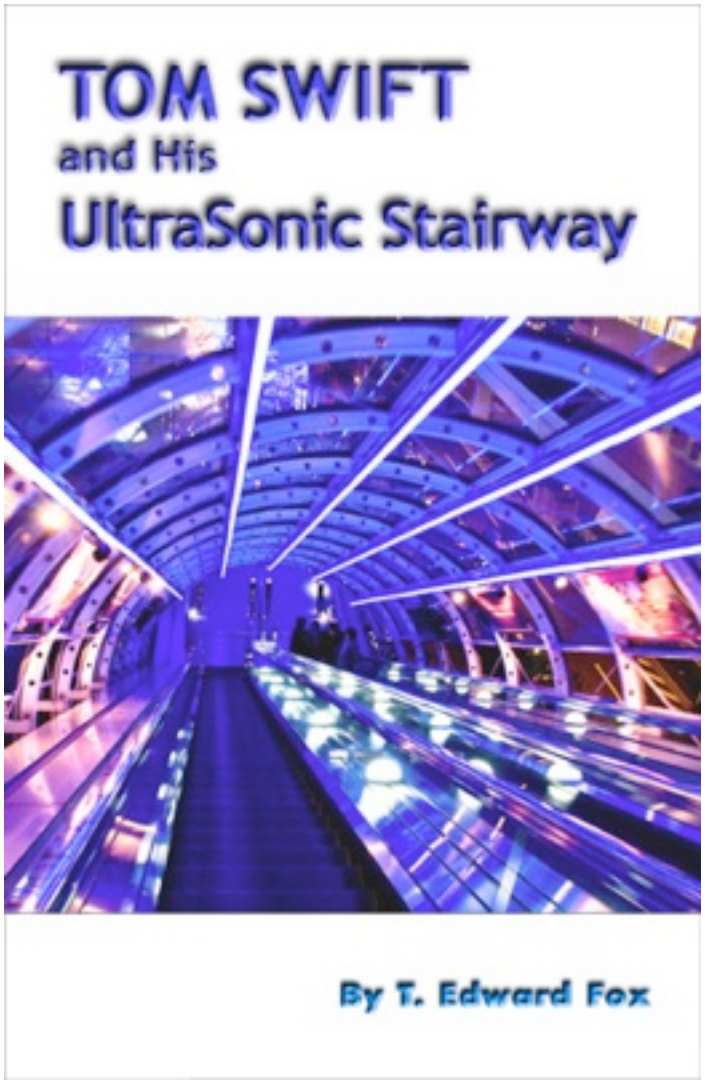

A SWIFT ENTERPRISES INVENTION STORY

Tom Swift and His UltraSonic Stairway

By T. Edward Fox

How can Tom Swift say "no" to a very special request from the National Aquarium? Especially when it comes personally from the President of The United States!

At first, it could be pretty easy. They are asking for something that is seemingly impossible.

A combination of an automatic walkway and moving stairway making absolutely no mechanical or electrical noise. It is to be used in a brand new million-gallon high-pressure tank that will house never-before-seen fish and plant life from below 10,000 feet where no noise penetrates, and their first test specimens die from panic at the noise from the original moving belt and escalator mechanisms.

Tom must find a way to save both the exhibit and the millions of tax dollars already spent.

This short story has been written for no other purpose than to satisfy my own curiosity about taking a random title and attempting to make some sense from it. Thanks, Jon! Oh… and to come up with a story that 'sounds' vaguely logical even if it is a bit far fetched.

Tom Swift and His UltraSonic Stairway

FOREWORD

Ours is a world where the heroes of yesterday have been replaced by the effeminate vampires of today. As the Wicked Witch once said, "What a world? What a world!"

There are no more men of the stature of *Hopalong Cassidy*, *Roy Rogers*, *Rocky Jones: Space Ranger* or even *Mr. Ed* on our movie and television screens. Well, that last one was a horse of stature. Of course. Of course.

As far as literature goes, please show me the section in my local mega-book-extravaganza-retailer where I can find the likes of Tom Swift and Rick Blane novels. You remember the ones written for young readers and teens that held your attention because they were fun, not because you could hardly wait for the next bloody scene.

Give me the whimsy of *The Wonderful Flight to The Mushroom Planet* and *The Spaceship Under the Apple Tree* any day or night of the week over things cranked out by today's only anything-for-a-buck publishers.

Present to me positive role models that tell me of friendship, courage, honesty, intelligence and exposure to sunshine.

Stop shoveling out the same stables full of werewolves, sickly children suffering from angst and amoral teens who don't appear to have parents anywhere.

It's all been done before and with a lot more wit and intelligence. Heck. Old Charles Addams had most of today's popular genre covered and totally lambasted in single cell cartoon form decades ago.

In fact, just show me that any publisher has anyone brave enough to simply pull out a few of the old chestnuts, dust them off, and perhaps even give them a little spit and polish and then… AND THEN put a little monetary muscle behind it and publish, publish, publish.

You all know I'm talking about Tom Swift by now, don't you? I mean, it should be bloody obvious!

Anyway, Messr's S and S, if you are reading this, a dedicated bunch of talented writers have done most of the work for you. And, you won't believe why.

Go ahead. Guess.

Nope. Not for money. For love. For fond remembrances of days gone by long ago. For memories of afternoons, evening and weekends spent reading and re-reading about Tom and Bud and Chow and Hank and Arv and, and, and…

What we've done is to lovingly extend the world of Tom Swift, giving him both a good shine and many new adventures. And, here's the funny part—that's funny as in strange, not ha-ha—what we've written is actually better than anything you have done. Eminently readable by the original target audience and completely enjoyable for adult readers.

Yu don't want Tom anymore; you've proved that through inaction and that terrible 5th series. Yuck! If you don't like Tom anymore, give him to us. We love him and will take very good care of him for years to come!

Thackery Edward Fox

Tom Swift and His UltraSonic Stairway

WHEN THE KNOCK came on the door, Tom Swift was sitting in one of the large, leather chairs in the office he sometimes shared with his father. He was spending the day relaxing and catching up on a few technical journals. So far it had been wonderfully quiet.

Munford Trent, their secretary and essential assistant, poked his face into the office.

"Tom? You seem to have a very important call on line three. And, it not a joke from Bud Barclay. I just thought you ought to know that in advance." He gave the young inventor a slight smile before backing out and closing the door.

Marking his place, Tom pushed himself up and out of the chair and walked over to his desk. He was about to pick up the receiver when he thought about it and decided to sit down first.

He reached for the handset, pressed the flashing button and said, "This is Tom Swift. How can I help you?" If the voice on the other end hadn't rung an immediate bell, the first eight words from the caller's mouth cemented the deal.

"This is the President of The United States. How are you today, Mr. Swift?"

Bud might mimic *some* people's voices, but the accent-neutral voice of the new ruler of the free world was unmistakable.

"Uh... oh... hello, Mr. President. I have to admit to being a little surprised. And, taken aback. Please call me Tom, sir."

The man on the other end chuckled. "I'd love to ask you to call me Lionel, Tom, but I'd have the protocol police down on me so fast it would make both of our heads spin. We'll have to settle for either 'sir' or 'Mr. President' for the time being. Well, now that that's behind us, I'm guessing you might like to know why this call, hmmm?"

"It's probably not to thank me for voting for you, sir, although I did. Please help me on this one, if you would."

"Gladly, Tom. Have you been to the National Aquarium down here? The one in Baltimore, not the smaller one in the D.C. area."

"I have. Yes, sir. It is quite the facility as I remember, although it has been five years. Why?"

"Well, because I have a very special favor to ask of you and your company. You see, we—and by that I mean the Government—decided two years ago to provide them with about eleven million dollars to build a brand new exhibit. A deep-sea oceanarium they plan to fill with species that only live below ten thousand feet."

"I've heard about it. Quite an undertaking. I know what tremendous pressures are found down there, so being able to build a tank to withstand those is a real feat!"

"Yes," the President said with a hint of disappointment. "A feat, indeed, but not their greatest challenge. You see, they brought up a few of the more plentiful species to test the tank and the water. Five fish arrived in various states of paralysis. At first, everyone thought it might be the change in light, but none of the fish have eyes."

"I've heard that some can sense both light and motion with their scales. Could that be it?"

The man on the other end sighed. "I wish it were. No, once the fish were placed in the large tank they seemed to be okay. Settled in over a day or so and even began to thrive. One was obviously a female as she laid eggs in an outcropping and the

other of her species, now we know it to be a male, fertilized them."

With more than a hint of curiosity in his own voice, Tom said, "I'm not exactly sure where this is heading, sir. Uh..."

"A month ago workers brought in all of the parts of a new rolling walkway that will circle the tank and then travel up and around it several times followed by it changing into an escalator, all on one continuous loop. The noise of the workers was very bothersome to the fish in the tank, but the real problems came when they turned it on for a test."

"What happened?" Tom's curiosity suddenly turned to dread.

"Each and every one of the fish began swimming wildly around, flinging themselves into the heavy glass and the rocks on the floor of the tank. Within five minutes they all were dead!"

Tom was speechless. It was terrible news.

"I'll give you a moment to digest that, Tom."

The inventor was quiet for a minute, but the asked, "Have they figured out what happened?"

"Oh, absolutely. It was the noise. Every time workers hit something, the fish jerked around and tried to swim to the other side of the tank. The aquarium's chief of life sciences is convinced that the fish live as such a depth that they have no sounds to contend with. Too much pressure for sound waves to travel through the water very far."

"Well, either that or the high pressure changes the sound frequencies so much that it has no more effect than if the fish move up or down a few hundred feet. Wow! But why is it so disastrous at the aquarium?"

"Tom? I'll need to leave that up to you and the aquarium folks. Please say that you'll help all of us out with this. While it is a matter of tax dollars, it is also a matter of pride. And," he said more cautiously, "it is a potential source of embarrassment for this administration. After all, we're the ones that pushed through the funding package."

Tom couldn't help but pick up on the obvious embarrassment of the man on the phone.

"You realize, sir, that I can't make any promises, but I'll give the aquarium a call. Is it still Dr. Merriweather running things?"

The President confirmed Tom's question. "Anthony Merriweather is indeed still the man in charge there. He is also the man with his head on the chopping block."

Before placing a call to Baltimore, Tom spent an hour researching deep-sea fish life. There was precious little to be found. I fact, at least five scientific journals pointed directly Dr. Merriweather and the aquarium as being in the prime position to answer any of their questions *once the exhibit opened*.

The voice of the man sounded tired and defeated when Tom finally was connected to him that afternoon.

"Well, it sounds as if our Commander in Chief filled you in on our failure, Tom," he said in answer to the young inventor's detailing of the earlier call. "There was absolutely no difference in the water, no changes in the lighting—which is so fast into the ultra red spectrum that visitors will need to wear special glasses—and nothing else we an detect except for the noises of the workers as first, and then of the moving walkway and stairs. Frankly, I'm about to submit my resignation over this. I feel as if I have failed. Murdered our first group of specimens to boot!"

"Doctor. I hope that you will reconsider. Your stewardship of the aquarium these past dozen years is what has made it the

facility that it is!"

"To tell you the truth, Tom, I would hate to leave here, but the Board of Directors is looking for a head to chop off rather than one to just take the blame, and I believe my neck is stretched out so far that it makes a very inviting target for them. No, my days are numbered unless something along the lines of a miracle can be found."

With a determination Tom hoped he could deliver on, he told the worried man, "Then, I'd better get to finding that miracle!"

* * * * *

Two days later Tom arrived at the aquarium where he was quickly shown to the office of Dr. Merriweather.

"Well. Tom. I'm guessing that this is a fact finding visit rather than one to bring about my career salvation." Tom nodded, so the man continued, "What may I help you with, then?"

"I would like to see the entire new facility first, and then get a copy of any autopsy results your team may have collected."

"They did, indeed, perform autopsies on all of our poor, departed test fish. The startling results are that four of them died when their circulatory systems simply expanded to the point where their little hearts couldn't keep enough blood flowing. Everything collapsed and they perished."

Tom asked about the fifth fish.

"Ah. That one quite literally bashed its brains out. Fractured skull and brain matter leaking out. They don't have much of a brain, you know," he stated. "Barely enough to keep them moving, breathing and eating. It would be a wonder that they can survive except that about ninety-six percent of the species down that deep are scavengers. Opportunists of the ocean bottoms with almost no predators to outthink."

"Are you planning on featuring any of the hunters?"

"Oh, my, no, Tom!" Dr. Merriweather exclaimed in slight horror. "We were darned lucky to get permission for fifty-five fish total, and those have to last the exhibit three years before we can go back and gather others. Others to replace as well as new species to feature."

The young inventor gave a quick nod of understanding. "So, you are already down by five?"

"Yes. Although we may get a few from the fertilized eggs," he said hopefully"

The doctor took Tom around for a grand tour of the new facility. Built out into the harbor and almost two hundred feet below the surface of the water, it was accessible to the public via a snaking loop of individual steps. Going up and down, these formed a long escalator; at the bottom of the exhibit tank these flattened out to form a continuously moving walkway. Visitors would be able to step off of the moving floor at any point and stand on a twelve-foot wide platform that slowly spiraled up and around the circular tank.

The moving floor performed the same spiral so anyone could step back onto it and ride up the same incline.

In total, the stationary and moving floors made three complete loops around the one hundred foot wide and fifty-foot tall tank.

Tom was in awe just looking at the tank and the simulated deep sea bed it contained. It had taken both men a few minutes to get to the bottom as the walkway was not in operation, and the good doctor had to stop several times for a quick rest.

"Can I hear the machinery in action, sir?" Tom requested.

"Uh, I suppose we could run it for a few minutes. In fact, I think I will need to ride up on it or risk that the Board will not

require my resignation as I will have passed away from physical exertion!" He smiled grimly at Tom. Taking out a set of keys, Dr. Merriweather walked to a small doorway built into the outer wall. The cubbyhole contained a handset that he picked us, spoke to someone for a moment and then hung back up.

As he clicked the doorway shut, there came a deep rumbling, and the walkway began to slowly move.

"It takes about ten seconds to get up to speed, Tom. Then, we can hop on if you wish."

"Before we do that I would like to take a few measurements, if you don't mind." With that, he pulled out a small device no larger than a pack of playing cards and flicked on a hidden switch. A small screen came to life and the doctor would see that it contained at least a half dozen different readings.

"Tricorder in real life?" he asked with a quizzically raised eyebrow.

"Pretty much. It is a multi measurement tool that I can program with around fifty different functions. Right now I am measuring the decibels in the vicinity, dynamic air pressure caused by any noise, ambient temperature, light lumens, and the total range of audible and inaudible noises."

He showed his host the device and its different readouts. Amazed and wanting to ask many questions, the doctor chose to be quiet for the two minutes Tom required for his work. Once complete, he turned to the doctor. "And, now I need to understand everything you folks know about your fish!"

On the way back to the ground level, he answered as many questions regarding his measurement tool as the doctor could think to ask. In the end, the man sighed.

"Once again the truth of the genius of today outshines the science fiction of yesterday. I was certain that a device such as yours, that amazing medical bed they had and even beaming around from ship to planet would never come to pass. Now, I know of at least three companies making diagnostic-capable hospital beds, science has been able to transport the image of matter over a short distance for a couple years and you've got that," he said pointing at Tom's shirt pocket." He shook his head but smiled to himself.

Three hours later Tom left the facility armed with a solid-state hard drive filled with information about deep sea species in general and about each of the species the aquarium had been working with before the unfortunate events, and those they hoped to feature assuming that Tom could find the answers they desperately needed.

The next morning he appeared at the Enterprises' Dispensary seeking some time with Doc Simpson, the young head of Health Services at the facility.

"I need a medical eye on this, Doc," he told the young medico. He explained the situation at the aquarium and the terrible results to the fish once the equipment was turned on. The two went over everything for the next four hours, only interrupted when a worker was brought in with a broken finger that happened when she tried to lift a tool that was too heavy.

"I feel like a fool, Mr. Swift," she told Tom before he corrected her that his father was 'Mr. Swift' and that she should call him 'Tom."

"Thank you, Tom, but I still feel like a fool. Hank Sterling told me to get someone else to bring the darned tool over but I got all stubborn and obstinate and, 'I'm no sissy girl, Hank,' and just yanked the thing up off the bench." She held up her splinted middle finger. "I have officially learned my lesson. I'm sorry."

Tom chuckled. "Don't be sorry. Just promise me two things. One, if Hank suggests that you let someone else lift anything else, just nod and agree. Second, I wouldn't be waiving that taped up finger around. People might get a wrong idea!"

She looked at her finger, puzzled at first, but soon turned bright red as she realized what he meant. "Oops! With a capital O."

Tom and Doc finished their studies after lunch.

"Well, I'm pretty certain what went wrong," Doc told him. "Those fish have never been subjected to the sorts of noises and dynamic pressures they were subjected to. Surface fish would soon get used to it because the water pressure isn't very great and the outside sounds would just sort of smooth out. But, that deep and any noise would travel as pressure. Hard, too."

"So, you think just the noise killed them?"

"Let's see if I can articulate this, skipper. For starters, they don't have ears so everything is in terms of pressure waves and this is obvious but they have never been exposed to those particular pressures. Now, we add the fact that the major noises seem to be in the lowest ranges, most that we can hear as deep rumblings but some so low that our ears don't pick them up. Well, they do but our brains selectively ignore them. Our dead fish couldn't ignore those sounds."

"But, why did it frighten and kill them, Doc?"

Simpson thought a moment before continuing. "Look at it like this. If you are used to someone tapping on your head with an open palm a little like this—" he gently patted Tom's head, "—you don't mind it. Oh, sure. You might grow tied of it but it does you no harm. However, if that patting turned into really, really hard smacks, you're going to react differently. You'd first try to get away—"

"Like the fish swimming wildly in all sorts of directions?"

"Right. But the head slapping was coming from everywhere. They had no escape. And, being normally mild-mannered scavengers and not thinking hunter-killers, they could only do one thing. Panic!"

"So their bodies just went into shock and they died."

"Like humans, great shock often opens the blood vessels and blood pressure drops. For us, we faint, fall down and everything generally goes back to normal. For them, the pressures they live in pushed in so hard that their hearts couldn't re-expand the vessels. No blood flow equaled death"

"Looks like I've got to find something that makes no noise or the aquarium is doomed."

Doc looked at Tom out of the corner of his eyes. "You know, you might think about getting rid of the low pitched noises and not worry too much about high pitched ones. They don't have ears or any form of hearing; they feel sounds and movements. High pitched noises are tight little waves versus those monumental sine waves of the low pitches. Difference between a gnat and a charging rhino."

Tom smiled. "Thanks, Doc. Now I've got to find a way to test that theory!"

* * * * *

Three days later, Tom and Bud flew out to Fearing Island. Home to Enterprises fleet of rockets and submarines it would provide the perfect vessel for the boys to travel deep under the surface of the Atlantic Ocean.

"Tell me again what we're going to do," Bud requested. "My little pilot's brain has been so caught up in flying high over the water that I'm a bit brain-rusty on the swimming thing."

"Sure you are," Tom replied. "Well, you and I are going on a deep dive. Down to around ten thousand feet. Then, we swim out, make noise and collect data. Simple?"

"That's the way I like things," Bud said with a grin, "but Sandy is always after me to explain what I've been doing. I was hoping that this time I could come back with more than, 'went deep in big pond, made thumpa-thump, came back up.' You know?"

"My sister know all about this," Tom told his best friend. She was sitting at the table last night while dad and I discussed the whole thing. But, just to help you a little, we need to test a wide range of frequencies on fish at that depth. I've told you all about the aquarium problem. What I hope we'll discover is that only a small range of sounds scare or harm the fish. If I can narrow it all down then I am a lot closer to coming up with something that will let people travel around the exhibit without endangering the exhibitees."

Although many of Tom's submarines were capable of going to depth depths, from experience he knew that even his most capable diving suits tended to suffer maneuverability and motion problems at anything greater than about nine thousand feet.

His newest hydrolung suits were built from a transparent material that could easily withstand the pressure, but he had spent two days coming up with a sort of exoskeleton for the arm and leg joints.

"Did you get a chance to test those hydraulic monstrosities?" Bud asked.

"First, they use electromagnetic activators that can function in the vacuum of space and way down where we're about to sink," Tom told him with a smile. "No hydraulics were injured in the creation of them. Secondly... no. I didn't have the time. It takes a full day to go through the aquarium's pressure lock system and to come back out. Besides, it is meant only for real emergencies. Everything else is mechanical and stays under pressure. It's a wet equivalent of having our robots out at The Citadel. They stay in and work in places we just can't."

The pair boarded one of the newest jetmarine subs in the fleet. This one was a six-man job capable of both great speed as well as deep exploration.

Two hours later they arrived at the approximate location of the dive they would take. The ocean floor ranged from just under ten thousand feet down to about eleven thousand directly below them.

Tom sent the sub drifting downward in a great spiral. At a dive rate of three hundred feet per minute, the trip required nearly a half hour. Beginning when they reached one thousand feet, Tom turned on his amazing undersea light system. Using a radical alternate light range along with specially coated view panes and camera lenses, it let the boys see several thousand feet away almost as if it were through day-lit air rather than dark water.

Several times they passed through levels of certain types of sea life only to drop into another layer a thousand or more feet down with different species. And, as they neared the sea floor, a stark sight awaited them.

"Jetz!" Bud exclaimed. In shocking contrast to the ocean floor found a mile or more above their current depth, what met them was a lunar landscape of heavily silt-covered rocks, hills and small trenches, mostly in shades of gray and dark blues punctuated with the occasional red or orange spire of an anemone or a coral-like growth.

But what had caught Bud's attention most was the array of bones, all stripped clean, that littered the landscape.

Tom pointed out giant vertebrae from whales, skeletons that he guessed might be those of sharks and several that looked startlingly like human femurs and other large bones.

The flier looked at the inventor with wide eyes. "Um..." was all he could get out.

Tom slowly shook his head. He could add nothing to illuminate what they were seeing.

As the jetmarine settled down into the silt, the boys left the transparent nose and control area and went aft to the airlock and changing area. It took just a few minutes for them to climb into the basic hydrolung suits. They would don the exoskeletons once outside as those devices had been lashed to the outer hull.

Tom grabbed a large suitcase that contained the equipment they would need for the tests. With it, the duo entered the airlock, slowly flooded it keeping their suit pressure adequate to support against the added pressures outside while not crushing them, and then exited the sub.

It took the efforts of both Tom and Bud to get the flier into his exo-framework. Once in and powered up, Bud easily assisted Tom in donning his. A quick systems check by both of them showed that all systems were functioning correctly, so they set off away from the sub.

"The idea is to get a couple hundred feet of separation from the jetmarine before we hunker down to set up the transducers," Tom explained.

"And, then?"

"Well, then we hope that a lot of the fish we scared away coming down will venture back in this area so I can test different audio signals. I've brought a scent bait that should do the trick," he said taking out a small, clear bag filled with a reddish material."

He explained that he intended to begin with the highest ranges of sounds, those in the 35KHz down to 25KHz range, far too high for humans to hear. After that, the signal range would be slowly lowered for both steady sounds as well as pulsed beats.

"The idea is to find the highest point where they begin to notice the noises. We'll hold on those for up to thirty minutes to see if they get used to it, and then take them on down a little."

"So, I guess you'll repeat everything until you find a level they can't ignore?"

"Right. We and the fish are fortunate down here that they can escape if they feel the need. I'm almost positive that we won't be seeing any damage done to our non-volunteers."

It took about five hours to find the level that began causing distress among the fish that had returned to the area. Tom was happy to find that it began at about600Hz. It was low enough to tell him that mechanical equipment was almost definitely the cause of the previous problems and that this was most likely to be something he could overcome. Given time.

Actually, as he thought it over while he and Bud returned to Fearing Island, they could get rid of the offending audio by simply shutting down the moveable walkway. That, plus moving the water circulation equipment farther away.

* * * * *

"That's good and bad news, isn't it?" Dr. Merriweather commented when Tom phoned him the following morning. "Although quite the inconvenience for the sixty percent of our visitors who are over the age or sixty, we could just freeze the walkway where it is. Unfortunately, we have the water

circulation equipment as far away as possible given the enormous pressures we have to run them at."

"I see," Tom told him. "I guess I need to come back to measure the sound and pressure levels of just the circulation pumps. Actually, I could send you the multi data recorder and you could take the samples for me. If I overnight it to you, could you do that, sir?"

"You can't imagine the girl-like giggle I am suppressing right at this very minute, Tom. I'll truly love to get my hands on that little miracle box of yours." He sobered a little while adding, "And, I'll get it sent back out that evening for next morning delivery to you."

Tom thought for a moment. "Well, that would be fine, but how about this? You get it and take the measurements, then connect it to your computer and I can walk you through the process of downloading everything to me remotely. Then, you can play around with it for a few days before popping it back in the mail to me. Deal?"

"Oh, my gracious, yes!"

When Tom received the results of the new measurements, he felt a grin spread across his face.

"Nine hundred Hertz, Bud. The pumps and everything else start way above the point where the fish would even notice it. This is great news!"

"So, what's next?" Bud asked eagerly, now feeling Tom's excitement.

"Well, for starters I need to come up with a way to move the walkway that is both quiet for the safe of the visitors, and produces sounds that are at least as high as the water pumps and filtration system." His face sobered. "Of course, that means that practically anything mechanical is out of the question. While I was waiting to get these latest results back I did a lot of research."

Seeing his friend now look worried, Bud inquired, "Is it that bad?"

"I'm afraid that it is," Tom replied. "You see, it isn't so much one thing. For instance," he added seeing a question coming, "you can't isolate the noise from the electric motors that run everything. While they can be partially muffled, they transmit noises through everything they touch. It's more than that. It's the gears and the rollers and the switching mechanisms under the walkway that rumble at the low frequencies. Frankly, I think that we might be looking at a radically new form of locomotion for the walkway. That's what my next few days are going to be filled with." He shrugged. While he knew he wouldn't like it if everything were easy and fixes to things like the walkway just happened, Tom had hoped that he might get this one over and done with quickly so that he could turn to a new project on his horizon.

The following morning he sat in the office he shared with his father in the Administration building. They were in the comfortable chairs in the conversation area of the office, sipping coffee and talking about Tom's troubles.

"I'll assume that you have investigated mag-lev technologies?" his father asked him.

"Yes. Two problems with that. First, the amount of power required would bankrupt the aquarium in six months and the second is that some of the deep-sea fish are known to use a type of magnetic navigation. That would get scrambled with a mag-lev system and probably cause as much suffering as noise does."

"I see. Well, what about using the very water pressure that keeps the tank pressurized and everything flowing?"

Tom pondered this suggestion. "I'll check into that, but my gut feeling is that we still need to deal with the issue of the almost subsonic rumbling of the gears and rollers."

They discussed four other possibilities and Tom promised to look into two of them; the other two had been researched and discarded earlier.

Bud, Sandy and Tom's girlfriend, Bashalli, dropped by late that afternoon.

"I know that you are deep into your problem with the fish, Thomas," Bashalli told him, "but we all think that it would be a nice thing for you to have at least one evening off from your worries. Please say that you will come out with us? There is a wonderful performance group in town with a show they call the Technology Circus." She looked hopefully at the young inventor. "We have tickets..."

Tom couldn't resist her beautiful smile. The perfect teeth behind the smooth, dark tan skin almost glowed.

"Okay. You're right. I need a few hours away from all this."

The two girls let out little squeals of joy and Bud slapped his pal on the back. "Wonderful. Let's go!"

The foursome had a nice meal at their favorite Italian restaurant before heading toward the large Civic Auditorium where the evening's show was to take place.

Generally, Tom quickly grew bored with exhibitions of what some people might term "wonders of technology," especially when they were commonplace demonstrations of everyday sciences. The performance began with several electrical experiments that made most of the crowd murmur appropriate "Ahs" and "Ooos," and that fell into Tom's "been there, done that" category.

But, one example that really caught his eye was listed in the program as, "A demonstration of the power of sounds." This began with a sub-sonic battering ram that Swift Enterprises had designed and had been building for about a year. By combining a high-power amplifier with a special type of speaker, a rapid succession of overlapping 'thumps' far too low to hear but easily felt by anyone standing in front of it, the SonicRam invisibly hammered into the lock and door handle of the demo set causing such great pressure to build up that the area around the handle splintered and flew apart within five seconds.

There was a huge round of applause from the appreciative audience.

Sandy and Bud both looked at Tom to try to gauge his reaction. They both knew this was one of his inventions. He sat there, leaning forward with a look of wonder they hadn't expected.

It was the next demo that really caught his attention. A clear plastic tube, about eight feet long and a foot wide, was wheeled out. The bottom disappeared into a cube that also had a thick electrical lead trailing back behind the device and under the curtain at the rear of the stage.

"So, folks. You've seen the power of noise so low you can only feel it, and *boy* what a job it did on that door, huh?" the man acting as the master of ceremonies told the eager audience. There was a smattering of applause agreeing with him. "Well, now hold onto your hats while we show you what noise too high for you to either hear *or* feel can do!" He stepped back, swinging an arm around to indicate they should now pay attention to the cube and tube device.

A stagehand came out with a bucket and poured a gallon or so of what Tom believed must be water into the open end of the tube. It sloshed around for a moment before subsiding.

The woman next flipped an overly large switch—Tom believed that to be a prop with someone back stage actually turning on the machine—and a bright red light glowed on the front. In seconds the water was rhythmically moving and roiling around in the tube. Then, an astonishing thing occurred. Instead of the surface remaining flat and parallel to the stage, it began tilting until it matched the 45-degree angle of the tube.

The 'switch' was flipped off and the water returned to match the laws of physical science.

The woman then stretched a large balloon over the open end of the tube. She pushed the tube into an upright position and returned to the switch. "Ladies and gentlemen," she said. "You have seen a phenomena where certain frequencies can cause the normal surface tension of water to behave in a most peculiar manner. Now, let me show you how high-pitched audio waves can do to that same water. Behold!" and she depressed a large button on the cube.

Everyone could see the water began to dance inside the tube. But that wasn't all. Soon, a great deal of vapor began rising from the water. As it did, the balloon on the top started to inflate. The more vapor that was produced, the lower the level of the water and the fuller the balloon became.

When there was only any inch or so of liquid left, she pressed the switch once more. In seconds, it began to 'rain' inside the tube and the balloon deflated until it was a sagging bag and the water level had mostly been restored.

Tom barely paid attention to the next hour of the show. He was mulling over what he had seen, and it intrigued him greatly.

By the time the foursome left the auditorium and returned to Bud's car, Tom was visibly excited.

He explained what had caught his attention, and the other three were soon almost as excited. Bashalli leaned over and give him a little kiss, stating that it was a reward for his cleverness.

Tom blushed a little but secretly was just about as happy that the others realized what he had been telling them, and that they appreciated how important it must be.

* * * * *

It took Tom another week of design work before he turned over some plans to Hank Sterling and Arvid Hanson. Both men traditionally worked with the initial designs during the prototyping stage of most inventions. Where Arv was amazing in his ability to create scale miniatures—often fully functional so that they might be used for testing purposes—Hank was in charge of turning any design into a series of pattern pieces, jigs, molds and CAD instructions that would allow the building of full-sized versions and ongoing production runs.

He knew it would be impossible to build a full-scale test version of the walkway, so Tom opted to have a one-tenth scale and greatly simplified version created.

While both Arv worked with Tom on the drive mechanism, Hank created first a single tread piece, then a mold, and then began cranking out the more than five hundred treads that would be required for the test model.

A week later Tom placed a call to the Baltimore Aquarium. "I would like to speak with Dr. Merriweather," he told the secretary who answered.

"Oh, dear. I'm sorry to have to tell you but Dr. Merriweather tendered his resignation last night at an emergency Board of Directors meeting. May I put you through to Mr. Doncaster, the Board Chairman? He is temporarily filling the position."

Tom was dismayed at the news. Resignedly he agreed. "Uh, yes. Please let me speak with him."

After being told primarily the same piece of news, Tom launched into an explanation of his work. When he finished telling the man of his success, Mr. Doncaster let out a weary sigh.

"Well, it is too bad you weren't a little quicker, then. Dr. Merriweather is gone and he will not be coming back. *Fate accompli*, as they say."

The man's attitude made Tom's blood boil. Taking a deep breath he asked, "Does the President agree with all this?"

"President? What president? We don't have a president here. *Who* are you talking about?"

"The President of The United States. He personally asked me to assist Dr. Merriweather in finding a solution. What did he say when you told him of the Board's decision to force the doctor to retire?" Tom felt a sense of wicked glee creeping into him. From the way Doncaster had asked, it was obvious that he had no idea the nation's number one resident was so involved.

Stammering, Doncaster finally said, "I was never told that the President had taken an interest in this. Why wasn't I consulted? Why didn't Dr. Merriweather tell me?" He sounded as if he had been punched in the gut as he gasped out the final question.

"Perhaps, if you and your Board hadn't been spending so much time looking for a scapegoat, you might have made a proper set of inquiries. Well, I'm hanging up now. Got to call the White House to tell them of your decision. Bye!"

Tom hung up before the man could say anything.

Picking the receiver back up, he asked Munford Trent to place a call to a special number at the White House. "Tell them it is in regard to the Baltimore Aquarium project, please."

Two minutes later Tom was speaking with the President's Chief of Staff. "The President is in a conference with Senators Quintana, Pierce, Masterson and LaSqually. I can either let you listen to the interminable loop of what someone believes to be 'on hold' music, or I could have Mrs. Patterson, the President's secretary, call you back immediately when he is available."

Tom opted for the latter solution and sat back to wait. He only needed to occupy twenty minutes before the phone rang.

"It's the President, Tom. Line five."

"Hello, Tom. How are things at Swift Enterprises?"

Tom told him about two recent projects that were coming along very well and then turned the subject to the aquarium. As he detailed his findings and the success he believes was at hand he could sense the other man's appreciation. However...

Once the President heard of the departure of Dr. Merriweather, and the aquarium's Board of Directors' involvement in that departure, he became noticeably cool.

"Let me make a pair of calls, Tom. Just assume that our Dr. Merriweather will be available to come to Enterprises in the next day or two for a demonstration of your system. After that, I am certain *he* will be making the correct choices."

* * * * *

Two days later, Dr. Merriweather and a very subdued Herbert Doncaster arrived. Mr. Doncaster was introduced as the doctor's 'assistant' with nothing being said about his status —possible 'former' Tom thought—with the Board.

They took one of the small electric cars out to the north end of Enterprises, past the longest of the runways and onto an area that was not paved or improved. Sitting on a temporary

plywood stage was what looked like a small amusement park ride consisting of a platform about twenty two feet up with a continuous track running down at a 40-degree angle.

From that point it was obvious that it represented the spiral walkway with the final escalator ride back to the upper platform.

Almost fifty miniature bodies were affixed at various parts of the belt.

Tom walked over to a small control panel mounted to a post and pressed a button. It required ten seconds, but the belt slowly began to move until it was traveling at a scale speed similar to the existing system.

"I'm not hearing anything, Tom," the doctor stated. "Have you actually found a solution or is being outside affecting my hearing?"

Tom laughed. "No, sir. I mean, yes, sir and no, sir. Yes I have actually found a solution using ultrasonic audio waves to create cold expanded water vapor that will push the belt along with no noticeable noise. And, no, being out here is not having any effect on what you would hear in the aquarium."

He explained to the two men about his recent experience with the traveling show and how it had all just clicked.

"We use about a third as much electricity as you would with the old style system and all that should be necessary is to check the water level each evening and top it off if needed."

"But, how?" Mr. Doncaster asked. "How do you keep the rollers from rumbling and causing the noise that killed the first samples?"

"Oh, I forgot to explain. We use the expanded vapor to both push the belt smoothly along and to raise a thin, floating track the step sections run along. As it never contacts the sides or the bottom of the installed track, there is no noise conduction into the ground and the tank. The little bit of noise we do get will be subdued by a coating of a special foam we will spray on the outside of the tracks."

Mr. Doncaster looked a bit sad at the news. It was obvious that he wasn't happy with the current state of affairs and possibly hoped that Tom's solution would prove to be a flop. He suddenly brightened and he came up with a question. "Ah!.But, how will this all get paid for? We don't have any additional funds leftover. Dr. Merriweather spent it all on the failed system." He gave an emphatic nod of his head and took on a smug look.

Tom favored him with a slight smile that he held for almost a half minute before the other man suddenly paled and looked away.

"You have a benefactor, Dr. Merriweather, who is footing the bill for our work. The aquarium will have no further out of pocket expenses, and we believe that if you give us the go-ahead, we can have the full-scale system up and running in a month."

Dr. Merriweather nodded. "See that, Doncaster. If you weren't such an incredibly vile nincompoop, you might have friends like that!"