



Tom Swift's— The Robot In My Garden

By T. Edward Fox

Several years earlier, Tom Swift created a giant robot, one capable of spending all of its days inside of the deadly reactor area of The Citadel—the Swift's nuclear facility in New Mexico. Large, ponderous and ultimately clumsy, it was the best product given the technology available at the time.

Now, Tom has been asked by the U.S. Forestry Service to develop a team of autonomous robots for use tending to the many National Parks across America. They must be a combination gardener, fire detector/fighter and guide for the public.

Knowing how important it is that the robots be both fool-proof as well as inviting, Tom sets about creating ALAN, the new Autonomous Life-form and Naturalist. But, the path to success is paved with both good intentions as well as moments of terror.

Will ALAN be a hit or a miss?

©Copyright 2011 by the author of this book (T. Edward Fox - pseud.). The book author retains sole copyright to his or her contributions to this book.

This book is a work of fan fiction. It is not claimed to be part of any previously published adventures of the main characters. It has been self-published and is not intended to supplant any authored works attributed to the pseudonymous author or to claim the rights of any legitimate publishing entity.

This story is dedicated to people who get caught up in bureaucracy, specifically the sort that begins with sheer stupidity (read: politics) and usually ends up with either someone losing a job, a tax hike, or both! Most of us just shrug and tell ourselves, "Well, at least it didn't happen to me." Wrong attitude. Take a hint from Tom—find a way to help a bad situation.

A SWIFT ENTERPRISES INVENTION BONUS

The Robot In My Garden

FOREWORD

Man has long been intrigued by the notion of the robot, from the first automaton mentioned in Jewish texts in the first century AD to stage plays (Capek's *Rossum's Universal Robots*-1920) and into the twenty-first century. There is no hint that they will not be with us in the future.

The difference is that where futurists once predicted what robots might do, we have actual robots available to us today. I personally have an iRobot Roomba vacuuming robot that keeps my floors relatively clear of loose dog hairs.

The notion that Tom might go beyond his original giant robot should come as no surprise. After all, the state of electronics grows almost exponentially by the year. Why not that same sort of growth and advances in some of his previous inventions?

This is a tale that takes place almost two years after Tom's first giant robot was sealed, forever, inside of The Citadel. In that time, he has tinkered with numerous robotic machines, inventing several assembly robots that are in constant use in various industries around the world.

Is it any wonder that the U.S Forestry Service has come to Tom to ask for his help? (Is that a rhetorical question?)

Victor Appleton II

CONTENTS

PART		PAGE
1	Wanted: Robot—Must Like Trees	3
2	Something's Lurking Out There!	7
3	To Your Scattered Forests Go	11

PART 1**Wanted: Robot—Must Like Trees**

TOM SWIFT, young inventor and adventurer, had returned from his latest visit to the outpost in space following the delivery and setup of a new stabilization system three days earlier. Today, as he sat perched on a stool in front of his favorite workbench at Swift Enterprises, he realized that he was bored.

Bored almost to the point of wanting to scream.

The past seven weeks had been a whirlwind of activity, and he had relished it. But, at the end of the latest mission he found that there was nothing on his plate. Every duck, as they say, was in a row. His famous father needed no help on any of his projects and the several departments he had visited were in no need of any assistance. There was nothing for him to do.

Well, certainly there was the need to catch up on his dating responsibilities with Bashalli Prandit, the beautiful, dark-haired Pakistani girl he had been seeing since he was eighteen. That was not a chore; that was pure pleasure, but her schedule of work meant that they saw each other only in the evenings.

That left Tom with several long, boring days to try to fill. It wasn't going well.

Even having the time to pal around with his best friend, Bud Barclay, had only filled a few hours so far.

He lurched forward as his phone began to ring.

"Tom Swift," he stated into the receiver. He sat, listening, for almost a minute before replying, "I'm certain that we could come up with something to meet your needs, sir. Would it be possible to receive a detailed specification of the project?" Again, he listened and then frowned. "Well, that will make it a bit more difficult, but I suppose I can work with your team to develop the specs."

A meeting time for the following day was agreed upon and he hung up just as Bud walked through the door of the laboratory in Tom's underground hangar.

When he had seen Tom the day before, the inventor had seemed lost, even somewhat sullen and distant. But, Bud immediately could see the gleam in his buddy's eye that meant something good was afoot.

"Got a hot one, skipper?" he asked.

"I've got a curious one, Bud," Tom replied. "The U.S. Department of Forestry just called with a request. Perhaps even for a prototype. They need something, have no idea what to spec out and no idea what to try to budget for."

Bud cocked his head to one side. He waited for Tom to pick up on his 'Tell me more' signal but the inventor seemed to be pondering something.

Finally, Tom looked up and said, "All the project manager could tell me is that they need to automate the National Parks system and take some of the human element out of things. But," he finished with a frown,

“they absolutely do not want to lose the human element.”

Now it was Bud’s turn to frown. “That doesn’t make any sense. Do they mean they want to have some sort of self-guided tour but also keep people in the loop?”

Tom shrugged. “I don’t know and he couldn’t tell me anything more. He and his team of three will be here tomorrow morning about eleven. Want to be there?”

Bud grinned. “You bet!” he exclaimed. “I’m really curious what these folks might really be thinking. Should I clam up and let you do all the talking or can I put in my two cents worth?”

“For all I know, we may need a whole nickel’s worth of Budworth Barclay. Feel free to speak up!”

When the small contingent arrived from Washington D.C the following day, they were led to the spacious office Tom shared with his father, Damon Swift. Mr. Swift had literally passed them in the air having headed for Washington within a few minutes of the visitors having left there.

Following introductions and pleasantries, Tom motioned to the large, leather chairs surrounding a low, square coffee/conference table in one corner of the office. “Please, have a seat,” he suggested. “Coffee, tea and water will be here in a few minutes and we’ll have a small lunch a little later if you all have the time.”

They soon got down to business.

Scratching his forehead, the project manager, Barry Graham, started the conversation. “We are coming to you

with practically empty pockets and even emptier heads, Tom. The Undersecretary in charge of our Department is facing the same thing all Government departments are, namely a cut in our budgets that will either mean shutting down programs or finding alternate ways to operate or fund them. We are in a particularly difficult place in that by law we can’t make up deficits by simply charging more.”

“Right. I remember the last time we went on a family vacation to Hawaii,” Bud said. “My grandparents didn’t get charged anything to get into the volcanoes national park because of their age and I think that my folks and I each only had to pay a couple bucks. Something like that?”

“Precisely. Even when our operating costs go up, it is almost impossible to get Congressional time and effort to go into legally raising rates. So, as of this coming fiscal year, we are going to face a thirty percent reduction in funding.”

“What will that mean in real terms?” Tom inquired.

“Well, that equates to our entire annual budget for forest fire fighting, for example. We could take the old-fashioned approach of letting fires burn themselves out, but that will certainly endanger lives and park amenities that would have to be rebuilt afterwards. Or, we could get rid of about half of all our employees nation wide. Or, we could totally cease efforts to build and maintain trails and to keep dangerously flammable brush cut back and under control, plus let fifteen percent of our employees go.”

He looked from Tom to Bud with a helpless expression.

One of his team, a husky Samoan woman named Ethel, added, “We have gone over at least fifty scenarios and can’t find anything that doesn’t lose us too much to recover from in the event of zero funding increases in a few years.”

They spent the rest of the day going over all of their thoughts and lists of possibly cuts, and then over more than a dozen others Tom and Bud were able to put forth.

By the end of the day, Tom got up and stretched, saying, “It’s just too bad that you don’t have a good budget to put something in place now that might mitigate the effects of next year’s budget crunch.”

Barry looked at Tom with his eyes wide. “Didn’t we mention that we have a special one-time windfall we can use for this? I’m sure we mentioned it.” He looked around the group seeing nothing but blank faces. “*Didn’t we?*”

“No,” Tom told him. “What is it?”

Barry outlined the multi-million dollar special fund they had been allocated to prepare the parks for the probability of a downsized staff.

“It might look like a lot, fifty-seven million,” he told Tom and Bud, “but spread out among all of our parks that means just a hundred thousand or so per park. Fine for the smaller ones, but that barely gets a crew into a place like Yosemite to do a single, cursory clear out of underbrush. I think I was secretly hoping that you Swifts have an off-the-shelf robot that can take all of that over. You know? Works twenty-four/seven and just goes about its work. At least, that would let us cut some of the fire

fighting budget and save a few jobs.”

“I may have a solution in mind,” Tom told them all.

“For the underbrush removal?” John Perkins, another of the visiting people asked.

“Oh, much more than that,” Tom stated. “In fact, I’ve had a little idea in the back of my mind for months. You see, we have our Fearing Island off the coast and it is all scrub grass wherever we haven’t made improvements. I’ve wanted to automate the trimming and all that. And, I mean really automate it. No human interaction. The devices would make their own decisions simply by taking in outside info and data like flight and space launch information. They would ‘know’ when they should leave an area and would even act as a police force in case of anyone trying to sneak onto the island by small boat.”

He quickly told them about several earlier instances where foreign agents had been able to get onto the island using scuba gear or one small dingy that had not registered on the island’s RADAR or SONAR systems.

“So,” he told them, “these robots could do your brush clearing and even act as security or search and rescue units.”

Looking at his visitors, Tom sensed that there was something more on their minds. He asked about it.

“Well,” Barry began slowly. “Overall we have also been mandated to reduce certain job descriptions over the next three years. Mostly in the area of park guides. Attrition will handle about half of that, but we will end up letting

more than a few hundred good men and women go.”

Ethel piped up, “Even at that, those left behind will have to put in longer hours or make the guided walks almost at the run in order to get through the numbers of people we see in the summers.”

Bud brightened as an idea hit him. “Tom’s weed-omatic robots could be outfitted with treads and could lead people around. Put a few sensors in certain locations and they would know when to tell everyone about some special tree or about a rock formation. Things like that!”

There were blank stares from all the visiting team members.

“Okay...” Bud said slowly, “I obviously said something wrong. I’ll apologize, but tell me what I goofed on, please.”

Tom could see their visitors struggling to come up with the right words. “I think I may see it,” he said. “It’s the whole robot thing. Right?”

Barry and his team nodded, a little miserably. “We get people from all over the world and all age brackets, Bud. There would be a lot of... well... negative feelings if we just roll up a box on treads and have it tell the visitors to follow it.”

Tom smiled inwardly while trying to maintain a straight face. “I’m fairly certain we can present something that is a little more appealing, sir. Something that is a bit more human-looking than a box on wheels, or treads!”

The meeting ended with Tom promising to come up

with a few preliminary designs for such a robot and the forestry team agreeing to provide a more detailed list of everything they might want from such a device.

After they left, Bud turned to Tom. “Going to haul out the designs for your giant robot, skipper? Make another SERMEK or ATOR?” he asked referring to the first two giant robots Tom had built. “If it can handle the radiation at the Citadel, it ought to be a cinch to be able to walk around in the woods!”

Tom shook his head. With a grin he told his friend, “Oh, no, Bud. I’ve got an entirely new design in mind. In fact, I’ve got it in the computer, all ready to build!”

PART 2**Something's Lurking Out There!**

IT ONLY took three days before the forestry people sent Tom their list. Barry had decided the best thing to do was to send Tom a two-part list showing what they were in danger of losing and then what they would need to see in anything that would be part of a robotic replacement.

Tom whistled as he reviewed the lists. Five things really stood out, even though they were not the first five on the list. When he took the list to show his father, the older Swift also whistled. He had been briefed about the visit and as many of the aspects of the dilemma the forestry department was in as Tom could think to pass on.

“That’s one heck of a list, son,” he said after rereading several sections. “Do you really think we’re up to this? That *you’re* up to this?”

Tom nodded. “I’m pretty sure, Dad. You see, I’ve been doing a lot of design work on the computer ever since we locked up the Citadel robots. Almost immediately I knew we had made some errors. Even waiting a couple of months would have allowed me to use some newer circuitry and components that would have made ATOR a much better robot than it is.”

Damon Swift considered his son’s words. He realized the truth in them. Tom’s robot was certainly functional and fulfilled his basic mission within the fiery atomic pile’s outer shielding, but it was extremely limited. He

had considered asking his son to create a replacement for several months now. This might be a win-win for both the forestry service as well as the company.

He gave Tom permission to spend the necessary funds to work with the Department of Forestry, “But only to the point where they will need to come up with the funding to actually build the prototype,” he said with a warning wink.

Tom understood. He had, on several occasions, gotten ahead of everything in his exuberance and had ended up costing Swift Enterprises a fair amount of money on at least one project that was cancelled after Tom had already spent more than a million dollars of company money.

Over the next two weeks Tom spent much of his time between his desk and the 3D engineering software he preferred to use, and his two laboratories where he built many special circuits and devices he knew would be necessary for the construction of his new robot.

For their part, Barry and his people worked diligently to get the funding freed so that Enterprises could build a prototype and eventually—it was hoped—a series of robotic forest rangers.

One afternoon there was a soft knock on his lab door down the hall from his office. It was so soft that the sound failed to register on his brain. A moment later came a slightly louder knock accompanied by a soft cough. Tom spun around to see the smiling face of his girlfriend, Bashalli, standing just inside of the door.

She held up a picnic basket and looked at him

expectantly.

Mentally Tom slapped himself on the forehead. They were supposed to be having a picnic on the shore of Lake Carlopa today. He tried to sneak a glance at the clock.

“There is no need to look at the clock for support, Thomas,” Bashalli told him. “I will let you off of the hook and tell you that I am a full hour early. I assume that you have not forgotten our date, and I choose to believe that your confusion is totally based on my early appearance.” She smiled sweetly at him.

The two had met many months earlier when Tom was preparing to fly his giant Flying Lab, the Sky Queen. The two had hit it off immediately and began dating within a few days. Since then they had shared many adventures together. While Tom’s actions had placed her life in peril several times, in truth she wouldn’t have had it any other way. She loved him.

Tom placed his soldering pencil into its holder and shut off the power. He removed the safety glasses he was using and set them to one side.

“Since you’re already here...” he began looking directly into her nearly black eyes, “...I suppose that I should just set this aside. Is that—” he sniffed the air and smiled, “—your mother’s spicy chicken and yogurt?”

She nodded. Although she attempted to copy her mother’s recipes, she knew that her skill was surpassed by a factor of five by her mother.

“Some day I hope to surprise you and tell you it is my

cooking.”

“Ah, Bash. I’ve tasted your version and it is just as good. It’s just a little different is all.”

After a pleasant drive to a quiet and infrequently used beach area on the lake’s western side, they changed into their bathing suits and took a swim, followed by a quick nap in the shade of an old oak tree.

Once they were both awake, Bashalli asked about Tom’s latest invention. He had hinted about it the previous weekend but hadn’t provided much detail.

After giving her the basic reasons and requirements, he added, “The one thing that is going to stump me is making this, as they put it, ‘pleasant to look at and interact with.’ I’m not certain I even know what that means.”

Bashalli looked at Tom and could see the consternation in his face. She leaned forward and gave him a warm kiss.

“Inspiration?” he asked.

“I certainly hope so,” she answered with another smile. “Actually, I was trying to soften you up for a little suggestion I want to make.” She looked at him trying to judge if he would be receptive.

“Gosh, yes, Bash,” he said. “Fire away. I can use all the help and ideas and suggestions I can get.”

“Why don’t you let me design the outside? I mean, I can come up with several designs that you can take to the forest people and see if one of them fits their ideal. I think

I can make the drawings look pleasant and even enjoyable. Certainly I can make them non-threatening looking. What do you think?"

He thought a moment and then leaned over and gave her a kiss back. "Tag! You're it!" he told her.

He was surprised that he didn't hear anything from her for almost a full week. He even asked his sister, Sandy, what she knew.

"Oh, brother, dear," she told him placing a hand on his shoulder. "How little you know the woman I hope you will someday marry and make my sister."

Tom felt his face glow red.

"You gave Bashi permission to do several versions of this robo-ranger of yours, and she is taking it very seriously. I mean very with a capital V, seriously. Give her a few more days. I know she is working on these night and day and wants them to be just right for you."

Sandy proved to be absolutely correct. Four days later Bashalli called Tom at home before he could leave for work. "May I come to your office to show you the drawings, Tom?"

"Come whenever you want, Bash. I'll be in the big office for a few hours to start and then in the lab at the underground hangar most of the rest of the day. I'll see you when you get there."

She arrived just before Tom was about to walk from the office to the lab. They strolled together, hand-in, hand, with Bash also toting along a large drawing portfolio.

Once at the lab Tom cleared counter space and Bashalli got her presentation ready.

Tom was absolutely at a loss for words when she finished. He had been staring at her drawings, each one more fantastic than the one before, since the start. The robots were all humanoid and all different in many ways.

She stood there biting her lip unsure how to interpret his silence. He complicated things by simply walking over to her and giving her a big hug.

He helped put her mind to rest quickly. "Those are amazing, Bash. Absolutely amazing. I'm certain that the forestry people will have difficulty choosing just one. In fact, I'd not be at all surprised if they asked us to build robots using at least two of these looks."

They called Arv Hanson over to see Bashalli's work. After Tom briefed him on the uses for the proposed robot, all he could do was smile as he viewed the five major designs.

"If I had to put my finger on one, it would be this," he said pointing to the third one she had shown Tom.

"One of my two top favorites, too," Tom told them both.

"What will the finished product be called?" Arv asked.

"Well, Sandy is calling them Robo-Rangers, Bud hasn't kicked in his suggestion... yet... and the forestry people call it an Autonomous Lifelike Guide, Ranger and Forester. Not bad as far as description go, but not the best acronym."

“Al-grf?” Arv asked.

“Right. I’m thinking along the lines of ALAN. An Autonomous Life-form And Naturalist”

The other two agreed that it was a much better name. “I like ALAN,” Bashalli stated. “And, given that name I think I like the design you and Tom picked out as well.”

A presentation took place two days later in Washington. Bashalli came along as Tom wanted her to be able to take the credit and praise he knew would be forthcoming, and he knew that she had never been to the nation’s capital.

There were eleven representatives from the Department of Forestry and three from the General Accounting office.

Though they had come into the meeting with the idea of shooting many holes in the proposed project and thereby save some money, by the end of the presentation all of the GAO people were enthusiastic about what ALAN could do.

The only thing that didn’t go well was that every one of the Government people liked the one design that Bashalli had almost not even shown to Tom. The design looked almost bug-like and very cartoonish. However, it was decided at the meeting that a prototype would be funded using that design.

As they were flying back up to Shopton, Tom consoled Bashalli. “Don’t worry about which one they chose. The great thing is that they really loved that design. Now, all I have to do is figure out a way to make the basic robot fit into that.”

He explained that the two designs he had preferred were the ones that would allow for the most internal components and would be easiest to deal with.

“Don’t look sad,” he told her. “I can make this one work, it will just take some extra time to miniaturize a lot of the stuff inside.”

While Tom worked with a team of Enterprises technicians and engineers on the internal pieces and the programming, Arv and Hank Sterling—Enterprises’ chief pattern maker and the man who would devise the way to make each piece of the body so that it could be replicated many times—took Bashalli’s excellent artwork and turned it all into a series of 3-dimensional drawings.

These were used to recreate the total robotic body in the computer which, in turn, would allow them to make both scale as well as full-size components.

Tom dropped by Arv’s workshop one day and asked for a favor.

“Bash is a little down about which design they picked, and I want to do something to show her how good it really can look. Are you and Hank in a position to pump out a scale miniature that I can give her?”

Arv smiled. “Of course, skipper. We finished all of the wire frame stuff the other day after Hank gave it a slightly upsized body. I ran a small static version in the 3D printer yesterday—” he reached over and pulled the four-inch-tall piece out of his desk drawer. Like all pieces coming from the layer-by-layer printing process, it was a solid color. He had chosen to make it a pale green.

Turning it over in his hands, Tom asked, “Can you give me one of these about twelve inches tall and paint it for me to match her design?”

“Static or articulated?”

“I think articulated so she can see how it looks in different poses.”

Arv thought a few seconds before committing to a time. “This time day after tomorrow. Will that work?”

Tom smiled. “It will work wonders, Arv. Oh,” he added as he was turning to leave, “be ready to make a second one for the Washington folks. Some time next week. Same thing as Bash’s.”

Tom and the engineers worked hard and long hours the next week with Tom only taking time out to drive to Bashalli’s parents’ house to give her the moveable model. When he pulled it out of the paper bag he used to disguise it, she took one look and began sobbing.

Tom looked, horrified, at his girlfriend and then at her parents. He didn’t know what to do. Mrs. Prandit came to the rescue.

“She overjoyed at seeing some of her work made real, Thomas. I know those tears. They are good tears. I believe her father and I should go into the kitchen and allow you to console her.” She gave Tom a wink he had not expected, and then pulled her husband out of his chair and pushed him along and through the kitchen door.

Tom stepped forward and Bashalli sank into his arms. She sobbed and laughed and cried for three minutes

before stepping back and trying to wipe her eyes with her shirt cuffs.

“My mother is very correct, Tom. I am so overwhelmed at seeing my design come to life.”

“If you love this little one,” he told her looking into her eyes, “just wait until you see to full size version.”

It required a further six weeks for both the inner workings as well as the outer ‘skin’ to be completed and assembled.

During that time Tom had to devise several new components including a micro-gyro that could be mounted in almost one hundred places inside of the robot. Every moving piece needed one or two so that the computer brain could keep track of the exact position, attitude and angle of every part of its body.

With so much data coming in just relating to the body, Tom found that the duo of computers inside the body and head were insufficient to perform the tens of thousands of positional checks that occurred each second much less operate the entire robot.

That required him to design eight purpose-built microcomputers to keep track of the feet, legs, hands, arms and major joints of the body. These compiled data, made minor correction to anything out of position, and then reported its progress to the big brain in the head.

That freed up a lot of computing space that was needed to perform the many special functions required of the automaton.

Entire days were spent having Arv or Hank remake this body piece or that when it was discovered that even minute changes required just a small amount of additional space inside.

Tom brought on an entire team of programmers to handle the fifteen separate functions the robot would perform in its series of duties. He just didn't have the time to do it himself.

Finally, and at almost midnight one Friday, ALAN was complete. It stood exactly five feet, nine inches tall and weighed two hundred pounds. Most of its skeleton was titanium and magnetitanium and the body was carbon fiber and Durastress.

Tom sat looking at the robot that sat on a special stool, not yet activated. Getting up he patted ALAN on the shoulder and said, "I think you will come home with me tomorrow. I can test you in our yard on Sunday." He turned and left for the evening.

Tom returned the following day and put ALAN through a series of tests checking its agility, strength and ability to maintain its balance. He was able to perform almost all of the tests before depositing the robot in his work shed at home and heading out for a date with Bashalli that evening.

An hour after returning home that night he was awakened by a knock on his door.

"Tom. It's your mother. There's something lurking outside in your old shed. It hasn't tripped the alarm, but I can hear it moving around in there."

Groggily, he told her, "I know all about it, Momsie. It's something I brought home to run a few test on. Nothing to worry about. It's locked in good and tight. 'Night!"

She seemed mollified and he heard her walking down the hallway before he drifted back to sleep.

The following morning he was awakened by his mother banging on his bedroom door.

"Thomas Swift! Get out here right this instant. There's a robot in my garden and it's pulling up all my petunias!"

PART 3**To Your Scattered Forests Go**

TOM LOOKED at the clock. 6:00 a.m. He was tired and her words hadn't made it through his brain yet. Then, he suddenly sat bolt upright.

"In the garden?" he shouted as he jumped out of bed and pulled his jeans on. He flung open his door and dashed down the hall and downstairs taking them three at a time.

Standing at the kitchen window, Tom's mother, Anne, had her hands on her hips and was not looking at all pleased.

"First get that thing to stop killing my flowers and then explain to me what the heck it is!" she demanded.

Tom yanked the back door open and ran across to his mother's flowerbed. ALAN had, indeed, been pulling up her carefully planted petunias. They had been growing in the greenhouse until the previous day. Tom knew his mother had worked most of that afternoon getting them into the ground.

He was about to reach for the emergency shut-off switch when a thought hit him.

"ALAN?" he addressed the robot.

Immediately the robot, that had been on its knees and sitting on its heels bent over the flowerbed, stopped and straightened. It turned its head to face Tom. In a slightly not-quite-human voice, it replied, "Yes, mister Swift?"

Tom had to think. Was ALAN's programming capable of handling multiple and non-sequential questions? Now was the time to find out.

"I have a few questions for you. First, how did you get out of the shed? I believe I put you into stand-by mode."

ALAN had been programmed to attempt to look at humans at eye level. It computed that it was much too low to continue addressing Tom. So, it stood up and faced the inventor.

"The mode you set was to stand by until dawn. At that time my programming recognized the new day's light and bought me to full function status. Is that a sufficient answer to your question?"

"Uh, yes it is. Thank you. My second question is why did you leave the shed?"

Again, because of its programming, ALAN computed the best manner in which to answer the question. Its eyes opened wider and its articulated mouth formed a small grin.

"My primary programming was consulted. Based on the parameters of one: sunlight, and two: not forest area, only vegetation known as flowers, I am required to perform the duties listed under gardener. In order to perform my duties I needed to be outside of the small wooden building to your right. Was I incorrect?"

Tom had to chuckle. "Actually, it appears that I was the one who was incorrect. You are supposed to act on your own programming and decisions. According to that, you did just as you were supposed to. I may need to add parameters that limit you in some circumstances. So, that

brings me to my third question. Why were you pulling up my mother's petunias? They are a flower, not a weed."

"Based on my GPS position, the calendar date and amount of available sunlight, these should not be present. They are not native to this location. They are, therefore, classified as an invasive species. As such, they should be removed. Was I incorrect?"

Again, Tom had to chuckle. "According to your programming, you were perfectly correct. But, again I need to modify your programming. These are decorative flowers that have been purposely planted in this location for the enjoyment of my mother. They should remain where they are."

ALAN's mouth dropped open. Its head turned from side to side as it scanned the surroundings.

"Should I have classified this as a garden?" it asked.

"Well, yes. It is a garden, ALAN."

The robot's mouth closed for a moment, then it said, "The area surrounding this garden is larger than my programming understands. It was classified as a minimal area of invasive species location. I agree that my programming should be adjusted to allow me to make broader classification decisions. I will replant each of these flowers. I was careful to not destroy them during removal. To do so would be to invite them to regrow where they are undesired. I will place them back in their previous locations in... twenty-one point four minutes. Is this permissible?"

"It is. Thank you. When you are finished I want you to go back to the shed and power down to full standby mode.

I will have more functions for you later today."

Tom and Anne were joined by Sandy at the kitchen window where they watched in amazement as ALAN finished his replanting exactly on time. Tom could see the robot looking from side to side almost as if it were trying to find something. He poked his head out of the back door.

"What are you trying to find, ALAN?"

The robot located him and judged that an increase in vocal volume would be needed. In his louder voice, ALAN asked, "Should I return to the shed now or would it be permissible for me to water the replanted flowers?"

"Does your programming indicate that watering is suggested in a case like this?"

The robot's head bobbed up and down. "Yes," it called out.

"Then, please do that before returning to the shed. The hose is over here next to the house."

"How long before you can think of all the things that it might misinterpret, Son?" his father asked an hour later as they sat having breakfast.

"This version of the software and operating system doesn't automatically learn. New or changed ideas have to be manually devised and installed. The final software will have the ability for each robot to not only learn things as they are corrected, but they will transfer that knowledge to all the others. I'll just be happy in three weeks when we demonstrate ALAN to the forestry folks. Between now and then I hope to have a lot of the kinks worked out."

During the first of the weeks leading up to the demo it became increasingly evident that there might need to be two versions of the ALANs. These would actually be the same model but with different programming.

One would be set up to provide the various forestry services starting with weed and brush removal up to fire fighting, and the other would be set to be a guide, filled with information and insights into each of the parks, even able to cross-reference to any other park in the system to get input from another ALAN there.

Tom made one major design change to accommodate this. The back plate of the ALAN could be quickly removed and a solid-state memory bank change would accomplish the changeover from one version to the other in less than two minutes.

Tom and the engineers also worked with Bashalli to soften some of the robot's expressions making some of them more random and others more in tune with how a human would interact and express themselves facially. They even added a shrug mode the robots could use when faced with a problem or question they were unable to handle alone.

Finally, the prototype was equipped with the ability to download questions and situations for which it was not prepared so that answers might be drawn from a large, internet-based data source and fed back to the robot. It required only a few seconds for the robots to ask and receive answers and then to present them to the park visitors.

On the day of the demonstration, Tom, Bud, Bashalli, Mr. Swift and ALAN flew to Washington D.C. in a Swift

jet and took a taxi to the appropriate federal building. A team had come a day early to set up a series of stations in an area behind the building. They would also go to the U.S. Botanical Gardens where ALAN could show off its knowledge about the many different species of flora there.

At the last minute Tom had added a special programming instruction that would have ALAN turn directly to Tom whenever it was unsure or how to react or had any conflicts in its programming.

The first part of the demo was simply to have everyone meet ALAN and to have the opportunity to ask it questions pertaining to the national park system in general and any particular park they might think of.

It went very well with ALAN surprising one woman, a Congressional aide to the junior senator from Wyoming. She asked ALAN about Fossil Butte National Monument. With a smug look she inquired about one of the trails visitors would hike. She was stunned when ALAN answered, "Madam. That trail was washed out during a large rainstorm three days ago. Signs have been posted in fifteen locations where people have been know to access the trail as well as large signage at the entrance to the monument parking area. Would you like to know what people are now missing?"

She simply shook her head and turned away, mouthing "He's good!" to the man standing behind her.

"It's all rather for the children, isn't it?" asked a foppish man Tom recognized as one of the freelance authors the Department of Forestry used to write their brochures. They had met once before and Tom had taken a dislike to the man almost immediately.

“What would be your frame of reference, Mr. Thornberg?” Mr. Swift asked before Tom could say anything. “Certainly even you can see that a robot such as this, with its mission to work around adults and children can’t be in the form of some scary, monster robot. Or, do you have a dissenting opinion?”

The man was so taken by surprise—he seemed to have expected to gain some sort of notice with his remark and not to be challenged—that he could only shake his head. He scowled and quickly moved away from the main group.

“Well,” Barry Graham said as soon as ALAN had completed all of his gardening tests, “this only leaves the fire fighting test tomorrow. I would like to suggest that we convene at the DCFD training station on Shepherd Parkway at ten tomorrow. Does that work for everyone? Tom? ALAN?”

“If you are inquiring as to my readiness for a test tomorrow, the answer is yes. I am prepared,” ALAN stated.

This caused a ripple of laughter to move through the crowd, with the exception of Mr. Thornberg who scowled again at the robot and walked away.

Tom and Damon spent much of the evening going through the fire fighting programming for ALAN. Everything checked out so they put ALAN ‘to bed’ and went out with Bud and Bashalli for a late night bite to eat.

When they returned Tom was dismayed to find that ALAN was out of his bedroom and was sitting on the floor in the middle of the living room in the suite they were

staying in.

“I guess I have more work to do to keep him from getting restless,” Tom admitted to the rest of the party. “I’ll turn him all the way off tonight and reboot him tomorrow.”

“Now it’s a ‘him’ and not an ‘it?’” Mr. Swift asked with one raised eyebrow.

Tom grinned and nodded. “We’ve made him anthropomorphic so I figure he might as well be a he. After all, he has a masculine name and voice.”

By the time the last of the attendees arrived at the fire fighting training station and its five story concrete tower, Tom and the rest of the Swift party had been on site for more than two hours.

Everything was ready.

“This final test,” Barry Graham told the assembled group, “is only to show ALAN’s ability to ascertain the source of a fire and to put it out as quickly as possible. Are you ready?”

Tom gave a thumbs up sign. Graham in turn gave a signal to the fireman in charge of turning on the gas and setting an undisclosed area inside the tower alight. Smoke and some flames began pouring out from the second, third and fourth floors.

“Okay, ALAN. Find the fire and put it out,” Tom ordered.

ALAN turned to face the tower. His head moved up and down and from side to side as he scanned the building. As he did this Tom explained that he was using his sensors to

determine the main hot spot.

“In the case of a forest fire, there would be many hot spots so the entire team of ALANs would coordinate and split up so they can attack all of them as quickly as possible.”

ALAN bent over and picked up the special hose he would use to put the fire out. It was more heat resistant than standard hoses and could withstand the high temperatures for a longer period of time.

“If he keeps the valve off until he locates the actual flames, he will have about four minutes inside until the coating will get too hot. Then the hose will want to blow up like a long balloon when pressure builds up. Let’s hope he turns in on once he’s inside. The running water will keep it cool enough, and for a lot longer.”

They all watched as ALAN reached the metal door where he paused and did another up and down scan. He moved to one side of the door and opened it. Flames licked out but missed him. He turned on the valve and set the nozzle to provide a wide, circular spray. Soon, he was inside and all they could see was the hose as it pulled along the ground and disappeared into the smoke-filled structure.

“He should be on the third floor,” Tom told the group less than a minute later. “If that’s where the fire is located, he’ll begin fighting it about now.” Indeed, the hose stopped moving. Tom smiled at his father and nodded. ALAN was doing just as expected.

But, his smile faded a minute later when the smoke and flames kept coming out of the windows. There was no sign

it was abating.

“Any problems?” Barry asked.

“I’m not sure, sir. ALAN should have doused those flames by now. Something must have happened. Can we get the gas shut off, please?”

In a minute it was verified that the flames were out. Huge fans roared into life to clear out the smoke and a team of rescue fire fighters suited up to go in to search for the robot.

Tom looked around in dismay. Everyone was looking worried. They had all come to like the robot. That is, everyone save a single man standing to one side. He could barely contain his laughter.

It was the writer, Mr. Thornberg. Tom glared at him and was rewarded with a stuck out tongue and more laughter.

But his laughter stopped suddenly and a gasp came from the rest of the group. Tom spun around in time to see ALAN emerge, smoke-stained and dripping wet, from the ground floor doorway. He still held the nozzle in his right hand but the hose had been burned away.

“Please do not come too near to me,” ALAN called out as a few people rushed forward. “I am at a temperature of five hundred and thirty nine degrees. Please allow me to cool for five minutes.”

Tom pushed his way through the crowd and approached slowly stopping when he was about fifteen feet from the mechanical man. He could feel the radiating heat.

“Are your systems okay?” he called to the robot.

“My systems are confused and have some manner of blockage,” came the reply. “I may have made an error in judgment but I failed to notify you that one of the people in this audience came into your rooms last night when you were eating and inserted something into my left side. Was I incorrect?”

Tom’s mouth hung agape. He could scarcely believe what he was hearing. “What? Who?” was all he could get out.

ALAN raised his left arm and pointed at the one person not near to the close-packed crowd of onlookers. “That man, Tom,” he replied.

Tom looked. “Thornberg!” he shouted. “Get that man!”

But, Mr. Thornberg had taken flight and was running away. He didn’t get very far. A group of fire fighters that had been observing the test grabbed him as he tried to muscle between them.

While the police were being called, Tom approached ALAN. “How hot now?”

“One hundred seventeen. My internal fans are running and cooling vents are opened. You may access safely.”

Tom opened an access door under ALAN’s left arm. He let out a startled cry when he saw the large magnet that had been adhered inside using a thick, foam tape.

Using his handkerchief, he pulled it out and put it inside a pocket. It would later prove to have the fingerprints of Jeremy Thornberg and another man who turned out to be the partner of Thornberg.

While ALAN ran a systems check, Tom walked over to explain what had happened to the assembled group. They all agreed that if the robot was able to do it, they would like to see a proper demonstration.

ALAN signaled to Tom that he was ready and able to continue, so another hose was brought out and the test repeated.

This time, when the hose stopped moving the viewers could see massive amounts of steam pouring from the building and all signs of smoke and flames went out in seconds. ALAN returned to the group, still sooty but at a reasonable temperature and reported success.

Bud slapped Tom and ALAN on their backs, wincing as his relatively soft hand contacted the robot’s steel hard shell.

Everyone was enthusiastic and wanted to know when an army of the robots could be ready.

Tom and Damon demurred answering that stating that an actual order still needed to be placed.

Barry promised that a decision would be made within the week. “I’m fairly certain that ALAN’s demonstrations have secured his success. I foresee us needing at least two hundred and eighty of them. Is that going to be too much?”

Tom shook his head.

Barry also told Tom that there would be no delay in getting the robots out to the most needed locations as quickly as they could be delivered.

“I don’t want this to sound like a promise,” Tom told

him, “but I think you can count on our being able to deliver batches of twenty every week for as long as it takes to complete your order.”

Bashalli, who had been hanging back to stay out of the way, spent the entire twenty minutes before the crowd dispersed wiping ALAN off and restoring him to his shiny self.

On the trip back to Shopton Tom asked her, “So, now that you’ve got your first commercial design project under your belt, what’s next?”

She looked at him and innocently stated, “Why, that is simplicity itself, Tom. Now that we have ALAN, a boy robot, I’m going to go back to my drawing table and come up with a suitable female robot for him. After all, every good boy deserves a female. Right?”