elevator and they all went up to the control room. Sitting in three of the pop-up seats near the front windows, he finally composed himself. "Thank you."

"Frank," Tom said softly, "do you think it might be best to just evacuate you all tonight and then I can come back with a team to try something that could help?"

When the colony manager stared blankly at him, he explained about the TomaCoat.

"I haven't told anyone about the President's order. Not yet. Nerves are raw and tempers are on edge. You'd have an outright rebellion from about half of them if you proposed that right now. The others would gladly go back and hunt down the scoundrels at Wingate. But," he paused as a thought appeared to hit him, "if you couched it as 'this coating will make everyone ill, so we need to take you back to Earth for, umm, forty-eight hours while it is being applied,' we might get away with it."

As they discussed how to best handle the situation, the other *Challenger* crewmembers were assisting the lunar team to unload all the equipment from the hangar. Tom glanced down to the surface in time to see the first tractor heading back to the collection of buildings.

A few minutes later they went down to the lower deck, got into spacesuits and left the ship.

It took just fifteen minutes to tour the remaining buildings and to see that the two closest to the damaged building were showing signs of stress.

Pointing to one of the roof beams, Tom commented, “I can see that it is bent even from down here. We’re what? Thirty feet below it?” He turned to their host, “If I were you I’d seal this building off from the adjoining ones. Workers in suits only until that can be fixed.”

Wearily, Frank replied, “Fine, except that it is one of our main hydroponics buildings. It will be next to impossible to tend to things while suited up, and everything in here needs to be tended to on at least an hourly basis.” He sounded tired, distraught and like a man who knew he was beaten. Tom and Damon both immediately felt his anguish.

“This is one of the reasons you all need to come home,” Damon said, placing a hand on the man’s shoulder. He was about to say more when he saw Tom shaking his head off to the side.

“Maybe not. Or, at least not for this reason alone. I have an idea. If I and one of our technicians stay here and get this building spray coated along with two others, you can take the *Challenger* to Enterprises and bring back four of our inflatable emergency environments. Of course, we would have to do a lot of changes if you absolutely can’t use four individual chambers. I see one being attached to the current airlock of each of the surrounding buildings. At the very least they will give you sealed storage or living space. I think that once we have them up here we can start to move things into them to make the coating job easier.” He looked at his father and mouthed the words, “We need to talk.”

Damon nodded. “Uh, Frank. Tom and I must confer about his plan. If you will excuse us for a minute or two…?”

Williams left them alone. Once he was gone, Damon turned to Tom. “Are you hoping to turn this into a public demonstration of how much of a mistake the selection committee made?” When Tom nodded, he added, “Good. Let’s get their best structural man, or woman, to give us the dimensions of a new beam that we can tack onto that stressed one, and I’ll head back home. We’ll need to make various arrangements, so I’ll leave it to you regarding the environmental tents while I work on everything else. Oh, and be certain to order more of your coating. I’ll bring that along when we return in two days.”

An hour later Damon and the other two crewmen took off along with the nine women of the colony. It had been decided they should be evacuated no matter what. And, as Tom pointed out, with the base’s reduced oxygen production it was better to have fewer breathers there.

Mr. Swift returned thirty hours later to find that Tom, the technician and five of the colonists had managed to spray the TomaCoat throughout the endangered building and to shore up one wall that had bowed in. They also had coated the sleeping quarters building and the combination equipment storage, mess hall and gym/recreation facility; it had been the building next to the first ruined structure. The only thing left to do was to get the new beam—this one made from Durastress instead of the heavier aluminum alloy of the original—raised and bolted in place.

Because each of the inflatable emergency shelters was just a few feet smaller than one quarter of the damaged building area, the decision was made to pull all the machinery out of the collapsed building, demolish it, and erect the inflatables in its place. Fortunately, the normal position of the airlock in each tent aligned close enough to the surrounding buildings to let all four be installed. Tom and a small team installed a Durastress net over the top of the four inflatables. Mr. Swift brought that along, and Tom immediately saw the wisdom of it. In the lower lunar gravity and tight space, there had been no way to anchor all four structures adequately.

Two days later the tents were full of equipment and two more of the remaining buildings had received TomaCoat.

Challenger was packed up and made ready to leave. This included bringing back the bodies of the deceased. Their relatives did not wish to have them buried on the Moon.

"I'll let you hang onto the TomaCoat machine so your people can do the last of the buildings once I send up a few more tanks. Also, once they are emptied, spray the inside of the tents to give them more structure and security. Please try to get it all finished within the next ten days. After that I'll arrange for the ladies to return and we'll pick up the machinery."

As *Challenger* soared away from the Moon, Damon asked him, "Do you think I have a chance to get reimbursed by the Feds for those inflatables?" Tom looked at him and could detect the slight smile playing around his father's mouth.

By the following day the trip was behind them and both men were deep into their own projects.

Tom and Bashalli had asked his folks to come have dinner that evening in their new home. When the older Swifts arrived Bashalli was a bundle of nerves. Although she had cooked individual dishes for them on a few occasions, this was the first time she was making an entire meal. Anne Swift gave her a hug and suggested that they "hit the kitchen" while Tom and his father "did work stuff!"

"Dad. After seeing the inflatables up there I am more determined

than ever to try building the sort of structure we planned for the lunar colony in the first place. Maybe we can get Government support if we couch it as a permanent replacement for the first building that was destroyed. And," he lowered his voice conspiratorially, "if we can prove their worth, perhaps they'll let us replace all of the other buildings over time."

"Hmmm. Perhaps. But I don't want you doing anything until we get a go-ahead and a solid order. Understand?" He knew that Tom loved to jump the gun on things and get started well before funding was secured. It generally turned out for the best, but in the current financial environment, he would prefer to not have that sort of exposure for the company.

Tom, who hadn't actually been a Boy Scout, held up their three-fingered salute and promise, "I will not start *making* an actual building!"

Mr. Swift peered at him over his reading glasses, his eyes narrowed. "Let me amend that in light of your response. You will not construct anything over, oh, let's say a ten foot by ten foot model of the building you will no doubt have fully designed and ready to go within the next day or two. Okay?"

Tom laughed and replied. "Deal!"

After lunch the next day Tom wandered over to one department he rarely visited—not because their work didn't affect him on a daily basis, but rather because whatever they did, it just seemed to happen. It was the Uniforms department, responsible for providing everything from the coveralls worn by many employees, including Tom when he needed to protect his clothes, to tablecloths for the commissary to the incredibly intricate deep sea and space suits worn on various missions.

The very efficient yet rather severe-looking manager, Marjorie Morning-Eagle—a proud member of the Narragansett Indian tribe of Rhode Island—scowled at him when he entered the large workroom. She was never known to be given to enthusiastic politeness, even to Damon Swift, yet she was never actually rude.

"And, I suppose that you have some earth-shakingly important, 'I was wondering if you could rush up a spacesuit for my new pet bulldog today' project?"

Underneath the gruffness, Tom knew there lurked an individual who would move heaven and earth to complete a project on time, and someone who enjoyed acting much sterner than she was.

"Hello, Major," he returned her greeting using the name he had given her based both on her demeanor and her actual name. "And, no, my imaginary pet dog is remaining dirt-side for the time being. Actually, I believe I have something that you and your ladies might enjoy as a little change of pace."

She eyed him suspiciously for a moment, and then snorted. “Okay. I’ll bite. What’s cooking?”

Tom motioned toward her office, a glass-enclosed space on a raised platform in one corner of the room. She nodded, turned and they walked into the office. After sitting down he pulled out a sketch of a square that seemed to have a pattern of intersecting lines running all over it.

She laughed. “If you are asking me to make you an Indian blanket —sorry, I mean a *Native American* blanket—I’ve got to tell you that ain’t one of my tribe’s designs. I doubt it’s any tribe’s.”

Tom grinned at her. “This, Major, is a scaled down portion of a flat panel that might be as large as fifty feet wide and one hundred feet long. Those lines,” he pointed at the pattern. “are actually a network of little tubes, maybe a half of an inch wide once they are inflated.” He paused as she held up a hand.

“Details later, big picture now,” she urged.

“Okay. I plan on building a large, inflatable tent. You might recall having a similar discussion about a year ago.” He looked into her face to see if there was any recognition. When there wasn’t, he added, “The Moon colony project?”

Her face brightened. “Oh, yeah. That Dingaling Brothers tent for the folks up there. I remember now. But, hey. I thought that was a no go!”

Tom told her about the two tragedies that had claimed twenty lives so far.

“I want to try to convince the Government people behind the colony that our self-inflating dome idea needs to be recognized as what they should have gone for in the first place, but now that the damage has been done, it can be the salvation for the remaining colonists.”

They got down to discussing how the panels would be constructed and how they were supposed to work. Each panel would have the layout of tubes that would form an almost geodesic pattern except for the final one-inch at each edge. There, and spaced at about two-foot intervals, was where each tube sealed to the adjoining panel’s tubing. Tubes would stick out perpendicular to the edge and would be mated with the next panel using a pressure fitting that would either snap into place, or would be glued in.

“If we are making replacements for the two buildings up there, then these will end up as rectangular tents of about seventy feet by a hundred forty feet.”

“How tall? And, is it flat or domed?”

“In order to accommodate what they have, I’d say they would be

about thirty feet high at the corners, but the top of the inflated dome might be another fifteen or eighteen feet or so. Is that important?"

She snorted. "From a sewing aspect, yeah. It's important. I guess as long as we're talking completely square corners it isn't such a big deal, but if you ever go for something with a softer profile and rounded corners, then all the gathers and darts and tucks get pretty tricky. Assuming, that is, you are going for construction strength." She winked at him.

He nodded. "What if I wanted to build something that could have airlocks in all four corners? Kind of like the soft locks we have in the emergency pressure tents you make for our expeditions. Perhaps large enough for four or five people at a time."

He watched as she sketched out a more curved corner with a panel that could be unsealed and folded or even rolled back. "Like that?"

"Sure. Does that cause any problems?"

She nodded, but then tilted her head to one side and gave it a small shake. "Yes, and no. The smaller the overall building the more of an area we have to use in that curve. This drawing is my guess of the corner and curve on your seventy by one-forty tent. The smaller you go the wider proportionally those corners have to become, and that's where we get into *issues*." She made finger quotes when she said that final word. "I'd say you need to keep this no smaller that maybe fifty by fifty, or cut down on the number of corner locks, or," she looked at him and stared wide-eyed to emphasize her point, "center the locks on the sides!"

"For this one, they need to be at the corners, but for anything else, it's a deal… side airlocks. Now, the really big issue is what to make this out of. The problem on the Moon is that they have taken a couple hits from flying space rocks. I want something that is tougher than the woven tomasite and Durastress cloth we came up with for the original bid. It's going to need to be as thin as possible for transport purposes, but strong enough to deflect a .45 caliber bullet fired at close range. And, if it does get punctured, it must be rip-resistant. And needs to be patchable, quickly."

Marjorie Morning Eagle looked at him. "You don't half ask for the nearly impossible, do you?"

CHAPTER 3 /

THE BLOW-UP

TOM WAS smiling at her a minute later as she began listing several possibilities. Among then was a new product from the South American country of Uruguay. Tom vaguely recalled hearing about the product, SpiderSilk, from a technical journal a few months previous.

"What can you tell me about that?" he asked her.

"Well, what I know is that it is a synthetic form of spider silk, and we all know *that* is about ten times stronger than Kevlar. A man down there managed to tear apart the genetic makeup of spider silk and then replicate it. Then, he did something kind of gross, but it makes it even more useful."

"I'm not sure I remember that part. What did he do?" Tom asked with a puzzled look.

Marjorie scrunched up her face before replying. "He mixed it with human skin cells. Yuck! Actually, he started it as a skin replacement product for skin grafts. Real skin has to be harvested really thin in order to not endanger the donor site, and he figured out the special matrix and how to get it all to grow together."

Tom was amazed. This was all new to him. "And it's still that much stronger?" he asked.

She shook her head. "Nope. Only three times as strong as Kevlar that way. But, about fifty times stronger than skin, even at one layer thick, and has a mesh form that lets real skin cells grow into it and attach easily."

"Oh. Not particularly air tight, then," Tom stated in disappointment.

"No, but if you want the higher strength which, by the way, is about one-fifth the weight of a layer of Durastress fiber cloth at half the price, then the non-dermis artificial spider silk will be the way to go. How much are you going to want me to buy?"

Tom thought for a moment. "Well, dad won't okay any purchases along the lines of what we need until a certain Uncle named Sam ponies up and gives us a contract. How are you figuring on using it?"

Now, she took a few moments to think and to do a few calculations on a piece of paper. Finally she looked up. "I would suggest a five-layer approach with your little network of tubes in the middle. A layer of Kevlar, one of SpiderSilk, your tubes, an airtight layer, SpiderSilk

and the final Kevlar layer. My guess is that in between we run very tiny lines of Swift FlexTac every, oh, three feet or so? Yeah. That ought to keep things together and still let you roll it all up. So I would need about… hmmm, thirty-three hundred yards for your inflatable. I know that sounds like a lot, but that includes all of the sewing allowances and a bit extra just in case of a mistake."

Tom grinned. He knew she prided herself and her team on their having not made a "mistake" in several years.

"So, the final cost?" he inquired.

"Easy to figure," she replied. "Thirty-three hundred times twenty bucks a yard… sixty-six thousand. Plus delivery. Call it seventy thou, just to be sure."

Nodding, Tom added his mental cost of the network of tubing—considerably less at about five thousand dollars worth of finished materials—and smiled. Seventy-five thousand was cheap! Of course that didn't include labor costs, but since Marjorie and her team were already on salary that was negligible.

"Great! If you could make inquiries and see if we can get that much, then I'll work on the financial side—with dad, of course. Let's touch base day after tomorrow. Okay?"

She shook her head. "No. That's Sunday. I'm not coming in on Sunday for a *maybe* project. Make it Monday and we're still friends."

Tom held out his right hand and she shook it, giving him a big smile and a wink.

"Now, get out of here and let me get back to scowling. Got to keep up appearances, ya know?" she said, rising from her chair.

Back at the shared office Tom told his father about the costs. As he expected, Mr. Swift responded:

"That's a third of what I expected, Son. I'm tempted to let you go ahead, but give me until quitting time to verify it. Can you live with that?"

"Of course, Dad. In fact, the Major isn't going to have her info about availability until Monday. I guess it can all wait through the weekend."

Late in the day Tom received a call from the Uniforms manager.

"If you can let me place a small order for two hundred yards, today, I can get it from a vendor in Miami for ten bucks a yard. He doesn't know what to do with it and is gonna wrap it up and send it back to the manufacturer tomorrow."

"What can we do with that little?" Tom asked, a little puzzled.

"Make a test puff," she replied. "You know, a small inflatable to see if the design and concept work? It'll end up being about twenty by twenty with a single two-man airlock and a floor. He can have it on a plane tonight for delivery late tomorrow, all for the ten per price. What do you think, boss?"

"I think we can't pass on that. If dad has a problem I'll pay for it out of my discretionary funds. Go for it, Major. Oh, and thanks!"

"Uh, Tom?" the woman asked in a pensive voice. "You know all those little tubes and such?"

"Yes."

"Will we have to make this small one all in separate panels that can be connected together and disconnected? I'm guessing that the full-sized one will need to be broken down. If nothing else, just to get it up into space. Right?"

Tom laughed. "Wow, Major. I wasn't going to mention that until Monday, but you've hit the nail on the head. And, you're right. The full-sized model will need to be divided into, oh, maybe eight sections. I'd like to be able to say half that, but I can't see all those tubes letting me take much more than a single rolled part up in *Challenger's* hangar at a time. It's all moot once we get up to the Outpost since we can shove a lot into the forward hold of the *Sutter*. But, to answer your immediate question, I think it will be just fine as a proof of concept to have this small unit all built as one piece."

There was a brief silence at the other end before the manager said, "If we built it in halves at least that way you can give your connectors a test. How would that be?"

Tom agreed that it was a good idea. They talked over several possibilities for sealing the two halves tightly enough to hold a pressurized atmosphere as well as to withstand the sort of impacts they hoped the inflatable would handle. In the end Tom realized he had a lot of work to do on that front.

"In the meantime, go for the two-part approach. And, have a nice weekend, Major!"

After attending to several details regarding the approaching return to the lunar colony, Tom dialed Bud's desk phone.

"Are you ready, flyboy?" he asked.

"Sure. Always am. Ever ready Barclay they call me. Just one teeny tiny question, though. Ready for *what*, exactly?" He genuinely sounded embarrassed.

"You and Sandy are coming over to pick Bash and me up in about an hour and we're all going to see that Marx Brothers retrospective at

the Holly Theater downtown. *Duck Soup*? *Animal Crackers*? Is this ringing any bells in that dark haired head of yours?"

With a little laugh, and obviously trying to cover up for his momentary forgetfulness, Bud stated, "Of course I remember. Did all along. Ummm, just testing you." His last statement was more of a question.

Tom headed home a few minutes later and was greeted at his front door by having a beautiful woman launching herself into his arms. It almost sent them both backwards out the door, but the lanky inventor managed to get one leg behind him to keep them from falling over.

Not realizing how close they had come to a fall, Bashalli began kissing him all over the face. It was obvious that she was very happy about something, and Tom couldn't believe it was simply his coming home.

Giving her a squeeze, he eased her back to the ground where she stepped back.

"You seem to be more than a little excited about seeing me, Bash," he told her. "I'm thinking that there is some other reason than just my smiling face. What's up?"

Bashalli Swift stood back and looked at her husband with eyes almost glowing and a huge smile across her face.

"I am happy to see you, and all of that, Tom, but I am even more happy about the news I received today at the advertising agency. I have been promoted!" She jumped forward and was once again in his arms, kissing his face.

When he finally managed to untangle her, he said, "That's great! Uh, promoted to what?"

She took him by the hand and led him inside where he kicked the door shut behind him. "I have been promoted from being a simple artist to assistant manager of the art department!" she squealed. "Instead of a cubicle with a drafting board, I will soon have an office with a door and a drafting board." She ended with an emphatic nod.

Tom recalled that she worked in a fairly small group, but didn't want to lessen her excitement and happiness over the promotion, so he asked, "So, along with some management responsibilities, what else will you do that is different?"

She gave him a short list that included more creative control as well as more flexible hours. "But the best part, Thomas, my lovely and loving husband, is that your beautiful and vivacious wife now gets to decide who is assigned to which project. We have not had

anyone who could do that except based on who had enough time. Since I know art and can see the capabilities of each of the three other artists, I can now determine who will be suited best for what."

They talked about the promotion on the way upstairs and all during the time they were dressing for the evening out. By the time Bud arrived with Sandy, Tom was in a short-sleeved shirt featuring caricatures of about a dozen different dog breeds, and Bashalli was in a pink floral spring dress.

"Gee, Bud. Look at the cute *married* couple and their colorful outfits." Sandy chided her date as she hugged her sister-in-law. "Don't they look all colorful and happy and… *married*?" She stared meaningfully at him and batted her eyelashes.

There was no secret about it. Sandy Swift had identified Bud Barclay as the man she would marry way back when she was still fifteen and had fallen for the athletic sixteen-year-old. Ever since Tom had proposed to Bashalli, Sandy had been ratcheting up her campaign to get him to propose as well. Now that Tom was married she had doubled her efforts. He finally had, shortly after he and Tom had returned from their trip to a nearby solar system to witness an incredibly backward-running black hole. Both young men had been injured and required several weeks of recuperation in the hospital. It was during that recovery period that Bud had popped the question.

And, although Sandy had immediately said, "Yes!" a few weeks later she had told him that she wanted to give him another chance.

"I can't bring myself to hold you to that proposal made while you were still in pain. I love you, ya big lunkhead, and I will marry you, but I want you to feel comfortable and ask me again in your own time. Not mine. Okay?"

That night, Sandy had fallen asleep in Bud's arms on the large sofa in the Swift's living room. On seeing her daughter the next morning, still fully dressed but obviously having engaged in a marathon kissing event—as witnessed by her lip gloss being all over Bud's face, lips and neck—Anne Swift gave a polite little cough that brought Sandy's eyes wide open.

She looked at her mother who, in turn looked back at her and raised one eyebrow in a very meaningful manner.

Sandy blushed but lightly shook her head and gave a little shrug.

But, now, Sandy needled Bud about wanting him to hurry up every chance she could manage.

Bud looked at Tom and then at Bashalli. There was something in his eyes that made Bashalli take her husband by the hand and lead him out of the living room and into the kitchen, closing the door

behind them.

"Wha—" he started to ask, but was hushed by a finger pressed over his lips.

"I believe that something momentous is about to occur," she told him in a low tone. "And, if we listen carefully…"

From the other room came, "Yipee! Yes! Yes! Yes!"

"See," Bashalli told him. "It will be safe to go back into the room in about one minute." At the end of that time Tom pushed the spring-loaded door open a little and let it shut again.

"Nope. Not yet," he told her. "They're still locked together. I've got a feeling we may not be going out tonight. What have we got in the freezer?"

And, it turned out that Sandy was so ecstatic about Bud's real and heartfelt proposal, and the somewhat large and overwhelming ring she was now sporting, that the four of them decided to stay at the Swifts' home and have a dinner of fish sticks, tater tots and some asparagus from the refrigerator, while the conversation was non-stop about all of Sandy's plans for the wedding.

The planning and re-planning continued for Sandy, Bashalli and Anne Swift the rest of the weekend.

On Monday Tom paid an early visit to the Uniforms department. A small yet long cardboard box sat to one side while Marjorie Morning-Eagle and her seamstresses stood around the large cutting table in the middle of the room.

The table held a three-foot roll of a shimmering silver-green material that looked about as substantial as damp tissue paper. When Tom stepped over and mentioned his impression, Marjorie picked up one corner of the cloth.

"Here. Rip it," she challenged him.

Taking the cloth, which had practically no weight to it, Tom took hold of two areas about a foot apart and gave a good yank. Then a more substantial yank. And another.

He moved to the very edge of the fabric and tried to separate the thin fibers, but he could not. Finally he dropped the material and stepped back.

"A little tough, isn't it?" the large manager asked in an innocent voice.

Laughing, Tom admitted that is was much stronger than it appeared.

“Yep. It’s even going to take a bit of extra oomph to cut it,” he was informed. “The distributor included a special cutting blade for our rotary tool. We were about to give that a go when you arrived. Lexie?” she called over to one of her workers, “will you get the cutter in position and take off about a one-inch strip from the end please?”

Once it had been detached, everyone made an even closer examination of the SpiderSilk fabric. It was possible to push the tip of a sewing pin through it, yet none of them could come close to tearing it.

Wishing them well, and making sure that they had a schedule for completing the test tent, he left them to do their jobs.

“I’ll see you on Wednesday, then,” he called over his shoulder.

By the time he reached the shared office Trent was just getting off the phone and was absolutely beaming with pride. “Your wonderful sister, Sandra, has asked me to help her coordinate everything for the wedding. Isn’t that amazing?” he stated.

With as many conflicting plans that Tom had heard just that Friday evening, he was glad to know that the most organized man in Shopton—and possible the Eastern Seaboard—was going to keep things going smoothly.

“Hey, Dad,” he greeted Mr. Swift as he stepped inside the office. “I’ve got some news for you… and admission of possible guilt.”

“As long as it doesn’t involve flowers, invitations, lists of invitees, food, dresses, bridesmaid dresses or anything else I’ve been inundated with the past two days, then I give you my blessing for whatever you think you might have done. Well, short of murder, that is. So, tell me what this is about.”

Tom told his father about the SpiderSilk fabric and the incredible deal he had authorized, and that the scale model would be ready in two day’s time.

“I still have more than thirty thousand in my discretionary fund, so I can pay for the fabric if need be.”

With a smile and a shake of his head, Mr. Swift told his son, “That won’t be necessary. About five minutes before you came in I got off the phone with the chief scheduler for Congressional Subcommittee Hearings, Meetings, and Events. He pronounced those words with capital letters over the phone by the way. There was a lot of ‘Your presence is required at,’ and ‘By order of Senator Blah-blah,’ but once I impressed on him that I respond to polite invitations and subpoenas, but not to underlings trying to impress me with titles and statements made in verbal capitals, he settled down and told me that there is a committee being called to investigate the lunar colony

situation and that my input would be vital to their understanding of the situation. I told him I couldn't speak for you, but I would see if you could come on Thursday. Can you, by the way?"

Tom shook his head. "Sorry, unless it is urgent that I be there. I'm heading back up to the Moon with the female colony members and a bunch of supplies, and bringing back our equipment. Can you do it without me?"

"Sure. Just thought I'd ask. But, say… is the test structure really going to be ready day after tomorrow?"

Tom informed him of the design, size and promise from the Uniforms team that he would be able to inflate it on Wednesday afternoon.

"If possible, I'd like to take it down to D.C. with me. I can write off the cost that way. That is, unless you were going to take it up for a lunar test."

Tom shook his head. "No. I'm still trying to come up with the best way to inflate all of the tubes that will give it shape and a firmer structure. My test is going to use compressed air. Why don't you come watch, and if you think it could help in your meeting, we can deflate it, roll it up, and get it ready to go."

The older inventor asked about the weight.

"The stuff is lighter than feathers. I glanced at the shipping label and for the whole roll that will make up the test tent, the weight was twenty-six pounds. And, my guess is that the box outside and the cardboard tube inside the roll account for at least six or seven of that!"

When Wednesday afternoon arrived, Tom and Damon, along with Bud and three structural engineers, headed for the Uniforms department. To their amazement, the entire team was waiting for them outside on the lawn in front of their building.

"Welcome, Mr. Swift. Mr. Swift. Mr. Barclay. And you nameless people I've never had the privilege of meeting before," Marjorie greeted them. "We finished the puffy thing an hour ago. Both halves meet up just as I knew they would, but we weren't certain how to inflate it or at what pressure, so we decided to come out and let you take over. It also was just a tiny bit too tall to inflate inside our workshop."

Tom had brought a pressure bottle of a mixture of gasses he believed would be the most gentle on the system of tubes, including a special pressure valve that would let the gas out at the appropriate rate, yet be resealable at the press of a single button.

Five minutes later he gave the assembled crowd a grin and thumbs up.

"Okay. I'm ready." He briefly explained the structural reasons for the tubes rather than simply inflating the structure like a balloon. "If and when we build a larger version of this we will need to do it in sections that can be reassembled in either an atmosphere or in space. In a vacuum it would require far too much air to inflate something that is upwards of two hundred forty cubic feet. Using embedded tubes, that cuts down to just five cubic feet for this one and seventy for the full-scale one. So, let's give it a try and see if theory holds up under Earth gravity."

After he double-checked the fitting between the pressure bottle and the inflatable, Tom flipped a small toggle switch on the hand-held controller and pressed his thumb down on the green GO button. They all heard the immediate hissing of air running down the line. As the next minute went on it continued to increase in volume.

"Is it supposed to be doing that, Son," Damon Swift asked.

"Yes. I set it to start slow and to automatically increase. We're about sixty percent of the way," he added looking at the structure. Something didn't seem quite right to him so he stopped the process and walked forward to check the structure.

"Ah!" he said a few minutes later. "Found one of the tube connections that's come loose," he told everyone as he twisted both ends. Satisfied, he returned to the controller and was soon completing the fill process. The structure, now puffy and tight, stood before them.

"Except for the bit of lost air, I'd say it looks good," his father complimented him.

"I do too, but I want to see what it is like inside." So saying, Tom walked to the small double-zippered door flap. As he brought the zipper tag up and over the top, there was a tremendous *bang*, and he found himself completely covered by half of the structure.

As soon as people helped move the lightweight tent half off, Tom looked sheepishly at them.

"Guess even the reduced fill pressure blew the connectors apart. Sorry, Dad," he said turning to his father," "but I don't think it will be ready for you to take tomorrow."

"Well, I wasn't counting on it and I'm not even certain they'd let me in with it, so you take your time and get those connectors right."

* * * * * *

As soon as Damon was ushered into the large chamber, the Master

at Arms closed and locked the heavy doors. He looked at the raised semi-ring of the desks behind which the fifteen members of the select committee were seated. There were a few people he knew well, including the Chairman, Senator Quintana of New Mexico, and a few he had never met. What annoyed him was the appearance of two recent congresspersons—one rather snooty young man from Nevada he and Tom had heard *nothing* good about, and an older woman who he knew had just taken her husband's seat following his untimely death. In her first six months she had made many enemies in the aerospace and technology sectors as she considered anything not spent on the poor to be a waste and something evil.

Senator Quintana called the meeting to order.

That was the highlight of the session.

An hour later Damon stormed out of the doors with the Chairman running to catch up with him.

CHAPTER 4 /
WHAT? ANOTHER NEW AIRCRAFT?

AS HE entered the shared office, Damon stopped in front of Tom's desk. Setting his briefcase down he plopped onto the visitor's chair, facing his son. "That," he said with a note of exasperation, "has to be one of the most futile meetings I've ever been called to. It's just a good thing you weren't there to see your old man lose his temper and tell off a room full of senators and congressmen." He shook his head.

Tom rose and walked over to the credenza next to the conference area and poured a tall glass of ice water. Handing it to his father he asked, "How much of this do I want to hear?"

Damon began chuckling, and it soon turned into outright laughter. "Oh, Son. If it hadn't been a closed session my face would be all over the news tonight with declarations of 'Swift Enterprises head man reads Congress the riot act,' or 'Can charges of contempt be far off for this once beloved inventor?' I really lost it." He shook his head sadly.

"What happened? I've seen you steaming mad before but you always hold it in until you get out of there. What made this one different?"

Mr. Swift tried to form the sentences to tell his son about the unsuccessful meeting. He sat there, nodding periodically and alternately scowling and looking resigned until he finally looked up.

"I was informed in no uncertain terms that our intent to bid and to submit designs and plans for the repair and protection of Moon Colony One will be rejected. Good god, they didn't even have Wingate there to grill over all the problems, but they sure put the screws to me!" Tom practically jumped from his seat and opened his mouth, but Damon cut him off. "Sit. We knew that we want to submit something that was a long shot and there was no proposal request asking for it. And, yes, we knew that from the very beginning our solution is a better and safer and less expensive one. But, and I could not deny this, it wasn't the set of ten barns they asked for."

Tom had listened to this with many questions vying to rush out, but he held his tongue. That was all water under the bridge. For unexplained reasons Wingate Aero Construction had been awarded the bid, they had come in late and over budget—with no reprisals other than delayed payments to them—and people at the lunar colony had died. He didn't want to rehash that, but he did ask, "What was it that had you so furious? The refusal to let us help?"

"Not as such. They got off on the wrong foot by assuming I was there to complain about the original contract, and greeted me with the old, 'Why are you bothering us about this?' attitude. I tried to

correct that, to remind them I was asked to be there, and to get them in the mood to listen to our proposal to, well, fix a bad situation and save lives. Or, to ask me the questions they summoned me to answer. No, it was what they informed me of right after that. Mind you, they finally realized that they never asked if we might consider it, they just told me that for any repair or retrofit program we would provide launch support services, and that all rockets from Wingate would be taking off from Fearing." His face began turning red again and he stopped to take a few breaths and another drink of water. "I told them it was not going to happen. We aren't about to turn over our space port to someone else."

"Darned right!" Tom said with conviction. "And, especially a company as outright incompetent as Wingate!"

"Yes. Well, a couple of the junior members of the committee tried to make it a matter of 'We've got the power to take that land away from you,' until Senator Quintana pointed out that the one hundred year lease and agreement we have specifically states that the Government can only step in if there is a specific and dire *national* emergency. Even at that, they must agree to totally safeguard, to our satisfaction, each and every bit of our property."

"Did that settle things?"

"No, it started a real shouting match where that little twerp from Nevada began yelling over anything I tried to say with statements that equated Swift Enterprises with foreign terrorist organizations." He stopped and looked, wide-eyed, at Tom. "Can you imagine that?"

"I don't blame you for blowing up, then," Tom said. "I don't have your tact and diplomacy, so there's no telling what I might have done. And, I can only imagine the scene if Bud had been there!"

That made Damon laugh.

"Yes. It's probably a good thing I was there alone. Anyway, Senator Quintana called a recess and when we came back, the Nevada twerp was missing. Unfortunately not that vile 'Anything we pay to you steals food from babies' woman from San Francisco, California. So, things ended up badly. We might have been a subcontractor on any future repair job, but that's now in the toilet. I'm afraid that the Moon Colony is not going to include anything from the Swifts."

Tom scowled as he saw a certain look on his father's face. "You actually don't seem totally upset by this. What aren't you telling me?"

Now, Damon gave Tom a conspiratorial grin. "On the way out, Pete Quintana stopped me and took me across to his office. Actually, he ended up chasing after me once I left the building. He handed me this." He reached down, opened the briefcase and extracted an inch-thick binder and placed it in front of Tom, face up.

Tom read the title. “X-95 Configuration Platform. Okay, can you give me some details or do I need to read this?”

“I will be most happy to discuss it with you, but not until you have had the chance to read what’s in that. There are about fifty pages inside, but you should take it in two steps. Read the first part—I think it’s pages one through nineteen—tonight, digest that, and tackle the rest tomorrow. It’s going to take you the entire evening to absorb what they are talking about in the end results specs. The rest is a lot of ‘and it also needs to…’ stuff.”

It was all Tom could do to not read everything right then. The thing that stopped him was an appointment with the team finalizing the building of his little collapsible plane. There were enough questions on the agenda he knew it couldn’t just be handled in a few email exchanges.

He left the office with his father just picking up the phone asking Trent to connect him with Jake Aturian at the Construction company.

“Hey, guys,” Tom greeted the team as he strode into Hank Sterling’s large workshop twenty minutes later. “I have two hours, so let’s get going!”

After a status review that let Tom know the planes could go into production within the month—assuming a few “tiny details” could be hammered out—the first question came.

“Can we downsize those fanpellers? Right now with the addition of the extra padding for the saddle they are causing us a headache in the fold-over department. We had to shift the mounts slightly and now the right prop wants to hit the shaft of the left one. If we could make them each a half-inch narrower, the problem goes away.”

“Okay, but have you done the testing in the computer to see what that does to the overall thrust?”

The young engineer shook her head. She was a new hire and had only recently graduated from a technical university in the Midwest. “Umm, I didn’t want to do all that until I found out if it was even necessary,” she explained. “Like, after testing, I mean.”

Tom smiled, and patiently explained that he wanted all team members to simulate as much work up front so that when issues such as this arose they might already have found the answer to their own questions.

“I would rather reset the engine mounts slightly in or out from their positions to have everything clear like it should. So, take a couple hours to pull up the CAD for the plane and play with that positioning. Run every change through the folding simulator and then come to me with your best suggestions. This isn’t punishment; it is just the way we do things at Enterprises. Thank you. Next?”

The other questions were easily answered so Tom left the meeting one hour later feeling very good about getting a start on production when the order came in.

That evening he read through—three times—the first part of the Government spec document. It was a real eye-opener. But, more than that, it was a shock.

He met his father in the parking lot the next morning. As he held the document up in the air, he asked, "Did you ever submit that design?"

Damon Swift shook his head but grinned at his son. "Ah, so you *do* recognize the basic aircraft, then?"

"Recog— recognize it? It's as if somebody stole a two year old design from my locked storage cabinet and just rearranged a few of the words describing it. Of course I recognize it. I created it back just before I built the *Sky Queen*!"

By this time they had stepped out of the elevator and were walking down the corridor to the shared office. "Did you peek ahead to the second part, or did you hold off as I requested?"

Tom stopped in the middle of the hall. "How could I not look on once I read the first part? Heck, I even read it once more before going on and then read the whole document from start to finish after that. Do you want me to do this?"

As they walked past Munford Trent and said good morning to him, Mr. Swift replied, "Yes. For one reason and one only. What we can offer them is better than their specs, cheaper by a quarter, and according to Pete Quintana, will either get awarded to us as a consolation for the botched Moon Colony project or to a small firm in Nevada that is, get this, secretly owned by the step father of the little twerp Congressman that I ran afoul of yesterday. Pete wants us to go through the entire process so he can try to catch the little— catch the junior Congressman in any illegal attempts to help his family with the contract."

They sat down in the conference area and went over the proposal. It called for a rather unique type of aircraft. One featuring four or six engines, a canard wing up front for maneuverability, and *two sets of wings* that could be moved into multiple positions and orientations depending on the flight characteristics required. What made it an especially difficult plane to design—or build—were the twin requirements that it be: A) capable of Mach 2 flight speeds; and, B) so silent that it could not be detected by the human ear flying at five thousand feet overhead at any supersonic speed!

The final page before the signature block had the closing statement:

> All entries for this project must fulfill each and every requirement as of the date of test vehicle demonstration. No "fine tuning" or rework will be

allowed. Any entry not fulfilling the requirements will be disqualified without opportunity to resubmit.

Tom knew that the aircraft he had designed back when he was still seventeen was almost exactly what the document requested. The only thing he had not considered in his design was the aspect of silent flight.

That, he now believed, was a double-edged sword to dodge around. While it was true that his revolutionary QuieTurbine jet engines—based on using small repelatrons to spin the blades rather than the burning of jet fuel—could be made into a Mach-2-capable propulsion system, it was just part of the supersonic story. Even the most advanced "wasp-waisted" jet designs that reduced sonic booms to only soft popping noises were not sufficient to meet the project demands.

Besides, he had tried using such a fuselage and found it to be quieter but not very stable above about Mach 1.75.

He began making notes regarding the few differences between his original concept and the requirements document. For starters, his design had centered around a proposed eighty-foot fuselage where the request called for an aircraft that was one hundred and ten feet long.

It was a fairly easy change to make.

What wasn't as easy was the internal configuration. His plan had been for a low operating cost jetliner that allowed eighty people to travel at almost twelve hundred miles per hour. The requested craft needed to accommodate one hundred troops, each with a seventy-pound backpack that had to be ready in the cabin, not in the hold below. He quickly realized that the body was going to need to either be longer, or wider… or the seat padding minimized.

The other issue was how to allow for the mechanisms that could move both of the main wing pairs around. Under what he considered to be normal design circumstances, the mechanics for that would take up a lot of internal room, room needed for the passengers.

The specs were very clear. The wings needed to be able to function with the middle set moved into position in front of the rear wings, in a configuration where they touched forming two very large wings in both minimally-swept and full-swept positions, with both wings extended but separated by up to eight feet, and even with the forward wings moved back and up into a modified biplane setup.

Tom called Arvid Hanson. Arv was the man who hand-built each and every scale and display model of Tom and Damon Swift's inventions. Although much of his initial work on any project was now handled by CAD design plans feeding into his array of 3D printing devices—some of which could build part or even complete models of up to five feet in length and four feet wide—he also could do the same

things with raw materials and just his hands, a few tools, and imagination.

"Hey, Arv. It's Tom. Do you recall about three years or so ago when I came up with that triple-winged jet?"

There was a moment's silence followed by laughter of recognition when the model maker recalled the project. "Sure, skipper. Funky looking thing, but the model I built sure could fly. Why do you ask? Got a hankering for some R/C fun?"

"No, and you're not going to believe this, but I'm sitting here looking at a military Request for Proposal that is spelling out pretty much that very aircraft. What do you think?"

"Ha! I think it's as strange a RFP as that model is strange as an aircraft. Whatever do they want something like that for?"

Tom told him about the Mach-2 troop carrying capability as well as the absolute stealth.

"I need to come over to see this RFP. You busy right now?"

Tom told him to come over to the large shared office. Ten minutes later the two of them were sitting on one side of the large conference table looking through the specifications. When they finished reading and discussing things more than two hours later, Arv left with two pages of notes and the request from Tom that he pull out the flight-capable model from the archive building and get it ready for some tests the following day.

When he mentioned it to Bashalli that evening she replied, "I seem to recall you showing me that design. I believe it was more than two years ago, was it not? And, I also recall that you told me it was… let me see. What were your words? Ah, yes. It was 'an exercise in pointing out that more is not necessarily better.' Was that right after you saw the advertisements for the six-bladed razor?"

Tom laughed and gave his wife a hug. "Yes it was. I started shaving with a twin blade and although I've tried all of the others, nothing is any better. In the end, they pulled that six blade thing off the market because too many men were shaving off the top layers of their skin."

Bashalli shivered at the thought. It had been a disaster for the small company making the blade cartridges. Within six months of releasing the product they had to shutter their doors to stop all of the lawsuits.

Before that happened, Tom had decided to take a few weeks between projects and come up with his satiric and ironical homage to the folly of adding more of a good thing, just because you could. A proposed three-wing jet had been published in a little read journal

under the heading of, “The Lighter Side of Invention.”

But, now, it appeared that someone believed that such an aircraft could work for their needs.

Tom met with Arv and Hank Sterling—pattern maker for Enterprises and the man who would be responsible for engineering a full-size aircraft—at the north field on the Enterprises property. One of the few unfinished areas, it stretched most of the four miles along the high wall and was between one hundred fifty and three hundred feet wide. He believed it would be the best location for their flight test as the prevailing winds of the day meant the East/West runways were not being used.

The two men were talking when Tom pulled up and got out.

“It’s strange, and no doubt about it, skipper,” Hank stated when Tom shook his hand. “I recall the model but was asking Arv to remind me of the why question. He can’t remember, either.”

Tom laughed and told them both about it coming from a period of combined boredom and disdain for the razor ads.

“I had to change out the four small jet engines, skipper,” Arv explained. “They weren’t designed to sit for a long time without being run. One seized up on me during testing last night and I didn’t want to take a chance on the others.”

“Good thinking. Get the old ones over to Dianne Duquesne and the Propulsion folks for refurbishment. Okay,” he said rubbing his hands together, “let’s see what this little model can do.”

Although its wings were locked in the position with one about six scale feet in front of the other, it took off quickly and climbed even better than Tom remembered. Up it went and then around in a tight circle. Seconds later it zoomed overhead, the four tiny engines letting off an almost ear-splitting whine.

Each man took a turn at the controls, but Tom was the one to land it. He figured that if anyone were going to crash it, that would happen on landing and he did not want either Hank or Arv to feel responsible if that happened.

He needn’t have worried. Although the jet wobbled at the slow landing speed, the landing was fairly smooth with the eight-foot model making a safe landing.

After they lifted it onto the trailer, it was back to the Barn where it would spend the next few weeks undergoing a retrofit to give the wings the necessary ability to reconfigure.

“We’re going to have to outfit this with a miniature version of the Silentenna,” Tom told them. “And, before either of you mention it, I realize that this isn’t the model we will use for demonstration

purposes, but I want it to be our first test bed for everything so when we do build the final model, we know what to expect."

The two men nodded their understanding.

"I still have one of the small test versions of the silencer," Arv told them. "It ended up on my desk so I could model it, but nobody ever took it back. I'll pull it out and see if it still works."

The very next day Tom received three phone calls. The first was from Dan Perkins at the *Shopton Bulletin*, the small daily paper in town. Never one to let facts stand in the way of reporting something bad, Dan began the conversation with, "I hear that you are trying to take over the Moon colony. What have you got to say about that!"

Tom pulled the phone from his ear and held it at arm's length, looking at it. He brought it back to his head and calmly answered, "I have no idea where you are getting such rubbish, but print that lie and our legal team will shut you down, Dan. Good-bye!"

Shortly after hanging up he took a call from George Dilling.

"Tom? I just got off a conference call with Harlan Ames and a Deputy Director at the State Department. I think you need to give Harlan a call."

About to speak, Tom was interrupted by the third call. "Looks like he's calling me, George. Got to go," and stabbed down a finger on the blinking line.

"Yes, Harlan? George just called. What's going on?"

"Big and not very nice things, Tom," the Security chief answered. "The State Department received a strange message purporting to be from the government of Brungaria."

Tom was slightly shocked. Never a friendly nation, Brungaria had undergone several regime changes in the past year. Nobody knew the exact attitude of the current rulers. "What does it say?"

"I'll read it. 'The freedom-loving peoples of the free nation of Brungaria must sadly report that secret communications between agents of the Swift organization have been intercepted. These spell out specific steps being taken to seize control of the Moon, and to use it as a base from which they intend to enslave any nation with oil reserves. We demand that the U.S. Government take steps to *stop the Swifts*!' "

CHAPTER 5 /
A HINT OF TROUBLES TO COME

IT WASN'T something Tom had expected to hear, but it explained the newspaperman's call. It took him several seconds to utter a little cry of dismay.

"Brungaria? Again? I thought they had managed to get rid of the sort of rulers who would stoop to that low level. What happened?"

"Tom. There may have been a few changes in their government over the past months, but we have no idea just what is really going on inside their borders and even less is known about who is in charge and what their agenda might be. If you ask my opinion, I say we let the State Department make an official inquiry as to what proof they have. In the past we've seen how futile it has been to publicly deny their claims."

"Right," Tom said recalling several occasions where he and his father had held press conferences to deny outlandish Brungarian claims, only to have one ridiculous question after another being posed by the supposed "neutral" press.

"So, I asked our friends at State to go through all the official channels and give the Brungarians ten hours to come clean, or our Government would make an announcement about how a foreign government is using bullying techniques against an American company."

"Will it… will it do any good?" Tom asked hesitantly.

"We'll see."

The inventor tried to get back into working on plans for a replacement dome for the Moon colony but found his mind constantly drifting to the Brungarian announcement. It made him angry, both at the accusation and at himself for allowing it to get to him. In the end he stood up and walked out of the office and the building. His initial thought was to take a walk through the building complex, along the meandering path that was used by many Enterprises employees. But, just one building away he did an about face and headed for the parking lot. As he strode purposefully, he took out his cell phone and dialed a number.

"Hi, Bash. It's me."

"Oh, hello, Thomas. I was about to call you to see if you might be able to get off work early. There is a charity walk from downtown Shopton out to the airport, around the perimeter and back into town.

It is for cancer research and my company is sponsoring me. I can make almost three hundred dollars for the cause if I finish the six miles."

"That sounds great, Bash. Put Enterprises in for double that, plus I'll join you. Should I grab a couple burgers before I meet you?"

"Umm, well there is supposed to be food provided by another sponsor, but forget that for a moment. There is something in your voice that tells me you have things on your mind. If you would rather not—"

"Absolutely no, Bash. I need a sounding board, and you're right." He gave her a brief description of the Brungarian announcement.

"That is so horribly unfair!" she declared, now as angry as he was. "We will talk this out and come up with a plan of action. You must do something to stop this sort of thing from happening!"

Her determination was so absolute that Tom almost laughed out loud. Instead he asked where and when to meet.

"In forty minutes in the parking lot by the marina."

After telling her he would be there Tom looked at his watch. There was just enough time for him to go have a chat with Harlan Ames to see if anything had happened in the past hour.

"Boy, are you a mind reader or what?" the Security man said when he looked up to see Tom standing in his doorway. "I just got off the phone with the State Department and they just got off the phone with the Brungarian Embassy in Berlin."

"Berlin?"

"Yeah. Since there is no embassy in the U.S. or Canada, and their Ambassador in London was recently expelled, that leaves Germany as the most open one available to us. Anyway, that is unimportant in light of what I found out. Brungaria in no way, shape or form released anything anti American or anti Swift in the past thirty days. Nothing. In fact, their Ambassador in Germany assures our people that their government is in such turmoil that nothing is being sent outside of the borders. They have severed the Internet connection in and out and he is afraid there are more internal troubles brewing. I've just finished listening to the tape of the conversation and the man sounds both sincere and worried. He even mentioned that he has contacted the German government and put out feelers for their willingness to accept his staff under amnesty conditions should the order to return to Brungaria be given."

"Wow! So we're almost certain they didn't release that announcement?"

“From the tone of his voice I’d say with ninety-nine percent probability.”

“Then, who did?”

“That’s a mighty good question, Tom and it is on the top of my list. As always, I’ll let you know. That is, if you don’t get a jump on me and call first!”

Two minutes later, with a great weight lifted off his shoulders, only to be replaced by a slightly less worrying one, Tom left the Security building and headed for his car. It was a beautiful afternoon so he took the top down and cruised out the gate giving the guard a wave and a friendly, “See ya tomorrow, Davey.”

Both the walk and his discussion with Bashalli worked wonders, and by the time they got home they were tired, still a little hungry, and happier that they had been earlier.

As she fixed them a small omelet to share they talked about another subject on Tom’s mind.

“What is happening with the inflatable replacement building for the Moon?” she asked over her shoulder. Tom, sitting at the kitchen table, had been admiring her beautiful dark hair and how it cascaded down her back—as well as her legs—took a minute to answer.

“Well, if you discount the fact that nobody in the Government has given us the go-ahead to actually do anything, I suppose it is chugging along fairly well. Senator Quintana is coming here on what he has to call a ‘fact finding’ tour of Enterprises day after tomorrow—and sorry but I do have to work even though that is Saturday—at which time dad and I will show him the plans and our small test structure along with our three-winged jet.”

Setting the spatula down for a moment, she turned to face him before asking, “Will he be able to give you permission to build the full size one for the Moon?”

“Probably not,” Tom admitted. “But, with his powers of persuasion, and seniority, we believe Enterprises will receive an invitation to provide support for the colony in the form of a new structure. I’m just not sure when. It will have to be carefully worded, dad says, so that it doesn’t seem like we are stepping on anyone’s toes —”

“Stepping on toes? But, that other company, the one that did receive the contract, performed shoddy work and many people have died. How can your desire to save more lives be seen as stepping on toes?” She had her head tilted to one side and a look of disbelief on her face.

"You'd better tend to that omelet," he suggested getting up to stand next to her. "It is a pretty tense political situation as is. Some things were done and decisions made that were not entirely within the letter of the law, but we can't make a big deal of those unless we're willing to accept the consequences of being finger pointers. Another word for companies that do that is 'bankrupt.' There is an unfortunately fine line between working within the system and being excluded."

They ate in silence, went upstairs and got ready for bed. Finally, Bashalli asked, "What would happen if you just went to the Moon and installed that building?"

"An excellent question from the representative of women for intelligence. Unfortunately, this man has no proper way to answer that. Let's hit the sack."

The following morning Tom did bring that very question up with his father. "It doesn't cost us much to fly the *Challenger*, and other than employee expenses, the thing will cost seventy-five thousand dollars. Could we just build it, take it up and install it?"

"Ask Pete Quintana tomorrow," Damon suggested.

The remainder of the day Tom worked on three projects—the potential Moon structure, the multi-winged transport jet, and trying to come up with a plan for a future colony of his own, perhaps on the Moon or even one on Mars. Just before closing time he picked up the phone and asked Trent to connect him with someone outside Enterprises with whom he had worked on an earlier project.

"This is Hazard Samson's office. How may I assist you," came a pleasant and very young-sounding voice.

"Hello. This is Tom Swift. Is Haz, I mean Mr. Samson, available?"

"Can I relay the nature of the call?" she asked.

"Certainly. First tell him who is calling and then if he needs more of an explanation, tell him I'm looking for a giant of a man for a giant of a project."

There was a polite little cough, but the young woman placed him on hold. Barely six seconds later the music stopped an a booming voice said, "Tom! What the heck can I do for my favorite inventor?"

Hazard Samson, son of Atlas Samson—the former shipping magnate turned undersea pirate and currently residing in a maximum security prison in France—had been instrumental in the success of the mission to mine the riches of Pluto when it had been moved close to Earth by the ruling race of his Space Friends. Not only had he warned the Swifts of his father's bad intentions, he had saved

Tom's life when an agent of his father's had tried to attack the inventor deep in space.

In the business world he was "Hazard," but to friends he was just plain "Haz."

"Well, Haz," Tom began, "I've been thinking about trying to design a special type of structure that can be transported off Earth and used to—"

"Hey! Are you going to go fix that Moon colony?" Haz interrupted. "Because, each time I hear about how one of that nincompoop Preston Wingate's collapsible buildings have killed some good people I just want to wring his neck. I probably would if he hadn't gone total recluse a couple years ago. Believe me, I've tried to locate him. I want to confront the man over a couple of deals he still owes me money on… but, I ought to let you speak now, right?"

Tom laughed. Haz Samson was about as forthright and outgoing as they come.

"Sure. What I was going to say is I'm contemplating a little colonization effort of my own, but maybe a bit farther out. How does Mars sound to you?"

He could hear the sound of Samson's fingers scratching his beard stubble as he considered Tom's words.

"Mars, huh? I guess as long as you don't go building houses out of glass or *papier maché*, you have a better chance of making a go of it than anyone else I know. How can I help?"

"How would you like to be in command? At first I mean in coordinating all of the logistics for what will be needed inside the structure I intend to build. Everything it will take in men and supplies to go up there, in the *Sutter* by the way (Haz knew the *Sutter* very well) and make a self-sufficient colony of perhaps fifty people for starters with an eventual aim to increase everything to one-hundred-fifty."

There was a moment of silence before Samson spoke. "Can you give me some time to think this one over, Tom? I mean it's a huge project and there are so many things I have on my plate right now. Is this something I have to tell you yes or no on right this minute?"

"Heck no, Haz. I just wanted to broach the subject to you. Nothing is set in stone. Not even in wet sand. It just struck me that if anyone could handle this it's you. Take as long as you need. Weeks or months if you need it."

"Say, Tom, I hate to cut this call short but I have to make a quick call myself. I'll talk to you later." The phone went dead. But, not for

long. About fifteen seconds later his private live rang. Thinking it must be his father, Tom answered, “Hi. What can I do for you?”

“My answer is *yes*!” came Haz Samson’s booming voice and the line went dead again.

Tom was still laughing when Bud walked in a minute later. “What’s so funny?”

Tom told him.

That set the dark haired flyer off which made Tom laugh all over again.

“Well, if and when you do get ready to set things up, at least you’ve got a real driver to manage the project,” Bud commented. “You know. I was suspicious of Haz when we first met him, but I have to admit I’m now a big fan. Oh!—” he said as if remembering something important. “I forgot why I came here. The men and woman working on your collapsible mini-plane would like to have you join them for an hour today where they can demonstrate it to you. I’ve been given a preview and like it even more than I did when you showed it to me in the first place. They will be hosting a group of military dignitaries from Australia tomorrow for some demo flights, but want your blessings.”

“Tomorrow?” Tom almost sputtered. “But, Senator Quintana is coming tomorrow. I can’t be in two places at once,” he protested.

“Uhhh, Tom? I think you dad intends to get the Senator in on the jet demo *and* the little plane as well while he’s here, so I wouldn’t worry about it.”

Together they walked over to the Barn where the tiny aircraft was parked. The five engineers involved were standing there polishing little places filled with imaginary spots on the wings and fuselage. Everyone stopped when Tom called out to them.

“Hey, guys. She’s looking very nice. So, is anyone going to tell me what changes you made or should I try to figure those out for myself?”

One man, tall and heavyset, spoke for them. “Why don’t you see if you can spot the obvious ones and we can tell you about the invisible ones?”

Tom agreed. He and Bud walked all around the little plane two times, with both kneeling and stooping at various spots to look closely at things. Finally, Tom stopped and turned to the group.

Okay. I see four obvious changes starting with the placement of the engine mounts. It looks like the port-side one is hinged so it can tilt out a bit while the starboard one tilts in. I assume that is when it

is being collapsed and that means you found a solution for the two bumping into each other during the folding process."

They all smiled.

Tom easily spotted the redesigned pilot's recess that now was slightly deeper and lined with a ribbed material meant to help hold onto the pilot. The other changes included slightly larger wheels on landing struts that were now about two inches longer, stirrups instead of pegs for the pilot's feet, and beefier mufflers to quiet engine noise.

"What have I missed?" he asked.

The young female engineer stepped forward. "Well, we increased the fuel capacity by almost one gallon by using a bladder like you have on your flyable ejection seat system, we added two extra blades to the fanpellers which give about fourteen percent more airflow, put in an autopilot computer in case the man or woman is unable to fly it, and a small weather RADAR up in the nose to let evacuating pilots see what they might have to dodge around."

"How does it fly?"

"It will never do acrobatics, Tom, but it will save lives," came the blunt answer.

Tom turned to his friend. "Bud? Ready to take it up?"

He was surprised when the flyer shook his head. "Nope. Your turn. I spent fifty minutes shaking it down this morning. This team has done an amazing job and I think you can only appreciate it if you fly it yourself."

When he turned back to face the group, Tom was mildly surprised to see a flight suit was now draped over the fuselage, waiting for him. With a grin he took it to the restroom in the Barn and changed.

The female engineer handed him the helmet. That, too, had changed. Instead of a heads up instruments display for the little windscreen on the aircraft, the helmet now included a flip-down over-eye monitor that provided all of the readouts—including RADAR—via a wireless connection.

He attached his suit to the hold-down cable and climbed on. Without needing to press anything, a sensor detected his presence and the cable was drawn in until he was lying tight against the ribbed cushion. Three minutes later he was taxiing toward the closest East-West runway and asking for takeoff clearance.

"Roger, skipper. You've been pre-cleared for all airspace above Enterprises out to one-half mile beyond perimeter, and up to three thousand feet. Go when ready."

The two engines, even more muffled than before, roared as he pulled the throttle out to the full position. The plane rolled slowly for the first twenty feet and then seemed to leap forward getting airborne in less than three hundred feet of runway.

Thirty minutes later he landed, allowing the autopilot to take control, and taxied back to the waiting group. His broad smile told them all they needed to know, and by the time he had changed back into his clothes, the little plane had been folded up and was being carried to its waiting storage cradle.

The visit the following day from Senator Pete Quintana and his three aides went very well, starting with the three-winged jet. The Senator could barely stop smiling at that.

He watched with a big smile when the test building was inflated and he was allowed to go inside as Tom explained how the finished version could be erected and tied into the existing Moon colony buildings. He also asked about anything that might be done to cover the other buildings.

"As you know, we coated the insides with a substance that can self-seal over tiny micro-meteor holes, but unless we create a giant tent over the top of everything—or replace each individual building with a set of these inflatables—the Wingate structures will remain vulnerable."

"That is exactly what I hate to hear, and precisely what I expected. Well, I've got a real up*hill*, no pun intended, battle over this. Somehow Wingate's lawyers inserted a clause in the contract that went unnoticed. It says that the Government cannot go to an outside contractor without letting Wingate bid on the same project. The problem is we are afraid that anything else they do will be just as bad, but the Attorney General tells me we're a little stuck."

"Senator?" Tom asked. "Can you define a 'contractor'?"

"Well… uh, that is, umm, that would be any person or business concern we hire to do something. Something tangible, that is. Casual stuff like verbal suggestions probably don't fit into that, but if we are going to pay anyone, Wingate wants to make certain it is them."

Tom nodded. "I think I may have a suggestion," he told the older man as he glanced at his father. Damon squinted at Tom but they opened his eyes in realization, and then nodded. "Don't hire Swift Enterprises to do anything up on the Moon."

"What?"

"Don't hire us, but also don't stop us from going up there and installing the new building on our own dime."

“You mean as in don’t announce it, don’t have the colonists say anything and don’t make a big deal out of it in any way? I like it!”

Another thing he liked was the demonstration of what Bud spontaneously dubbed the *Aussie Moth*. While the nine person contingent from Australia was congratulating Tom and the design and development team—and stating their intent to go ahead with an even larger order—Pete Quintana and Damon Swift stood to one side discussing how the U.S. military and forest services could benefit from such as aircraft.

Tom was feeling very good through the rest of the weekend until he entered the shared office Monday morning Waiting for him were his father and Patrick Peck of the Legal department.

“We’ve got some bad news, Tom,” Patrick told him. “It seems that Wingate Aero got word about your intentions to replace one or more of their buildings in the Moon colony, and issued an audio press release on Saturday denouncing Enterprises, along with sending us a Cease and Desist order accompanied by a Defamation of Character and Slander suit for making their company appear to the criminally liable for the deaths on the Moon!”

CHAPTER 6 /
"IS THE FLEA CIRCUS IN TOWN?"

"HOW IN THE world could they have heard anything?" Tom wanted to know. We made no announcements about it and the only person we've even spoken to about it is Senator Quintana…" his voice trailed off. "Dad? Pete Quintana?"

Damon Swift shook his head. "No. Not Pete. But he did have other people who accompanied him here on Saturday. I've already put in a call and left a message to have him get back to me as soon as he returns from a floor vote. Probably an hour at best. Until then… we wait."

"Do we tell him he's got a traitor in his office, Dad?"

"I would advise against it for the time being," Patrick put in. "I've met the Senator several times and he strikes me as the sort of individual who would call his people in and level charges just to see who blinks. In this case that might be counter-productive. We want to ferret out any mole, of course, but this obviously goes a lot higher. We don't know if this person is a single act, or if this is a chain of agents. For all we know this might be a lot more than industrial espionage. This needs to start with the FBI. Remember. We've had rumblings, possibly from the Brungarians."

Tom had to concede that the man was right. "How about letting Harlan know?"

"That has already been done, Son. Even before Patrick came to me this morning he got Harlan and his folks involved."

There was little else the three men could do at present, so Patrick excused himself and left. After he did, Damon went to his desk, took out an old and battered address book from a drawer, and looked up a number. He dialed it and waited.

Presently, he said, "Yes. Is he in? This is Damon Swift with Swift Enterprises… I'm sorry? What?… Wait. If you would just tell him who this is I believe he will take my call. This is important for both our companies… But… No, there is no message." With that he put the receiver down and shook his head, sadly.

"What was that?" Tom asked.

"It would seem to have been absolutely nothing, Tom. Nothing at all." He looked at his watch. "I have to go. Jake Aturian and I have a meeting. I'll be back after lunch." He stood, placed several folders into his briefcase and left the office, and a bewildered young man.

As Tom left a minute later he stopped at Munford Trent's desk. "Do you have any idea who dad might have been calling just a couple minutes ago?"

"I'm sorry, Tom," the secretary said shaking his head. "He used his private line so I don't see anything on my screen out here."

Tom thanked him and walked down the hall and out of the building. By the time he reached his underground lab and office his mind was miles away on other things.

It was there that Arv Hanson met up with him. Tom had called to ask the model maker to come over as he walked across the tarmac. "I've got a tiny and somewhat meaningless project for you."

"Ah-h-h, Tom. You don't need to sugar coat these things. I'll be right over."

When he walked in the door Tom was at his computer using a drawing tablet to input something. Looking up, he invited Arv to have a seat next to him. "I'm just about finished with this; give me one more minute."

"Sure. But I have to warn you, skipper. You got me so excited with your over the top description on the phone that I'm really eager—" He stopped seeing the guilty look on his young boss' face. "Sorry, Tom. Whatever it is, you know I'll do it."

"It isn't that, Arv," Tom admitted. "It's just that this is something I want to do, but I'm pretty sure that there is no way Enterprises will get involved. So, fair warming but this might be all for nothing. Take a look." He swiveled his monitor to the side so Arv had a better view.

"Well, I see three variations on that small test inflatable you made. I'm not going out on a limb when I say they must be considerably larger versions. What for?"

Tom looked at his friend and employee as if trying to gauge if the man would think him to be a little crazy. "A Mars environment building. No, it's actually an Earth-like environment to be erected on Mars. Basically, I want to see if it is possible to build a self-sustaining colony, or at least a scientific outpost, up on Mars."

Arv whistled long and low. "Wow. That's… uh, that's got to be some amazing undertaking, Tom. I mean, just how big will that thing be?" He pointed at the screen.

"I haven't done the number crunching yet, but that more rectangular one? It could be as long as a half mile and about a quarter mile front to back. Right now, I have no idea. There are thousands of details I need to research, like how much oxygen a given number of people will use, and how much we can make to replace it

and get rid of the CO2. How do we make food? What about toilet facilities?"

"Did you want me to build you some models of those?"

Tom smiled and said, "Yes. All three of them, please. I'm thinking that the square one in the upper right will be about ten inches by ten. The others will be on that same scale. Can your 3-D printers do these in a soft, inflatable material?"

"Hollow? Hmmmm. No. At least if you mean something you can flatten out and then blow up like a balloon. The walls would be too thin. I can make them out of a flexible plastic, hollow on the inside, but they will come out of the tank filled with the delivery fluid. I can program a small hole in one corner that we can squeeze the liquid out through." He looked at Tom. "It'll stay soggy inside for quite a long time. That delivery fluid is designed to not evaporate."

"Okay. Any other ideas for these," Tom asked.

Arv thought for a moment and then smiled. "How about if I make the upper part, the canopy, separate from the bottom plate and then heat seal them together once they are out and dried?"

"That's a great idea. When can I have them? Not, of course, that I'm really in a hurry since, as I said before, this probably isn't going anywhere, but I'd like to have them here as inspiration."

Looking at his watch Arv stated, "If I can have your designs in an hour, I can do the wire-form CADs for these this afternoon and get things running before I leave. So, tomorrow around ten?"

Tom told him that would be more than fine, so Arv left a minute later.

The next day when Arv delivered the three models—all made from a pliable matte white plastic and each one having enough give to let Tom poke a finger at least a full inch into them—the model maker asked if he needed any others. "I've got the hang of this, now. If you want something star-shaped or circular, well more circular than the oblong one I just made, then say the word. Get your request in by noon and have the finished product by six!"

Tom sat at his desk turning the models around and contemplating how each one might withstand the dusty windstorms of Mars. He picked up the phone and made a call to the wind tunnel facility. "Great. I'll be over in ten minutes."

Before leaving he Televoc'd Bud.

"Gimme two minutes, Tom," the page came back. "Just landing in this most recent adaptation of the Toad."

Tom's Toad—officially known as the Swift SE-11 Commuter Jet—had receive its amphibian nickname from Bud on his first seeing it from the front. With the two jet engines mounted atop the high wing and the cockpit slung underneath, it did have a slightly toady appearance.

As Tom climbed into one of the little 2-seater electric cars Enterprises' employees used to get around the four-mile-square facility, Bud called him back. "I'm down. Talk about a Mr. Toad's wild ride. Wow! The Aviation Design boys and girls put a false pointy nose on this thing and new, really sharp front cowlings on the engines. Gives her another thirty knots. But, you know this because you probably ordered it. What's up?"

"After you taxi that to the hangar, meet me at the wind tunnel."

"Will do!"

As Tom was pulling up to the front of the special-purpose wind tunnel building, Bud eased the Toad into the six parking spaces next to him. Giving his best friend a little wave, he shut its engines down, popped open the large canopy and climbed out. "It sounded important so I came as quickly as I could," he said with a grin.

"What if there hadn't been empty spaces?" Tom inquired trying to keep a straight face.

"I'd have double parked right behind you!"

They entered the facility with Tom carrying a box containing the three models.

Bud held his tongue until Tom had removed all three and set them on a staging table.

"Is the flea circus in town?" he asked.

"No. Although, we might make a few extra bucks selling these for that purpose. Actually, these are potentials for a new and larger version of my little inflatable dome." He had already told the flyer about his dream of a colony on the fourth planet.

"So, what are you testing today?"

"I want to see how both direct and swirling winds effect these three shapes. With not a lot of structure to stiffen things, it will be vital to make the final version able to let the wind just move up and over it. Hence, today's tests which are probably the first of many."

Tom had adhered hook-and-loop material around the bottom perimeter of each model that went to within a half-inch the edges so that he could see where any lift might occur. In the bottom of the box was a piece of plywood that was covered with the other side of the

connector material and featured four holes where the wood could be screwed down to the pedestal inside the tunnel.

The first model up was the oblong one. In Tom's mind it held the most promise, but he knew that was an opinion and not a proven fact. And so, he wasn't disappointed when it failed miserably in both the direct gust and swirling winds tests. It held up fine through about thirty-one miles per hour, but began to flatten and deform above that.

"Not so bad, was it?" Bud asked as Tom took that model out and placed the square one in its place.

"Well, that thirty-one MPH wind here on Earth and at our atmospheric density exerted greater force and pressure than Martian winds at well below their top speed, nowhere near the highest we've measured on any of the rovers there."

The square one fared slightly worse, but Tom expected that with its boxy shape. "We should get better results from the last one," he said. "I've curved things up slowly even at the corners so it should be a better aerodynamic shape."

It was.

In fact, it took forty-seven MPH winds to deform it to the point Tom believed an actual dome might get into trouble. "And, that is equivalent to at least six miles per hour faster than high winds on Mars!"

That evening after they ate dinner, Tom and Bashalli stood on their back patio looking up at the stars. It was a beautiful clear night and being away from the lights of town meant they had an incredible view.

During dinner he had told her more of his hopes for a Mars colony some day and the results from that day's wind tunnel tests. That had led to him explaining all of the difficulties in such an undertaking.

"Not the least of which is keeping a breathable environment for the people. It isn't easy duplicating the Terran environment we have here on Earth."

"Terran vironment?" she asked, having misheard him.

"No, it's…" he gave it some thought. "Well, actually, shortening it to Terranvironment or even TerraVironment isn't a bad thought. I suppose I'll have to tell Bud he's been out-named by my wonderful wife."

"Sandra will make certain he doesn't fuss about it."

They had been standing facing the same direction with Tom

behind his wife. She turned around in his arms and hugged him.

"Thomas?" she began to ask, tilting her head up to look into his eyes."

"Yes, Bash?"

"I know that we live on the Earth, and that the next planet out is Mars and the one closer to the sun is Mercury, but how do you keep all the others straight?"

Tom grinned down into her face. "My very excellent mother just started using new potatoes."

Bashalli's face went blank before she frowned at him and tried to form a question. Finally, she succeeded. "What in the world made you say that?"

"Well, you wanted to know how to keep all of the planet's names straight, and I think you also meant in the right order…" he checked to see if he had that right. She nodded. "Okay. Then the best way I found when I was a young boy was the mnemonic I just told you." He spelled the term for her.

"Fine. Then please explain how that is supposed to help me."

Laughing, Tom stepped back and held up both hands, but with his right thumb tucked in. "Here goes." He wiggled his left pinkie. "My equals Mercury. Very means Venus," and he stopped moving the pinkie and wagged his ring finger. "The rest follows on as excellent meaning Earth, mother is for Mars, just is Jupiter, started is Saturn, using for Uranus, new for Neptune, and potatoes for our little friend Pluto."

She considered this for a moment before breaking into a huge smile. "I have it!" she declared. "My very excellent mother just started using new potatoes. How wonderful!" She rewarded Tom with a very long and warm hug. "I married a genius," she told him.

The following morning came news from Harlan that all but two of the people working with Senator Quintana, and especially the three who accompanied him to the demonstration, were considered to be above reproach.

"Where does that leave us, Dad? Could it be one of the two they're not sure of? Or, one of ours?" Tom asked after being told, and feeling a little sense of dread that he might not really wish to hear the answer.

Mr. Swift thought this over before answering. "We don't know, but that doesn't mean we should be sitting here, worrying and waiting to hear. Security can run some quiet checks on everyone who had taken part in the design, development and testing of the inflatable habitat.

If it turns out that the Senator's employees are not involved, I think that puts it back in our court… unfortunately, and I want us to be ahead of things and not trailing behind. It has happened in the past and it may well be happening again. Swift Enterprises might have a bad employee."

"Did Harlan give you any indication he might have a notion where to start?"

"I'm afraid not yet. For now he suggests that nobody else be brought into the project. That includes George Dilling and his PR folks, other executives in the company, and even anyone you might want to consult with. His words were, 'Tighten the loop for now.' I think it is a good idea."

"Do we tell people like Hank and Arv? They're pretty involved in everything that goes on here and I trust them to keep an eye and ear open." He looked at his father expecting to get a negative answer.

"I trust them as much as I trust you. If either of them were ever approached by someone asking snoopy questions they would report it faster than it takes to say those words. Go ahead. In fact, call them over here and we can do it together."

Tom tapped his TeleVoc pin. A minute later he looked up. "They're on their way and curious about the meeting. I didn't tell them anything."

Damon opened the office door and spoke to their secretary for a moment. "We won't be disturbed once they arrive," he told Tom.

When the two men walked in the door they were followed by Trent carrying a large tray with coffee, hot water for tea, and a few pastries. He set it down on the table in front of the men and walked quickly out.

"Tom was kind of mysterious about this, Damon," Hank said favoring his boss with a curious look. "I didn't know what to bring with me so I brought nothing."

"Don't worry, Hank. You either, Arv," Mr. Swift told them. "Grab a beverage and sit down. We have something extremely company confidential to let you in on."

Hank looked at Tom. "Now *that's* how you pose a mystery, skipper!" Returning from getting a cup of coffee he asked Mr. Swift, "Is this project related or something else?"

"I would have to say it is a bit of both. You see, within hours of Senator Quintana and his people departing the other day, Wingate Aero made a public announcement including things they could only have learned from what was said and done during the demo of Tom's

inflatable building." He let that sink in a moment.

"We all know the Senator, but I'd never seen any of the trio that came here with him," Arv said. "Any idea if it's one of them?"

Tom spoke. "Not according to Harlan. But the FBI is also looking into a couple of his other staff people. It might be that one of the people who came here talked to somebody else that blabbed it to the Wingate people."

"That's one possibility," Damon said. "The other is that we have someone inside Swift Enterprises. And that's the reason for this meeting. I need you to be in on our efforts to contain all information on the foldable plane, the three-wing jet project, and Tom's inflatable structure project to just those that already know. Nobody else sees or hears a thing for the time being. Absolutely nobody."

By the time the meeting broke up, everyone understood just what they needed to do. Damon phoned Harlan Ames and filled him in on having brought Arv and Hank into the inner circle.

"Well, normally I'd ask that you check with me first on this sort of thing, but the truth is I was about to call and suggest just that… plus Jake Aturian. Have you called him yet?"

Mr. Swift said he had not, and promised to make the call right away.

With little to do toward the security angle, Tom headed down the hall to his large lab. There he pulled the model of the Silentenna over and started to open the case. He checked to make certain that the area of sonic coverage of this unit would be sufficient for the model but had to figure out how to scale the effect up for the full-size jet.

It already had a fairly broadband capability and all that broadcasting power was going to be a waste in the case of the new transport jet. In truth, it already had proven capable of "trapping" a sonic boom and covering that sound, but it worked on frequencies of noise and not on the accompanying pressure waves.

That might be a problem. The specifications not only called for the jet to be as silent as possible, but to be undetectable flying close overhead. Of course nothing had been stated about RADAR invisibility, or any other stealth measures, or about visibility during daylight. That sort of invisibility was not something Tom wanted to even contemplate.

So, as he sat there he made a few notes. The Silentenna technology could be tuned so it countered the sonic noise, but it was going to require another technology or design to suppress or eliminate the actual pressure waves.

Tom had a few ideas and several older versions of the noise eliminator he wanted to check, but he first needed to see what, if any, help it might be for the second issue. He closed up the Silentenna case and carried it to the test chamber in the far corner of the lab. After connecting it to a power supply and plugging in the control lines so he could operate it from outside the chamber, he went to a locker and pulled out a simple-looking tube and dual-cylinder contraption. Based on a toy he had built as a twelve-year-old to fire tennis balls and shuttlecocks, it was a propane cannon capable of creating a fireball and concussive wave on a low scale. Not enough to simulate a sonic boom, but enough for a first test.

He set it up on the table across from the Silentenna and turned around to align the two devices.

Outside the chamber he saw Chow enter the lab with lunch. As the westerner rolled his cart over to the desk he spotted Tom. The inventor gave a little wave and pointed at the end of the workbench, close to the control panel. He would be able to eat and run his tests at the same time.

As the chef tried to squeeze between the bench and control panel he twisted around and accidentally brushed the control panel with his still rather large midsection.

In horror Tom watched as a perfect storm of events meant that the cook, in an effort to move through the narrow gap, swung his belly around and placed one hand on the control panel for balance. It hit the one switch that turned on the Silentenna, and without anything to counteract, a searing wave of sonic pain slammed into Tom's ears. He dropped to the ground with a scream of agony.

CHAPTER 7 /
MOLE, RAT, AND UNHAPPY CIRCUMSTANCES

OUTSIDE THE closed chamber, Chow had no idea what was happening behind him. He went about setting the plate and silverware up and only saw Tom's plight when he turned to take the covered dish off his cart.

Only seeing that his young boss was lying on the floor twitching and apparently screaming, the older man vaulted over his lunch cart, sending it flying across the room in the process, and yanked open the chamber door. He was immediately slammed into by the same sonic waves that were about to incapacitate Tom.

Without thinking of turning off the controls, he yanked his ten-gallon hat down over his ears, reached into the chamber and grabbed a handful of pants leg.

In two seconds he had Tom out of the chamber and was shoving the door shut.

They sat, slumped up against the outer wall of the chamber panting and trying to clear their heads. Tom was so weakened that he couldn't get out simple instructions to get the chef to turn things off. He had the presence of mind to reach up and tap his TeleVoc pin, paging his father.

Twenty-seconds later the older inventor raced into the room, sized up the situation and flicked the power switch to the OFF position. He then used his TeleVoc to call for Doc Simpson.

As the medico came on the run he tried to TeleVoc Tom. "What happened? Poisoned? Gassed? Broken? Shot? Electrocuted?"

Tom was able to relay the basic problem in just a few words. When Doc arrived he already had two of his assistants bringing over the necessary gear to check Tom and Chow for hearing damage.

Luckily, there was no long-lasting harm done to either of them, although Chow was so distraught over what he saw as having been practically an attack against Tom that Doc had him follow one medical technician to the Dispensary.

"Give him a couple ounces of medicinal bourbon, Randy. Tell him it's Doc's orders," he whispered to the taller of the two.

Turning back to Tom he held up one hand. "How feny mingers am I holding up?"

"Feny mingers? What the heck is that, Doc?" Tom asked, bewildered.

Doc Simpson laughed. “Just a little extra test to make certain you actually *can* hear me and aren’t trying to get away with anything by pretending to be better,” he answered with a laugh.

Mr. Swift who had taken a seat to one side in order to remain out of the way now stood and came over. “Are you really okay, Son?”

Tom nodded. “Yes. I’ve got little ringing in my head, but it’s going away. Can you let Chow know that it wasn’t his fault, please. I was the one who pointed to the end of the bench out there. If I hadn’t, he would have set things up over at the computer desk. I also see the need for a safety switch for things like this in the future.”

“What were you testing?”

Tom told his father about the need to handle both the sonic and pressure waves.

“Well, I might be able to lend a hand on that,” his father told him. “Some old NASA research and a little military know-how might help you.” As the two inventors began to talk, Doc and his remaining tech left the room.

“Back in the day, one of NASA’s experimental aircraft pioneered the ultra-thin wing supersonic jet. We knew that it was possible to make a jet’s nose pointy to the degree where it effectively punctures any pressure bubble building up in front of the aircraft, and that left sonic booms—and those were heavily caused by drag—to build on the wings and tail. Based on a pair of old F-16 L-series test jets, we got the wing thickness down to just two inches. And, instead of the traditional bulging front and tapered back shape we discovered that a gentle curve centered front to back gave us the same lift without the ability for pressure to build. Of course, we also made the leading and trailing edges so sharp you could cut your finger on them if you weren’t careful.”

Tom was enthralled by this information. He asked a lot of questions that his father had to keep referring him to a few published studies. Finally, the older inventor mentioned something totally new.

“The engineers played around with drilling a series of tiny holes, some less than half a millimeter wide, in the surfaces of the wing to allow slight buildups of pressure to move into the wing and then out via thin slots at the back. The bottom line is that drag was cut to the point where not only were sonic booms cut by seriously large levels, but the pressure waves coming off the wings and also the swirling vortices behind all but disappeared.”

Mr. Swift left and Tom sat at his bench absently eating the now cold bowl of broccoli cheese soup and a turkey sandwich Chow had been bringing to him when the accident happened.

What his father told him made sense and he looked forward to seeing the reports and test data.

Much to Bashalli's dismay he spent the next two days—the weekend—sitting in his easy chair reading through a thick stack of reports on the NASA tests.

By Monday he had more than fifty pages of notes that he turned over to Hank Sterling.

"Somewhere in there is what I believe to be the solution to the sonic and pressure wave problems for the transport jet. Let me know if I've missed anything."

The next day Hank called Tom to report that he had found several things that could be tried on the model.

"The team also came up with a few ideas of our own. I think when you see the next revision of the model you will be pleasantly surprised."

There was still no firm indication of what Swift Enterprises might do for the lunar colony, and Tom's own Martian colony pet project was still mostly insubstantial, and so Tom decided to take a walk. It was on such solo walks that a number of inspirations had hit him in the past, and he had hopes that his mind would be able to relax enough to let the creative juices flow today.

Instead, he found that he was quickly joined by Phil Radnor, the number two man in Security. Phil was an athletic man even if he carried around an extra thirty pound of weight. He went on daily walks to try to work it off, but his deep love of cooking and food always sabotaged any good the exercise did for him.

"Hey, Tom," he called out as he stepped onto the path around the buildings.

"Hi, Phil. What's new?"

"Well, the *old* new is that two more of Senator Quintana's people checked out. But, that may be a good thing. You see," he said in answer to Tom's puzzled look, "one person that had been cleared by the FBI suddenly took an emergency leave of absence. As in, he called on Friday morning to say he would be away on personal business for at least a month, and then disappeared."

"Sounds suspicious," Tom commented.

"Harlan thinks so, and the FBI thinks doubly so. Take a guess at what state the guy is from."

Tom stopped walking and his shoulders sagged. He turned to look at Phil. "Nevada?"

Phil's face brightened. "Got it in one! And, the man once worked on the election campaign of one very junior Congressman from that same state."

"Oh, jeeeze!" Tom said with disgust as they resumed their walk. "I take it he wasn't one of the three who came to Enterprises. Right?"

"No, he was here. And, he was the last one dropped off when the limo drove them all home back in D.C. He evidently heard enough while here and reported it to the Wingate people. Or, possibly to the congressman who then passed it along to Wingate."

Tom stopped again. "But, that doesn't make sense, Phil. Certainly the audio statement they sent out could have been created and distributed in a short period of time, but for Wingate's legal people to send out those lawsuits in the same time is impossible. They wouldn't have had the time unless someone called them during the demonstration. As for the Congressman passing info to Wingate, he would have practically have had to be listening in on the demos and then feeding it out live. No, it doesn't add up. Something is fishy and as much as dad might like it to see that Congressman being taken down enough pegs to build an office block, I think he might just not be involved."

Phil was jogging slowly in place, but he stopped. "So, if I get this right, and discounting that any radio messages or texts were sent right from the Senator's jet—and I'll go back to the office and get the FBI to check the assistants' phone records—then the audio press release wouldn't have had time to percolate through the Congressman's office and out to Wingate Aero and then to the media. Is that it?"

Tom nodded. "That means someone in Washington must have sent out that audio. But who?"

Neither of them had a good answer for that although they continued to talk about possibilities over the next thirty minutes. As they rounded one building Tom excused himself and set off on a diagonal walkway to get back to the shared office.

He told his father about his conversation with Phil.

Mr. Swift agreed that the timing element was odd. "It's almost as if they had everything set and were just waiting for the actual information. As if they knew Pete and his people would be coming back from an important demo but needed an eye-witness account of what they saw. I don't like it."

"Neither do I. I'd really like to get Harlan and Phil over here and work up a timeline of when we all did what and when and who saw each thing. Somewhere in there we might find a good clue about how

this happened so fast."

When he was called, Harlan told Tom that Phil had just come back and given him a briefing on their conversation. "If you can give him twenty minutes to shower and change, we can both be over there and one of us will not smell too bad."

An hour later, and after making several calls to speak with various Enterprises employees, they had it all down on paper, and it told an interesting story. One person appeared to have been just about everywhere during the few hours they were all at the company. He was one of the Senator's aides—the missing one—and it was obvious that he had been a very curious man.

Most of the employees they spoke to recalled the aide having asked them a number of questions. What did they do? What projects were they working on? Should the Senator know about anything that the Swifts might be keeping hidden?

Harlan made a call to an FBI contact in Washington and offered to send an electronic copy of the chart over. The agent had eagerly agreed, so the Security man scanned it in at Tom's desk and sent it off.

"We'll see if that seed bears any fruit. I hope so because the only other person within our company I can find anything odd about is someone I want to give the benefit of the doubt to. If it turns out they are involved I will be a very unhappy man."

"Is this anyone Tom or I should know about?" Damon asked.

"Not unless this all blows up in my face."

* * * * * *

Arv Hanson walked into his workshop to find Tom standing there, admiring the mostly empty fuselage of the new model of the tri-winged aircraft. At just over eighteen feet long and a wing span of seventeen feet—at the third or rear set of wings—it was both recognizable as well as subtly different from the old, first model. For one, rather than featuring four engines as the small and second models had mounted below the rear wings, this one had two larger, slightly curved and tapered engines mounted close to the fuselage at the back of the jet.

The people working for Dianne Duquesne in Propulsion Engineering had outdone themselves. Instead of the thick, curved cowling around a typical jet engine, the front of this one was thin and came to an almost knife-like edge at the very front. Everything about the small engines would tell anyone looking that this wasn't any old turbine. Each outer area was sleek and designed to cut through the air with practically no resistance. Like the wings, tiny holes could be

seen in various places and a paper-thin exit slot was located at the back.

Even the nacelle's attaching the engines to the fuselage were thin, razor-sharp at the front and back, and shaped to provide a small amount of lift for the tail section.

"Pretty amazing," Tom commented without turning around. He recognized Arv's footsteps as the model maker stepped closer. Together they approached the jet.

Tom ran his hands over the nearby left-rear wing. He grinned as his fingers felt as if they were touching a frictionless surface. When he developed his transcontinental bullet train for hauling large loads across the country in just hours, he came up with a way to alternately energize ions of air right next to the skin to be positive on one cycle and negative the next. By alternating this charge sixty times a second nothing stuck to the surface. Not dust, rain or even fingerprints.

And in the case of this aircraft, as Arv explained, not even air. It all just slipped back and off.

Arv and Hank decided it would be a good addition to the list of things to test out. That hunch had paid out in a reduction of resistance by more than seventy percent and meant an additional three hundred knots of speed. That put the Swift jet over the top in projected speed capability.

Along with using a new generation of more powerful repelatrons inside the turbines, this gave the jet both an unheard of level of quiet and a top speed of Mach 2.125.

The only other addition had been the sonic Silentenna technology that suppressed the last bit of noise from the now small but detectable boom that accompanied travel of an object at that speed along with the slight amount of noise from the rapidly spinning turbine blades.

As the proposal demanded, neither this demo model nor the full-sized final version could make enough noise at supersonic speed to be noticed five thousand feet away. Computer and wind tunnel testing had shown the Swift entry would cut that distance easily in half. About the only thing nobody could do anything about was the movement of air as it swirled off the vertical stabilizer leaving a reduced vortex behind.

"When do we fly it?" Arv asked.

Tom turned to look at his friend and employee. "Well, we have to finalize the wing positioning systems and come up with a way to handle all of the troops the Government wants this thing to carry, and then a certain model maker I know will need to build all of that,

and… the truth is, what with all I've got on my plate, and this not even due to the acceptance committee for three months, I'm not seeing anything happening for awhile. Three or even five weeks at least."

It was disappointing news, but not the first Swift project to get a good running start only to be back-burnered in favor of something more important.

By the following day Tom found himself rushing around to get the full-size lunar inflatable structure completed and ready to test. His work was interrupted by Senator Quintana's office calling to request that Tom and Damon come down to his office the next morning.

When they arrived the New Mexico politician met them with warm handshakes and a big smile.

"Sit. Sit," he told them motioning to a pair of green leather chairs. "I've got about five things to tell you and just about that many minutes before I have to rush back to vote on some appropriation bill to supply motor scooters to juvenile delinquents in Vermont, or something equally as ridiculous. So, first I have to tell you that the FBI called yesterday. They found my missing, uh… associate. He was caught speeding across North Dakota in a stolen Jaguar. Evidently, if you travel at one hundred fifteen miles per hour their state police take exception and give chase. He is being held in Bismarck waiting to be extradited back here. We'll get to the bottom of this in the end. Now, if we can assume *that* fiasco is covered I want to tell you that there is great interest in your collapsible aircraft, Tom. It wouldn't work for the Navy SEALs, what with the water thing, but the Army's Rangers see a real benefit for extricating injured soldiers and—if you can give them a version that is fairly quiet—even for insertion operations."

Tom was elated, but had to ask, "How quiet?"

"Well, I'll let them tell you that when they get in contact. I don't want to say something like 'quiet as a whisper' when they really want 'as quiet as a mouse.' Or something like that."

Damon gave a small cough and pointed at his own watch.

"Ah. Right. Well forget the next two and let's talk about the big one. As you know my little committee is not of one mind on the Moon colony situation. And so, six of us mavericks have been meeting without the rabble-rousers or that vile woman who wants to buy votes by giving away money to people who won't work… sorry. That's a little point of personal anger for me. Anyway, we have decided to use discretionary funds to have you mount a *safety mission*," and he made finger quotes, "to the Moon to see what might be done to

safeguard those folks up there. And taxpayer investments as well." He paused and appeared to be counting to ten.

"Oh! Welcome back from your safety mission to the Moon, Tom. So, you tell me that you believe some sort of inflatable, meteor-proof structure might be constructed and delivered to them, and that would be used to both give them back at least one of their missing buildings and act as a test bed for possible further such buildings? Great! I am so glad that you came to tell me that." He gave Tom a look that spelled out "No questions."

Tom smiled and nodded his head. "Yes, sir. That is essentially correct. We were happy to undertake the mission. May we get started?"

The Senator looked surprised and leaned forward, lowering his voice. "I thought you already had," he told the young man with a wink. "And, if you haven't, then please do. We can't give you money up front for this, and I'm hoping our friendship will cover that for a few months, Damon," he said taking a look at the older inventor.

Mr. Swift nodded.

"Good. Then if you can both just keep me in the loop, personally and not through any of my people, I will appreciate it. And, with that I see that I must dash. Bye!" He rose from his seat and headed to the door with Tom and Damon in his wake.

As the Swifts prepared to leave the outer office the woman behind the desk asked, "Can you please tell me what you discussed in there? I need to keep the Senator's logs up to date."

Damon was about to explain that he was under a security mandate from his own company when he decided to tell a small lie instead.

"As you saw, we were in there just five minutes and in that time we discussed several upcoming permits we will be filing in New Mexico for our nuclear facility. I can't divulge the nature of them at this point. Have a pleasant day."

With that, he and Tom walked out the door.

"That was a very strange meeting, Dad," Tom stated as they were climbing into the Toad for the flight back to Shopton. Neither man had wanted to say anything in the taxi.

Damon laughed heartily. "Yes, it was and it was also pretty typical of Pete Quintana from years gone by. Get you in, tell you what it is about in as few words as possible, lead you to say or agree to what he wants, and then move on to the next item. I'm proud of you for catching on to the fact that he was giving you the go ahead as well as the cover story. Smart man. Both of you."

Tom blushed slightly as he started the twin engines and prepared to send them into the air.

By the time they landed Tom had made several important calls to Enterprises. First, and at his father's request, he contacted Harlan Ames to see if he knew of the capture of the missing congressional aide. He did and was able to tell them that the FBI had two men en route to pick the man up.

"They have an all-encompassing search warrant for his car, house and office as well as court permission to keep him in custody for up to sixty days under an industrial espionage indictment that sailed through the D.C. grand jury today."

The next call had been to Marjorie Morning-Eagle telling her the full project was green-lit and that she should be finishing up the work as soon as possible.

"We have a small issue," she told him. "We have to completely glue in and seal each and every tube individually before we sew up the edge seams. The problem is that if we are off by more than a millimeter or so, there's all heck to pay when it comes time to bind things together. And, it sometimes cascades and becomes a gap. As it is we haven't successfully attached more than three test panels together at one time. I'm at a loss, and I'll deny every having said that if you quote me."

"Not to worry, Major. Do you remember me mentioning that I had a Plan B, and it was to use short interconnect tubes? Well, that has just become Plan A. I'll drop in on you in about an hour to show you what I have in mind. I think it will make both our jobs a lot easier."

When he showed her his idea she immediately understood how effective it was going to be. "If you weren't so scrawny and pale and my boss I'd wrap my big old arms around you and give you a good squeeze," she told him.

The simple addition of a half-inch flexible interconnect tube to attach panel edges would be a cinch to use. All that the assemblers needed to make certain of was that they had them positioned the correct way to take advantage of the different ends to left and right tubes.

That was Thursday and by the following Monday the Uniforms manager called Tom to inform him that their two- and three-panel practices showed that things—at least in the shop—worked.

CHAPTER 8 /
WHAT SORT O' MARSH-MELLER IS THAT?

HIS NEXT STEP was to make certain that everything worked in the real world and with the full set of panels.

Over the next five days Tom and his team began assembling the large inflatable structure. Even though he knew that this smaller structure could have been built from larger and fewer panels, it was his test bed for a giant structure for the Mars project. And so it had been constructed in many small—or relatively small compared to the overall finished size—sections, each about twenty feet wide and fifty feet long. It was decided early on to start with the identical and rectangular center sections as they required the least amount of alignment and tugging and pulling.

The area he selected to take over for the final assembly was to the west of the cluster of buildings that made up the center part of Enterprises' complex. He had the parallel runways closed off and specially marked with giant, lighted "X" billboards. Enterprises' industrial parking lot sweeper/vacuum truck had been borrowed from Maintenance and kept in almost constant use the first two days cleaning the area of any and all debris that might cause damage to the material. It was also washed down twice using recycled water they had trucked in. In the end it was very clean.

Everyone crowded around, and Tom demonstrated the techniques he hoped would make assembly as easy as possible.

"With about two hundred small tubes built into each panel we have to make certain they all get connected using these." He held up a short blue drinking straw-like tube. "As you move up or across a panel, the first half goes into the tube on the first panel, and then into the corresponding tube on the next one. As long as you keep everything aligned and smoothed out, this should be pretty easy."

He passed several of the tubes out so they could see them. Each tube featured a small, raised ring right in the middle. This, he explained, would allow them to push exactly half the connector onto each tube end.

"As you can see, the top and right sides of the panels have a half-inch flap that goes beyond the edge of the tubes. This is our seam point and that work will be done by a small team of people who get even more training than most of you will require. They will assure that all tubes are in place and everything is butted up against the next panel, and then they will use an electromagnetic tool that seams the flap on one panel permanently to the side of the next."

“Uh, Tom?” came a voice from a young woman who had arrived a little late. “What are all those tubes for?”

“Once on site, we will inflate the building and then pump in a self-hardening foam similar to what we use in our skyway projects. It will provide rigidity to the structure and keep it in proper shape even if the building is punctured. We can’t have it all come billowing down on top of things.”

Over the next few minutes he explained that this was a test building that would end up being less than one tenth of the size of the final one he planned for later use.

“Assuming that we get this right, I’ll feel a lot better about turning on the equipment to make the even larger panels and in the quantity we need,” he told them.

Two flatbed trucks approached them, each carrying several rolls of what appeared to be white fabric. They were the eight middle sections for the inflatable building. As a team of ten of the men assembled next to the first truck, prepared to haul the long rolls off, Tom called out, “It’s only going to take two of you on each one. They might be pretty long, but they weigh only about sixty pounds! Get those into position while we wait for the floor to arrive.”

Art Wiltessa, one of Enterprises’ long time employees and a top mechanical engineer, experimentally lifted one end of the closest roll. A huge smile crossed his face as he found that it weighted even less than he could have imagined. He smiled at his young boss. “Neat!” he proclaimed as he slid the first roll onto his shoulder and carried it all by himself to the first assembly outline.

Tom had rectangular sections marked off with tape right after the area had been scrubbed and dusted. All along these outlines were small bags of water to be used to hold the expanse of material down.

The next truck arrived and everyone worked to unroll and position the one-piece floor panel.

Tom followed Art to the first area and helped him align the first panels with the appropriate markings. As they unrolled things, he remarked to Tom, “I appreciate the chance to get out of the Mechanical lab, skipper. I love doing what I do, but every once in awhile it’s nice to get the chance to do something different. Like this.”

The young inventor smiled at him. Art had been part of many of Tom’s earlier experiments and inventions, even becoming one of the first dozen or so astronauts to qualify for the assembly teams for the Outpost. A vacation diving accident had ruptured one of his eardrums so he was never again allowed to go into space. He had made peace with his more sedentary work life.

“Happy to have you out here, Art. I only wish I could keep using you up there,” he said pointing at the sky.

“It’s okay, Tom,” the older man told him with a shrug. “My wife is happy that I’m grounded. I miss it… space and all that… but just as long as you’ll keep me around I want to be part of everything I can.”

Tom walked over and warmly shook Art by the hand. Looking the engineer straight in the eyes, he promised, “On the day Doc Simpson tells me there’s a cure or a procedure or whatever to give you back one hundred percent of your equilibrium, Enterprises is footing the bill and we’ll get you back to top form!”

Art now turned way to wipe a tear from his right eye. Turning back, he grinned. “Until then, I’ll do you proud.”

While they had been talking, three women from the Uniform department had picked up and spread out the next roll of panels. As one of them began placing the water bags along the top of a rectangle, the other two went to opposite sides and began inserting the blue connectors into the evenly spaced tubes. When that was finished, less that five minutes later, a second panel was spread out to the left of the first and another to the right.

More people moved in and—waddling on their kneepads—started the process over again finally connecting their work to the floor unit. Within fifteen minutes everyone stood back to admire the three partially connected pieces.

“Let’s get the seamers in and seal those together,” Tom ordered. Two “cherry picker” mini cranes started up and two men climbed into the bucket of each. It had been decided that it would be best if nobody stepped on the connected panels of the building once on the ground. So, with their hydraulic arms outstretched and parallel to the ground, the machines moved forward enough so that the buckets were poised over the top of a two-panel seam.

The buckets dipped slightly so that the seam machine operator could reach down and feed the edges into the portable machine while the other man acted as the driver piloting the motorized base backward.

The process required about thirty minutes but as the cranes moved out of the way, everyone could see that the white fabric looked to be a single piece almost as wide as it was tall. A round of applause started up and didn’t stop until Tom stepped forward, motioning for quiet.

“This is just the first step. It’s the easiest one as well. I’d like to have the next panel attached to this by one team while the others of you get the second four-panel setup going over on the other side.

Let's go!"

He asked Art to manage the current set while he took command of the new group. In less than an hour the pair of four-panel sections were finished and everyone headed over to the food truck that had pulled up moments earlier.

"Howdy, folks!" Chow's voice boomed out. "I gots tea an' coffee an' sody pops an' even some ice water for yer thirst and then some little, bitty finger san'wiches o' all sorts for yer tummies! Dig in."

The food truck had been a present to the chef as he celebrated his fifth full year of working at Enterprises. It allowed the western cook to pack up food and drinks and take them anywhere in the four-mile-square facility or even over to the old Construction Company. Tom had even arranged for a personalized license plate: **CHWS WGN**

While everyone ate, Chow climbed down from the truck and approached Tom. "What's that gonna be?" he asked as he scratched his bald head.

Without mentioning the Moon, Tom explained about how his plans for a Martian colony made it necessary to have one or more large structures to live and work in. "You see, Chow, as close to Earth's conditions as Mars is, it is still deadly cold and there's not enough oxygen to let you breath for more than a few seconds. So, we need to have the buildings. Dad and I wanted to do this for the Moon colony project, but we lost out on that. Too bad, because what they're ending up with are more like glass hothouses. Anyway, we can't haul any buildings up whole, and it would take about two hundred percent more trips up to take temporary structures and tools and supplies up, so we plan to do it all with inflatable tents."

Chow had been nodding as he listened. "Okay. Makes sense, even ta me. But, why white? Ya cain't look out through that, an' I don't see no win-ders in it."

Tom laughed. "No. No win-ders, Chow. Mostly because they can't be rolled up for transport, but it is white to help buffer and spread out the harsh light the Moon gets. And, that will provide a lot of protection from the Sun's rays."

Chow smiled. "Kin I go around up thar without my hat? I mean, without my bald head gettin' all sunburnt?"

Tom laughed out loud. "Chow, you could go walking around in shorts and a t-shirt and not get a sunburn. I guarantee it!"

Chow looked down at his chest and belly. Over the past year he had dieted and exercised and shed nearly sixty-five pounds. He was now only slightly heavier than when he first hooked up with the Swifts. A real plus was that he was now getting back his muscle

fitness just as it had been when he lived and worked in the open prairies of Texas and New Mexico. Still… a t-shirt and shorts?

With most people finished with their food and drink, Chow went around with a pair of carts on wheels that could be stowed under the raised floor of the truck. The first was for trash and the other for recycles. Minutes later he drove off giving a final salute with the musical horns that Sandy Swift had suggested, playing *Deep In The Heart of Texas*.

One of the flatbed trucks had driven away after its first load had been removed. It now came back with two uneven piles of the white fabric.

"Those are the corner pieces and airlocks," Tom explained to the assembled workers. "They should fit together just like the others, except that they do not lay flat. Kind of like any fitted shirt or dress, they are gathered in at some places and let out at others. So, take you time and things should be fine."

It did take a bit longer, but before the mid-afternoon snack break came around, all four corners had been added to the side panels. After that the straight panels at both ends were connected and seamed, and the three-piece roof added.

The middle of that was just a larger square version of the straight side panels, but the two end pieces had to account for the gathered corners as well as the curved nature of the end building. They were fairly intricate and took additional time.

It was nearly quitting time when the roof was finally installed.

"We'll go for tie down and inflation tomorrow," Tom told the happy but slightly weary crowd.

When Bashalli asked him about his day, he smiled, took her in his arms and gave he a big kiss. She stood back catching her breath. "My goodness, Mr. Swift. Whatever must you think of me, allowing you such liberties?" she giggled.

"It was a great day, Bash. We got the test building assembled. Even the floor. Tomorrow, we inflate and pump colored water through the tubes to check for any bad connections. Then, if all is right, we go for the pressure test."

She frowned slightly and asked, "What will that do?"

"That makes all of the integrated tubes stiff enough to raise the building up to look like what it is suppose to. And that, I suppose, will look like a giant pillow to any aircraft flying overhead. I think I need to alert the FAA to tell them it will be visible for a few days." He kissed her again and went off to change into a light shirt and cutoffs.

It took a bit of doing, and made Tom reconsider how the full-sized structure might be better assembled, but two hours after they started the next day, the team began working inside seaming down the interior walls that made up the airlocks that would be in use on the Moon for safety reasons.

The doorways also came in handy as the air grew heavy and stale from sixteen people and the hot seaming equipment worked to complete the job. Tom ordered large fans set up at one end to blow in fresh air that escaped out the opposite end.

The initial colored water test went well so Tom radioed Chow to bring their lunch out early. While they waited he decided to start the pressure test.

It would take almost half an hour and could easily be overlapped with the break time.

Twelve minutes later they could hear the distant horns of Chow's truck. All heads turned toward the complex of buildings and could soon see the gleaming red truck coming around a corner, heading toward them.

Suddenly, the truck swerved to one side and a second later they could hear the sounds of screeching tires. Nobody moved. The truck had stopped, but the horns kept playing. Then, even that sound shut off. Tom was about to call for emergency medical help when the trucks' lights flashed on and off several times and it moved forward again.

The chef's eyes were as wide as saucers as he pulled up next to the crowd and got out. He couldn't take his eyes off the inflated white building as he sidled over to Tom's side.

"If that ain't the dangdest… I mean… I mean… ah shucks. I don't know what I mean, Son. What sort o' marsh-meller is that?"

Everyone had heard his question, and they all laughed as Tom explained, "It's what we've been working on, my inflatable building, Chow. Or, at least the Moon version. We'll roll it up and fly it out tied down to the top of the *Challenger*, and then take it down to the surface."

Chow was fanning himself with his ten-gallon hat. "So, if I catch yer meanin' ya sort o' unroll it up there and folks start blowin' it up like a balloon." He looked at Tom, searching for some sign that he was close to the answer.

"Kind of like that, Chow. Except we'll use tanks of a special foam instead of breaths to hold it up." He explained how the tubes would give it shape.

“Don’t that just beat all?” Chow said to nobody in particular as he returned to his truck. Minutes later he was serving up drinks and food, all the while taking lots of looks at the white building.

About twenty-five minutes later Tom called a halt to the pumping of the colored water. With one small exception—and it appeared that one of the people inserting the connecting tubes might have bitten on one of them—everything held. Under Earth’s gravity Tom had computed that it would be necessary to put the liquid under fifty psi pressure. It had still been holding at eighty psi.

On Mars, the final structure, many times larger than this test one, would only have to accommodate thirty psi to inflate to its desired shape. On the Moon, just eight psi.

After thanking everyone for their day and a half of work on the project, he released most of them to go back to their normal jobs. One young woman who had particularly enjoyed the experience called out, “I thought things like this *were* our regular jobs. Thanks, Tom!”

He waved to her and the others as they waked back to the building complex.

The six people he asked to remain assisted him in drawing all of the water back out to deflate the building and then to fold and roll it into a single, tight bundle.

During the process Tom noticed that the seams were very stiff. Not too stiff for the lunar building but perhaps too much for the larger Mars dome. He was going to have to come up with an alternative to achieve a total seal.

An hour later it was deflated and rolled up.

Between them they managed the three hundred and twenty pound load getting it onto the only remaining flatbed truck.

“Get that over to storage in hangar… oh, put it in hangar five. No. Make that six. It’s empty. And try to get it up really close to Bud’s office door. That will teach him to plan a demo in Ohio while we all work and slave,” Tom told the driver. As they drove away, Tom could have sworn he could hear them cackling with glee at the prospect.

“What’s next on the agenda?” Art asked.

As they walked, the inventor described several of the following steps to accomplish. “But,” he concluded as they crossed the final taxiway, “I have to create a self-contained single sheet of the fabric to test for foam-filled strength and the ability to quickly patch.”

“Long as I can keep my feet on the ground and not up a ladder, count me in,” the engineer requested.

Tom decided to let the ladies from the Uniform Fabrication department have the rest of the day off for their extraordinary work out on the tarmac, but informed them of the need for a special panel to be started the next day.

"If you can, please lay out a new twenty by twenty foot panel with all of the tube ends interconnected except for one at the upper left and another at the lower right positions. I'll be using those to fill and bleed out air for the self-hardening foam. Thank you, again."

He was sitting at his desk in the shared office that afternoon when he heard the sound of the doorknob being turned. Usually, Munford Trent would give a polite knock-knock-knock before opening the door with his standard, "May I interrupt? You have…" but there was no announcement.

Tom quickly looked at the clock on his computer screen and then at the door. It was still before five so Trent ought to be there.

A chill ran down Tom's spine as the thought of an attack came to his mind.

Wide-eyed, he looked straight at the door only to see four fingers appear and curl around the thick wood. These were followed by a bare leg as it curled in and around the door as well.

A husky but definitely feminine voice called out, "Are you ready for me, Mr. Swift?"

Tom's heart raced. There were several possibilities that he did not wish to consider. But then, he thought he could hear a little muffled giggling going on outside the office.

In a stern voice that he hoped sounded like his father's, he replied, "You had best come in right now, young ladies!"

The leg and fingers disappeared and in hushed voices he could now hear, "Oh, golly. It's *daddy*! Let's get out of here, Bashi."

Tom jumped up and raced to the door. He pulled it open to reveal his sister—obviously the instigator in this—and his red-faced wife. Bashalli was dressed in a light blue blouse and yellow shorts that revealed about ninety percent of her legs—*awfully nice legs,* Tom told himself—and his sister was in a long shirt that probably belonged to Bud, tied around her waist and a matching pair of shorts.

Seeing Tom, Sandy let out a relieved giggle and Bashalli jumped into his arms. Across the outer office, Trent sat attempting to maintain a straight face.

"Hi, Bash. Hey, *troublemaker*. Is my sister trying to get you into trouble, sweetheart?"

Bashalli released herself from around his neck and stepped back. “Oh, no, Thomas. Sandra is behaving in a very ladylike manner. And, Mr. Trent had nothing to do with this.”

“Okay. I know something is up when you drop back into the using of people’s formal names. Come on in, you two. Tell me why I deserve this nice visit.”

Once they had been seated in the leather chairs of the conference area, Sandy got to the point.

“We were heading to the mall—we both managed to get the afternoon off—when we heard the strangest thing on the radio. Then,” she said lowering her eyes, “I kinda got silly and talked Bashi into trying the sexy leg thing. Anyway, a news flash came on. The man said that Swift Enterprises appears to be building an artificial cloud and that it could be part of *a chemical warfare scheme!*”

CHAPTER 9 /
ON-AIR SHOCK (THE) JOCK

HIS FACE went pale before it reddened and then he began to laugh. “Chemical warfare? Where do they get these ideas?” He was both angry and almost hysterical with laughter at the very idea. “What station were you listening to?”

“Um, it was that high-powered all talk station down in New Jersey. The one with the split political format? Every other hour they change political positions. Ultra Liberal one time the super Conservative the next block,” Sandy told him.

Tom held up a hand and tried to collect himself. “Wait. You mean the one that has the same guy using two obviously fake and bad voices who pretends to be different people?” A giggle escaped his lips. “The station, as I’ve been informed by our Legal department, that is on the verge of losing its license for faking incoming calls? Including one supposedly coming from me. Oh, this is too much. I’ve got to go there one of these days and let them know how incredibly moronic they are.” He smiled at the two ladies.

“So, you are not angry over that announcement?” Bashalli asked, cautiously.

Tom picked up his phone. As he dialed he answered her. “No, Bash. I’ll leave that to the lawyers. Oh, hi. This is Tom. My sister and wife were just listening to the radio, and that shock political station down in Camden, New Jersey is at it again.”

He listened for a moment before replying, “Yes. It’s something to do with accusing Enterprises of preparing to engage in chemical warfare. I’m pretty certain it was based on a sighting of my white, puffy inflatable building, but it could get out of hand… Sure. Thanks!” He hung up.

A few minutes later just as the ladies were saying their goodbyes, the phone rang. Trent announced the caller. “It’s Patrick Peck from Legal.”

Tom gave his wife a quick kiss and reached for the phone. “Patrick. I didn’t expect you to get back so soon. What’s up?”

“Well, Tom, I made a call to the station and managed to actually get on air. It’s amazing what you can do if don’t tell them you are a lawyer up front. Anyway, the man who calls himself Mack Malone said ‘You’re on the air. What’s the beef?’ and I told him that I thought making reports like the one about the Swifts was taking something they had no corroboration on and trying to turn it into a fear story

was illegal. He kept trying to draw me out until I told him I am the Swift's lawyer at which time he tried to hit the dump button, but didn't make it in time. It all went out on air."

Tom laughed. "Is that going to shut them up?"

"No. At least not by itself. I was unceremoniously transferred to the station manager. We chatted about the weather and whether or not we were going to sue them, or perhaps file a complaint with the FCC. He bluffed and blustered but then admitted they were already on notice from the FCC and that Mack Malone—born Herbie Feinstein by the way—was to blame and that he was being fired at the end of today's show. He suggested that you come down to set the record straight."

"Why?"

"I think he is trying to do two things—save face in order to not have his license revoked, and to try to get you to spill some legitimate story so they can do a 'We told you they were up to something' piece. I actually think you ought to do it… with me in attendance, of course."

Tom requested a day to think it over, thanked the man and hung up.

Late that afternoon he ran into Bud in the company gym.

"Bash's cooking been putting on a few pounds?" Bud asked with a big grin as they jogged side-by-side on treadmills. "Now that Sandy and I are engaged she insists on coming over almost every night to make dinner for us. Please don't tell her, but while I love her and would lay down my life for her, she isn't anywhere close to your mom in kitchen capability. And, she thinks that she has discovered some sort of miracle in spiced, canned meat!"

Tom laughed so hard he had to step off the machine for a moment. "Mom is getting the brunt of that on weekends while Sandy practices. She told me if she sees any more cans of SpicyHam come in the house that she'll scream. But, to answer your question, I am trying to exercise out some anger and nerves."

He told Bud about the radio show and the invitation.

"Yeah. I think you should go, too," Bud told him. "I mean, heck. You sit in front of Congress down in D.C. You hold your own there. Hey, I know. I'll come along so we really outnumber the other guy. Maybe I'll work on my scowly face."

Tom dropped by the Legal department on his way back to the office and met briefly with Patrick. By the time he left the call had been placed and arrangements for Tom and "his two technology advisors" to be at the station the following evening at eight p.m.

"You'll have twenty minutes," the small, red-faced man told them

as they sat down at the microphones. For some unknown reason the station had decided to not fire the him, but he was pretty subdued. “We’re in commercials now, so I’ll give you a ten-second finger wiggle before we come back on. Just relax and try to give me good, reasonably long answers. No lectures, but radio listeners don’t like just “yes” and “no” from our guests.”

They were positioned around a circular table with spring-loaded arms holding individual mics in front of them. Their host had his back to a blank wall with Tom directly across from him, his back to the glass of the control booth. Patrick was on Tom’s left and Bud—who scooted his chair and moved his mic when the host wasn’t paying attention—sat very close to the small phone board on the table.

Things began fairly amiably, but after a commercial break their host, in his now mysteriously deep ‘radio’ voice turned on Tom.

“So, we’ve all seen what you Swifts get up to. Bringing your secret alien pals to Earth to scope us out. Setting your illegal mining things up on the Moon to rob the wealth up there. And now, you’re building some sort of giant flying chemical-spewing device and trying to keep the purpose of that secret. Well?”

Tom looked at him. “Until you find a way to turn that into a question I think that we’ll just go for dead air. Okay with you?”

Feinstein/Malone blanched and stuttered for a few seconds, but then gathered himself. “Fine. Just peachy fine. If that’s the way you want to play it, then how about this. Didn’t you sneak a group of outer space aliens down here to check out Earth’s defenses?”

Tom shook his head. “No. We did not do that. Perhaps you should have read the detailed accounts in the newspapers and the Government’s own press releases. *They* mostly got it right.” He smiled at the host who looked incredibly uncomfortable.

Things went from bad to worse for the radio host as he tried goading Tom with several other false or even slanderous statements. He almost choked as he saw that Patrick had set up a small tape recorder and was taking notes on a yellow legal pad.

“What’s he doing?” the now pale man practically shouted into the mic.

“Him? Oh, he’s our corporate lawyer and he’s taking very careful note of each and every lie you are telling to your audience, or using to try to get me to tell you some deep, dark secrets. That we do not have, by the way.”

The man’s right hand rose and slammed down on the control board. Or, it would have if Bud hadn’t blocked it. “Stop it!” he screamed in panic.

Calmly, Tom asked, “Do you mean the seven-second dump button. The one you apparently wanted to use to stop listeners from hearing about our lawyer being here. The one you will want to use when I tell listeners the following. Oh,” he turned around to look at the engineer in the other room, “I would like to remind your sound man about the law against dead air. I would also like to speak for my attorney to tell you that suddenly going to commercial at this time will not go over well with either the FCC… or a judge.”

For the following six minutes Tom reminded listeners that the entire world knew of the visit from the Swift’s Space Friends. He rebuked the man’s assertions regarding at least two other Swift projects, detailing the positives that had been realized, and finished by explaining that the supposed chemical warfare balloon was simply an inflatable building and even told whoever might still be listening that they could look up many similar buildings on the Internet.

“And that, Mr. Herbie Feinstein, who pretends to be both Mack Malone and also the more liberal Darius Smith-Jones, and who knows *whom* else on this station… I bid you good day and we will be seeing you in court!”

Bud took his hand away from the board and patted the radio personality on the head, dislodging his toupee in the process.

The three men took a taxi to the small regional airport and flew back to Enterprises, arriving just before nine-fifteen that night.

By the following morning the news of Tom’s appearance on radio had raced around the globe with news services in practically every nation picking up on the story. While the vast majority were complimentary toward Tom, a few—especially those in countries not on friendly terms with the United States—ran from no coverage at all to scathing reports of Tom being a “bully and physically threatening to destroy the free people’s radio station with a death ray from his secret military platform in space” (*The Kranjovia Truth*).

George Dilling called to report that he had been receiving about twenty phone calls and hundreds of emails per hour since seven a.m. requesting details, photographs and even plans for Tom’s new inflatable building. “Most are simply from curious individuals, Tom—and I’m working on a small piece for our website—but there are a few I would like to send over to you and your dad.”

“Like what?”

“Well, a small town in New Mexico called Questa relies on water runoff from the nearby mountains that feed their outdoor reservoir. Right now, even in spring they lose about twenty percent of the water to evaporation and are on water rationing eight months out of the year. They believe one of your domes would solve their problems. Oh,

and some folks with Manitoba Power say they could use several of them to cover power stations that get hit by so much rain and snow they have three or four transformers short out each year at a cost of about a quarter million dollars, each."

Tom let out a whistle. "Well, sure. Send the ones you think are legitimate over. I will have to do some redesign as the current one is meant for low gravity and zero atmosphere, but I may have a couple ideas. Thanks!"

"Good show last night," Damon Swift complimented his son as he walked into the large office. "You had your mother sitting on the edge of the sofa clapping with joy. Of course," he added, turning more serious, "this won't put a stop to that sort of distortion reporting, but it has pointed a huge finger at the issue. Was Patrick happy?"

Tom nodded and smiled. "He was. Oh. George Dilling just called." Tom explained the interest in the inflatable dome and the two commercial uses that had been mentioned.

"Is the dome stable enough for use down here?"

"Not as such, but I think if I beef up the tubing to half or three-quarters of an inch and create a stronger yet flexible self-hardening foam it ought to be possible."

They talked about several other possibilities for the dome, but Mr. Swift reminded Tom that the primary use right at that moment was for the possible repair and replacement of the now missing structures on the Moon.

"Speaking of which, I have to jet down to Washington to meet with Senator Quintana and a few other renegades who are interested in hearing what we will be able to do for the folks up at the colony. Want to come along?" His eyes twinkled with a barely disguised glee he felt at having received the secret invitation.

Tom considered it for a quick moment but shook his head. "Thanks, but I want to get some notes down in the computer while things are fresh in my head. Say hello to the Senator, please. And tell him we plan to make another *safety mission* in the near future. Maybe by next week."

Tom left the office a few minutes later and went down the hall to his large laboratory. There, he brought up the design plans for what he was now thinking of as the Moon dome. As he sat there looking at the square shape he let his imagination wander. It quickly turned to his desired plan to either terraform the planet Mars, or at least to create a large-scale colony. Before the dome had become a near reality, he had been playing with the idea of excavating a large hole to house an underground facility. Not only would it place the inhabitants in a safe position in which to ride out Martian

windstorms which could be in the sixty miles per hour or greater range, the ground would provide ample insulation from the extreme temperatures.

He also thought of attempting to set up a network of devices like he used on Nesteria to hold down a floating blanket of ultra-fine fibers that could contain the atmosphere. More to the point, he had considered using the blanket to squeeze the atmosphere down closer to the ground and thereby increase its density.

It was a fanciful plan, and one he felt still had merit, only not for the first colony he wanted to set up. That level of Terraforming was years away. His dome was the best bet.

He got to work creating a series of designs for the giant inflatable structure that might be able to ward off the winds while providing for a large living space. Knowing that his early tests showed the rectangular building to be the best shape, he concentrated on variations of that.

As each design was complete and stored in the computer he subjected it to a series of simulated tests. To his surprise, a straight-sided dome with a rounded top actually showed some promise. Where he thought the increase in height might provide too much surface areas, that shape allowed good airflow around no matter what direction the wind came from. Then, the direct pressure test revealed the fault. The computer told him that gusts hitting from a single direction and concentrated right in the middle of long sides would set up such a low-pressure zone on the back side that it would suck the dome into itself given sufficient wind speed.

What appeared to hold the most promise was a fairly low dome where the crest was no greater than eighteen-point-seven percent the length of the structure. Further tests indicated that the shorter ends needed to be about sixty percent of the length.

When he met up with Bud that afternoon for a coffee in the canteen he told the flyer, “That means that if I want the top of the dome to be, say, fifty feet high, the dome needs to be about two-hundred-sixty feet long and about one-sixty from front to back.”

“That seems pretty easy to do,” Bud stated. But, when Tom shook his head he asked, “So, what am I missing?”

“A structure that size, and given that the oxygen would be provided mostly from hydroponics, would only support about five people. Perhaps six.” He looked at his friend.

“Oh. So how large is your dream dome going to need to be?”

“Well, to support fifty people I need to come up with something about fifteen-hundred-feet long, nine-hundred-feet deep and around

two-hundred eighty-feet high."

They sat in silent contemplation for a minute before Bud piped up with, "Easy?"

"Not as such. At least nothing I can build and test right here on Earth. Well, check that. I could build it, make it so it can support its own weight down here, and then not be able to transport it to Mars because it would just be too darned bulky."

"So, what do you do?"

"What I do is a lot more research and computer testing to refine the large structure. Then, someday, we build it, take it to Mars, and hope for the best. But my tests also show that it will be better if I don't just rely on the tubes in the dome for support. I may need to create five or six support columns to fit in and around the hydroponics equipment."

"How the heck are you going to get something that huge to Mars?"

"I will empty out the entire front end of the *Sutter* and roll the thing up really tight and shove it in."

The *Sutter* was the enormous golden spaceship Tom developed for mining purposes when the former planet Pluto mysteriously moved to a new orbit close to Mars. Shaped like a blunted cone, and with only the repelatron engine modules installed the front eighty percent or so could house anything from storage to specific equipment. In the first use of the space Tom created an extendable mining drill and conveyor system to bring minerals into the ship where an automatic crushing and smelting system purified everything. The "good" stuff went into giant bins while the "junk" was expelled to fall back onto the surface.

The totally self-contained mining and processing module had been a huge success.

Tom already had done calculations that showed that a dome of the size he believed necessary, and made just like the one he hoped to soon take to the Moon, would fit into the front areas if folded and rolled in a precise manner. He told the flyer about the intricate process, and Bud assured him he would be ready to help when the time came.

When they parted. Tom walked over to the north hangar area of Enterprises. He had recently asked for several changes in the avionics be made to his little Skeeter, the small helicopter that he often carried in the back of the *Sky Queen*. One change was the addition of a miniature version of his SuperSight system, called the Digital BigEye. Though not as powerful as its large cousin, the portable version could bring something more than a mile away up so it

appeared to be just twenty feet away.

There was also a brand new all-glass control panel that wrapped around the two seats replacing the old flat one with physical gauges. The new panel could be "dimmed" to the point where the pilot and passenger could see right through it removing that as an obstacle to any visual search. The best part was, and the thing he really wanted to see in action, was that specific flight-critical readouts could just "float" in front of the pilot.

Another thing he was interested in testing was a ground-detecting system and auto-pilot that gave the helo the ability to fly just a few feet above treetop level, on its own, while the pilot or passenger used the Digital BigEye system.

Tom gave the two ground crew men the signal that he was starting rotation of the blades. They stepped back, looked up to check that they were clear and both gave thumbs up signs.

The blades began to swing around gaining speed quickly. In less than one minute they were at full speed and all five of the indicator lights had turned green.

"Swift Two ready to lift," he radioed.

"Roger. All east-west traffic clear for you to traverse all north end runways. Happy flying!"

He eased the throttle up and the Skeeter practically jumped into the air. Once he got to about forty feet he tilted the nose down and the small helicopter began moving forward. By the time it crossed over the east wall of Enterprises, it was traveling at about sixty miles per hour and had reached one hundred feet altitude.

The lake was just about thirty seconds away and he was admiring the shimmer of the water when he heard an explosion under him and an intense pain shot up his right leg.

Someone had just shot him!

CHAPTER 10 /
A NEW DECISION

TOM GRABBED his leg with his right hand while he keyed his microphone with his left.

"Mayday, mayday, mayday," he called out with a calm he didn't really feel. He took a quick glance down and could see his pants leg getting more and more wet and red with blood. "This is Swift Two. I've been hit by a bullet. It's in my right leg and I'm bleeding heavily. Request a vector to Shopton General, ASAP." He released the button.

"Swift Two. Tom, this is Barry in the Enterprises control tower. We understand and will clear all airspace. Can you vector to S.G on your own?"

Tom gritted his teeth. The pain was tremendous, made more so by the tight grip he tried to maintain to slow the blood flow.

"Roger. Tell them I'll be setting down on their helo pad in two minutes. I'll need a compression bandage. Tell them I'm bleeding a lot! And, my blood type is A B negative."

"Okay. Mark is making the call and I'm sending out the stay clear… hang on…" Tom heard the broadcast from his tower and the three acknowledgements.

"Tower, it's Tom. Tell Harlan the shot came straight up just as I passed over the owl preserve by the lake. I didn't see anyone, but there's only one road in and out. If he hurries—" He stopped to concentrate on getting the helicopter on the correct track.

"Tom! Are you still there?"

"Yeah. Still here. Had to make a course correction. Anyway, if Harlan can get a team out their pronto—"

"Understood. You just leave the mic open and give me a status grunt every ten seconds or so. Oh, and the hospital is standing by."

Tom brought the Skeeter in over the bright red circle and reduced power, letting go of the control stick. It meant a slightly harder landing, but it got him on the ground seconds faster. The last thing he recalled was stabbing out with his now free left hand and hitting the "kill" switch.

"Tom? Hello, Tom? It's Doc Simpson. Are you with us?" The voice was coming from somewhere in a fog, but it was registering on his mind. "Tom? Come on, skipper. That's it. Open those steely blues for me."

One eye flickered open and then the other. It took a couple

seconds of blinking but they focused on the young doctor's face. Tom licked his dry lips.

"Mmmm I glddd ta seeeee ya, dc," he managed to get out. Even in his current state he knew that hadn't come out right. He cleared his throat and tried again. "I'm glad to see you, Doc. What happened?"

"Well," the medico replied as he shown a light into the inventor's eyes, "according to your radio calls you got shot at, and hit in the right thigh. You lost a couple pints of blood but nothing we couldn't pump back into you once we got the hole shut. Do you remember setting the Skeeter down here at the hospital?"

Tom thought. "Oh. Yeah. I brought it in a little hard but I didn't think I'd stay awake for a slow and soft landing. Guess I survived. How's the helo?"

Doc laughed. "You make 'em pretty strong, Tom. Both you and the Skeeter will be fine in a couple of days. Your wife should be here any minute. I held off calling her until you were in the recovery room. And, before you ask, as long as you behave for twenty-four hours, you can go home tomorrow."

Tom grinned. He was feeling very little pain and figured it was from the anesthetics. "Will there be any residual issues with the leg?"

Spinning back to look at the inventor, Doc's face became a mask of seriousness. "What leg, Tom? Didn't I make it clear? We had to amputate—"

"What!" Tom suddenly woke up and sat bolt upright. The Recovery Room nurse was startled but she placed a soothing hand on his chest and pressed him back into his pillows. "There, there, Mr. Swift. It's sometimes a bit rough coming out of the sedation. Can you tell me where you are?"

Tom let out a sigh of relief. The dream had been far too real. "Yes. I'm at Shopton General Hospital in Shopton, New York and my name is Tom Swift and I am the son of Damon and Anne Swift and married to the former Bashalli Prandit. It is Wednesday, or at least it was when I got shot and landed here, and it is or was the twenty-third of the month. Do I pass?"

She smiled at him. "Better than we get from most people. By the way, it still is Wednesday and just two hours after your rather bouncy landing. I was part of the team out at the pad. That's a damn funny helicopter you came in on. From the front it sort of looks like—"

"I know," he interrupted her. "My sister calls it a Butt-copter."

The nurse laughed. "Yeah. That double curved front does look a might… uh, gluteal. Dr. Simpson rushed over to assist in the op on your leg. I'll call him so he can give you the rundown, but from what I

hear it only nicked an artery and did superficial muscle damage. It will be plenty sore for a couple weeks but my guess is… well, I shouldn't be making guesses. The doctor will tell you everything." She turned and walked to the nurse's station and made a phone call.

Two minutes later a pair of men entered the room and strode over to Tom's bed.

"Hey, Doc. Hey, Harlan. Who's got the better news for me?"

"Well," Doc Simpson spoke up, "probably both of us. For my part I can tell you that the single bullet that came up through the Skeeter hit the underside of your right leg, nicked an artery—"

"—and did superficial damage to the muscles?" Tom guessed.

Doc smiled. "Harlan? Even unconscious this kid stays abreast of everything going on around him. And, yes, Tom. You lost a couple pints of blood but we transfused that into you while Dr. Davies and I pulled the slug out and got you all patched up. You'll only have a scar about the size of a pencil eraser once it all heals up."

Tom's head turned to his Security manager. "Well?"

"The well of it is that thanks to your call Phil and Gary got out there in time to nab the shooter. He was sitting in his little dilapidated car sobbing his eyes out. They took him into custody and retrieved the gun he had flung into some bushes nearby."

He stopped and Tom looked at him, sensing there was more to the story. When he asked, Ames nodded.

"Yes. You're right. Your would-be assassin was Herbie Feinstein, formerly of radio station WPIS down in New Jersey."

Tom gasped.

"Yeah. He evidently took getting fired and given a three-year 'No On Air Time' order by the FCC pretty hard. Once he stopped bawling he got a little belligerent and was telling anyone who would listen that you 'made him do it.' And, that he wouldn't have dreamed of attacking a flea except that you had 'forced him to seek retribution.' For once," he grinned, "if there is anything good to say about this episode, it's that it had nothing to do with your typical Brungarian or North Korean or even another Atlas Samson attack. This lone nut case is now off the air."

Five minutes later Tom was transferred to a private room.

There was a soft knock on the door. It opened and Bashalli tried to tip toe in, but when she saw Tom sitting up she let out a pleased squeak and rushed over to the bed. She hugged and kissed him until Tom had to hold her at bay.

"I'm really glad to see you, Bash. Ecstatic, in fact, but you're on the bad leg side and even with the drugs it's hurting a bit."

She paled and tears began streaming down her cheeks. “Oh, Tom. I am hurting you. Forgive me?”

He patted the other side of the bed and she came around to sit next to him.

“Climb on,” he suggested. “I can use all the soothing hugs I can get.”

He looked up to find that both Greg Simpson and Harlan Ames had left the room.

The following morning he opened his eyes in time to watch a new nurse come in to draw a small blood sample. “I thought they were putting that stuff in, and not taking it back out,” he said giving her a little smile.

“Good morning, sir. I’m Amy and I am taking the, hopefully, final sample out to check for blood count. If it’s looking good, then Dr. Simpson says you are to be released at noon. If not, we have to give you one more bag of blood and do another check at six.”

Twenty minutes later she poked her head into the room to say that the test was fine and the paperwork had been started.

With Bashalli at work Tom needed a ride so he called Bud’s cell phone.

“Sorry, skipper, but Doc already primed me for this call. He will have one of Enterprises’ ambulances at the front door of the hospital at exactly noon. It will be transporting you to your lovely home in the Meadow Waters subdivision where you will be carried upstairs and placed into your own snug and comfy bed, and will be attended to, until six, by your mother!”

“And I suppose that after that I get my darling wife and pushy sister. Is that the plan?” Tom asked. It was the pretty standard reaction of the women in his life whenever he was injured and ordered to get bed rest.

“Yeah. Just don’t take up all of Sandy’s time. I’ve got my own plans for her, you know!”

By the time he finally got home and was deposited in bed, Tom had dozens of things going through his mind. One of them actually came to him as he was fighting off the sedation back in the hospital. Almost in a dream a new flying vehicle materialized in his head. If he could make it work, it would be a boon for anyone on Mars, assuming he ever got the colony off the ground, that is. Instead of plodding along in some large pneumatic-wheeled or treaded ground vehicle, with the constant problem of rocky debris, sudden gullies and hills and mountains to get over or around, why not fly over them?

Anne Swift opened a storage closet across the room and pulled out a special worktable Tom had designed months earlier. She rolled it over so that the legs stuck under the bed, and then pushed a release

button so the surface could be tilted right in front of Tom.

Built into the surface was a flat screen high definition monitor and a powerful computer fit inside the upright side stand. All his mother had to do was plug it in.

"Thanks, Momsie. If I promise to not get out of bed, at least until Bash gets home and can help me to the bathroom, will you leave me alone and go home to make dinner for dad?" He fluttered his eyelashes at her.

Anne snorted. "Right. Let me see if I have all this correct. You were given not one but two liters of fluids in the hospital in addition to the blood, and that was hours ago. You only lost, according to Doc, two pints or so, which means you've got about a quart of excess liquid running around inside. Your darling wife will not be home for at least two hours, and between now and then you are absolutely certain that you won't need a potty break?"

Tom thought about it and did a quick body check. He did kind of have to go a little. "Okay. You win. Can you help your poor, battered child across the floor to the bathroom then?"

She shook her head and reached into a paper bag she had earlier set on a chair. "Here," she said taking out a plastic bottle. "The ultimate in porta-potties. I will leave the room while you use it, and I will go downstairs and knit—because I am wise enough to have a bag always packed with such projects for just these occasions—and I will wait for Bashalli to come home. Tommy go… mommy stay. Got it?"

Tom had to laugh, and *that* put pressure on his bladder and that told him he really *did* have to "go."

"Right. Thanks. If you could bring me a cola in about five minutes I think I can accept your terms."

Tousling his hair and leaning in to give him a kiss on the forehead, she told him, "According to my instructions, you only get water as your liquid today." She sighed. "I had so hoped that once you and Bashalli were married that this sort of stuff would stop. But, I see it hasn't. I can only hope that your wife has the strength to accept that she isn't going to change you either." With that, she turned and left the room.

When she returned with his drink, Tom was deep into putting together the basic structure for the new air vehicle he believed would one day ply the skies of Mars.

She glanced at it and was intrigued. He could see that she wanted to ask him about it, but was holding back.

"Strange, and a little neat, isn't it?" he asked her.

"I'll say it is," Anne replied. "Right now it looks like a three-armed boomerang or some sort. Is it a—" she paused because it hit her that it most definitely could not be what she was thinking.

"A what?"

Sighing, she plunged forward. "Well, a weapon of some kind. And, yes, I know we Swifts are against weapons, but there are moments I wish you had something to blast the bad guys with before they get to you."

Tom took his mother's hand and gave it a reassuring squeeze. "No. It's not a weapon. Actually, it's a flying device. An entirely new sort, at least once it's full size and able to carry a couple people. It's a little like some of those camera drones the Government and military use. Multiple rotary blades—in this case I'm aiming for three—running on electricity and with a central power source."

He told her about his intent to build a colony on Mars and how the triple-rotor craft could be used. The conversation went on and on with Anne asking questions, sometimes offering opinions or suggestions, and Tom divided between jotting notes, talking, and making changes and additions to the CAD design on his screen.

Both were surprised when the heard Bashalli's voice call out as she came in the front door.

"Thomas. I am home and you had best not be out of our bed. I can see that mother Swift's car is here and I hope that you have not managed to convince her that you are fine. Oh, hello," she said stepping in the bedroom.

She hugged her mother-in-law and then climbed onto the bed next to Tom.

"And that is my cue to exit," Anne stated with a glint in her eyes.

After she had gone, Tom spent almost a half hour telling Bashalli that he felt mostly fine, "Although I have to admit that the wound is starting to ache a lot," he finished with.

She kissed him tenderly and then changed into her favorite around-the-house outfit, one of his larger T-shirts and a pair of baggy shorts. It was a favorite of Tom's as it not only showed off her stunning dark legs, it made her seem relaxed and happy.

He shook his head to clear that thought and went back to work on the triple-rotor craft.

By the time Bashalli brought up their dinner—a medium-rare steak "because you need to build back your blood!" and green beans with a cherry compote for dessert—Tom had managed to fine-tune the design into something that was beginning to look like a viable aircraft. The central body that had started out as a circular pod now looked more triangular, and the three "arms" that ended with rotor blades were interconnected by a series of lines that Tom believed could be thin yet strong cables that would keep the arms more rigidly in position no matter what torque the rotors might experience. Being thin, they would offer no wind resistance and could be made from an

alloy weighing only a pound or so per fifty-foot length.

"How large with that be?" Bashalli asked sitting next to Tom who was propped up against all four of the bed's pillows. She pulled one out for herself.

"Not counting the blades of the rotors, I would say it needs to be about sixty feet across," he told her around a mouthful of dessert. "I'll build it to be collapsible with the arms wrapping around the central cockpit area. If I do it right—and I'm sure that Hank, Arv and all the folks at Enterprises will make sure I do—it should fold down to about twenty feet across and maybe eight feet thick."

She nodded her head as she studied the CAD drawing. "Yes. I can see how that can happen. But what about the rotor blades?"

Tom looked at his drawing and then at his wife. "I don't get you, Bash. What about the blades?"

"Well," she said slowly as she strove to put the right words together. "What I mean is that I can see how one set of blades can come in right over the top of things, and another set might come in below things, but where do your put the third set? Would not the hub from one bump into the hub of another forcing it to be much wider?"

Tom looked back at the drawing before answering. She was correct and he had not made it to the point where such details became considerations. But, he was a quick thinker and immediately saw how to approach the problem.

"Right. And, if I keep the four blades spread out like they are in flight mode, you would be absolutely right and I would be an idiot for not seeing that. But," he said as she opened her mouth, most likely to protest his statement of his failings, "once you spotted that it just hit me that the blades will fold back into a stack, like military helos, for storage and fold out and lock into place for flight."

"I knew that you would have the answer for that," she praised him. Giving him a quick kiss on the nose she hopped off the bed, picked up their dishes and headed back downstairs to the kitchen. As she left the room she called over her shoulder, "Oh, and Doctor Simpson asked me to pick up two prescriptions for you that he says you are to take starting tonight." She poked her head back into the room. "He also said to tell you 'No argument' about it. One is a pain pill that he says you will need in order to sleep and the other is an antibiotic for any infection your might try to get. I'll bring them up with a glass of water in a few minutes."

While she was gone he made some notes regarding the folding blades issue and then saved his work. He was turning the computer off when she came back.

Flipping the worktable upside down turned it into a felt-covered

surface. Bashalli pulled two packs of playing cards from the table next to her side of the bed and handed one to him.

"Spite and Malice?" she asked.

It was one of their favorite card games, and they played once or twice a week on those nights when the inventor came home at a reasonable hour. They shuffled their decks, dealt out the appropriate cards and began playing. An hour and four games later Tom's pain pill began working, and it made him a little groggy.

He begged off a fifth game, explaining, "Doc will appreciate it if we call it an early night."

"How is your leg feeling?"

He slowly flexed the leg under the sheets. There was still a twinge of pain when moved, but as long as he kept it still, the ache seemed to have mostly disappeared. "Not too bad. Please don't test it by kicking me in the middle of the night, but I think I'll be okay."

As he settled back into his two pillows, she reached up and turned off the lights. "Good night, Tom. I love you." She kissed him on the side of his mouth.

"I love you, too. Bash? I need to ask you something rather serious," he told her as they snuggled in before going to sleep.

"What is that?" she asked, her face buried in his shoulder.

Tom took a deep breath. "What if I told you that I was thinking of our living on Mars for a year? As part of the Enterprises effort to create a Martian colony I have been pondering whether it would be best to have me up there, or down here. What do you think?"

Her voice sounding a little drowsy, she replied, "I think that wherever you go, Thomas Swift, I will be next to you. Remember how after you returned from that nearly disastrous flight to the black hole I told you that you were not going on any long space missions without me. No matter what. I love you, Tom Swif..." and her light snore told him she was asleep.

CHAPTER 11 /

INCOMING!

TOM COULD not believe how bad his leg felt when he awoke in the morning. In his young life he had been shot five times and this one was the worst. Of course, as he gingerly got out of bed and tried the leg to see if it would hold him, he recalled that three of the others had been in his arms and two had been considered more like flesh wounds. This was definitely the deepest of the penetrations.

"Good morning, Tom— oh, you do not look happy. In fact you appear to be in pain," Bashalli stated as she opened the bedroom door and brought in a tray with his breakfast. Setting it on the dresser she came over to help him sit back down.

Tom winced as he tried to pull the leg up to get a closer look. She patted his knee and eased the leg back down.

"Doctor Simpson told me to tell you that you may only make short bathroom trips today and definitely no stairs until tomorrow afternoon. He also left you this letter." She handed the note to him.

Tom,

I know you and I know you want to be up and around, but that bullet did some bad damage in your leg. It will heal, but you have to give it time. Listen to what I told Bashalli. Oh, and don't be mister Brave Guy and refuse to take the pain pills. They were prescribed for a good reason. I'll drop by and see you about 24-hours after your operation.

Greg "Your Doctor and don't you forget it!" Simpson

Tom laughed as he eased back. "Boy. Between you and Doc I'm not going anywhere," he said, favoring her with a warm grin. "Okay. I'll be a good little inventor and spend the day in bed. Are Sandy or mom coming over to make sure I behave?"

"No. I will leave for work in about ten minutes and you will be on your honor to remain quiet and in bed. You may do all the computer work you wish and I will even come home and fix you lunch, but please be careful and do what the doctor says. Please?"

Her look was so genuinely worried that Tom had to laugh. "I promise. But, can you help me to the bathroom before you go. I should be able to stay in bed at least until lunch time."

While Tom was in the bathroom, Bashalli retrieved and plugged in the multi-line phone set they kept for such occasions. A special set of

lines to and from Enterprises went directly into a special jack on the wall.

"You are all ready for work, Thomas. *Bed* work!" She kissed him and left, her car driving away a minute later.

At night, while Tom slept, his brain was frequently busy working out designs, problems, and coming up with potential inventions. The previous night had been no different, except that the pain pill had somehow made them a bit more vivid that normal. He spent the first hour of solitude making notes about six or seven things that had come to him in the night.

Next, he made a call to Hank Sterling. "Hey, Hank. Tom. I wanted to check on the status of the latest model of that tri-wing jet. How's it going?"

"Pretty good, skipper. Pretty good. Just like the small original one it flies really fast, maneuvers great and has a low take-off and landing speed."

"I'm hearing a 'but' in there. What is it?"

"But," the engineer and pattern maker admitted, "it needs to get up to about three hundred knots before it becomes stable. Before that it's a bit like trying to pilot a flying sloth. Slow, ponderous and prone to sort of tipping to one side. Doesn't matter which side, it just wants to roll over at slow speeds. And frankly, we are stumped!"

Tom offered to come by and take a look in a couple days. "If it can wait, that is," he added.

"We are officially five weeks ahead of schedule, Tom. It can wait!"

Next he called Enterprises' Security and Harlan Ames.

"Not much news, Tom," the Security chief told him. "The police and I have questioned your shooter. He is so afraid he'll be sent to some deep, dark hole of a prison that everybody will forget about him. Broke down a least once every five minutes. We're about as certain as we can be that he acted alone. I've done a comparison of your wound slug to his other ammo. Both are 30-06. With no disintegration or mushrooming, it was a cinch to match. You and the Skeeter didn't offer enough resistance to deform it much."

After asking Tom several questions, very few of which the youth could answer, he promised to call as soon as anything was else known.

His third call was to Arv Hanson.

He answered Arv's questions about his health but quickly turned the conversation to the reason for the call. "Before the end of the day I should have a design for you on the CAD server. It's for a triple

rotor light helicopter." He described the strange flying craft.

"I'll leave it up to you whether or not to put a skin over the bare structure, Arv, but I want you to make a flying model for me. About six feet from tip to tip which is about one-twelfth scale. Oh, and could you make up two, three and four blade interchangeable rotors for it?"

"What sort of weight limits do I need to accommodate?"

Tom referred to his electronic calculations. "The full-size machine will be between four hundred fifty and five hundred pounds without pilot and passenger with most of that the power pod and motors. I'm hoping on Earth it will carry four hundred pounds of people and materials."

"Uhhh, on *Earth*?" Arv asked.

"Yeah. Guess I forgot to tell you that the real version is going to Mars." He then told the surprised craftsman that his plans for a Martian colony could soon become reality and the need for an all-terrain vehicle that could ignore the actual terrain would be important.

"Goody!" Arv stated. "This is the sort of project that makes my day! I'll get on it tomorrow first thing and should have the design parted out by the end of the day. I can come in on Saturday if you need this pronto..."

"No. Next week is fine," Tom told him. "Besides, I'll be back at work on Monday and can come over to resolve anything that isn't looking quite right."

He had to admit to himself that plans and designs created while in pain or under the influence of pain medication might be prone to a few mistakes.

Doc put in his promised appearance that afternoon. After changing Tom's dressings he injected the inventor with a long-lasting painkiller. Although the injection site burned for a few seconds, Tom's face reflected the fact that five seconds later, the entire area was wonderfully numb.

"Now, don't mistake this for everything being okay in there," Doc lectured him. "In fact, if you weren't in such obvious discomfort, and didn't have a wife who has called me three time today pleading to make the hurting stop, I would not have given you that. Too many people get a false sense and go injure themselves even more."

Tom promised that he would take it easy.

"Can I go to work on Monday?" he asked.

Nodding, Doc said, "Yep! Provided you are a good patient between now and then, and there is no sign of infection, you may come in. I

will have a cane delivered to you in case of any unsteadiness."

Good to his word, Tom was a model patient—or prisoner as he considered himself—and drove to work on Monday morning. The leg was still a little sore and stiff, but Doc had come by Sunday evening and checked the wounds and declared them to be healing "nicely!"

After visiting the shared office, where he discovered that his father and Trent had handled all of his correspondence, Tom limped out of the office, took the ride/walk belt down the hall and stepped into the elevator.

Once he left the Administration building he stopped to assess his condition. The leg was beginning to feel better with the exercise, so he walked—slowly—to Arv's shop three buildings away.

Stepping inside the workroom area, Tom came to a halt. Hovering in the middle of the room, about eight feet in the air, was a bright green miniature of his triple-rotor helicopter. Arv glanced quickly at his young boss and grinned.

"Like it? Once I saw your design I knew I couldn't enjoy the weekend until I had this in the 3D printers. Come on and give her a try."

Tom walked over and stood watching Arv's fingers fly over the remote control. It was a special one Tom himself had built months earlier to control the multiple motors of the scale model of his bullet train. Instead of the typical two of three mini-joysticks, there were seven, and Arv was actively tapping and adjusting four of them. A moment later he set the helo down on the floor.

"It really needs a set of gyros and a computer to keep things balanced, but it flies!" he told Tom.

Tom knew it should but was pleased to see it in the air.

"Why four controllers? There're just the three rotors after all."

"Ah," Arv said holding up a finger. "That's what I thought until the first flight yesterday. The problem is that it's almost impossible to bring all three rotors up to the same speed at exactly the same time, the result of which is that it tips over and breaks a rotor blade or two. Or three. I added a master power control to bring the three motors up to speed as close as possible and the three other joysticks to fine control the speed of the individual sets of blades. I didn't have the space or time to give you pitchable blades. They are at a set angle today, but the finished version by Wednesday will give you full helo-like controls."

Tom walked around the six-foot-wide model noting that the rotors had three blades each.

"Have you tried the other two setups?"

“Yes. Two blades chop a lot of air but don’t give the lift, and four blades have too narrow a sweet spot.”

“Sweet spot?” Tom asked.

“Sure. As in that special range where there is enough rotor speed to give lift and slightly more where the thing soars into the ceiling and all comes falling down with many broken rotor blades. Good thing Paul there is a great catcher,” he said pointing to one of his assistants. “I knew I’d need his services. I’m no pilot.”

“And an even better thing that Arv made me dress up in protective gear. As it is, I got slapped in the shoulder by one of the rotors and now I’ll have to explain a black and blue mark to my wife. Can I have a note, Tom?” Paul asked with a grin.

“Sure. You write it and I’ll sign. That notwithstanding, do you think having pitch control on the blades will make a difference? I would think it should.”

“Short answer is yes, and long answer is yes but with a lot of other stuff thrown in. Now, if you ask my opinion, I’m not sure that the atmosphere up there on our red planet neighbor is thick enough for the blades to lift this thing up.” Arv looked a little concerned. “Anyway, once you’ve had a go, I’m going to beg the use of the storm chamber to do a little thin air testing. It won’t give us correct numbers since I can’t do anything about the gravity difference, but I’ll know if I have to increase blade size.”

“The chamber is yours. I’ll get it cleared out. I think it still has some stuff from dad’s last corrosive Venus air tests.”

The little craft was given a quick charge so its battery could give Tom a good five minutes of flying time. He picked up the controller and ran through what he wanted to do before the power was switched on. As soon as the craft had power, he nudged the slider up and was rewarded by having the ‘copter jump up and almost hit the ceiling before he gained control.

“Touchy, isn’t it?” Arv asked.

Tom nodded. “Yes. It is, but I think I can do something about that.” He landed the craft and turned everything off. Over at Arv’s workbench Tom unscrewed the back panel of the controller and inserted a long, thin plastic probe into it. After giving it a slight turn he reattached the back and turned things back on.

This time the craft did not jump and it was obvious that the power slider had been made less sensitive. Within a minute the inventor had the little helo model moving side to side, spinning on its central axis and running a racecourse lap around the perimeter of the large room.

He was all smiles as he brought it back to the ground.

"Great! That's amazing and I can hardly wait for the one with better control." he slapped Arv on the back, gave him a few suggestions and then signed the printed note Paul handed to him. He laughed as he read it:

> Please excuse Paul's boo-boo. He did a stupid thing at work and this is a good lesson for him. Tease him about it until he promises to think before he tries to catch a falling helicopter next time.
>
> Tom Swift

By the time Arv brought the helo over to the test chamber, Tom had removed several pieces of equipment and had the entire chamber scrubbed by a cleaning robot.

The next day he received an email with Arv's results. There were promising things in the report and a few disappointments. The one thing it pointed to was that nothing could be finally decided until they could field test it in actual Martian conditions.

"Unless," Arv's note concluded, "you want me to put more blades on the hubs and set them to provide reduced lift. Let me know."

Shortly after that he got a call from Hank Sterling.

"Skipper, I've got more good news and more bad news. Oh, and this is in regards the tri-wing jet project. Anyway, we pretty much fixed the low speed instability issue. It turns out the configuration for slow flight with the middle and rear wings separated but in the full out position was the problem. The mid wing was creating a mini-vortex that interfered with air flow over the rear wing. There never were problems with the bi-plane positioning or with the wings swept back for speed, so we've reprogrammed the computers to automatically shove the wings together in the slow and extended mode."

"When you said 'pretty much fixed,' just how much is that?"

"Well, it dropped the stability issue down to slowest flight speed, but that is still ten knots above stall. If the pilot gets the speed down between that and a stall it will still have problems. But, we're working on adding wing tiplettes to the canards in front that might help."

"Okay, so what is the bad news?"

"Can you meet me at Harlan's office? I think this is going to need

his input."

Tom agreed and five minutes later they met at the front desk of the Security offices. They were shown into Ames' office immediately.

"What do I owe this visit to?"

Hank answered for them. "We have a problem that I wanted to tell you and Tom about at the same time. Several of us were out at the north end testing a new jet model when a small private jet—no markings but some strange front to back lines on the wings—anyway it flew overhead just outside the property line."

"So?"

Hank looked from Tom the Harlan. "Our model followed that jet and disappeared!"

"What?" demanded Tom and Harlan in unison.

"Yeah. As the jet passed by, going pretty slow for a small corporate job like that, our model just sort of turned and began to follow it. A few seconds later they were both gone."

Ames yanked his phone receiver up and hit three numbers. "Tower? Ames. I want the course, speed and anything else you have on that jet that flashed by, uh—" he turned to Hank, "How long ago?"

Looking at his watch, he replied, "Twenty minute ago."

"Tower, it was twenty min—oh, you have it. Great. Can you send that all to my office screen, please? Thank you." He hung up. "It'll be up in a second. And, there it is."

They studied the satellite photograph of the entire area around Enterprises going out about thirty miles. Superimposed on the picture was a dotted red line coming in from the Southeast, skirting Enterprises, making a wide circle about a mile away and then heading almost due south moments later.

"Now, why did they make that circle, I wonder?" Harlan muttered, almost to himself.

"Could they have lost the model?" Tom asked. "I mean, that seems like the sort of maneuver you'd make if you had something, lost it, and wanted to see if you could spot it. Am I crazy?"

Hank replied, "Well, and this is the reason I didn't sound an immediate alarm, they would have lost the jet about a mile or so away. I installed an auto-kill circuit just in case the model got out of control. It's designed to shut down all power once the jet is around five thousand feet outside the perimeter."

"Good thinking, Hank," Tom said. "All we need to do is go out and

find it."

Ames picked up his phone again and dialed another three-digit number. A minute later he set it down. "Three teams are going out in less than a minute to search that circular area, but I've suggested, as you no doubt heard, that they first look no further than a quarter mile off that original heading before the jet made its circle."

"I'm going to grab Bud and join them," Tom declared as he headed for the door. On the way out of the building he TeleVoc'd his friend.

"Great! I'm always up for a scavenger hunt, Pick me up over at the hangars."

Five minutes later they zoomed out the private entrance of Enterprises where Tom, his father and most of the senior employees came and went rather than needing to wait for the many employees to pass through the main gate each morning and evening.

"Where are we going?" Bud asked.

"Well, Harlan's got his teams running down the original flight path, but I've got a hunch that whoever it was in that jet had started their turn to the south when our model shut down. So, we're heading a little further into town and the take old Hoffman Road. It gets pretty hilly and full of trees out that way, but I've got a little ringer." He reached behind Bud's seat and brought out the remote control box.

"You think it's still flying around and you can get it back home," the flyer asked.

"No, but the nice thing about this remote is that it lets you know when it is within range of whatever it is supposed to work with. Here," he said handing it over, "turn it on and watch that LED in the upper right corner. It will start to flash if we get within about four thousand feet and then go steady when we get to within a quarter mile. Keep an eye on it and call out even if it only flashes once," Tom directed.

They headed north along the highway leading into Shopton before turning left at Hoffman Road. Three minutes later Bud called out, "Got a flash. Wait… two, now three. We're on to something, skipper!"

But as quickly as his elation came, it disappeared when the little light ceased flashing. "Rats! It's gone," he said.

Tom spun the wheel and pulled across the road into the driveway of a small business. Checking for oncoming traffic he returned to the road heading back the way they had just come.

"It's back!" Bud shouted.

Tom pulled off the road.

"Okay. We're about two miles off the highway and pretty close to the arc of the turn that mystery jet made. I'd say it was about a half mile toward Enterprises, so let's find a road heading back that way. I think we passed one a couple hundred feet along here."

They located the south-running road, Trout Brook, and turned onto it.

"The light is flashing faster, Tom," Bud exclaimed. "Wait! Jetz! It's gone solid. We've got it now." The dark-haired flyer was almost ecstatic.

They had reached the point practically half way between Hoffman Road and Enterprises when Tom let out a shout.

"There it is!" He was pointing to a small grove of oak trees to their left. "See it? Up in the trees. Call Harlan."

Bud did. Tom pulled off the road and jumped out of the car while Bud tried to get a TeleVoc connection. Tom's latest version had a much wider range and could make a connection at up to a full mile. But, they were just a little too far away from Enterprises.

Next he tried subvocalizing for a connection to Gary Bradley, the Security number three man. Gary had recently switched shifts with another employee on vacation so he was working days.

"Yes, Bud. Gary here. What've you got?"

Bud told the man where they were. "We found it, Gary. Tom's making like a monkey and climbing up to see what condition it's in."

"That's great. I'm just turning off Hoffman and should be there in five. I'll let the rest of the teams know and get a truck out here with a cherry picker to lift it out and get it back home. Out."

By the time the flyer reached the bottom of the tree Tom was already half way back to the ground.

"It's a little crumpled in the front and one of the canard wings in front snapped off, but it's salvageable," he told his friend.

An hour later Tom, Hank and Arv stood looking over the scale aircraft back at Enterprises.

"What do you think happened?" Arv asked. Hank had filled him in of the sudden course change and disappearance of the test model.

"My guess is that whoever was in that jet had some sort of override controller. Probably one that scans through all the normal control frequencies and then can lock onto the appropriate one. I'm going to have to install a signal scrambler before we try another test,"

Tom told them. “Good thing it had that kill circuit.” He nodded to Hank.

“I’d ask the dumb question about ‘why would anyone want to steal the model’ but I can guess at that one. But,” Hank said, “how would anybody know we were flying the test jet today and be in a position with that jet to swoop over and try to steal it?”

Neither Tom nor Arv had an answer for that.

Harlan was also stumped when Tom put the question to him half an hour later. “What I can tell you is that the tower tapes show something flying about fifteen miles south of us starting an hour before the test began. And,” he added looking worried, “going back for at least a week we have the same thing. Mystery aircraft, on no declared flight plan according to the FAA, circling at about one thousand feet in that same area for up to five hours at a time.”

“What could that mean?” inquired Arv.

“That means somebody was waiting for the model to be in the air and intended to steal it when they got the chance. Which means that someone knew about it and had a pretty good idea about when it might be ready for testing.”

He looked at them both before adding, “And that means we might have a mole at Enterprises feeding them the information!”

CHAPTER 12 /
DELIVERY AND DISAPPOINTMENT

TWO DAYS later the model of the three wing aircraft was good as new and had completed a pair of flight tests. In the tower the RADAR and electronic signature detector was manned by one of Harlan's Security team. There had been no sign of any aircraft that they couldn't identify as being from the area.

With many other things he needed to attend to, Tom sought his father's permission to finalize and pack up the model for the demonstration. Hank and Arv would accompany it and perform the piloting duties.

"Do you want us to take it out this early, Tom" Arv asked.

"I suppose I ought to check to see if they can take it this soon. I'll give them a call," Tom ordered.

Once contacted, the liaison for the Air Force had to laugh. "Leave it to your folks at Swift Enterprises to want to deliver the first aircraft two weeks ahead of schedule. Sure. Send it out to Nellis in Nevada, but I have to warn you that it will just sit in a hangar until the demo. I can let the guys there know it is coming. But after they give it the once over, someone might sneak in a flight or two."

Now Tom laughed. "This one is a fully-functional *one-sixth* scale model. I doubt anyone will want to ride on it at Mach speeds. When the demo time comes we intend to send a few of our engineers to give the brass a demonstration or two. Then, if there is interest we can leave it and teach a few of your test pilots how to control it."

Details were discussed with several possible delivery dates closer to the actual demonstration mentioned, and Tom hung up twenty minutes later after deciding to not ship out early. It would allow for more testing.

His father was even more pleased.

"Well, past performance is no guarantee, but the companies that announce readiness early generally get a better mindset and greater attention than just-in-timers. We might be able to turn that old project into something. So, how is the model flying?" He only asked because he knew of the previous slow-speed instability.

"By forcing the computers to take control of wing position at anything under two-eighty, even for landing maneuvers, we can keep it level and stable. I'm just worried that the full-size jet may have an even larger problem than the model."

"On the other hand," Damon said with an encouraging grin, "the

big jet may be what gets rid of that final instability. It might actually be a matter of size."

Now, Tom returned the hopeful grin. "Perhaps. We'll see. Anyway, now that I know we can get it to them at any time we have awhile to perfect things. And, I can still work on my Mars dome."

"How is the large structure coming along? Will you be ready to assemble it soon?"

Tom nodded. "The individual panels are about eighty percent finished and awaiting assembly. That's good except once we found out that heat seaming them together isn't going to work, it still needs my coming up with an adhesive that will be air tight, stay flexible in the wildly fluctuating temperatures, and can hold together with the inflated air pressure inside."

They talked about several of the Swift adhesives but Tom had tested them and nothing seemed to give him all three capabilities.

It was Mr. Swift who came up with the solution.

"As you have told me, SwiftSeal Number Six gives you the flexibility and the air tight functionality, it's just a few percentage point off perfect for the holding tight given an internal force from the atmosphere. Right?"

"Yes."

"Okay. Do you know what spline is?"

Tom thought. "Oh. You mean the stuff that holds screen material stretched in a screen door?"

"Right. It compresses and fits tightly into a channel in the doorframe. Is it too late to have the ladies over in Uniforms sew in a strip on one side of each panel featuring a built-in channel and on the corresponding edge adding one with a sort of spline-like bulge? You could line the indent with the adhesive."

"I like it!" Tom declared. "And, it is probably just the thing. I'm going over right now to see. I'll let you know. Thanks, Dad!" And with that, he was out the office door, his running footfalls heard going down the corridor.

Outside the building he ran into Bud.

"Where's the fire?" the flyer asked.

When Tom told him about the giant habitat tent and his father's suggestion, Bud was intrigued. "That sounds great. Listen, I'd love to go in with you, but I've got to run. Good luck with the Major!"

Moments later Tom was facing the stern face of Marjorie Morning Eagle.

“Funny you should drop by, Tom. I’ve had an inspiration about the sealing of our habitat.” She proceeded to outline exactly the idea Tom’s father had given him. With each sentence she spoke, his face dropped more and more until his mouth sagged open.

He was about to say something when a giggle came from behind him. Spinning around he saw Bud doubled over in laughter at the door.

“What?” Tom demanded. “What’s so gosh darn funny?”

“Your face, Tom. Don’t you know what day it is?”

Tom considered a moment and answered, “The end of March. The thirtieth or thirty-first I guess.”

“Check again, skipper. It’s the first of the following month. As in April Fools Day! I called the Major here right after you walked away. Your face just sort of dropping like that was priceless!”

Tom turned to face the large woman. “You were in on this?”

“Oh, Tom. I’m sorry, but Bud assured me this would be a good joke on you. Don’t be angry with him. Or, me for that matter.”

Tom relaxed as he saw the humor in the situation. “Okay. You both really got me with that. But in my defense I’ve been so worried about the habitat and getting the panels to stay together that I never saw that one coming.”

With his friend at his side, Tom and Marjorie and two of her lead seamstresses discussed the nature of the add-ons. It seemed to be both feasible as well as an easy-to-add part of each panel.

“We’ll have two test panels outfitted with it in two days—” she began to promise before holding up her hand. “No. Wait. Check that. We’ll take apart the edges of the small model that popped apart and add it to those panels. Then, when we inflate it we can give the seal a good test. I’ll have that for you to play with by quitting time tomorrow,” she told him.

“Fine, but I’m not going to add any adhesive right away. I want to test just the spline concept first. Then we go for permanency.”

On his way back to the office he received a TeleVoc call from Art Wiltessa.

“Tom? If you have a spare hour today or tomorrow I’d like to meet with you over at the Construction Company. Hank and Jake Aturian and I have been playing around with the help of some of the folks over there and think we’ve come up with a bit of a revolutionary way to make a lot of large carbon fiber panels and pieces.”

Tom was full of questions, but Art begged off until the inventor would see what they had devised. The meeting was set for two o’clock

the next day.

Before lunch, Tom called Bud to invite him along. “I’m not certain what all this is about, and it better not be another April Fools joke, but since it is now the second, I’m trusting that we will be seeing something pretty neat. You interested?”

“You bet. Let’s do lunch at Chez Chow, in your office, that is, and then we’ll drive over together.”

When he arrived the western cook was just setting up the dishes.

“Wahl, howdy thar, Buddy-boy,” he greeted the flyer. “I hope yer ready fer some mighty fine vittles today. Some o’ my right famous roadrunner in a bag!” he declared.

“Ugh!” Bud retorted. “Some great eating that ought to be.” He stuck his tongue out and grimaced.

While Bud and the old chef frequently bantered about the foods that Chow once cooked in the open prairies of Texas and New Mexico, food Chow threatened to serve him if he didn’t behave, it had all been in good fun until the “rattlesnake stew” incident.

On that occasion, he had served Tom and Bud a tureen full of a stew that sat in the middle of a coil of unidentifiable cooked meat. The westerner had primed Tom to let Bud off the hook, but only after the flyer had taken at least one big bite, by letting him know that it was actually a chicken sausage he had sewn a rattlesnake tail onto.

The boys had chowed down and had second helpings of the delicious concoction. It was only as he was clearing the dishes that day when Chow let the label from the sausage fall onto the table. It had read:

Contains 100% rattlesnake meat, salt and spices.

Since that day Bud was never certain of what he was being served when Chow’s lunch plates were revealed.

“Now, don’t ya worry, Buddy-boy. This roadrunner is ach’chally a good, ole American roasting chicken. No lies. An’ it is really cooked in a bag. You’ll like it. Trust me,” he added giving Tom an exaggerated wink that Bud saw.

With a gulp he picked up his fork and took a small bite.

“It’s chicken!” he said almost in disbelief.

“What’d I tell ya? Sheesh!” With that Chow turned around and walked out of the room.

“Did I hurt his feeling?” Bud asked, genuinely concerned.

“No. I don’t think so, but you do have to trust him. After all, he never told you that stew had chicken sausage in it. I did. All along he

kept calling it rattlesnake. Anyway, just eat and smile when he comes back with the dessert."

Chow was back ten minutes later with Boysenberry cobbler and fresh-made vanilla ice cream for them.

"Best roadrunner I've had in ages, old-timer," Bud complimented him. "Oh, and in case I didn't mention it, I love the bright red shirt. New?"

"Yeah. Like it? Ya ought ta see it outside. Got all sorts a little silver threads in it that catches the sunlight right purty like. Almost sparkles right off'n my old body! It's a real hit with the ladies down at the Elks Lodge dances."

He remained while they ate and then cleaned up as they left for their meeting at the Construction Company.

"So, what are we going to see?" Bud inquired as they drove one of the two-man electric runabouts out the gate and down the road to the site of the original Swift factories, now a gathering of large assembly halls and fabrication buildings.

"I have no idea, except that Hank once told me he and Art were working on a way to make a *Pigeon Special* in just ten parts, and five of those would be control surfaces."

"Neat. Now I'm looking forward to it."

Art met them outside of building four, the largest of the structures and the one where the majority of construction on planes, jets and spacecraft components took place.

"Hey, skipper. Bud. Glad you could make it. Hank had wanted to be here but he just left to make a small change on that triple-winged model. Come on in and I'll try to do our new baby justice."

Once inside Bud let out a laugh. "That looks just like a giant silk screening machine," he declared, "that's been mated with a vacuum-form machine."

Tom let out a whistle as Art walked them closer.

"We have always had a bit of an issue when making larger carbon fiber components. The bigger they get, the more difficult it becomes keeping them stiff enough to get them into a curing oven. That, plus the size of the ovens are just about unmanageable. This takes care of everything."

As he had been talking he had also been maneuvering a large plastic mold into the bed of the machine using an overhead winch. Tom recognized it as the lower half of one of his drone aircraft.

"We keep the various fiber sheets on large rolls—carbon, Kevlar,

woven Durastress, graphene, and even rip-stop nylon—over there," he told them pointing at six giant rolls of material, each more than ten feet thick. "All we need to do is put in the mold, set the computer for a known load or manually pull our own mix, like this…" and a press of the button started the process.

Two layers of the tight carbon fiber weave were drawn over the mold followed by a layer of a yellowish material Tom recognized as Kevlar, and then two more carbon layers, all perfectly aligned. In all it took less than one minute to complete.

"Care to push the button, skipper," Art offered, pointing at one marked **FLOOD**.

Stepping forward, Tom replied, "Sure," and pressed it. Instantly the top of the machine closed down and a pump could be heard.

"That's the resin being pumped inside. It will change in… about…" and the tone changed. "Now. It is now undergoing vacuum to compress all the layers into one and draw off the excess resin.

Another minute went by before everything shut down except for something that sounded like another small pump.

"Just keeping the vacuum for another few minutes," Art explained as an armature lowered into the top of the bed. "That's the setting microwave emitter. The matching one is underneath. Watch it."

They moved even closer and saw that the emitter, a fully enclosed tube no thicker than the fat end of a baseball bat, moved from one end of the bed to the other, and then back again. The small pump now shut off. The microwave arm made one additional back and forth run before withdrawing, at which time the top of the machine reopened.

Inside was a perfectly formed and cured bottom half of a drone.

"Now, we manually pull it, trim it and it's ready for the final hardening that we do in one of the high-temp paint booths. Five minutes start to finish here plus two hours in the hot room as opposed to more than fifteen hours the traditional way, assembly of the three separate pieces we would have to create, and at that have an eight to ten percent fail rate."

"As Bud would say, 'Jetz!' That's phenomenal, Art," Tom said.

"Unfair," protested his friend. "Now I don't have anything to say except maybe 'ditto!'"

"We can mold an entire Toad in a morning and figure that if we had to build a second *Sutter*, instead of taking three months just to form the panels plus about nine thousand man-hours of labor, we could build *Sutter II* panels in five weeks with just four people in one

shift, cutting man hours to just nine hundred."

Tom's giant cone-shaped spaceship had been incredibly labor intensive, and while it was built in an effort to possibly protect the Earth from the former planet Pluto that has mysteriously disappeared and then begun hurtling it toward the sun—with Earth right in the way—it had only been through monies guaranteed by the federal government that Enterprises had been able to built it at all.

"I don't know what to say, Art, except that you and Hank deserve bonuses and extra vacation time for coming up with this. It's… it's just incredible!"

He was already making a mental note of the first use he wished to put it to: creating the numerous wall, floor and roof panels that would be required to construct the housing units to be erected inside of the finished Mars dome.

* * * * * *

Hank stepped out of the Swift cargo jet and into the springtime rain that had been blanketing Fairchild Air Force base for more than three weeks. He could not fathom why, with the forecast set for at least another week of the same, that a call for a pre-demonstration had been set for this location. Practically every other base *not* in the Pacific Northwest was unseasonable dry, but up here in Washington state, it was "weather as usual" for the season.

But, an official letter from Congress had arrived three days earlier directing Enterprises to bring their entry to the West Coast on this day.

The man who had been hastily called to act as their liaison, Major Timothy Simonson—nicknamed "Slick" by his squadron comrades—walked over from a waiting car, an umbrella clutched in one hand.

He walked up to Hank and extended a hand. "Welcome to ADF, Mr. Sterling. We only just found out about your arrival. Hope you enjoy a little light shower."

Hank laughed. "Yeah, I do, but our idea of a little shower in upstate New York may be a bit different that yours out here. By the way, what does ADF stand for?"

"Always Damp Fairchild!"

With another laugh, Hank told the man, "I love it when something so simple is so descriptive. Is there going to be a truck for us?"

"A truck?" The Major was puzzled. "The communiqué said to expect a model. Can't you just carry it?"

Hank made a "come here" motion with his right index finger. "You

tell me," he suggested leading the way back inside the aircraft.

"Holy sh—" started the military man. "Pardon me, sir. No excuse for rudeness, but just what the… uh, *heck* is that?"

"That," replied Hank, now also puzzled, "is the one-sixth scale *model* of the aircraft we have been requested to demonstrate to you guys."

Spotting a jump seat against the port bulkhead, the Major lowered himself into it. He wiped his damp face with one hand and let out a sigh. "Oh, boy! A major bollux job. The letter that came this morning told us to expect a small flying model that could be demonstrated in our large hangar while we get lots of video and photos of it." He hooked his right thumb over his shoulder in the direction of a large structure Hank had spotted earlier. "Nobody said anything about this monster!"

Hank sat down in the next seat. "Who told you this was some dinky model airplane? Our contacts in D.C. know exactly how large this is."

"Umm, some Senator or Congressman from Nevada. Weasily little guy from the picture I found on the Internet, fresh out of the mold and green as they come. I take it he *isn't* one of your contacts, huh?"

"No. I need to go forward and use the radio to call back to Enterprises and report this. Come along if you want." They two men stood and moved to the cockpit where Hank picked up his radio headset and pressed the button. Red Jones who had accompanied him as co-pilot looked on with curiosity.

"Swift Cargo Three to Home. Swift Cargo Three to Home."

The radio came to life in his ear and he reached over to turn on the speaker so the Major could hear. "Enterprises here. Go ahead."

"Enterprise, Hank here. Patch me to either Tom or Damon, please. Priority two. If not available, Harlan Ames."

"Roger." There was a half-minute pause and then Damon came on the line.

"Hank? Damon Swift. What's going on?"

Sterling told his boss about the apparently false directive and the probable involvement by the junior senator from Nevada. Damon swore into his mic at the mention of the man from Nevada.

"Sorry, Hank. Hope the FCC isn't listening or I'm in for a fine. Anyway, you were right to call, although I'd have termed this a Priority One, personally. Will there be any need to perform the demo?"

Hank described the weather and the forecast. “Not for a week if that. The real demo is in nine days. Can you see if there is actually a need for this, or was it some ruse to get photographs to supply to someone else. If it is remotely legit, is there someplace else I can take this and get the military there to see it?”

Damon promised to do so. “Be back to you in about two hours. Out.”

Hank turned to the Major. “Well, sir, guess you are going to have to keep us occupied for a couple hours. Anything fun to do around here?”

“Well, clamming on the coast is too far away, so that really leaves going into Spokane. Great little diner in an old railway car if you’re in the mood for that sort of fine eats.”

After setting both the radio link to transfer to a portable unit on his belt, and the security lockouts for the jet, he and Red joined the Major in his car and they sped off base and into Spokane and what Hank hoped would be some good diner-style corned beef hash.

“Actually I’m glad this turned out to be a false demo,” Hank told the Major. “We’re still working to meet a few of the smaller specs and I was nervous that somebody might point that out.” What he didn’t mention was that the model had yet to be outfitted with the mechanics to shift wing positions. Those still had to be maneuvered into position by hand.

The call came in over his radio as they were just driving back to the base two hours later.

“Hank? It’s Damon. Okay. We have what some folks would call ‘a situation.’ It seems that the junior senator from Nevada has overstepped his bounds. He set up the false demo knowing full well that there was no ‘pre-demo’ requested by anybody. But there’s more.”

“Go ahead. I am mostly ears.”

“Harlan Ames walked into my office ten minutes ago to tell me that he has ferreted out an employee who seems to be feeding secret details out of Enterprises!”

CHAPTER 13 /
SLOWLY IT ROSE, INCH BY INCH...

THE TIME came when Tom knew he could wait no longer to help the colonists on the Moon. In spite of the threats from Wingate Aero, between the Attorney General of the United States, his New York state counterpart and the entire legal department at Swift Enterprises, it had been decided that a completely voluntary good will mission mounted by Enterprises with no Government support was not in violation of the additional wording that had made its way, undetected, into the original colony contract.

Knowing that every step taken with the small structure would provide incredible knowledge and understanding that would be needed for the much larger Martian structure, Tom spent three days running simulations on his computer just to determine the specific and best method of folding and rolling the collapsed dome so that it would create a cone for transport.

He asked the employees in the Uniforms department to create a full size test piece for practice. Marjorie Morning-Eagle suggested it be made from heavy muslin.

"It won't be as thick, but we can treat it with something to make it a bit stiff like the puff tent is."

"Puff tent? Has Bud Barclay been visiting you?"

She laughed. "Nah. That's courtesy of a couple of the girls. Both of 'em were born in Japan and have problems with pronouncing 'structure,' so they started calling it that. It sorta stuck over here."

Tom asked when such a thing might be ready.

"Hmmm. Day to order, day to ship and cut, day to treat and another day to sew. It's Thursday, so with the weekend in there, it's gonna be next Wednesday."

He asked where the fabric would be shipped from.

"Probably Chicago. Why?"

"Well, what if you place the order right now and I have Bud or Red Jones or someone fly you out there to pick it up today. You would be back before quitting time. That cuts out a lot of waiting around."

"Can you authorize Saturday overtime?"

"If you can give me the practice piece on Monday, sure."

It was agreed on and Tom hung up knowing that it was going to be worth the extra money.

The Uniforms manager called him on Monday afternoon. "We're

about seventy percent finished," she informed him. "Give us another hour and it'll be ready for you. Where do you want it?"

"I'll have a truck at your door in an hour. We're going to take it to hangar nine. Many thanks to you and your ladies, Major!" Tom cut the connection and called Hank Sterling.

"Can you get me nine people in an hour?" He explained that it was to practice the fold and roll of the dome stand-in.

"Sure. Are we going to make a lot of try and see runs or is there a diagram to follow?"

"Assuming that the computer simulations are correct," Tom replied, "then I have a step-by-step process to follow. It should take us just twenty minutes to run through it all. I'd like to do three runs before we tackle to actual dome. My intention is to practice today and tomorrow morning and roll the real thing tomorrow afternoon. If we succeed, it goes up on Wednesday!"

Just as Tom was beginning the one-mile walk to the hangar he heard a horn of a truck coming from behind. In the cab was the familiar face of Marjorie Morning-Eagle, driving, along with a man Tom recognized as being from the Transportation department. Evidently, from his expression, the Major had insisted on driving. They stopped and picked up Tom.

"Passenger, Daren?" Tom asked with a twinkle in his eye.

Pointing at their driver with his left thumb, he replied, "She wouldn't have it any other way!"

Once at the hangar it took seconds to unload the roll of light brown fabric. It was heavier than it appeared and took the combined efforts of four of the men. As it was being placed in the middle of the hangar floor Tom asked, "Why is it so heavy?"

"Well, forgive me but I thought you wanted to practice on something that would be like the real thing. Between the thick fabric and the stiffening agent it only weighs eight more pounds than the real thing."

Tom asked for forgiveness. "It all makes sense and is perfect. I don't know why I thought it would be like a bundle of feathers. Thanks for the hard work. Would you like to stay and watch us wrangle it around?"

She snorted. "Naw. I've seen too much of that thing in the past few days. It's yours. Have fun."

Tom got everyone organized and explained what they were about to do. "Everyone will need to remove shoes for this. Socks are okay, as when we get to the real thing you will be wearing disposable booties. Let's give this a try."

With only a single false fold, the first practice went fine. It took a little longer than Tom or his computer thought, but only by five minutes. The second time went well at nineteen minutes and a few seconds. But the third was their best at under seventeen minutes. Plus, the ending conical shape was tight and straight.

"Great, guys. We'll meet here at eleven tomorrow morning for one last practice, Chow will provide a lunch, and then we do the real thing at one. Have a great night."

The following day the practice was slightly better than their third run the afternoon before and everybody was eager to tackle the real thing. It had been carefully laid down on a freshly scrubbed and dried area of the hangar floor next to the practice area. With lunch still a half hour away Hank asked Tom if they ought to just do the actual dome while they waited.

"I can't see a reason why not," he replied.

So, by the time Chow and one of his assistants pulled up just outside in his fancy mobile kitchen, Tom and his team were just wrapping the last of the heat resistant film around the cone and sealing the ends. And, though he hadn't taken any measurements, he could see that it was a good, straight and even job. It was thirteen feet across at the bottom and just nine feet tall.

The inflatable structure for the Moon was ready to go.

"It certainly is purty," Chow said when he saw it. Everyone had pulled over a pair of waiting tables and set of chairs when the chef came in with the first four plates balanced on his forearms. Once he had placed them in front of some of the men he looked back at the cone. "Tom? That thing's gonna expand inta that huge white puffy buildin'?"

"It sure is. Why?"

Chow scrunched up his face. "Wahl, it don't look like it's much o' anything like that. Sorta like some cone o' cloth waitin' ta be turned inta kitchen work overalls."

He walked back out to get more food shaking his head in amazement. When he put Tom's plate down he asked, "Kin I go up with ya? I'm thinkin' mebbe those Moon folks could use a good meal ta raise their spirits while you raise that buildin'."

Tom agreed. "Can you be ready to fly out to Fearing Island tonight?" he asked.

"Heck, son, I'm ready right now!"

At five the giant *Super Queen* with the large cone in its forward storage pod took off from Enterprises. It had been necessary to use the larger aircraft when it became clear that the cone wasn't going to fit into the *Sky Queen's* hangar in addition to the multiple tanks of air

and the liquid foam that would fill and harden inside of the support tubes for the dome.

While everyone slept in the guest quarters, a team of Fearing personnel hoisted the cone onto the top of the *Challenger*. For this trip the top repelatrons had been removed and a flat deck attached. On this sat the cone, now firmly held down by a mesh Durastress net.

It was just a few minutes past seven when Tom and crew entered the ship and took off. But, unlike most times when the mighty ship reached about five hundred feet and then zoomed off into space, this time it was necessary to keep up a slow and steady acceleration, never exceeding two hundred miles per hour until they reached the uppermost atmosphere where there was almost zero resistance to disturb their balanced cargo.

From that point the trip went like any other and they touched down on the lunar surface several hours later. After walking the final five hundred feet, necessary to avoid kicking up lunar dust that would fall back onto the buildings, Tom, Bud and Hank were greeted by the colony manager, Frank Williams—the man who had been in command since the first day the twenty ships bearing the original colonist arrived.

"Tom," he said shaking the young man's hand. "And Bud. And…?"

Tom introduced him to Hank.

"Well," Williams said somewhat wearily, "it is a… well, if not a pleasure then at least a relief to have you come here for a visit and not another hearse run. To what do we owe the pleasure?"

As they walked through two of the remaining buildings Tom explained about his inflatable replacement structure he intended to swap the four smaller inflatables with. He finished with, "From above it looks as if everything else up here is still intact. Is that a fair observation?"

"Yeah. That stuff you coated the insides with has helped on more than a few occasions. We got caught in a micro-meteor shower a few weeks back. Left about a hundred pinhole punctures and a few spider web cracks, but we never lost atmosphere or integrity. Now, I don't want to seem inhospitable, but when can we get you the heck out of here? And by that I mean when can you have the new dome up so you are able to leave? You see, we got word that the Wingate folks are mounting a mission to come up here to assess the damage. They took off without much notice from some deserted spaceport in South America two days ago and have radioed to say they'll land in about thirty hours from now."

Tom bit his upper lip. "Oh. That isn't very good news. You see, we are here against their wishes and without any support from the U.S. Government. It's just that I can't sleep very well knowing how

vulnerable you people are. And," he looked meaningfully at Williams, "how much you want to get the colonists back that we helped evacuate. But I'm afraid that if we put up the dome and they get here, all hell will break loose, and I'm not certain they might not just try to ruin the dome. What would you suggest?"

Frank Williams though for a moment before answering. "I think the remaining men up here need to hear about this and take a vote. That's what I think, Tom."

Ten minutes later the remaining men of the colony, now half of what the population once was, had assembled in the only building that featured a large enough room for all to have a seat—the sleeping quarters.

All the men were pleased to see Tom and his team, and were doubly enthusiastic once the nature of their trip was explained.

But, they were about evenly split between those who said to put the dome up immediately and those who suggested that Tom ought to move his ship off for a couple days—until the Wingate people left—perhaps even taking the four smaller building with them as well.

In the end Frank cast the deciding vote for installing the dome as quickly as possible and then having the *Challenger* move to a safe and unseen location.

Tom radioed the ship and the process of lowering the large cone to the surface began. Two hours later a small electric tractor had pulled a trailer over to the area once occupied by the first of the two demolished buildings. That one had taken a direct hit by a chunk of space rock no larger than a golf ball, but it had skipped on the surface and had taken them completely by surprise.

The trailer was unloaded near to the next building and then returned to the ship to collect a portable crane and the first of the tanks of self-hardening foam.

By the time they had been on the lunar surface for five hours everything was ready to go. The smaller domes had been deflated and lifted out of the space. The new dome would be moved, still tightly wrapped, with the hoses to carry both the foam as well as the breathable air to fill the inside of the dome training up and over the building between the open space and the other missing building.

Things went more smoothly than Tom might have hoped for with the cone in place dead center of the surrounding buildings and the outer wrap removed just thirty minutes later.

Four two-man teams stood along the four surrounding walls ready to open and then attach the four airlock sections to the corresponding building hatches as the dome fully unfolded.

With Frank giving him a thumbs up, Tom turned the first valve

letting the inner atmosphere into the dome to get it open and expanded. Ten seconds later Hank and his assistant announced that the cone was beginning to unwrap. “You want me to give it some help, skipper?” he asked.

“No. The computer says it will all go smoothly if we just let it happen as it wants to. But, stand by in case the simulation is wrong.”

There was no need for anyone to help. Several minutes later the cone almost magically fell apart and the different sides of the dome rolled out a few yards. As the top began to rise and the sides continued to slowly straighten, the teams moved in and began performing their work of attaching the dome to the colony.

In less than an hour it was finished. The air had expanded the dome to full height filling the old space, the foam had been pumped into the maze of tubes and was showing the first signs of hardening, and two of the installation teams had been lifted by the crane so they could use cables and locks to attach the upper edges of the dome to the solid buildings around it.

While Hank took the rest of the crew and all of the equipment and empty tanks back to the *Challenger*, Tom and Bud gave Frank and his people a tour of the dome.

“While this wasn’t built to allow enough sunlight in to grow anything, you might consider using it as your housing building. You can see there are raisable partition curtains so you can make this one large space into two, three or even four spaces. I’m thinking for privacy purposes as well as for the utility of it all. That way you can move in here and devote your current residence building to additional grow facilities.”

One man in the back raised a hand. “When can we get more of these, Mr. Swift? And, why didn’t we have these in the first place?”

Tom looked slightly embarrassed. “The answer to the first is as soon as all of the legal aspects are worked out. Our hands are tied. I told Frank here that we are doing this without permission from the Feds and against the legal demands of Wingate Aero. If and when that all is settled then we can bring these up practically weekly until we are told that’s enough. As to the second question, that is a political hot potato and I have no answer or right to even guess. For that, I am truly sorry.” This did not seem to satisfy the man, but he asked no further questions.

The one man not in the new dome had been manning the radio. He came rushing in to announce that the Wingate ship was ahead of schedule and would arrive in five hours.

Tom bade them all goodbye and reminded them to not volunteer anything to the Wingate people.

"But," he told Frank Williams as he was pulling on his helmet ready to step into the airlock, "if they try to do anything to damage that building, have your radioman squawk code three-three-three and we'll come in at top speed."

When Tom and Bud returned, the ship was in takeoff standby. They lifted off a minute later, skimming over the Moon's surface and then up and over the thousand foot mountain range to the north of the colony.

The ship touched down in the dark shadows and waited. Tom tuned into the colony's main radio frequency so he could monitor anything between the approaching ship and the colonists. He only had to wait about fifty minutes.

"This is Wingate One calling Wingate Lunar Colony. Come in. Wingate One to Wingate Lunar Colony. You will answer me!"

Exhibiting very little enthusiasm, Frank's voice came on. "This is *the* lunar colony. We read you. We didn't ask you here, so what do you want?"

"Don't be ungrateful. You wouldn't be here if it weren't for the generosity of the Wingate Aero companies. Stand by to receive us. We will touch down next to your building in two hours."

"Wingate One. Be advised that you will most definitely *not* touch down next to the buildings. You will observe a one thousand foot safety zone. These death traps you built can't withstand the shock from your rocket exhaust. I repeat, stay at least one thousand feet away!"

An unidentifiable growl could be heard before a gruff voice said, "Fine. But be prepared to receive our team of six. We will remain with you for two weeks while we study what you might have done to impede the safety of our buildings. Out!"

An hour later the radio crackled back to life. "Wingate Lunar? What is that in the middle of our buildings? What is that white thing?"

"That is a safety covering over the second of your faulty buildings to break apart killing several of my people. That is what that white thing is."

"Well, plan on that coming down when we arrive. It is unauthorized and it *will* go."

"Approaching ship. This is Lunar Colony One. We are a free colony and therefore are not subject to you or your company's wishes. You were paid by the U.S. Government and have zero claim on this colony or any of the buildings or assets down here. You are hereby notified that your presence is considered hostile and you are also notified that you have no permission to land. Three three three,

and out!"

"That's us, people," Tom called out. He wasn't certain what he was about to do, but knew that he promised to assist the colonists. The mighty *Challenger* took off and soared into the dark lunar sky.

Tom keyed his microphone. "Wingate One. This is the Swift ship, *Challenger*. You are hereby notified that you will not land on the Moon, at least not within fifty miles of the colony. A radio call has been placed to Washington D.C. letting both the State Department as well as the President know that your intentions appear to be hostile. Turn back."

The answer came not as a radio message but in the form of a missile streaking in from the direction of the incoming rocket. It was a fairly simple task to move to one side and to hit the missile with a repelatron beam. It instantly began to gyrate wildly until a self-destruct circuit was tripped, exploding it harmlessly three hundred miles from the surface.

"No more pretending," the radio call came in. "We are the free peoples of Brungaria and lay claim to the Moon. We will destroy you and your puny colony!"

The rocket was approaching quickly. Much too quickly to be attempting a landing and Tom could see at least six of what appeared to be open missile tubes! He directed three of his unused repelatrons into the rocket. Even at a distance of several hundred miles the effect was almost immediate and impressive. The body of the rocket jerked to one side with the entire tail assembly snapping off to go tumbling through space, exploding a few seconds later. Tom did a fast calculation and determined that the forward portion of the Brungarian ship was in danger of crashing onto the surface of the Moon. Wishing to avoid an international incident he next calculated a new trajectory for the remaining two-thirds of the rocket. The repelatrons were aimed and gave the out of control rocket a good nudge.

"There," he radioed. "You will now pass around the back of the Moon and we will meet you on this side to give you a shove toward the Earth!"

The *Challenger's* maneuvers went as expected and after assuring that the rocket was headed for an orbital insertion, Tom headed back to Fearing Island.

It was a most curious thing that although RADAR and visual imaging caught the returning rocket four days later—and several radio contacts it made as it neared the planet were recorded—there was absolutely no complaint lodged by Brungaria, nor were there any news reports on the subject.

CHAPTER 14 /
THINGS GO A BIT SMOOTH FOR A CHANGE

THIS WAS a source of confusion until three mornings later when Tom and Damon received a visit from Harlan Ames. As the Security chief sat down in one of the leather conference area chairs he motioned for the two Swifts to join him. They both sat down and watched as Harlan opened his briefcase—something he rarely ever carried—and pulled out a letter-size white envelope.

"These," he told them as he handed the packet to Damon, "came to us this morning via courier. Now, before you start reading let me tell you also that this courier was in a black limousine and was accompanied by three New York State Trooper motorcycles.

Damon, who had just taken out his reading glasses, slid them back into his shirt pocket. "A limo?"

Ames nodded. "That's right. The car and escorts pulled into the parking lot across from the main gate. You know… the one that was going to be a housing site at one time? Anyway, two of the troopers walked across the highway and had a word with Davey, our guard. He checked with me and I hustled out there."

"Who was it?" Tom was anxious to know.

"I'm getting to that. Anyway, I spoke with the troopers and it turns out they are actually FBI, and were escorting a foreign dignitary carrying a message for us."

"This is beginning to sound like something out of a spy movie," Mr. Swift commented. "But, go on. You've got my curiosity up."

"Mine, too," said Tom.

"Well, I let them pull inside the gate for a little privacy. The man in the limo would not get out, but he had good reason not to. You see, he is the foreign minister from Brungaria and had pretty much been snuck into the country via Canada earlier this morning."

Tom and Damon both gasped. "Brungaria!"

"The very same. Anyway, he told me a few very interesting things and then gave me these papers. They left a minute later and I assume they are heading back to Canada and then home. Now you may read."

With a wary shake of his head, Damon Swift again took out his glasses, put them on and opened the ornately-decorated envelope. It had a fancy seal embossed with gold foil and indicated in five languages that it was from the government of Brungaria. Inside was a single page.

"Go ahead and read it out loud," Harlan suggested.

"Okay. 'Greetings are offered to the free peoples of the United States of America from the free peoples of the great nation of Brungaria. Unfortunate circumstances have torn our two countries apart in the past. It is to be recognized that previous government rulers have had no interest in working together. They were accused of crimes against both your country as well as certain individuals and businesses located within your country. For this we can only offer apology. In recent days a space vehicle supposedly from Brungaria was made inoperative by a space ship belonging to the Swift Enterprises organization. This letter is not to make complaint over this. Instead, this letter is to assure the peoples of the United States of America, and the peoples owning and working at Swift Enterprises, that this rocket was once a part of the Brungarian Army but was lost with another such vehicle during the revolution, to peoples unknown. We assure you that this was not a mission from Brungaria and we assure you that no troubles will be caused over this. We will freely work with your military or security organizations to hunt down those who would use our names in the course of doing harm.' "

Damon took off his glasses and looked up. "Interesting," he said.

"It seems to explain why there was no brouhaha from them over Tom disabling that rocket," Ames stated.

"Can we believe it?" Tom asked.

Taking back the page and envelope from Damon, Harlan shrugged. "Well, that is a job for the State Department to sort out. Their minister requested that I forward this plus another envelope he gave me that is to remain sealed to Washington as soon as possible. He seemed genuinely sincere about this and even hinted that the Brungarian government—the current one, that is—is nervous about being seen as attempting to damage the Moon colony. They don't want that high-profile sort of bad publicity."

"How will you get those down to D.C.?" Damon inquired.

"Bud is waiting at the Barn with Tom's Toad jet. He'll fly me down and I'm expected at the Pentagon to meet with the Secretary and the Joint Chiefs of Staff at one today. I'll call once the meeting is over and let you know." He rose and left the room without another word.

"That would seem to explain why no real mention of the incident has been made," Tom told his father. "The better news is that I have a message on my computer from the Moon colonists telling me that the dome is working great. I suggested they move their bunkroom into it and then get ready to set up their spare hydroponics equipment in

the old building to give them more oxygen and food capability. I also left the four smaller buildings and hear they are using at least two of them for storage."

With an undisguised smirk, his father asked, "And when do you go up with a delivery of additional equipment, Son. Surely they don't have enough spare parts to build an entire production line. Well?"

Tom blushed. "Uh, okay. I also got a message from IHSC yesterday telling me—"

"Wait. IHSC?"

"Yes. International Hydroponics Supply Corporation, in Tokyo. They said that they have a 'spare' production line that is the right size to fit into the empty building up there and would be pleased to supply it for free, but would like to have permission—and transportation—to see it in action in a few months and to take promotional photographs and videos of it in operation in lieu of payment."

Damon now forced his face to look serious. "And, how do you suppose they ever learned of the need for such equipment. Do you think the folks at the colony might have contacted them on the off chance they might be of some assistance?"

"All right. You've caught me. I figured in for a penny, in for a pound!"

"And, a few yen as well?"

"Yeah. It started out innocently. I contacted them two days ago about what all it would take to build a hydroponics set up large enough to support our possible Mars colony. Without mentioning Mars, of course. That led to them inquiring about the Moon setup and how we are an honorable company and had recovered the dead people a few months back, and that led to me sort of telling them how we just helped set up a replacement and they offered that if the colony ever needed it, they might… well, you see where this is going. Right?"

"I do, and I approve. Not to change the subject too much, but when does the finished dome for the 'proposed' Mars colony get completed and when do you head to the red planet?"

"If everything goes on schedule, and Haz Samson is driving things at a good pace, the dome will be completed in three weeks and all of the first round of equipment ready to head up three weeks after that."

"So tell me, how in the world are you going to carry enough breathable air to fill that giant dome?"

"Tucked inside of the rolled up dome will be an air compressor. To go with that I'm building large membranes to filter out the massive

levels of carbon dioxide in the Martian air, so we end up with a dome filled with a mix of about thirty percent O2, sixty percent nitrogen, and just ten percent CO2. And yes, I know that is deadly high, so everyone will work in environmental suits at first."

"Surely it will take a long time to get the hydroponics systems up and running and to get all that CO2 taken care of."

Now, Tom smiled brightly. "You are right, but the same compressor/filter system will be taken inside where it will work to filter the air in the structure and exhaust the excess CO2 back outside!"

"Brilliant!"

Tom left the office about an hour later and walked to his underground office and lab. Once he was seated he picked up the phone and called Haz Samson's number. The same young woman answered the call.

"The offices of Hazard Samson. How may I assist you today?"

"Hello, Jeanine. It's Tom Swift. Is the giant at home?"

He heard giggling at the other end. "Yes, he's here, but he's doing a little verbal you-know-what kicking with a supplier who's late. Can I get him to call you back? Should be about ten minutes."

Tom told her that would be fine and hung up. He next called Hank Sterling to give him the news that he had finished designing the remaining wing-positioning system for the triple-winged jet.

"We'll lose one seat in each of rows eleven through nineteen, but the new seat backs you came up with, the ones that are like race car seats, let us pick up three additional rows of six seats overall, so we hit the magic number."

"That's great, but remind me how the troops keep close to their backpacks."

"Easy. Instead of overhead bins, each seat has a retractable net above it. The man or woman puts their pack in the proper net, it rises high and tight to the ceiling, and they sit down."

"Wonderful. Well, I'm looking forward to seeing the intricate set of gears and levers you plan to use to position those wings, skipper."

"Hank," Tom laughed, "once I got the picture of moving everything around clear in my mind it got pretty easy. The back wings can move forward and back by nine feet where they touch the middle ones. All that mechanism is located under the floor in the passenger compartment. The middle wing only has to arc up and over the rear wing once it is moved completely forward. That is what takes up a

little cabin space, but that's the entire thing. Each wing holds its own mechanisms for swinging back for supersonic flight."

"Glad we'll have it for the demo." Hank promised to have the prototype of the wing assemblies—with assistance from Arv—within two days of receiving the final plans.

Tom barely set the receiver back in the cradle when the phone rang.

"Hello, Haz," he said, seeing the caller ID.

"Hello, Tom. Jeanine tells me you called while I was exercising my vocal chords. Not, by the way, on anyone having anything to do with our little project. I've been waiting on a South American company to deliver a new set of screws for one of my super tankers, and they're a week late. No screws and no tanker getting underway and that's costing me about three hundred thousand bucks a day. But, I'd guess that's not why you called."

"No, just wanted to give you a status report on things at this end and see how the rest is going." He told the man about when the habitat dome would be ready and also his plans for filling it with air.

"Of course, we still are going to have to get all the structural foam up there as well as the stuff for inside. If you can tell me you will have a large portion of materials ready in two weeks, then I can get that into orbit in batches, pack it into the *Sutter* and have her make an orbital delivery to Mars so it will be waiting for us when we get there with the dome."

"Well, I've got all of the materials you sent for the pre-fabricated housing units. Those are bundled and waiting in a warehouse. The hydro conveyor system is going to take another two to three weeks since it needs to be built and tested before getting taken back apart and palletized. Food for the first two months is no problem. Oh, the one thing I'm still waiting on is the drilling equipment for water. Your Construction Company assures me they can create the necessary rig out of strong lightweight materials given another five weeks. I've asked for three and they will get it finished in four. I've got your small earth blaster for the anchor holes. Uh, do you have those anchor bolts underway?"

He referred to the self-expanding bolts, each about twenty feet long, that would be inserted into holes located each twenty feet around the entire dome perimeter. Once driven in, a small high-pressure canister of foam similar to that for the dome tubes would expand inside a bladder pushing out on eight curved plates. When they were extended by the planned two inches, these locked the bolt into the ground. Then the bolt would be attached to the dome holding

it down even in hurricane-force winds.

"Two hundred are finished with the final forty plus a spare twenty coming off the line tomorrow," Tom informed his project manager. It was a strange position for the inventor to be in. Since his seventeenth birthday he had always been the man in charge of his projects. Relinquishing overall control had been both a freeing and frustrating experience, but he was starting to appreciate it.

"Great, Tom. Not sure we'll have a load delivered before you are ready with the tent, but I've got a few ideas about what to send up first…" and they spent the next hour discussing things and creating a schedule. In the end they were both satisfied with the progress being made and what the future had in store.

Tom and his father had lunch together spending the entire time discussing the forthcoming Martian expedition. It was now only a matter of time, or so Tom thought until Mr. Swift asked, "Who is going to be in the first group of colonists?"

Tom's face went blank. "Uhhh… Oh! This isn't just a 'raise your hand if you'd like to try it' sort of thing, is it?"

Damon shook his head. "No. Now, with the understanding that it is almost a month away from the start of setting thing up, and at least a few months to get the systems working, I'd say that you have hit that time when you need to give the matter serious thought. I suggest that you contact Barbara Clack at MIT. She was involved in locating and vetting the Moon colonists. If anyone understands who is best suited for extended periods of relative isolation it's her. She was one of the original Biosphere 2 residents out in Arizona. Tell her I said to call. We trained at MIT together more years ago than I want to contemplate."

When Tom made the call, the Doctor said she would be not only happy to assist, but she was retiring in another month and might like to be considered as a possible colonist.

"My husband passed away last year and our daughter is living in New Zealand. I'm assuming that this isn't a one-way trip and that there will be the possibility of periodic visits back to Earth?"

"I'll say yes, but may I ask why?"

She laughed. "When the call went out for volunteers for the Biosphere Two project, about ten thousand applications were received. The only thing mentioned was that this was to be a long-term project. Once they let the applicants know that it was an open-ended total isolation situation, other than being able to see the outside world and communicate via telephone, they lost a good half of those people. Then, when they told the rest of us it would be a two-

year project, another three thousand cut and ran. The long and the short of it was that with each succeeding reduction in the proposed time, more and more people stayed on the list. Knowing there is an out is important."

"How often should we provide a home break?"

"Good question. No solid answer. You see, in the Biosphere we had only a few things to accomplish, and nothing very strenuous as they didn't want us using up too much oxygen. It got boring. But, a colony on Mars? Wow. Not only will people have the habitat to work with, there will be opportunities for exploration outside, scientific experiments and observations, and a whole slew of things. I would guess the proper candidates wouldn't want to come home but once a year and only then for a few weeks. And, the larger the population—hopefully more than forty or so—the more social interaction there can be and the more engaged in remaining in their new home you'll find people are. So, my answer is an unqualified 'yes, I will gladly help you find your colonists.' So, how many?"

"Probably forty to forty-five," Tom replied. "We have a colony manager and two other people from our organization already on the list. But I have to tell you that if the first dome is a success and can actually support the population, we will possibly set up a second dome right next door, tie the two together, and add another forty or so new colonists. Now what do you think?"

"I think, young mister Tom Swift, that I will lie, cheat or steal to get a chance to be in that first set of colonists. Can I drive over to meet with you tomorrow?"

They arranged the visit and Tom hung up absolutely elated. Things were falling into place and much more smoothly than he anticipated.

His TeleVoc pinged inside his head and he answered, "Tom here."

"Son, it your dad. Come back to the office. Harlan is on the line with a report on that meeting at the Pentagon. You need to hear this."

When he arrived his father was sitting in one of the conference chairs facing the wall-mounted flatscreen monitor on which Harlan Ames' face appeared.

"Hi, Tom," Ames greeted him as the young man slipped into the chair next to his father.

"Hi, Harlan. What's up?"

"Well, I'll tell you what's up. Two things actually. First, the Brungarian letter was for real. It was written on paper stock known to have properties that *only* their paper mills impart. Something to do

with the specific type of tree and acid they use. Anyway, the upshot is that we know it came from *them*. I emphasize 'them' because that's all we know. We don't really know who specifically wrote that. It was hand written by someone whose writing we have no record of. The Secretary believes that we should accept it, but with a large portion of caution attached."

"Okay, so we keep our eyes and ears open just in case. What was the second part?"

Harlan took a deep breath and let it out as more of a sigh. "It's the people at Wingate Aero. They're raising another stink over Enterprises' involvement up at the colony. They held a news conference detailing how Enterprises had gone around all channels and installed an unauthorized structure at the colony, thereby—in their spokesman's words—'placing the colonists in jeopardy, in much the same way Swift Enterprises may have had something to do with undermining the safety of the structures thereby causing the deaths of a number of brave and unsuspecting colonists.' "

He looked right into the camera and shrugged. "We know it's their shoddy work and they know it as well, and certainly the U.S. Government knows it, but the public now is being led to believe that we are the bad guys." He paused for a full thirty seconds before continuing. "What do you want me to do?"

Damon leaned forward in his seat. "For starters, are you still in D.C.?"

Ames nodded.

"Good. I'll call Senator Quintana's office and tell him you are on the way there. Fill him in on anything he doesn't already know. If there are any questions you can't answer, or if he seems uncertain what might be done, tell him the following: An official statement needs to be issued detailing that Enterprises has only and always been working to repair the poor workmanship of Wingate Aero. Second, he needs to announce a forthcoming investigation into Wingate Aero and how they managed to get the contract in the first place given that theirs was the highest bid and that they appear to have been secretly involved in writing the specification in the first place. Third, tell Pete that having the Moon colonists bail out on the project because of the dangers Wingate—really emphasize 'Wingate'—has placed them in would be a financial and public relations disaster for the current administration. If he has any more questions, tell him to call me."

With that, Damon hit the button that broke the connection. He was so angry that he got up and left the office without saying anything else.

CHAPTER 15 /
ROLL IT UP, AND MOVE IT OUT

TOM WAS befuddled by his father's attitude and anger, so he jumped up and ran out the door to find where he had gone.

He caught up with Damon outside of the Administration building where Mr. Swift was leaning against the wall breathing deeply.

"Dad? What's going on? I've only seen you this angry a couple times in the past. It isn't like you. First in the Senate hearing back a couple months and now this. Is there anything I can do to help?"

Damon looked at his son and nodded. "Come with me. I need a walk, and I'll tell you what has been coming for some time." They started off along the meandering pathway between buildings.

"You don't know this but Preston Wingate and I were incredibly good friends for years. In fact, he was one of the ushers at your mother's and my wedding. We worked closely at NASA for several years. After I took the reins here at Enterprises, he and I kept up for another year or two, but then things changed. He inherited quite a nice fortune from his grandfather and used it to start his own company."

"Wingate Aero?"

"No, actually it was a media company. His grandfather was one of the pioneer owners of television stations back in the fifties. Those were sold off to settle the estate, but Preston started up a new company making commercials and dabbling in TV production. It failed and so he started a new company in Montana. That was Wingate Aero. His only problem was he was never an innovator. It seemed that every time we came up with something, Wingate Aero had a version of it six months later. When I designed that electrical pitch hub for airplane propellers, he began selling a similar one later that year."

"Industrial espionage?"

"Not that we could tell or catch him at. Probably just reverse engineering. Anyway, a few years later, about when you turned nine, his wife died in an airplane accident. That plane was outfitted with a Wingate hub that came apart in mid-air. He publicly and privately blamed me for what I recall he said was 'leading him to building the hubs.' And, something like if he hadn't been forced into that business his wife would be alive."

"But, that's ridiculous. Blaming you for something he copied, and

evidently not very well."

Damon stopped walking and looked at Tom. "Whatever. The end result is that we stopped speaking. Even when I tried last year to contact him on a whim, I could not get through to his office. I tried again just last month. Let's just hope that Pete Quintana can put a little fear and sense in the man and we can get on with our own business."

* * * * * *

In the next two weeks incredible things happened. For starters, Wingate was served notice from the Government that they were to stop all efforts to discredit Swift Enterprises, and that having already done so nullified their original contracts, especially the hidden clause. The Moon colony was placed off limits to them and all current requests for proposals to which they had responded or might be working on were rescinded. There would be no Government work for them for a period of one year.

Next, and following Tom's meeting with Dr. Barbara Clack, hundreds of possible colonists were being interviewed, tested and evaluated for their appropriateness to be part of the project. She had run all tests on herself first and proudly handed Tom the results.

"I can go, as long as you will have me. I am eleven years older than the maximum I set up for everyone else, but I believe I can act as the colony's psychological barometer and even provide the commander with ideas and ways to keep everyone on track up there."

Tom gladly let her place her name on the final list.

The third thing that happened was the ladies in the uniform's department had set up their equipment in hangar 9 and were in the process of completing the massive dome structure. The panels were finished and one corner plus the first of the nine hundred foot sides were adhered and sewn together. They were a full week ahead of schedule when Haz arrived for an inspection.

He stood next to Tom and Damon, mouth agape, staring at the great expanse of material. In his right hand he held a sample square of the dome fabric. It weighed practically nothing making him pelt Tom with questions regarding its strength and durability. It was only when Tom suggested he hold two sides firmly and to stretch it apart —at which time Tom tried to plunge his pocket knife into the fabric, an act that only had it bouncing off—that Samson understood.

"I thought the original idea was to ship it up in sections and then put it together on site. That appears to have changed."

"Yes. As soon as we figured how to roll it all up and saw that it fits into *Sutter*'s nose section, I decided to send it ready to use. Of course,

that has meant connecting this hangar with the one directly behind and tearing out both ends, but now we have the floor space."

"Incredible," was about all he could say while they stood there. Outside he asked, "When does that get finished?"

"Another week and then we get it ready to ship upstairs. But tell me," Tom inquired, "what's the status of the hydroponics setup?"

As they walked back to the waiting car, he outlined how well everything was going. "When you're ready, I'll be ready to bring it up!"

* * * * * *

Tom's original plan had been to roll the entire inflatable structure into a single, tight package and then to transport that into orbit atop *Challenger*, push it into the *Sutter* and then zoom off to Mars. But, he quickly realized the major flaw in that idea.

It would not work. He had absolutely nothing large enough that could land on the Earth and carry that sort of bulk. Weight wasn't going to be the issue; it was the sheer size of the bundle to be balanced.

"Well then," Bud asked as they were walking from the hangar back to the main Administration building, "what's the fall-back plan? Haul out your dad's old *CosmoSoar* for one more trip?"

A few years earlier Tom and his father had vied to put the first civilian-built manned spaceship into Earth orbit. Where Tom's approach had been the sleek two-man *Star Spear* with its amazing fuel kicker and solarizer systems, Damon Swift had built the most fantastic five-stage rocket, the *CosmoSoar*. Traditional multi-stage rockets piled one stage atop another, but Damon's ship was built as a series of nested rings. The command and payload stage was in the center with the other four arranged outside of it. Altogether, it was about the height of the very first Mercury Atlas rocket, but it had the capacity to lift a payload three times that of the Apollo Saturn V rocket.

After the *CosmoSoar* had been stolen and the command stage destroyed, Damon had decided to abandon the project. However, on at least three occasions Tom had pulled the surviving stages of the old workhorse out of storage, made improvements to it, and used it to take large and heavy machinery as far away as the Moon.

"No. After our lunar mining project the old *Cosmi* is in pretty rough shape and I can't really justify the costs to bring her up to snuff," the inventor replied with a little sadness evident in his voice. "Besides, even if we built a new cargo stage and just used the outer three rings to boost everything up, we'd barely have room for a third

of the inflatable. No, I've got to come up with something else. Guess I sort of built the sailboat in the basement before I figured out I have no way to get it outside." He shrugged and gave Bud a lopsided grin.

Bud recognized the grin as Tom's way of silently saying, "I messed up, but I'll figure a way out of this."

"Whatever I can do to help," he told his blond friend. "I don't suppose there's any way to fill it up with helium and float it up to the upper atmosphere, and then grab onto it using the *Challenger*, huh?"

Tom's grin got a little wider. "I thought of that, but we'd never get it packed down to fit into the *Sutter* for the trip to Mars. Sorry, flyboy. Good idea but not for this trip."

"Well then, unless I'm way off base, you are still going to have to roll it into some sort of cone shape to fit into the *Sutter*. Correct?"

Tom nodded.

"Could you wrap it in something to hold it together, put that on some sort of platform with maybe a few rockets or even repelatrons underneath and send it skyward?"

Tom was about to laugh at the picture that came to mind but a thought hit him and his face turned serious.

"What is it, Tom?" Bud asked, suddenly concerned.

Tom's eyes glazed over as his mind raced through a hundred small details. When he shook his head and focused on his friend a minute later, Bud was standing patiently, arms crossed, and whistling.

"You back?" he inquired casually.

"Yes. And, believe it or not your idea isn't too far off from one that just might work." He explained his basic idea to the flyer who smiled as everything became clear.

"Jetz! I'd put money on it," he exclaimed.

They parted ways at the Administration building's side doors with Tom heading upstairs to the shared office and Bud skirting around the side of the building heading to the cafeteria.

"Your father is inside with a man from the State Department, Tom," Munford Trent told him as the inventor approached the large door to the office. "If I might suggest, why don't you take a seat and I'll buzz in to see if you can join them."

Tom nodded and walked the five feet to the comfortable sofa across from the secretary's desk. After speaking a few words quietly into his phone, Trent hung up and pointed at Tom.

"You're up!" He rose and opened the door for the younger man.

Stepping inside, Tom was surprised to see the extremely serious looks on both his father's face and that of their visitor, a man he did not recognize.

"Tom, this is Andrew Stout with the State Department. Mr. Stout? My son, Tom Swift."

The man stood up and shook Tom's offered hand. His grip was strong but his palm was damp. The effect was unpleasant but Tom strove to ignore it as he asked, "Is there a way to quickly bring me up to speed, or should I sit down and just listen?"

"Sit, Son. Mr. Stout was just relating a communiqué his department received last night. Would you mind reading that again?"

"Not at all, and please, both of you call me Andrew. Not Andy, though. I was somewhat plump and teased and called 'Andy Pandy' as a child." He cleared his throat as he took a letter back out of his briefcase. "In a nutshell it boils down to the final paragraph. Oh, by the way, Tom, it is from the Brungarian Ministry of Space and War Affairs. Anyway, here is that final part:

'In conclusion, and with full reference to our previous statements and our commitment to keeping intruders from attempting to lay claim to the planet: The People of Brungaria will attack and destroy any vessel attempting to land on our newly sovereign planet-nation. Our own glorious military armada is even now nearing that planet and will claim it in the name of our citizens soon. This is the single and only warning we will provide to the so-called peaceful base of operations—that we know for a fact to be a military base designed to enslave all of Earth—by the radical organization known covertly as Swift Enterprise.' "

He looked up as he passed the letter to Tom. "That's pretty much their tone throughout the whole letter. 'We're going to claim it any day now and once we do we will kill anyone trying to come near.' It doesn't look very good, to tell you the truth. The President is going absolutely spare over this and is demanding that I come back with answers." Now, he looked rather hopelessly at Damon and Tom. "Is there any way you can see to get us there ahead of them?"

Tom looked first at his father. They exchanged a glance that both of them recognized.

"I believe Tom can answer that," Mr. Swift offered.

"Right. Okay, Andrew, here it is. First of all what the heck happened to the 'we are not bad guys, we are free peoples and friends' stuff from that first Brungarian letter? This one doesn't even read like that. Oh, never mind. They've probably gone through five regime changes this week alone. Anyway. You know that Swift

Enterprises was precluded from taking part in the Moon colony project even though our solution is currently saving the people up there. Too bad so many had to die before folks in Washington woke up." He knew his voice sounded bitter, and it was, but he had to get that part out first. "So, with that in mind we decided to say the heck—no, to *hell* with the Government and all the bureaucracy and to go ahead and construct the sort of inflatable structure that we recently installed up on the Moon. That's just the first step. Now we intend to build one or more of sufficient size to support a small colony of people on the planet Mars. Hopefully dad already told you about that."

Andrew Stout nodded slowly.

"Good. What we have kept under wraps, even with the incident of the spying on our progress, is that we have completed the large inflatable structure and are ready, within the next week, to transport it into space where it will be loaded into our largest spaceship, the *Sutter*, and flown to Mars."

Pausing, Tom looked at this father who was sitting there with wide eyes, but a slight grin playing around his lips.

"Our *Sutter* can make the trip to Mars, even though it is currently fifty million miles farther away than if we waited for a month, in under a week. I seriously doubt that the Brungarians have anything like either our ship or our technology that would allow them to attempt the trip until Mars and Earth are making their closest point of approach for this orbit cycle."

"I'm not a scientist or an astrophysicists, Tom. What does that mean?"

"That means that unless they launched a ship three or four months ago that is only now getting near to the planet, they would be fools to try a launch today, or any time in the previous month, or any time in the next seven months. The physics are against them. They are known to fly using chemical rockets and have to launch from Earth. They have nothing of any size other than spy satellites in orbit. They have nothing on the Moon. In other words, they are bluffing and can't successfully launch anything other than a suicide mission right now. Even at that, our ship can outpace them by a hundred times."

Andrew looked confused but relieved. "So, we can beat them there?"

"If you insist on considering this to be a race, that only emphasizes our many reasons for not involving the Government in this project. We aren't going up there to set up a base; we're going to Mars to put

a small colony with an exceptionally good chance of success in a good location. Hopefully, the first of many."

Mr. Swift took up the conversation. "You see, Andrew, I believe the Brungarians want to possess Mars because their culture only allows them to believe that if they get there first, they claim it all. They tried that with the Moon, tried it with Nestria and it appears they want to try that with Mars. Once we get there and are established, they will either go off and pout, or attempt to attack."

Alarmed, Stout asked, "But what can you do?"

Now, both Damon and Tom chuckled, but Tom answered, "If they try to launch a force of spaceships, everyone will know about it. You just don't keep rocket launches secret these days. If that is the case, we can go up and literally run rings around them and use electronic jamming devices that will render their navigation equipment useless. They will either have to turn back or perish. If we see no signs of any further launchings, we know that they are sulking."

Damon cleared his throat. "There is one other thing, Andrew. Have the FBI test the paper of this letter. Along with what Tom said about it not sounding anything like previous communications my bet is that this isn't Brungarian paper. This probably came from an impostor."

Andrew Stout left Enterprises an hour later a happy man.

As they watched his small Air Force jet take off Damon turned to his son. "Did you mean that about being able to launch in a week? I thought the whole transport to orbit thing was a long way from being solved."

"Yes, although I'd rather take a full month. Bud helped me see the solution is not it trying to cram it into a spaceship down here but to float it up as high as we can, probably under a helium balloon with a little extra help, and then to use the repelatrons on the *Challenger* to continue lifting it up until we can get it close to the *Sutter*." He quickly explained Bud's idea of utilizing the conical shape to their advantage. "It has to be tightly wrapped up anyway, so we only have to shove it into the cargo hold. It'll be aerodynamic to some extent so we treat it like it is its own nose cone."

He also told his father about the first suggestion of inflating the actual structure with helium. Mr. Swift shook his head. "I can see what a disaster *that* might turn out to be," he commented.

Tom's face turned serious. "Yeah. Me, too, but we might want to think about doing just that. Or rather, a modified version of that. With the Brungarians or whoever it is threatening us, and we've already witnessed that they have some way of knowing a little about

what we are doing here, I'm going to suggest a radical plan. We have the basic construction down to the point where I can get a thin, lightweight duplicate of the Moon inflatable built in two days out of white Mylar. We assemble it outside of hangar nine, making a big deal out of it but keeping all personnel away, get it complete, inflated with air and attach a lifting balloon."

Mr. Swift nodded but said, "I can see that will be a decoy but when do you launch the real one and how do we make the switch?"

Tom smiled. "Easy. We make a big show of getting the fake ready directly next to the hangar, right in its shadow. Then we make the switch at dusk when even night vision has problems. We pull the real one out and get its separate lifting balloon filled up and let it loose during the night. The next morning we fill and launch the decoy knowing that the real one is already in space."

Mr. Swift looked concerned. "Between the two balloons that's a lot of helium."

Tom grinned and nodded. "And that's why I will be including a vacuum tank and pump inside of each balloon. Once the real one reaches the proper height and *Challenger* picks up the package, we suck enough of the helium back into the tank to make the whole thing heavier than air and bring it down by parachute."

"And the decoy?"

"Well, that will be double-walled with only enough helium in between used to lift things. Maybe about one sixth of the apparent volume if we do it right. And, compartmentalized. So, even if they shoot a few holes into it, we might be able to reclaim the majority of the gas."

They called several department heads to the office, including Harlan Ames.

"Harl?" Tom addressed the Security man. "You are going to need to coordinate with the law enforcement agencies that might need to be involved along with the Air Force. My guess is that our enemies may have something more than just a few rocket grenades to lob at the floating structure."

Ames smiled. "If you are thinking about aircraft, then I agree. I'll get things going right away. Can I have a week to coordinate this?"

Tom explained his tight schedule.

"Okay! I'll keep you advised." With that, he left the meeting.

An hour later so did the other people, each one with their marching orders.

A few minutes later his TeleVoc pinged. “Yes? It’s Tom.”

“Tom, it’s Hank. I think you ought to come outside. It’s a beautiful day with not a cloud in the sky and I hear there’s going to be an air show in ten minutes. See you at the Barn?”

“Ummm, well, sure, Hank. Can you give me a clue?” Tom was bewildered.

“Already did, skipper. See you in five or six.” The connection went dead.

Tom walked quickly over to the small group of people standing in front of the open structure of the Barn.

Hank looked at him and grinned. “A minute or so behind schedule, but that’s okay. Just as long as you are here.”

“But, what am I here to see?” Tom asked in an insistent tone. “So what is this about some air show? Is this a practice run for some county event?”

Arv Hanson now joined them. “Am I late?”

“Nope,” Hank told him. “And now, if you both would please face directly south and raise your gaze about thirty degrees…” he glanced at his watch, “the show ought to start in fifteen seconds.”

The inventor’s eyes narrowed with suspicion, but he did as directed. And, he was glad he did. As he and the others looked skyward, an incredible tri-winged jet streaked across the sky at Mach 2 without so much as a roar let alone a sonic boom.

“And that, skipper, is how you demo a contract-winning model!”

CHAPTER 16 /

TO MARS!

WITH LESS than a week to go, preparations were running at a furious rate. Haz had put his second-in-command at the helm of his private business and moved into one of the guest apartments at Enterprises one week earlier.

Hank and Arv had packaged the three-winged jet model up and left for the demonstration flights in Nevada. Test after test of the model had been made in the previous days to ensure that everything worked to perfection and that it met all specs, including the one for top speed. And, to prove how silent it was, Tom had authorized a nighttime overflight of the downtown area of Shopton on Saturday night.

At an altitude of just five hundred feet, the jet shot over about a hundred people sitting and strolling in the downtown park at around eight-thirty. The only giveaway had been a slight breeze that had gently swirled down around the ground a few moments later.

And now, it was in the hold of one of the Swift cargo jets, flying west. They landed at Nellis Air Force Base at seven that evening and had the demo model set up and tested well before their nine a.m. start time the next day.

In all, thirty proposal requests had been issued and only five companies had responded. Of those, four were here to demonstrate their best efforts. As Hank and Arv looked around they could see the competition wasn't going to be too tough. Like their own, two of the companies had brought scale models. The other company had obviously re-fitted the body of an old DC-9 aircraft by adding two tiny canard wings up front—stationary and of no use in flight as Hank pointed out—four additional engines, and the middle wings that had to be manually unbolted and reattached to show the different positions.

The Swift entry was first up. Hank manned the controls with Arv working as his spotter. A full-head helmet let Hank see exactly what a pilot inside would. He took the jet down the runway and it raced into the air. During their thirty-minute window he was able to show the assembled military brass and Government purchasing individuals each and every aspect of the jet. But it wasn't until the final pass—the supersonic flyby—that there was any reaction from the crowd. When it passed overhead, one of the other entrants shouted out, "That's not fair. They cut their engines and were gliding over us. Make them go full power!"

Hank laughed. Between the Silentenna technology and the QuieTurbine engines, he knew the man was blowing hot air. When one of the Generals called out the question of the other man's validity, Hank shook his head. He brought the jet around and made a perfect landing.

Only then did he remove his helmet and say anything.

"With respect, sirs and madams, our competitor is incorrect. That was a Mach-2 pass at full throttle. Have your techs check. At no time were we slowing down. Besides, I thought the whole point of this aircraft was to be totally silent. That is what we just showed."

He watched as the man who had accused them of cheating turned beet red and went into a huddle with his team members.

It felt good to get the demo out of the way, and it felt better and better as each of the other companies took their turns with nobody coming close.

* * * * * *

The rolled and packaged dome was set on top of a very strange device. Looking more like a giant version of Tom's old repelatron donkeys—which in fact it was based on—it was unable to lift its payload against Earth gravity, but would be able to provide some assistance going up and then could handle the descent once at the destination. And, it provided a handy loading palette.

Using the new parts-forming machinery at the Construction Company it had been an easy job to build this last-minute addition and to outfit it with four off-the-shelf repelatrons and a large, spare solar battery.

The huge, special helium balloon was unnecessary and had been replaced with a smaller one. At three a.m. the first balloon lifted into the sky. Along with its real payload it reached the upper atmosphere by five. It was two hours after that when the second, decoy balloon was brought out of the shadows of the hangar and released.

Fifteen minutes later a white jet streaked in from the west, releasing an air-to-air missile that blew the second balloon to shreds. It plummeted to the ground.

* * * * * *

Tom and Bashalli spent the night before departure quietly holding onto each other. She held back tears right until the point when he told her how it was only going to be three weeks. He realized later this had been a tactical error.

Sandy, on the other hand, had spent that night showing Bud exactly what he was going to miss. She also gave him a little lecture.

"You know you've proposed to me. I know you did because I accepted. And, we both know you will marry me. I know that. What I don't know is when? When, Budworth Barclay, are we going to be able to be together each and every night without my getting a lecture from mother before and after the fact? Huh?"

He kissed her and whispered in her ear, "When I get back from Mars, you tell me what date you've picked. I'll be there. Promise!"

The two women—the young wife and the blond fiancé—stood together on the tarmac of Fearing Island waiving goodbye to Tom and Bud at ten the next morning. The two balloons had been released at Enterprises hours earlier. All anyone knew was that the payload was in space now.

"Did you make Bud feel guilty for leaving you?" Bashalli asked out of the side of her mouth.

"Yep. You give Tom the tears?"

"Yes, of course I did. And, I might say that they were honest tears. And so, what do we do to fill the next three weeks? Other than our jobs."

"We shop!"

Sandy could see the small smile playing on her sister-in-law's lips. "Of course we shop, Sandra. We must do everything possible to keep our spirits up. We owe that to our men."

It had been decided early on to use a small space vehicle to ferry down men and supplies. That ship was a fully rebuilt version of one of the rockets Enterprises used to build and supply the Outpost in Space, only now rather than chemical rockets it featured a trio of repelatron dishes in the tail. Tom had wanted to make do with a single one, but had found the balance of the long, tapered rocket to be difficult to maintain in a slow, descent. The three smaller dishes used a little more power but could be individually aimed to provide perfect balance at any speed.

When the *Challenger* arrived at the *Sutter's* holding position about one mile from the Outpost, it was Bud who let out a gasp and pointed to the rocket now lying atop the flattened upper part of the crew area known as The Expanse.

"What's that?"

Tom explained.

"Is it manned? I mean, not right now, but once it's in use."

"The beauty of it is it can be used as a manned vehicle, particularly going down to the surface, but it can return autonomously and dock

back with *Sutter* to be reloaded. Oh, and it can go back down on its own if necessary. I figure that the first several loads will be all of the anchor bolts and the team to get the dome unwrapped, partially unfolded, and in position. We've rolled it so that one entire side is opened first and anchored before we unroll the rest and try to inflate anything."

"Because we don't want it to blow away?" Bud guessed.

"Exactly. But we also need to manually open it up to pull out the compressor that will be pumping air in to inflate the thing."

"So, where exactly are we erecting this circus?"

Tom laughed but gave a slight shake of his head. "We've pre-spotted about half a dozen possible locations, with five serious contenders, but it's going to require some human surveying. For starters, although we have found areas with very little rocky debris we can't tell how level it is, and the area needs to be flat and level so everything inside works. Which is why we are also taking up a small tractor with a front blade to do any necessary excavation and filling."

"How about tamping things down?"

"Most of the Martian probes show that the ground is a combination of fine particles, a bit larger than sand, and rocks. If we move the rocks we should be left with dirt that needs very little tamping. Besides which, the floor of this large dome will also get a layer of self-hardening and self-leveling foam. That will fill in any small gaps and cover any little remaining rocks."

"Do you always think of everything?" Bud teased. He knew that there were plenty of times Tom berated himself for overlooking something obvious. But he always figured a way to work around those things.

They looked out of *Challenger's* large windows at the scene in front of them. *Sutter's* entire back end had been pulled out and swung to one side. The forward mining facility had also been withdrawn and taken to a parking place a kilometer away. It would remain there—sitting next to the repelatron power plant—until needed some time in the future. The power plant to be used was the plasma drive. Though slower off the start line, it could get the ship up to a speed much higher than the repelatrons could, and had the advantage of not requiring a direct push off of a heavier object or planet.

The giant, wrapped semi-cone of the inflatable was slowly being eased in through the open back end of the ship. Once inside it would be attached to a network of straps and the plasma drive section reinstalled. After that, it would be time to depart.

It became evident that the computer simulations had made an error in the folding and rolling of the dome. In the end, once it was inside *Sutter* everyone could see that more that fifteen feet of extra space was available between the bottom of the cone and the bulkhead of the plasma drive unit.

This was exceptionally good news as it allowed a large portion of the support materials for the colony to be taken in this first trip. Those had been scheduled for trip two and would have meant the construction team would have spent a few weeks sitting in the temporary tents waiting for the ship to return so they could continue working. It also meant that the entire setup for the colony could be brought up in just four trips instead of five.

And that was going to shorten the process of having a viable habitat by at least three weeks.

A few hours later than expected, Tom and his team of twenty seasoned spacemen left orbit and turned outward toward where Mars would be in a few days.

When they arrived it was decided that Tom and Bud along with a surveyor team of two would be the first to go down. Between them they would visit the five top potential sites the first day on the surface and perform a quantative survey the following day on the primary site. That was, if any of the sites proved to be good candidates.

There was no other way to get from the *Sutter* to the cargo rocket than to go outside. The four men suited up and left *Sutter* through a small access airlock in the front of the vertical "sail" of the ship. Inside the smaller ship Bud was pleased to see a standard set of repelatron controls, similar to those on the *Challenger*. He was surprised to see control room seemed to be from an old science fiction movie in that behind the pilot and copilot seats were five rows of three seats plus a final set of four against the back wall making the back look more like a bus than a spaceship.

"Behind that bulkhead," Tom told the other three, "is the cargo area. It's about forty feet in length and ranges between fourteen and seventeen feet wide. And behind that is the power pod and repelatrons. Oh," he turned to face Bud. "One thing you need to know. That power pod is the largest one we could fit, but it is still not going to provide unlimited power. In fact, one trip down and one up, and then it needs to sit and recover for at least twenty hours."

"So, one load per day, is that it?"

"Yes. The people remaining on *Sutter* will be able to offload all of the cargo in orbit over the next day. By the time we get back tomorrow we should have enough power to take one load and

everyone staying on Mars down. *Sutter* will head home with Red Jones and Art Wiltessa piloting. They will be back in about eleven days with the next batch. By then I intend on having the dome inflated and the air inside breathable. We can scout out all of the areas in just a few hours before dinner time."

Tom let Bud take the controls for the ride down. He called out position and speed information and gave the pilot coordinates to head for.

"We'll try the area the Outpost spotted near the center of what's called the Utopia Basin. It's just a bit north of the equator, so the temperature range will be the Mars equivalent of temperate. Astronomers believe it was once the site of a fairly small ocean. There are a lot fewer impact craters in that area supporting the idea that it hasn't been exposed to space for very long… comparatively, that is."

Bud let the ship sweep high over the surface, still above the detectable atmosphere, until they were nearly over the area in question. Looking at the downward camera angle, the four men in the rocket could see the flat-looking surface area. It stretched about twelve hundred miles across, interrupted at several points by what must have once been islands—now low and rounded hills. As they gave it a visual once-over one of the surveyors, Bob Reeve, indicated a rounded area near the western rise up to the nearby Syrtis Mountains.

"There. My chart says that's the Isidis Planitia and was one of the more shallow areas of that former sea. Can we head down there now? It's the third on the list but is closest right now."

Tom nodded and Bud set the controls to do a downward slide until the rocket was just one mile above the Martian surface and coming down for a landing.

After touchdown, Tom commented, "Well, it looked pretty good from orbit, but there are a lot of undulation ridges here. Would that be from tidal action?"

Reeve replied, "Probably. And I'm afraid if we find that here, we'll find that any place where the water was shallow. This, if you look at the erosion of the mountains over there, may have been around two hundred feet deep. Maybe less."

With the ship on the surface, Bud had powered down all but their environment systems and the radio. "What now? Get out and give it a little walk?"

Tom held up a finger as he keyed his headset. "Moving Van to *Sutter*. Are you in position to hear us?"

"Roger. We're going to head over your horizon in three minutes.

What can we do before that?"

Tom told him of the unsuitability of their present location. We're going to hop up and over site five on the list, Apollinaris Patera. We'll be there in twenty minutes but you'll be gone by then. Contact us once you come back over our horizon. Tom, out."

He made a motion with his head, and Bud began flipping the switches back on. They touched down in the suggested area only to find that a fairly bad wind storm was beginning to brew.

Before it could do anything such as knocking over the rocket, Tom ordered them back into the air. "Let's head back the other way and see what the Argyre Plantita has to offer. It's number one on your list, flyboy."

The new position had some promise. It was mostly below the typical surface level of the planet and would offer them some protection from wind. It also was surprisingly devoid of rocks and volcanic ejecta.

While Reeve and his assistant, Stacy Carter, began the survey of the local area, Tom and Bud took a walk around.

"Golly," Bud said. "It might have a lot less gravity than Earth, but this is like walking in deep sand. I feel as if I'm making the same amount of exertion as if I were on a California beach. How far down do you think this goes?"

"I'm not sure, but if it's more than a foot or two, this may not be a good place. We need a solid fifteen feet of rocky ground to sink the anchors into. Let's see if we can dig a bit with our hands."

They spent the next five minutes moving the dusty and pebbly soil to the side. But, try as they might, even when they had a hole almost three feet deep and a little wider, they were still finding nothing but the loose soil. Tom called a halt to their dig.

"Let's go back and see how the others are getting on."

The survey was only partially complete but there was something to report.

"We can't get the theodolite to stay still. This loose soil lets it tilt off to one side or the other. On the positive side we're seeing this would be easy to level. It's just that the loose stuff looks to be too deep. Stacy tried to do a core sample but after six feet of hand cranking that tube around he brought it up and everything just fell back out. Sorry, Tom."

"Nothing to be sorry for. If this isn't a good location, it just isn't. Let's get back to the ship and see if *Sutter* is coming overhead yet."

They got their helmets off just in time for a message from the orbiting ship to repeat. “Moving Van? We detect that you’ve changed location again. We just went overhead. What’s next on the agenda?”

“*Sutter*? Tom. The first three spots we’ve looked at are no go’s. I want to take a quick look at spot two on the list, the Chryse Planitia. It’s about as far north of the equator as we are south of it right now. Unless it is covered by a roaming herd of Martian buffalo, that’s were we’ll spend the night. I’ll catch you up on your next pass overhead.”

As the ship touched down in the new location, Tom had a sudden feeling. In front of them stretched a slight downward stretching plain and behind them was a narrow valley dividing two low mountains; one you could still see a volcanic cone on top of and the other just a gently rounded peak. He looked at Bud who was intent on the four views of their surrounding area.

“Jetz!” he exclaimed softly. “It’s beautiful.”

Tom agreed. “Let’s get out and make sure it has what we need before we put in an offer,” he said, jokingly.

When they all got outside Stacy was the first to notice what looked to be a small, frozen stream of water running down a gentle slope from an almost made-to-order flat area nestled near the mountain. On closer inspection it turned out to be crystals of some sort—Tom collected a few for analysis—and not water. But, it was beautiful and unexpected.

As Bob and Stacy got their equipment ready, Tom and Bud took another walk. The flat area appeared to the unaided eye to be about half a mile wide and nearly a third of a mile from front toward the closest mountain. To make things even more attractive, after a twenty to thirty foot wide flow of bare rocks, a similar area perhaps twice as large could be seen to the north.

Tom directed his surveyors to check both locations. “Who knows, Bud? If this goes as planned, Haz wants to at least double the size of the colony eventually. We could either put two domes end to end in this area, or the second one over there and even connect them with a fifty or sixty-foot tunnel. To tell you the truth, if this checks out I say we don’t bother looking at the last location.”

Bud raised one hand. “The ayes have it, skipper. I can hardly wait to get the girls up here. Do you think Sandy and Bash would like this?”

Tom considered the question. He knew that Sandy felt very comfortable right in Shopton and had even told their mother she hoped Bud would never want to move away. Bashalli, on the other hand, loved to travel and found beauty in just about everywhere she

went. As she once told him, “I came from a very rocky and not very lush area of Pakistan. To me, even your Citadel in the desert of New Mexico has a peaceful delicacy about it.”

“Yes, Bud. As a vacation trip, of course they’d love to see this. Just don’t go suggesting that we all move up here.” But, as soon as he said that, Tom’s brain was signaling him to not discount that notion. It was still in the back of his mind.

The survey went quickly and incredibly well. As the four men sat inside the rocket having a meal of rehydrated beef stew, the surveyors gave Tom and Bud their results.

With each piece of information Tom’s face went from expectant to grinning to laughing.

- Level to within one degree side to side and half a degree front to back.
- Soil depth before hitting solid ground, averaging four inches.
- Core sample showed highly compacted soil and rocks down to thirty feet with an interesting strata of permafrost beginning at an average depth of twenty-seven feet.

Tom radioed their finding to the *Sutter*. Zimby Cox was on duty in the control room.

“Do you want us to go to geostationary position, skipper?” he inquired. “We can be there in about fifty minutes and unload everything.”

“No, not yet. I want to drop off the big package from where you are. Everything is set to do a slow descent from your current seventy mile orbit.”

“Roger that. Have a good night, you Martians!”

The next day, floating down on the combination of repelatron platform and five large parachutes, the dome structure landed within thirty feet of being dead center on target. It was time to begin putting it all together.

CHAPTER 17 /
RIDING OUT THE STORM

THE CARGO rocket soared into the reddish sky ten minutes later with Bud taking it up to collect the next load from the *Sutter* along with the men who would remain on Mars when the ship headed back to Earth later in the day. Tom stayed on the surface and with the assistance from his two surveyors pulled off and bundled up the protective outer wrapping material from the giant cone and then used the weak repelatron pallet to move it to the exact position it should be.

Next, they activated a small hydraulic ram that pushed a scissor lever and tilted one side of the platform, letting them roll it off.

An hour later Bud radioed down that the cargo rocket was about to be loaded. “Other than what’s on the list, do you have anything you need?” he inquired.

“Just as long as you bring the portable pressure tent for us to live in and everyone else, I’ll be happy. Oh, that and the first of the food crates. By the way, when you get here please put down on the far side of the other level area. We will have the dome partially rolled out by then and I’d like to keep as much dust off it as possible. You can use the repelatron platform to carry things over to here.”

For the next two hours Tom and the other two carefully tugged, twisted and pulled on the corners of the dome to practically no avail. Everything had been bundled so tight it now seemed to be pulling back as if it did not wish to open. But, an idea came to him.

“I seem to recall that the tool box Bud left here has a good hundred feet of nylon rope. Break that out, would you, Stacy?”

“What are you going to use that for?”

“Well, now that I’ve let my brain shift from brute force mode to thinking man, I believe we can tie one end to the closest reinforced hole that will be used to lock down to an anchor, and the other end to the platform over there. Then, we just lift a little and gently tug.”

Bob clap himself on the faceplate and groaned while Stacy had a little laugh.

“Some practical guys we are!” Bob exclaimed.

Three minutes later and with the rope attached at both ends, Tom lifted the platform up about a foot using the remote control. As it tilted a little to one side, the rope went taut and the edge of the right corner of dome fabric began to move. It didn’t take much as once one

side had opened the other just sort of flopped out in its direction.

Soon, the compressor package became visible and Tom used the repelatron platform to move in and lift it out.

With the others' help Tom located the valve on one area of the dome and attached the six-inch duct from the compressor to it. He showed the other two his crossed fingers before pressing the POWER switch. A split second later a series of red lights blinked twice and then turned green, after which he pressed the only other button on it, the one marked COMPRESS.

The thin Martian air and their environmental helmets kept most of the sound from reaching their ears, but they all felt the deep rumbling of the compressor's three pressure cylinders through their feet as they throbbed into action.

A small cheer went up a minute later when the dome material began to move on its own.

"We've got pressure," Tom cried out, pumping a fist in the air.

Minute by minute they watched, mesmerized, as the different edges of the dome slowly unfolding this way and that, with arms of materials slowly unrolling and then doing their own unfolding.

By the time Bud and the rest of the installation team came down five hours later, more than half the dome had unrolled. Tom, Bob and Stacy had been kept busy as they manually adjusted the position of various bits when they seemed to have ended up out of alignment. The three were exhausted and gladly accepted Bud's offer to continue the process with a couple other people while the pressure tent and portable kitchen and bathroom were set up.

"You three head back into the rocket, get out of those suits and have a good sleep. See you in the morning!"

Tom had a little trouble falling to sleep although the others were gently snoring within minutes. He sat in the pilot's seat watching as Bud and the others continued to work the dome materials into position. Finally, as the sun began to set, work was halted although Tom was sure the compressor would be kept on all night, and that Bud would set up a rotation of men to keep an eye on things.

He drifted off to sleep, only to be awakened by a bright light shining into his face. Blinking and trying to block it with one hand, he realized that it was the rising sun and that he had slept all night. He gave out a small laugh and turned around to see how the other two were doing.

They weren't there. It was obvious that having fallen asleep a couple hours before Tom had, they must have risen early and left to

join the others. Their missing suits confirmed this.

He grabbed a moist disposable body towel—something he had designed for his trip through a wormhole when he knew he and Bud would be gone for more than a month and would require some form of body cleansing—and wiped himself down before changing into a clean body suit and getting back into his environment suit.

"Welcome to the Chow Winkler Honorable Last Chance Martian Chuck Wagon and Breakfast Bar, amigo!" Bud greeted him as he stepped into the pressure tent. "Pull up a packet of reconstituted scrambled eggs, some powdered OJ, and a soggy cereal bar. Get a good sleep? I only ask because we all saw you up in the rocket staring at us yesterday. Didn't trust us to do this right, huh?"

Bud's smile told Tom he was kidding, so Tom patted him on the head and replied, "Not so much not trusting you as wanting to make certain you didn't try to turn the big white square into a dance floor. But, if I might be serious a moment, did it all go well?"

Bud pointed at the dome, the left side of which was now about two feet high. "It's not going up as quickly as I would like it, but I read the notes, and it is on schedule. Is it really going to take nine days?"

Tom nodded. "Yep. And that is just to get it up at about Martian air pressure. It'll be another two days before we have the minimum of eight psi I want to inject the stiffening foam. Before that, in fact probably in three days when the upper material has finally lifted off the floor by a yard or so, we'll inject the bottom with foam and give it four days to fully harden. After that we can go inside and see how things are."

"Tom?" Stacy asked strolling over to where the inventor and flyer stood. "What the heck are the dark blue areas I'm seeing?" He was pointing to a trio of two car garage-sized squares evenly spaced across the long front of the dome.

"Those are the large equipment airlocks," Tom told him. "Three on the front and three on the back. And then there are another ten smaller ones just for people. Four front, four back and two on each end. The *Sutter* will be bringing up the Durastress roll-up doors for the big locks on its last trip. Doors plus a half dozen electric jeep-like vehicles for moving around outside on short trips. That sort of thing."

"Thanks. Now I can go back and tell those other guys what the blue patches are." He wandered over to the four men he had been standing with earlier.

Bud went back outside a few minutes later with most of the men he had ferried down the day before. They moved to the rocket and began to unload its batch of cargo. After many smaller containers had

been pulled out, a small armature extended from the side of the rocket. A winch came rolling slowly out with what looked like fifteen giant grasshoppers had collided with a massive cockroach. It was, of course, the fully-collapsed Tri-copter.

It only took the combined efforts of six men to lift it off its hook and to carry it to a tarp that had been place on the ground.

Finally, the first thirty of the anchor bolts came out—these had been loaded first and been placed all around the perimeter of the cargo hold—ending with the earth blaster that would bore the holes for each anchor.

Bob and Stacy had spent the morning surveying for, and marking the sites of, the row of anchors that would run along the entire left end of the building. Their line was laser straight and the twenty-foot placements exact, so Tom ordered that the first holes and anchors be put in place right away.

"Let's do every third one for now and then fill in later," he requested, wary that any good gust right now would jeopardize the dome.

The first hole was drilled ten minutes later. As several of the men moved the debris away from the building's edge, two others lifted the anchor and lowered it into the hole. It was a tight fit but they only had to hit the top with a rubber-ended sledgehammer once. It settled into the hole and stopped with just the upper bolt exposed.

Tom examined the work and then told the men, "Go ahead and set it!"

It took one minute for the compressed foam cylinder to empty, pressing out on the plates that surrounded the middle of the anchor. The special hardener inside was exposed to the propane gas that pressurized things, with the resulting reaction causing it to harden in three minutes. The front left corner of the building was attached to the ring using a special washer and a large lock nut, and just like that, the building was attached—at least at one point—to the planet Mars.

When the time came to break for lunch, eleven of the anchors along the left end had been installed. Once they had a bite to eat and a one-hour rest that Tom insisted everyone take, it was decided that the best thing to do for the security of the dome was to put in at least as many anchors on the far end. Everything was accomplished by human power. Fortunately, most of the items to be moved could be handled by four men on Earth. In the reduced Martian gravity and with the aid of the repelatron platform it was a breeze for two to do most jobs.

While most of the team member worked to get the floor of the

dome stretched so that no wrinkles would be found inside, and to do it before the first of the new set of anchor holes was drilled, Tom and Bud got to work unfolding and setting up the Tri-copter. The first order of business was to remove the small elastic straps holding things tightly together. Next, they opened the first of the three segmented arms, moving them outward, turning and unfolding and setting the stops at each pinion point. They repeated the same steps with the other two arms.

In the end it had been impossible to build the machine with standard helicopter rotor blades, and so Tom had three very large fanpellers constructed. Once built he discovered that it did not work to have the fanpellers attached and still get the entire Tri-copter folded. So, the blades for each had been swung around and stacked together just like the segments of a paper fan. These were bundled together for shipping, and would remain that way until attached to the three rotor hubs. Tom had foreseen the need to climb up to do the attachment and had built in a small ladder at the end of each long arm.

The two young men muscled the first set of blades up and got them attached. Tom ducked as he turned the release. Slowly at first and then with increasing speed, the thirteen blades swung around, telescoping out to their full length, finally snapping into their locked positions.

He looked up at the almost umbrella-like set of blade above him. “Not bad,” he stated.

“Yeah,” Bud snorted over the radio. “Not bad, huh? Try pure mechanical genius!”

They switched positions for the next set of blades, but decided to take a rest before tackling the final set. It was hard, hot and heavy work made more so by the insulated environmental suits they had to wear. After sitting up against one of the arms for about ten minutes, Bud made a big show of getting up.

“My, oh my. That’s some hard work you’re putting me through, Tom Swift. But, I suppose we ought to get on with it. I’ve got a date to radio your hot blond sister in about an hour.” He extended a hand and pulled the inventor up.

The final set of blades went on and unfolded as expected, but the locking mechanism had to be tapped a couple times with a small wrench to set in place.

That job finished, Tom attached the electrical lines to the three electric motor/gear assemblies on the ends of the arms before they went back to see what they might help with at the dome.

Tom asked how things had been progressing.

"Well, you might tell us what to do about *that*," Zimby said pointing at a dirty patch on the dome material. "I don't know if you and Bud felt it but we had a small dust devil over here and it tossed up a lot of dirt on the material. And, according to the schedule this is where someone is supposed to walk out to the middle of things and look in through the peephole to make sure the floor is flat. I didn't think you wanted anyone to crush that into the fabric."

The man was right. Even the relatively thin layer of loose Martian soil could be a problem right now. At the slightest provocation it rose in clouds of dust. That, by itself, wasn't the real issue. What was, was the abrasiveness of the soil. With it sitting on the building right now, the weight of anyone walking around in it could scour the material, grinding it in and potentially weakening it.

He sat on his heels thinking over the issue. The base pad was smooth and the layer of foam would take care of small wrinkles, but it was important to do the visual check soon.

Up in orbit along with the rest of the materials were several large fans, but that did them no good right now. It would be too time-consuming to try to retrieve them.

That still left what to do about the dust.

The idea came to him an hour later when he had returned to the cargo rocket. He stood on the small "porch" platform that had been extended from the hatch of the cargo hold looking out at everything when his eyes lit on one particular object.

It was the Tri-copter that caught his eye.

With its three fanpellers and ability to hover at a setting just above that of the pull of Martian gravity, Tom was sure that it could be used to move back and forth over the partially-inflated building to blow away all dust before any human foot walked out on it.

Problem, he hoped, solved!

After explaining his plan he asked that everyone else move to the pressure tent. Then he climbed into the small cockpit of the Tri-copter, flicked a few switches and was soon letting the fanpellers speed up. As soon as his gut told him to, he pulled back on the collective and the little, very odd helicopter lifted off. Of course, the downdraft kicked up even more dust but he intended to blow it all off and land far enough away to keep it from happening again.

Three minutes later he set back down four hundred feet away. The dome was now completely clear of most visible dust and Tom had made his first flight in the Tri-copter.

He radioed to Bud. “Come on out and let’s take a spin around the area and stay out of the people’s way.”

The flyer complied and minutes later they were flying off to the east.

Like the cargo rocket, the Tri-copter held the largest power pod it could carry, and that also meant a limited range. For this flight Tom wanted to remain within the fifty-mile radius zone and so they went out about forty miles, which required a leisurely hour, before turning back.

They had been flying back for ten minutes when Tom noticed his companion squirming in his seat.

Bud was looking around, below and behind the flying machine. The almost never-ending Mars-scape was both monotonous as well as eerily beautiful. “You know, it still hasn’t quite sunk into my head that Mars isn’t actually red. Why do we always call it the Red Planet, Tom?”

The inventor laughed. “It does look a bit on the brown side and not so much red, doesn’t it? Well, it goes way back to early sightings of the planet. From our vantage point back home—and you have to remember that we are looking up through lots of water vapor in the atmosphere—it did, and does, appear more red than anything else. But, once you get here you can see that it is a sort of brown from the higher concentration of iron oxide in the soil—”

“Huh? Rust?”

“Yes. But not the rip-roaring rust we get. There isn’t enough oxygen or water in the Martian atmosphere to turn it really deep red. And, it is that very oxide I hope to build on to give us a good extra source of oxygen. Break off the iron and you get the metal plus life-giving O2.”

Bud nodded. They remained quiet for a few more minutes. Tom could tell his friend had a further question and decided to allow him time to come up with it.

With the little aircraft skimming across the landscape and absolutely nothing else in the air to cause him to pay extra attention, Tom locked the controls, relaxed and turned to his friend. “You and Sandy take evening walks, right?” Bud nodded and slightly blushed, hoping that this line of questioning wasn’t going much further. “Well, can I assume that you two have stopped gazing into each other’s eyes long enough to enjoy a sunset?

“Of course. You’ve got to or else the girls think you’re a barbarian,” Bud stated with mock seriousness.

“Well, what do you see? What colors?”

“Uh… orange and yellow and… oh! Red. Wait. Do you mean the same air pollution that I learned about in school that causes the early morning and evening color shows is the same thing that makes this planet look red from Earth?”

“Well, to some extent. Our own atmosphere and the iron oxide dust here contribute to many years of our getting less than clear telescopic photos as well as enhancing the redness of what we see. When folks on Earth look up here with small telescopes what they see is that dust plus what little moisture there is in the air plus the atmospheric density plus reflected and refracted light plus—”

“Whoa! That’s enough for me,” Bud said. “Can I just think of it as being red because of rusty dust in the air?”

Tom smiled. “If that’s what it takes to help you sleep nights, then —”

Bud’s hand had just reached out and gripped the inventor’s right wrist. Tom looked over to see his friend’s head craned around looking out of the bubble door behind them. “What?”

“Trouble. We’ve got big trouble. Look!”

Tom spun around to look out the scene behind their heads. All he could see was a reddish-gray blob. A chill ran down his spine.

“Dust storm!” he declared. “Let’s get the heck out of here,” and he reached forward to disengage the control column lock.

“Can we outrun that?” Bud asked, a touch of nervousness creeping into his voice.

“Not sure, but we’re going to try,” Tom shot back. “I don’t want you getting airsick on me, but it will help if you can spin around and give me a better idea of how large that thing is and how close. I’m kinda busy right now.”

With Bud providing the requested information, Tom concentrated on getting the Tri-copter pointed in the exact opposite direction from the oncoming storm.

“Any chance of getting to one side?”

Bud looked again. “Nope. Sorry, but we bad-lucked ourselves right in the middle of that thing. It’s at least ten miles in either direction.”

Tom set his jaw and continued to fly them as quickly and as best he could, trying to find some way to save their lives.

They shot across the Martian landscape as fast and the Tri-copter could travel, hoping to get back to base before the storm.

It didn’t look like a race they could win.

CHAPTER 18 /
IMPROMPTU SPELUNKING

TOM HAD A MOMENT in which to glance at Bud. The flyer sat calmly in the second seat, a grin fixed on his face. Without turning, he said out of the corner of his mouth, “Got every confidence in you, skipper. Just keep flying.”

Tom couldn’t help but smile, even if it was more of a grimace of determination. “I’ve got nothing better to do right now. Take another a look behind us and tell me how close that storm is getting?”

Bud craned his neck out and around so he could see out of the right side window. He was glad that Tom had made the side windows more like half bubbles; it made scanning from the side to directly behind them much easier, even if it distorted the view just a little.

“Um,” he began. “You probably don’t really want to know, Tom. I’d suggest not worrying your pretty little head over such trivial things and try to get a little more forward tilt and speed out of this three-armed egg beater.” He took another quick glance back to verify his initial impression. The storm was gaining on them.

Tom reached out to the small control panel and found he could turn the pitch control another few degrees. As the Tri-copter’s rear end lifted slightly and the nose dropped, the air speed indicator inched up from 53 to 57, but stopped there and refused to go any higher.

“Well,” Tom commented, “she’s going a couple miles per hour faster than her design specs.”

Now staring straight ahead and silently reciting a mantra having to do with ‘make it go, not so slow,’ Bud nodded, but then pointed to the left and said, “Can we make it up and over that hill?”

Tom looked. “Yes. Probably. Almost certainly. Why?”

“Because if the wind works the same here on Mars as it does on Earth, pilots often use hills and mountains as buffers to oncoming storms. If we can get behind that, and really low to the ground, it may force the worst of the storm up and over our heads. At the very least, it might give us better air to set down in.”

Tom calculated their chances in continuing toward the dome. It wasn’t looking very good. In fact, he figured they would fall short by more than two miles.

“Okay, flyboy. I’m seeing a little dip in the hill on our ten o’clock. I can get us up and through that, then I’ll try to drop as low as possible before we take a hit from that storm.” He moved the control stick to

the left a fraction and the little aircraft tilted slightly and turned on a new heading.

Bud watched as the hill came closer and closer, and wasn't seeing as much rise in their elevation as he thought necessary to clear the crest of the hill. About the last thing Tom needed right then was him worrying about things like that and bringing up the subject. And, though Bud—and Tom—knew he was the better pilot overall, Tom had a skill and aptitude and a natural inclination for lightning-fast calculations that had save both their lives on more than one occasion.

At the very last moment, the Tri-copter gave a slight lurch and the nose pulled up just high enough and long enough for the three rotor helo to fly over the rocky crest, missing a small outcropping they both noticed at the very last second by a matter of feet.

With almost inhuman speed Tom dropped the nose, pushed in the throttle to slow them, spun the copter around and set it down on an outcropping halfway down the back slope.

With about five seconds to spare, he got the rotors stopped and pulled in and they sat there, trying to catch the breath both had been holding for at least the last minute, and watching as the storm pelted them with gray-red dust and small rocks.

Five minutes later, it was over.

Tom looked at Bud and then they both looked around them. A few rocks of notable size had been dislodged and had slid down the incline only to be stopped as they contacted the side of the Tri-copter, but, as Tom checked out all of the aircraft's systems, and as Bud opened his door and stepped out to clear the rocks and to take an inventory of any visible damage, they had one thought going through their minds:

We survived!

"Well," Bud told him as he climbed back in, "as long as the rotors still unfold and we can get things turning, I don't see anything other than enough paint scratches and small dings to keep an average body shop busy for a few hours." He grinned at his friend.

Tom grinned back and reached for the control panel. A flick of the master switch and the panel lit up. This was no surprise as Tom had already tested that. He next pushed the throttle control all the way in and watched as the tell-take green LED indicate its full functionality. The rotors all unfolded about one-third of the way around before Tom stopped them and suggested that they both step out and make sure that there was no stray dust or stones in the hinges or the locking points on the hubs.

Those proved to be clear—Bud had brushed them out with his

fingers earlier—so they climbed back in and completely opened the rotor assemblies.

Three minutes later they were airborne. Ten minutes after than they set down on the far level area from the environment dome.

"Jeez, skipper," exclaimed Zimby Cox as he rushed out to greet them. "I hope you didn't get caught in that storm we saw on RADAR."

Tom and Bud smiled silently at him until he blushed and looked away. "Oh. Sorry. Well, you don't look any the worse for wear."

"I'm not seeing anything covering the partially inflated dome," Bud commented. "It missed you all?"

Zimby nodded. "Yeah. By about a half mile. It did, however, knock out the comms antenna we took up and planted on the south peak this morning. I was hoping to take the Tri-copter up there and set it back up. Is she okay to fly?"

Tom told the pilot that the aircraft seemed to be in good condition, but cautioned him, "You ought to get the technicians out to give her a quick once-over and a good blow down to get out any stray dust before you take off. Oh, and I realize they won't be coming out until load number three, but I'd like to have you work up a schedule for installing the system of permanent antennas for Earth to Mars calls. I'll have the three satellites in that load as well. If all goes as planned we should be in nearly constant contact with the folks back home in one month."

"Will do, Tom. But I have a favor to ask regarding that."

"What?"

"Having that first antenna blow over tells me that the mounting plate and guy wire system isn't sufficient. Is there any way to make the antennas attached to an anchor like we're installing around the dome?"

Tom looked at him and smiled. "Perfect idea, Zim. I'll see that it happens."

Eleven days later when the *Sutter* arrived with its next load, Tom was surprised to learn that it carried atop The Expanse another cargo rocket. He went up in the existing rocket to check things out. Inside the new cargo rocket was a note from Mr. Swift:

I've decided to reconfigure all of our cargo rockets to the repelatron model. We used this one to test the combination underwater launch and repelatron drive system just before the Sutter departed. Since we will now be able to make as many launches as we wish with no restrictions on exhaust emissions, I

feel that we need to keep fewer of these sitting around Loonaui. Hope you can use it up there. We increased the cargo area by not adding any extra seats and by taking out the fuel tanks.

By the way, this one has the same power pod so you will need to keep things to one round trip per rocket per day,

Dad

Tom had to smile at it all. Leave it to his father to either guess or just plain know that they could use the extra rocket. A search of the cargo hold showed that it was almost twice as large as the area in rocket number one, and held some extra supplies he had requested at the last minute.

After talking with Zimby Cox who had made the trip home and back he found out that the second rocket hadn't been onboard when *Sutter* left orbit. At Mr. Swift's request they had kept the large ship under a slower acceleration for an extra day while the rocket caught up and was strapped down.

"Who flew it up?" Tom asked.

"Nobody. It did the whole thing on autopilot. Pretty neat, huh?"

Tom had to agree. Although many of the weekly cargo rockets up to the Outpost now flew without the need for a human pilot, to his knowledge nobody had written the necessary code to anything more than that—other than performing the two different location landings in the waters off Loonaui and Fearing Island.

Tom contacted Enterprises to thank his father. "You've really helped," he said. "Thank you."

"Think nothing of it, Son. But, before I let you go I wanted to pass on a small piece of information. You might recall that Harlan was worried we might have someone at Enterprises who was involved in leaking the information on the three-wing jet. Well, we do, but he's positive it was an honest mistake. It turns out that the young female engineer on the folding plane development team is the half sister of Senator Quintana's rogue aide. He began calling her about six months ago and she casually mentioned what she was working on as well as a few other things here at Enterprises. When they were here for the demo he cornered her and managed to get some sensitive information from her. She feels horrible and wants to quit, but we convinced her she ought to stay."

"Did she know anything about his activities?"

"No. They evidently hadn't spoken for more than five years until his first call. The other thing is that the aide confessed to being the

one who released the audio statement right after he got home."

"I hope she's learned a valuable lesson."

"I do as well," Damon responded. "By the way, you ought to become a detective like that Drew Nance character you met last year. Your hunch about the supposed Brungarian threat letter not being genuine was right. Tests showed that the paper came from a small plant in Pennsylvania."

After another minute they said goodbye and Tom left the rocket's control room to go back to the dome.

While Zimby organized the off-loading of the cavernous cargo section of the *Sutter*, Tom took the new rocket down to the planet, landing it on the far area from the fully inflated dome. But, this would be just about the final time that was necessary.

Inside the cargo hold was Tom's smallest paving machine that used the durable foam product he first pioneered for his repelatron skyway. This model was even smaller than the one he used in the African country of Magurro to connect all of its towns and villages. In fact, this one was only capable of laying a four-foot wide strip at a time.

But, all he wanted to do was a sixty by one hundred foot pad on which one or both rockets could set down without kicking up dust.

The rest of the cargo hold contained the foam for paving the pad along with a special shipment of frozen meals from Chow.

As most of the men started to come over to help with the unloading he radioed over, "I only need five of you, but that includes Jerry Ratner." Jerry was one of the three Enterprises employees who knew how to lay down a perfect line of the paving foam.

In fact, he was so good and so quick that he had the entire landing pad completed before dinner that evening. As a reward Tom gave him first choice at one of Chow's meals.

A life-long vegetarian, Jerry opted to take one of the chef's meatless lasagnas. He pulled the tab and the self-heating bottom began to warm up. Ten minutes later he and the rest of the crew were enjoying their first "home cooked" meals in several weeks.

Now that they had the landing pad finished—and much closer to the dome—things began to run more quickly. Each morning one of the cargo rockets would take off at seven a.m. to return by about one in the afternoon. The other rocket would have taken off at noon and would land again before dinner at six. This meant that the crew had a full day's of supplies to unload, organize and start to use each day.

Tom, wary of overworking his eager men, insisted that every fifth

day be one of relaxation. This meant to most of the crew that they had time to explore their surroundings. Many set out on foot and were able to cover several miles in an hour without much effort. A few checked out one of the two electric jeeps that had so far arrived.

Only Tom, Bud and Zimby were trained to pilot the Tri-copter and so were the only ones who flew it around. Since the one storm, nobody had noticed anything more than the occasional eight to ten miles per hour wind and those were mostly on the other side of the mountains behind the dome. With the integral tubing filled and hardened, nobody inside noticed anything whenever a wind did buffet the dome.

"You sure picked a great place to put this thing up," Bud complimented Tom as they took off on a mission to finally replace, permanently, the radio antenna that had been "hiked" up the slopes weeks earlier.

As soon as the Tri-copter landed on the peak Tom radioed down to the construction team.

"We discovered something on our way up here. No, make that two things."

"Something on that outcropping of rocks you stopped at?" Red asked. He evidently had taken over on the radio at the two o'clock change.

"No," Tom replied. "We stopped there to let the power pod cool down. With the thin air it's hard to gain altitude very fast with this full load, and I was running things a bit over the red line. Actually it's what we discovered now that we're up on top. For starters, just over the crest is the wreckage of an old Martian probe. It's not too burnt up, but pretty mangled. I believe it's the British one from the early two-thousands."

"Wait. You mean the one that they had contact with right up to the second it was supposed to go into orbit… and then nothing?"

"Yes. I'm fairly certain. Can you get a call back to dad and have him make enquiries? See if the Brits want us to bring it back to them for study?"

"Will do, but you mentioned two things. What's the other?"

Tom paused before answering. "I think we have located proof that there once was intelligent life on Mars."

There was a stunned silence at the other end. Finally, Red managed to get out, "Uh-h-h-h-h-hhh. Okay."

"Yes. And don't go thinking that Bud and I are suffering from the thin atmosphere. Our suits are working just fine. What we located is

a hole."

"Say that again, skipper. A hole? Maybe it's a vent from the old volcano?"

"Nope," Bud cut in. "The skipper's right, Red. This is a hole definitely dug out by machinery. The walls are scored with the marks of whatever tools were used."

"That's correct, Red. We didn't think to bring up a flashlight so we can only see in the first few yards, but it definitely isn't a natural phenomena. As soon as we get the antenna hole dug and the anchor installed, we're coming back down. Along with the antenna assembly and transmitter can you please pull out the brightest portable light we've got?"

"Will do. Did you want me to tell everyone about this, or keep mum in case you two really are delirious?"

Tom laughed while Bud scowled. "Be nice, Red. Go ahead and tell the others, assuming they are interested, but let them know I won't commit to saying what it is until we come back up later. Tom, out."

While Bud manhandled the earth blaster to dig the necessary anchor hole, Tom tied himself to the Tri-copter with the rope they brought along and eased himself down the slope to the wreckage. It only took two minutes before he found an etched metal plate. Though twisted and singed it plainly stated that it was attached to:

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EADS Astrium — Beagle 2

07-29-2002

Exactly what that meant would have to wait until he could see a components list but from the size and shape he believed it might be the underside that had once been covered by a heat shield. The one thing he recalled, and that made him give out a sad laugh, was that the *Beagle 2* probe was supposed to set down in the exact same location he and Bud and their surveyors had first landed when they arrived at Mars, Isidis Planitia.

The entire wreck was spread out over a twenty-foot area and the majority of the pieces were still connected.

With a shrug he pulled himself back up the fifty or so feet to the top of the hill and found that Bud was finished drilling and about to pick up the anchor. Tom gave him a hand and in a minute it was in the hole and the foam was expanding to lock it permanently in place.

"Do we go back now?" Bud asked.

"Yes. But we'll be back before dinner, just as soon as the power

pod recovers a little."

There were a number of things he needed to attend to, so Tom and Bud didn't have the chance to go back up until the following morning. That evening they received word that the British aerospace program people would "be most grateful if the Swift expedition might be able to recover and return" their probe. It wasn't going to be easy; the Tri-copter would be powerful enough to lift its seventy-five pounds, but he would need to come up with something to keep the pieces together.

Without the weight of the earth blaster and anchor to carry, Tom and Bud made it to the top of the peak without stopping. The first order of business was to extend and then bolt down the five-foot-wide dish antenna, attach and secure the transmitter box, and turn the system on. In all it took them just twenty minutes.

"Ready to spelunk?" Tom asked?

"Sandy's always called me a cave man," Bud replied with a grin.

This time they brought along harnesses and basic rock climbing equipment in case the hole made a sudden drop. As they entered the meter-wide opening on all fours, Bud said, "Well, I hope we don't wear out the knees on these suits. I'll never get my deposit back on this tux if we do!"

"Don't worry mister Prom King. In case you haven't noticed, the knees are pretty thick and coated with a self-sealing coating. Just as long as you don't drag your legs along you'll be fine." He turned on the light he had attached to his helmet. It might not be as powerful as a hand-held million candle power light—one of the options available to them—but both boys had lights that could penetrate nearly a hundred feet.

The hole remained at a steady width at first. After the first five yards it turned downward for about ten feet, which they lowered themselves into, before opening wide enough for them to walk bent over. It seemed to spiral slowly down and to the left for another hundred feet before opening into a dead end chamber.

Tom and Bud looked around with their lights playing on the walls. Both could barely breathe.

Etched into the walls were a series of complex symbols and what appeared to be equations. All were evenly spaced and about one-quarter-inch deep.

Tom sat down and began to laugh, soon joined by Bud.

"You do know what those are, don't you, flyboy?"

"Hey. I may not be able to read them, but I'll bet you a steak dinner

back home those are from your Space Friends!"

"They sure look like it. In fact, if you look up there," Tom said directing both his right index finger and helmet light upwards, "those first five symbols are the same ones that start the message on that very first rocket they sent us. 'We acknowledge and greet you.' Bud, it's a message from them for sure. Let's take a good video of it and go back to the camp. I think I might be able to translate this on my tablet computer."

Using both of their lights in a coordinated effort, Tom scanned the seven lines of between eight and fifteen symbols each. There was absolutely nothing else to see in the smooth-walled cave, so they pulled themselves back up and crawled out.

The bright sunlight—relative to the dark cave—made them squint a moment, but they soon recovered and flew back down to the dome.

An hour later Tom came out of the cargo rocket having first sent the video to his father before tackling the job of translating things. Both his manual method and the automatic computers at Enterprises used came up with basically the same message:

We acknowledge and greet you, friend Tom Swift.
This location is logical for you to
visit and construct colony so we say welcome
to planet you refer to being Mars. After we
visited your planet we made increased effort
to land on this planet. We succeed. We
will visit colony some day soon. We are pleased.

CHAPTER 19 /
THE UNSEEN ENEMY RETURNS

TOM AND BUD, along with the original construction team, returned to Earth with the *Sutter* on its second trip back from Mars. Everything was running smoothly and Haz Samson had come up to take command of the new crew.

On hand to meet the returning team were family members including Bashalli and Sandy. Tom was mildly surprised that his folks hadn't come to Fearing. They generally did when he had been gone for more than a few days. Sandy whispered in his ear, "Mother and daddy send their regards but figure they'd be fifth wheels. I think they know you and Bashi want to be alone. I sure know I want to get some 'just us' time with my lunk!"

So, it wasn't for another two days that he and Bud entered the grounds of Swift Enterprises.

"Welcome back, Tom," Damon greeted his son when he walked into the office two days after returning from Mars. "I hope you got reacquainted with your wife. We had her staying with us, in case she didn't mention that, most of the time you were gone. She slept in your old bed. Told your mother it made her feel close to you. So, I've been reading all of the reports. It sounds like things are just sailing along."

"They are, and with Haz Samson now in command, I can sit back and wait to enjoy the final outcome. Did Dr. Clack finalize the list of candidates?"

His father nodded. "A week ago. She wants either you or me to meet each one to give final approval. Won't tell me anything about them because she wants our unbiased opinion. The list stands at sixty and she is suggesting paring that to Haz, herself, and forty-six others for the first round of positions."

Tom raised an eyebrow and looked at his father. "First?"

Damon smiled. "Why, certainly. Our Mr. Samson is already submitting plans for a second of your domes and another forty to fifty residents. What do you think of that?"

Tom thought it was both wonderful and ambitious, and told his father so.

"Oh, I wanted to know how the recovery of the two lifting balloons went. In all the excitement and with everything to do up there I plain forgot to ask."

Mr. Swift looked a bit uncomfortable about the question. "Well,"

he started slowly, “the balloon and repelatron platform obviously got up to where you took over. As you hoped, the vacuum machine was able to suck out and compress enough of the helium to get the balloon to come back down. It drifted a bit and ended up over near the coast about ten miles inland from Portsmouth, New Hampshire. We recovered the tank but the balloon was torn apart by the trees it ended up in, so we lost about eight percent of the gas.”

“And the other? The dummy that went up later?”

“That, Son, was a total loss.” He told Tom about the sudden appearance of a jet that had launched a missile into the rising balloon. “It streaked in from the north-west, launched, and in the confusion it disappeared back north. It must have then hugged the ground because our RADAR and the RADAR at Northeast Control both lost it.”

Tom look dismayed. That had cost a lot of precious helium. Even with the more recent discovery of a huge reserve at the undersea helium mine, it was still something he had hoped to avoid. His intent had been to have an enemy target the dummy payload and not the gas envelope.

“Remember, Son, that you created it to use as little gas as possible and as a decoy. Sometimes decoys must be sacrificed.”

Tom didn’t like it but his father was right. He *had* built the light, hollow-wall balloon specifically to draw the attention of anyone wishing to attack his project. It had performed as expected with the result being that it had been lost. “But,” he told Bud at lunch that day, “I would rather that happened than having our dome blown to bits.”

The flyer stopped moving with a spoonful of soup halfway to his mouth. He lowered it back into the bowl before speaking. “What would have happened if this Wingate guy had ruined the first dome?”

“To be frank, we’ve invested so much in everything else to go inside it, and even to get it there, that we would have had to build another dome. We’re not talking millions and millions of dollars, but it would have been taken out of my allowance from now until the time I turn ninety!”

“Well, I’ve got a couple grand saved up, but I’m afraid your sister has her heart set on marrying me with some money in the bank, and not as a pauper.”

“Don’t worry, flyboy. Your money is safe in Sandy’s clutches.”

After lunch, Tom made arrangements for several new items to be sent up for transport in the *Sutter*. Haz had requested that a full laboratory, including all necessary spectra-analysis equipment and an additional, and more powerful, earth blaster to dig up deep

samples be provided. He also asked for about thirty special beams be provided to, in his words, “Let us attach the top of the hydroponics line to the top of the dome for increased stability.” Tom immediately set that rolling.

In addition, Doc Simpson had suggested weeks earlier that a variety of herbs be grown in addition to the plants producing oxygen and food.

“Not only will they add some needed flavor to things,” he advised, “but there are many herbal remedies the medic living there can create on the spot so they don’t need frequent shipments of medicines.”

Both men were right and he gladly added Doc’s items to the list as well.

One thing nobody suggested was actually at the top of Tom’s list. A way to rush one or several people back to Earth in an emergency. As with the evacuation balls now installed at the ends of each spoke at the Outpost, he knew there might come the time when having to remain on Mars, or to wait for something like the *Challenger* to come pick them up, could mean the difference between life and death.

While a cargo rocket might be used for this purpose, it was only marginally faster than having the larger ship travel out and back. This was mainly due to the lack of a high-capacity power source. And so Tom had devised a plan on the trip back.

He was going to ship up a large power pod—one specially designed to fully utilize the space in the cargo hold of the first cargo rocket—that could be quickly installed and hooked up and would provide constant power for the fastest possible safe flight back. The construction team out at the Citadel promised it would take fewer than six weeks, as long as the *Challenger* could land there to pick it up when ready.

A half hour later Tom was satisfied with the completeness of his list and had made all calls necessary to make things happen. He sat back and looked around his underground office… and sighed.

He had become used to the all-day workload and pace of construction happening on Mars. Now that things were practically on autopilot, he pondered what he could do next. Certainly, there were a couple small projects he had set aside over the past few months, but those would only take a few weeks to finish.

Even if Enterprises should get the go-ahead to build more of the replacement buildings for the Moon, all he could contribute would be a few directions and signatures on purchase orders. The ladies in Uniforms, under the guidance of Marjorie Morning-Eagle, would pump out whatever number were required as easily as if they were

asked to make a few dozen specialty coveralls from a bolt of silk.

He got up and wandered out into the hangar. It was large and empty with the *Sky Queen* currently running high-altitude flight tests for the folks on Fearing Island.

Minutes later—lost in thought—he found himself standing on the ride/walk belt heading to the shared office. Outside, Trent looked up and gave Tom a smile. "I hear the Mars installation is going great. I'd love to see some pictures of it one day."

The inventor smiled. "I'll upload the initial construction shots, but the real pictures that will tell the story are yet to be taken. Once the dome is occupied and in production, *that's* going to be the good stuff," Tom informed him.

He entered the office nodded to his father, and sat down behind his desk. He spent the next ten minutes answering a few emails and one personal appearance request.

Tom and Damon looked up when a knock came on the office door. Patrick Peck opened it and came in. "Sorry, but Trent seems to have taken a short break. Hope you have time for a little legal news." He looked expectantly, first at the two Swifts and then at the conference area.

Damon swept his right arm in invitation to take a seat. He and Tom quickly joined their legal man. "What is this about, Patrick," Mr. Swift inquired.

"Well, it is about something I'm afraid we in Legal have kept from you these past three days. If you are angry about it, once I tell you the outcome that is, then I've brought along my unsigned resignation. But, if you hear me out I think I'll keep my job."

"With an intro like that, you've got both our attentions. Go ahead."

Patrick reached over and picked up the remote for the monitor. "Do you mind?" When Damon shook his head, Patrick turned the device on and the flipped out the small keyboard, typed in a few things, and they were soon looking at the front page of a legal document.

Tom and his father gasped when they read the title:

In The Case of Wingate Aero Construction, Corp.

V.

Swift Enterprises, The Swift Construction Company, et al.

"What?" Tom practically shouted.

"Wait and hear me out, please," the man from Legal pleaded. "Here's the bottom line. Wingate filed a one billion dollar suit against you and everything you own claiming that you conspired with unnamed agencies of the U. S. Government to deprive them of their primary source of income, mainly Government contracts. They also claim that you have illegally staked a claim to the planet Mars while disregarding their own claim as having put the first man on that planet, although they provide no proof of that feat."

"This isn't a term I use often, but *balderdash!*" Damon exclaimed, his face now quite red with anger.

"It has a happy ending," Patrick said hopefully. "Of sorts." Damon calmed down—a little—and sat back in his seat. "Anyway, because the U.S. Government is listed as a 'co-conspirator,' this went straight to the Attorney General. He went ballistic and ordered that the National Guard of Montana surround the Wingate complex and then flew out to personally lead an FBI raid of the place. Guess what he found."

Tom said nothing, hoping his father might make a guess. But, the older man kept his mouth closed.

"Fine. I'll tell you." He pulled a paper out of his briefcase and slid it down the table to Damon. It was his resignation letter. "Nothing. They found nothing other than deserted buildings. No people, just all of their equipment, abandoned production lines and a lot of papers. Tons and tons of it all shredded and scattered."

Now, Damon leaned forward again, but this time his face showed nothing but curiosity. "Where did they all go?"

"According to some of the townsfolk who once worked there, Wingate laid off everybody by email three weeks ago. No severance and nothing but the big padlocked gates when they turned up to protest. The caretaker at the regional airport said the Wingate corporate jet took off about the same day the layoffs happened, filing no flight plan. And get this… he told the FBI that the Wingate jet had two external mounts under its wings. The sort that you put rockets on. Which means that was probably the jet that took out your second balloon, Tom."

"Well, at least we know what happened. But that also means that Wingate might be able to attack any aircraft that tries to come near."

"The military has been advised. But, Wingate and his jet seem to have totally disappeared."

"Then, were did this lawsuit come from?" Tom asked.

"Take a look at the postmark," Patrick advised as he changed the picture on the screen.

“Montana on… But that’s more than two months ago!” Tom gasped on seeing the date.

Patrick chuckled. “And that is what you get when you don’t put on enough postage and then let the Post Office deliver important things like lawsuits. We still haven’t received ours. What you see there is the one the Attorney General received. Anyway, to cut this to a short story, the A.G. has nullified and voided the suit. It is meaningless and will never see the light of day again. Although, he tells me he sincerely hopes that Wingate pops up as there is now an arrest warrant issued for the man.”

Damon reached out and picked up the resignation letter from the table and tore it into several pieces. “Thank you for this interesting but somewhat dismaying report. So, what is the state of Montana able to do for the displaced workers. They had something like a thousand men and women.”

“Eleven hundred and seven, to be exact, minus Wingate. I’m afraid that simple unemployment is about all they might receive. Except that the Feds are still holding on the remainder of their Moon contracts. There is about twenty million left unpaid and the A.G. says he’ll do his best to see if that can’t be put into an escrow account for those men and women. At least for the line workers. The executives seem to have disappeared as well.”

There was little more to say and so Patrick excused himself and left.

Damon looked at Tom and shook his head. “Sometimes I think that might be the way to handle difficult issues. Let it play out before anyone puts it on my plate. Well, I was just about to open a letter that came in the early express delivery. It is from the Office of Procurement, United States Army. Want me to read it to you?”

“Well, yeah!” Tom said. “Even if it’s more bad news we might just as well get it out of the way now.”

His father pulled the tear-to-open strip on the back of the large envelope and took out the three sheets of paper inside. “Let’s see. The first page is simply a cover to tell us there are two pages behind it. Good use of paper there,” he stated sarcastically. “And, page two just says that page three is the official announcement of Government Request For proposal G—as in George—seventeen hyphen Alpha hyphen one zero nine stroke S.E.U.S.A. hyphen one one seven five nine two. Did you want to hear what scintillating news the final page might contain,” he said looking up over his reading glasses.

“Might as well,” Tom replied.

His father set the second sheet on top of the first on his desk.

“Here goes, then:

> ‘Dear Swift Enterprises;
>
> It is with great pleasure that we announce to you the awarding of the contract to provide an initial delivery of ten of your aircraft as detailed in the RFP, above. Of all available aircraft presented yours distinguished itself by meeting and exceeding all specifications. Your specific demonstration was exemplary. Delivery dates and milestones to follow, but first aircraft must be available in eleven months. Following delivery of sixth aircraft an evaluation will be conducted with possible award of one or more additional contracts. The total number of aircraft possible under this program is not to exceed thirty-two. Signed,’ et cetera.

and that’s about it.” He took off his glasses and smiled at Tom. “I think we owe Hank and Arv one or more months of fine dining at company expense!”

Tom agreed.

Things seemed to be looking up all the way around. The Mars colony was considerably farther along than planned and with the new contract coming in, that just left two unanswered questions: What would happen on the Moon, and was the “Wingate problem” over and done with?

While the lunar question remained unanswered, a week later came word that several sightings had been made of a jet matching the general description of the one last seen departing the small Montana airport.

The first sighting was in southern Mexico where a local town’s police officer, while attempting to track drug smugglers through the dense forest, happened on a dirt airfield in the middle of nowhere with a strange jet parked at the far end. Twenty minutes later a battered pickup had pulled up next to it, three men got out and climbed into the aircraft which several minutes later roared down the field toward him, barely missing the tops of the trees he had positioned himself under.

One thing he reported that he found to be most strange was that it appeared to have two small missiles attached to the undersides of its wings.

The next sighting had been during a military exercise the next day in the mountains near Tegucigalpa, Honduras. Army spotters from that country had even taken several photographs of it. When they were provided to the U.S. State Department the opinion—even though the shots were fairly blurry—was this must be the same aircraft.

Wingate was on the move south and a plan was hatched to stop him.

Though the U.S. had no active Air Force base in Panama, there was a small contingent of reserve fighters stationed at the former France Field at Enrique Adolfo Jiménez Airport in the city of Colón on the east coast of the country. All three of the aircraft were put on high alert within an hour of the Honduras photos having been examined.

The trio of A-7 Corsairs, virtual relics that had last seen military service in the Viet Nam War, scrambled and began patrolling the skies. It wasn't until late that afternoon, about a half hour before sundown in the area, when their RADARs detected an incoming aircraft trying to run along the east coast. It was flying at just one thousand feet altitude and at a leisurely three hundred knots per hour.

The leader of the mini-squadron gave the orders and the fighters descended and turned to come up behind the jet. Visual identification was made. It was the Wingate Jet.

When ordered to fly to the Colón airfield by radio, the jet increased speed and nosed upward. Repeated radio attempts brought no response. The lead A-7 accelerated and pulled along side, about one hundred feet off the corporate jet's port side. The pilot indicated the jet was to descend, and received a rude gesture in return. The A-7 pilot made the "go down" motion again, and the private jet pilot answered by making a hard right turn away, little realizing there were two additional fighters less than a half mile behind.

When he spotted these, he fired one of his rockets. As it arced around to come at the military jets, one of them fired about ten rounds from their 20mm Gatling gun. They had meant to miss, but the Wingate jet made a sudden hard maneuver and ran into the path of the shells. The lead A-7 took out the Wingate missile with one of his own.

The tail of the jet disintegrated and it began to spiral downward. It was last seen plummeting into the large body of water below them, Lago Bayano. What the A-7 pilots did not see in the dusk light were the three parachutes that opened and drifted into the trees to the east of the lake.

* * * * * *

At the request of Haz Samson, Tom and Bud, along with Hank Sterling, Red Jones and Zimby Cox—returning after a short break back on Earth—took the *Challenger* to Mars several weeks later. The commander of the colony asked them to come up to attend the formal

christening ceremony for the now mostly functional colony dome.

It was a nice trip out, even though Tom decided to use a high-speed flight plan that required everyone to be strapped into their acceleration couches for most of the five day trip.

The final three hours had been spent coasting at an angle and speed that would put them into a high orbit over the planet. Tom intended to make at least one complete circuit before landing.

Hank, acting as their waiter, had just finished handing out some of the prepared meals Chow had sent along when Red cried out, "We've got troubles. Something hot and fast is coming at us from around the curve of the planet. *Incoming!*"

CHAPTER 20 /
HIGH-RISE FIELDS OF WAIVING GRAIN

"INCOMING? That's impossible!" Bud exclaimed as food dropped to the floor and everyone on board the *Challenger* scrambled to their positions.

"It isn't heading directly for us," Red Jones shouted. "It's gonna pass us by about a mile. What the—"

Indeed, the missile was arcing slightly away from the ship. If the *Sutter* had still been in orbit Tom might have believed that it was the target of whoever had fired on them. As he watched it pass to their starboard he had a sinking feeling.

"Give me the point of impact!" he ordered.

"It's the dome, skipper," Hank called out. "Impact in six minutes if that missile doesn't burn up on entry."

"Fat chance of that," Tom replied as his hands danced over the control board. "We're going after it, folks. Strap in." As he was saying that, he aimed the upper repelatrons at Phobos and sent the large ship into a rapid dive. Every ten seconds Red called out trajectory and positioning information on the missile.

It only took them fifty seconds to catch up with the deadly object. As it entered the upper atmosphere, even the less dense one of Mars, flames and sparks came streaking back off the nose. Tom moved a slider control up and increased the magnification on the SuperSight. As he and Bud watched, the missile threw out a drogue chute from its aft end. Made from some kind of metal mesh, it immediately slowed the thing down letting it drop to a speed where friction wasn't going to destroy it.

"Give me one or two of the repelatrons on the starboard side aimed at that thing," he called out.

"Roger."

Seconds after Tom pressed the button to turn on the repelatrons, the missile swung sharply away and exploded. Hundreds of bits could be seen on the close-up viewscreen as they spread out in all directions.

A cheer went up in the control room of the ship, and carried on until Red called out, "Sorry, guys. We've got more trouble. Look, skipper," he said as he transferred one camera view to Tom's screen.

On it a large piece of the missile could be seen falling. That was superimposed over a long-distance shot of the air and the planet

surface, with a red line indicating the approximate line of travel.

It terminated very near to the dome.

"Get them evacuated. Drop everything. Get 'em out!" Tom ordered his radioman.

Seconds later as video zoomed in on the dome, they could all see a group of small figures leaving the dome from all of its exits. The dome's five ground vehicles came out next picking up the people as they moved away. In less than another ninety seconds everyone appeared to be clear.

"Impact in thirty seconds," Red called. "It'll hit about fifty yards to the left of the forward corner."

Tom was relieved until the explosion came.

"Jetz!" Bud gasped. "That big bit was a warhead. It went off about a thousand feet up. I hope everyone's okay."

A quick radio check showed that everyone was fine. With the immediate threat over, the occupants were going to return to the dome to check for damage.

Tom wanted to set the *Challenger* down and assist, but a sudden sense of outrage hit him and he sent the ship soaring back into space.

"Uh, I don't mean to be a mister nosey guy, Tom, but where are we going? Don't they need us down there?"

"Somebody shot that missile at us, Bud. We're going after them before they can try again." His face was set in a grim look of determination. "I want all unused repelatrons to sweep around us looking for any collection of elements. Anything."

As the ship raced from the atmosphere Tom had Bud and Hank turn all sensors to the area surrounding them. Moments later Hank called out that he had detected a trace of hydrazine ahead and to their right.

"It's a trail of the stuff and looks to be heading straight out from the planet, skipper."

"Hydrazine?" Bud asked. "Isn't that one heck of a dangerous monopropellant, Tom?"

The inventor nodded. "It is. Whoever unleashed that missile isn't very bright. Not only are monopropellants dangerous and highly explosive, they are generally corrosive as all get out and not suited for space travel. And, if they are storing that stuff in glass, their tanks are vulnerable. I'd hate to be in that ship."

On they raced with Hank calling out periodic reports on the

relative strength of the hydrazine. “It’s getting really heavy, Tom. They must have sprung a leak. Plus, I’m getting a mass of steel, aluminum and titanium at the front of the leak.”

Tom called over instructions to the radioman. Ten seconds later the man nodded to him.

Tom keyed his microphone. “Swift *Challenger* to whoever you are out here. Swift *Challenger* to whoever just shot at our installation. We know you are out here and we know your hydrazine tank is leaking. Come in. We would rather save you now than try to recover your remains later.” He repeated the message twice more before sitting back.

A desperate-sounding voice crackled over the radio,

“Swift? I’ll get even with you if it’s the last thing I do. You did this! You sabotaged my ship!”

Tom was stunned. First by the accusation and second by the voice. He knew that voice. It was Preston Wingate, president and owner of Wingate Aero.

“Mr. Wingate. Stop whatever you are planning to do. Shut down all systems and jettison your fuel. You are in grave danger. I repeat, jettison your fuel. We will come pick you up and see that you get safely back to Earth.”

The only reply was a harsh growl before the connection was cut. Then to Tom’s horror and everyone else’s disbelief, the Wingate rocket sent out a lance of flame from its two engines. The reason why some people use monopropellants became obvious to all. With their ability to create their own oxidizer, the leaked fuel quickly caught fire even in the vacuum of space. And, as quickly as it shot back dozens of miles, it made an even faster trip back up into the rear of the rocket.

With a totally silent flash, the Wingate ship ruptured in the middle of a huge fireball. Three seconds later, all fuel now burned, the inky darkness of space replace the brilliant scene. The ship was nowhere to be seen.

It took everyone’s eyes a good minute to readjust before they could even see their own instruments. But, what they saw made their hearts fall. Instead of a one-hundred-foot long ship, there was nothing larger than a pack of chewing gum remaining.

Preston Wingate and whatever number of unfortunate men he had in his ship had perished.

They sat in silence for many minutes. Some praying for the souls of those they had just seen snuffed out like so many candles, some of them silently cursing the man who had killed his crew in his greed

and hatred.

Finally, Tom picked up his headset and put it back on. He did not recall yanking it off, but it was hanging over his right shoulder. Turning to the radioman, he requested, “Give me a channel to Enterprises, please.” And, because the Swift’s Space Friends had given them a number of almost instantaneous radio transmitters he was quickly connected to his father.

“Tom. Good to hear from you,” Damon began. “I’ve got Harlan here and he was just telling me a few things you might like to know.”

“Uh, Dad? Harlan? I think you need to hear my news first,” Tom said in a steady and measured tone that immediately made his father uneasy.

“Go ahead, Tom.”

The young inventor told them about the sudden missile attack, the close call with the dome on the surface of Mars, and the accident involving the Wingate ship. When he finished, there was another silence. Finally, Harlan spoke.

“Tom. My news was that Preston Wingate died of a heart attack two years ago while on a trip to Eastern Europe, about the time he became a total recluse. From what the FBI has discovered, it was a Brungarian operative with a talent for voice mimicry named Foma Rusilviech who took his place. My bet is that’s who died up there. He was wanted by the FBI, Interpol, and the Australian Federal Police, charged and tried in absentia on several counts of murder and racketeering in the past year alone. And, that leads me to a domestic connection. Preston Wingate has… had a nephew who just so happens to be the father of the junior Congressman from Nevada. The same Congressman who believed he was helping his family get back at the Swifts, and who told Senator Quintana he has made a fool of himself, embarrassed his family and his position, and intended to submit his resignation to his governor as of an hour ago. Not certain where all that’s headed, but I thought you ought to know.”

With a small sigh, Tom told him, “I would guess that bit of news made dad’s day.”

“It did,” Damon and Harlan chorused, but for entirely different reasons. “Then,” Ames said, “it was Rusilviech who spread the rumors and threats and not the Brungarian government. They flatly have denied all along any involvement, and I guess this bears that out.”

* * * * * *

It was a few months later and Tom, Bud and the girls had arrived on the *Sutter* to deliver the second inflatable dome just an hour

earlier. Their attention was drawn to the newest, and to Tom's eyes, the most incredible addition to the living area of the original dome. The four of them stood on grass in the open end of the horseshoe of housing structures, with their faces turned up to the top of what now occupied the corner.

It was a rock formation with a waterfall cascading down into an open pool.

Wisps of mist rose in the reduced gravity around the pool and the water itself was pouring down at what appeared to be about half speed. The overall effect was surreal, but highly serene and pleasant.

"Do you approve?" called out a voice behind him. Tom knew who it was so he didn't turn around or even acknowledge it until the man was standing to his right. "Does it meet your idea of—now what did you say your charming wife called it? A *TerraVironment*?"

Bashalli beamed at the mention of her contribution.

"It is… phenomenal," the inventor whispered. They stood enjoying the soft splattering sounds and the slight cooling of the mists. "When I suggested that you think about building a water feature, I never imagined this!"

Bud and the ladies also added their delighted comments.

The leader of the colony smiled. "You never told us we couldn't, though. Since we have to dehumidify the air back in the grow room to keep things from rotting, we figured we would need to burn about two thousand watts of power per hour to make humidity to keep the housing area comfortable. Possible, to be sure, but this was deemed a better use of the power. We pump the water up to the top—which is five feet higher than our hydroponics line—let about half of it spill over the edge which gives us both an excellent bit of white noise along with the proper level of moisture out here, then we let the rest circulate throughout the hydroponics courtesy of gravity."

Tom pondered the application for a minute. "So, if I can guess at this, you tapped into the main water piping system for the hydroponics and bring that out here?"

Haz Samson smiled and nodded. "Once it comes off the bottom of the hydroponics setup and gets filtered and purified, it ends up here."

"That should mean that the only pump you are using is the one we installed before and you've not had to add anything."

Haz continued to smile and nod. "Yep. It's sufficient to get everything out here, and the gravity trick actually means it is using the same amount of power overall. You ought to see this place in the evenings. Lots of folks just bring their meals out and sit on the grass

watching the waterfall until the artificial sun dims out at nine-thirty. According to Dr. Clack, it has lowered stress in all but two residents who were already low, and my own feeling is that people are happier. Makes the place seem more like a village than a giant closed tent on a foreign planet."

Tom nodded. "I can see that. So, it has my seal of approval. What else is new?"

They walked out of the housing area and through doors to the rear of the giant structure. When they had barely cleared through the gap between housing units and into the largest of the dome's subdivisions, Tom abruptly stopped and almost stumbled over his own feet with Bud bumping into Sandy and Bashalli clutching Tom's hand for balance. Before them stood the eight-level hydroponics setup that provided more than ninety percent of the oxygen for the dome along with all of the edible plant life. It was the first time he had seen it. And, it was huge!

Each level was almost twenty feet high. In total, Tom knew it contained a whopping 385 acres of growing space.

It was one of the most intricate arrangements of platforms, shallow tanks, gears, inclined slides and waterwheel-operated elevators he could imagine. The portion of the roof he could see was a maze of growth lights and special light tunnels that had been installed in the top panels to allow as much native light as possible to come in. The top tier provided three hours of direct daylight for each tank as it arrived at one end and spent that time traversing the entire length of the growing assembly.

As it was lowered to the next level, it continued to receive light that came down between the tanks via a series of mirrors at the top level. The next four levels were lit by artificial lights and that, in all, gave every tank a solid eighteen hours of sunlight for growing.

The bottom two tiers were only lit enough for the workers to maneuver around by day. This let the plants have a period of relaxation before they once again rose to the ceiling. Only during the Martian night did this lower area have its grow lights on to balance the cycle.

Large fans blew air gathered from the recirculation system across the plants and the algae tanks to help spread the CO_2-laden air over as much areas as possible while driving out the newly oxygenated air for use throughout the dome.

"How are you making up for the small lack of O_2 production?" Bud inquired.

"We were taking it from outside for awhile, but recently we built an

O2 separator that draws up water from a well down into the permafrost and splits off the hydrogen. That, by the way, we use in our large fuel cell to make electricity. But, by this time in two months we hope Tom will have finished the equipment to get what we need out of the oxides in the soil."

They wandered under and around the lowest tanks and watched with interest as the tending team took measurements and snipped off small samples to be quickly tested. Twice while they stood nearby, the lead person raised a thumb and pointed at a particular tank. It was disconnected, pulled from the conveyor, drained of the nourishment-rich water, and moved to a cart that already held three tanks and now had room for just one more.

"Those will be taken to the processing room once they get tank five off the line," Haz told them. "Everything will be harvested, any remaining plant matter—roots, stray leaves and that sort of stuff—will get puréed up for fertilizer, the tank replanted and moved to the germination chamber. Five days later it will go out to the line and will take the place of a tank being readied for harvest."

The final tank was soon claimed from the conveyor system so everyone followed the cart to the room partitioned off near the middle of the dome. As they looked on, three of the tanks that contained what appeared to be some sort of short-stalked grain were pushed to one side, while the others were totally emptied and the contents separated into the different foods they contained.

Sandy pointed at the three unharvested tanks. "What's going to happen to those?"

Haz got a big smile on his face, made "follow me" motion with his right index finger, and turned away, quickly walking down a corridor.

Everyone trailed after him. It took several minutes to get to a tunnel leading to the rear of the dome, and a few more to reach the inner door of an airlock at the far back. More than a dozen of the "grain" tanks were sitting there.

"Put on the suits," Haz instructed. "They're lightweight with just enough insulation to keep you from freezing up, and have an hour of air in that flat backpack thing."

In two groups they entered the airlock next to the door. Tom and Bud came out last.

Sandy and Bashalli had already frozen in place, and Tom and Bud followed their example. As they looked out toward the gentle slope of the nearby hill, a sight caught their eyes that they could barely believe.

While the foursome tried to find the words, Haz simply said, "This

is where the plants from those final three tanks will come."

"Amber waves of grain…" Sandy whispered.

Tom nodded. "Acres and acres of grain. Incredible," he said in a hushed tone.

Haz laughed. "Yep. You see, we have lots and lots of room to grow the stuff, but we don't have nearly enough space to let it do complete the drying part of the growth cycle. By the time it is ready to come out here, it is pretty much chill proof and doesn't need water or air for any further growth. We give the plants a little spin to get out as much of the water as possible clinging to the roots, then bring them out here. Five days and they are beautiful and amber like these closest ones. But, if you look, the ones out farthest are still greenish."

So," Bud spoke up, "the newest tanks go out there and by the time they're ready, you've moved them down here?"

Haz slapped the flyer on the shoulder. "Good man and well spotted!"

Bashalli seemed to suddenly come out of her awe. "And, you have done all of this in just three months, Mr. Samson?"

"We have. Fortunately, that husband of yours has pretty much sent us everything we've asked for without making too big a deal out of things like, 'Why do you need that extra two thousand feet of tubing?' and stuff like that." He laughed so hard his visor began to fog up. "Well, time to go back to the warmth of the dome, my friends."

Once inside he suggested that Bud and the ladies continue exploring. "I need to have a word with my boss, here," he explained.

After the other three left, Tom looked at Haz. "You've done an incredible job here. I'm a little jealous and a lot proud of what you and the others have accomplished. So, what did you want to ask or tell me?"

Haz pointed to a bench near the large door. They sat down and the tall man tugged at his left ear. "I think that I have come to understand what drives my father, Tom," he said, causing Tom to blanch. "No, not *that* way; not the 'I'm ridiculously rich and I'll do anything it takes including killing people' way, but in the way where I now understand that having a little of something that is unique or special makes you thirst for more. A lot more."

Tom's eyes narrowed. "And you are thirsting for what?"

Samson looked up and all around them, his eyes taking on a dreamy look. "More. More of this, Tom. Granted, we can barely sustain ourselves right now and wouldn't even be able to do that if it weren't for the permafrost and frozen water thirty feet below our feet.

As I told you all, it gives us hydrogen to make power, and oxygen that the plants can't quite keep up with. Yet. The solar smelter, once it is on line, will be a huge boon for us."

"And, you will have that," Tom reminded him.

"I know. And so I have a huge request. Send up a third dome and the same sort of hydroponics setup and housing that we have here. And, in a year, I want a fourth and even a fifth dome. With those up and running I can guarantee you that our forty-eight people up here now can be quadrupled or more. I've done the math and I'll show you the calculations, but I am positive that we can sustain a full-fledged colony of two hundred and fifty people, and that means we can have married couples here. Families some day."

Tom was surprised and pleased. "You can't imagine how happy I am to hear you say that. It's what I want you to do as well. Show me those figures and let's see what we can do to make it a reality!"

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Tom and Bud joined Bashalli and Sandy in The Expanse the next evening as *Sutter* prepared to head Earthward. The ladies were still in awe over the sights down on the planet, inside the building as well as out. Both had giggled with delight when their men—individually—took them for a ride in the Tri-copter.

Although, Bashalli almost dug her fingernails into Tom's forearm when he flew up and over a small hill she was certain they would crash into.

"Do you think Haz is the right person to keep the colony on track?" Sandy asked.

"I do," Tom replied. "He's an exceptionally smart man and knows how to handle people. I think he was the very best choice. With Dr. Clack assisting him, this appears to be a success. Of course," he added, lowering his voice, "only time will tell."

Bud raised a hand. "Are you going to go ahead with the third and fourth marshmallows?"

Tom chuckled remembering Chow's first impression of the test building all those months ago. "Yeah. Haz assures me that there is enough subterranean water in that area to support at least five of the buildings. That doesn't include the solar smelting facility that we'll be sending up in a few weeks to make oxygen from the local soil. Plus, he wants to turn part of one of them into a hotel. He figures that I can build a space taxi for them and bring up groups of eight or ten people for a month's stay at a million bucks a person. And, if I know him, he'll turn it into a real money maker!"

Sandy looped her arm in Bud's. "And, who knows? He might get it up and running in time for our honeymoon!" She looked right at him, adding, "And, when exactly *is* that going to be, Bud?"

"November eleventh of this year, or so you told me. *You* put it on my calendar!"

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