I, Robot

Isaac Asimov

TO JOHN W. CAMPBELL, JR, who godfathered THE ROBOTS

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CONTENTS

Introduction 2
Robbie 5
Runaround 20
Reason 34
Catch That Rabbit 48
Liar! 63
Little Lost Robot 77
Escape! 97
Evidence 114
The Evitable Conflict 132

Introduction

I LOOKED AT MY NOTES AND I DIDN'T LIKE THEM. I'd spent three days at U. S. Robots and might as well have spent them at home with the Encyclopedia Tellurica.

Susan Calvin had been born in the year 1982, they said, which made her seventy-five now. Everyone knew that. Appropriately enough, U. S. Robot and Mechanical Men, Inc. was seventy-five also, since it had been in the year of Dr. Calvin's birth that Lawrence Robertson had first taken out incorporation papers for what eventually became the strangest industrial giant in man's history. Well, everyone knew that, too.

At the age of twenty, Susan Calvin had been part of the particular Psycho-Math seminar at which Dr. Alfred Lanning of U. S. Robots had demonstrated the first mobile robot to be equipped with a voice. It was a large, clumsy unbeautiful robot, smelling of machine-oil and destined for the projected mines on Mercury. But it could speak and make sense.

Susan said nothing at that seminar; took no part in the hectic discussion period that followed. She was a frosty girl, plain and colorless, who protected herself against a world she disliked by a mask-like expression and a hypertrophy of intellect. But as she watched and listened, she felt the stirrings of a cold enthusiasm.

She obtained her bachelor's degree at Columbia in 2003 and began graduate work in cybernetics.

All that had been done in the mid-twentieth century on "calculating machines" had been upset by Robertson and his positronic brain-paths. The miles of relays and photocells had given way to the spongy globe of plantinumiridium about the size of a human brain.

She learned to calculate the parameters necessary to fix the possible variables within the "positronic brain"; to construct "brains" on paper such that the responses to given stimuli could be accurately predicted.

In 2008, she obtained her Ph.D. and joined United States Robots as a "Robopsychologist," becoming the first great practitioner of a new science. Lawrence Robertson was still president of the corporation; Alfred Lanning had become director of research.

For fifty years, she watched the direction of human progress change and leap ahead.

Now she was retiring — as much as she ever could. At least, she was allowing someone else's name to be inset upon the door of her office.

That, essentially, was what I had. I had a long list of her published papers, of the patents in her name; I had the chronological details of her promotions. In short I had her professional "vita" in full detail.

But that wasn't what I wanted.

I needed more than that for my feature articles for Interplanetary Press. Much more.

I told her so.

"Dr. Calvin," I said, as lushly as possible, "in the mind of the public you and U. S. Robots are identical. Your retirement will end an era and–"

“You want the human-interest angle?” She didn’t smile at me. I don’t think she ever smiles. But her eyes were sharp, though not angry. I felt her glance slide through me and out my occiput and knew that I was uncommonly transparent to her; that everybody was.

But I said, “That’s right.”

“Human interest out of robots? A contradiction.”

“No, doctor. Out of you.”

“Well, I’ve been called a robot myself. Surely, they’ve told you I’m not human.”

They had, but there was no point in saying so.

She got up from her chair. She wasn’t tall and she looked frail. I followed her to the window and we looked out.

The offices and factories of U. S. Robots were a small city; spaced and planned. It was flattened out like an aerial photograph.

“When I first came here,” she said, “I had a little room in a building right about there where the fire-house is now.” She pointed. “It was torn down before you were born. I shared the room with three others. I had half a desk. We built our robots all in one building. Output — three a week. Now look at us.”

“Fifty Years,” I hackneyed, “is a long time.”

“Not when you’re looking back at them,” she said. “You wonder how they vanished so quickly.”

She went back to her desk and sat down. She didn’t need expression on her face to look sad, somehow.

“How old are you?” she wanted to know.

“Thirty-two,” I said.

“Then you don’t remember a world without robots. There was a time when humanity faced the universe alone and without a friend. Now he has creatures to help him; stronger creatures than himself, more faithful, more useful, and absolutely devoted to him. Mankind is no longer alone. Have you ever thought of it that way?”

“I’m afraid I haven’t. May I quote you?”

“You may. To you, a robot is a robot. Gears and metal; electricity and positrons. Mind and iron! Human-made! If necessary, human-destroyed! But you haven’t worked with them, so you don’t know them. They’re a cleaner, better breed than we are.”

I tried to nudge her gently with words, “We’d like to hear some of the things you could tell us; get your views on robots. The Interplanetary Press reaches the entire Solar System. Potential audience is three billion, Dr. Calvin. They ought to know what you could tell them on robots.”

It wasn’t necessary to nudge. She didn’t hear me, but she was moving in the right direction.

“They might have known that from the start. We sold robots for Earth-use then — before my time it was, even. Of course, that was when robots could not talk. Afterward, they became more human and opposition began. The labor unions, of course, naturally opposed robot competition for human

jobs, and various segments of religious opinion had their superstitious objections. It was all quite ridiculous and quite useless. And yet there it was.”

I was taking it down verbatim on my pocket-recorder, trying not to show the knuckle-motions of my hand. If you practice a bit, you can get to the point where you can record accurately without taking the little gadget out of your pocket.

“Take the case of Robbie,” she said. “I never knew him. He was dismantled the year before I joined the company — hopelessly out-of-date. But I saw the little girl in the museum–”

She stopped, but I didn’t say anything. I let her eyes mist up and her mind travel back. She had lots of time to cover.

“I heard about it later, and when they called us blasphemers and demon-creators, I always thought of him. Robbie was a non-vocal robot. He couldn’t speak. He was made and sold in 1996. Those were the days before extreme specialization, so he was sold as a nursemaid.”

“As a what?”

“As a nursemaid.”

Robbie

"NINETY-EIGHT – NINETY-NINE – ONE HUNDRED." Gloria withdrew her chubby little forearm from before her eyes and stood for a moment, wrinkling her nose and blinking in the sunlight. Then, trying to watch in all directions at once, she withdrew a few cautious steps from the tree against which she had been leaning.

She craned her neck to investigate the possibilities of a clump of bushes to the right and then withdrew farther to obtain a better angle for viewing its dark recesses. The quiet was profound except for the incessant buzzing of insects and the occasional chirrup of some hardy bird, braving the midday sun.

Gloria pouted, "I bet he went inside the house, and I've told him a million times that that's not fair."

With tiny lips pressed together tightly and a severe frown crinkling her forehead, she moved determinedly toward the two-story building up past the driveway.

Too late she heard the rustling sound behind her, followed by the distinctive and rhythmic clump-clump of Robbie's metal feet. She whirled about to see her triumphing companion emerge from hiding and make for the home-tree at full speed.

Gloria shrieked in dismay. "Wait, Robbie! That wasn't fair, Robbie! You promised you wouldn't run until I found you." Her little feet could make no headway at all against Robbie's giant strides. Then, within ten feet of the goal, Robbie's pace slowed suddenly to the merest of crawls, and Gloria, with one final burst of wild speed, dashed pantingly past him to touch the welcome bark of home-tree first.

Gleefully, she turned on the faithful Robbie, and with the basest of ingratitude, rewarded him for his sacrifice by taunting him cruelly for a lack of running ability.

"Robbie can't run," she shouted at the top of her eight-year-old voice. "I can beat him any day. I can beat him any day." She chanted the words in a shrill rhythm.

Robbie didn't answer, of course — not in words. He pantomimed running instead, inching away until Gloria found herself running after him as he dodged her narrowly, forcing her to veer in helpless circles, little arms outstretched and fanning at the air.

"Robbie," she squealed, "stand still!" — And the laughter was forced out of her in breathless jerks.

Until he turned suddenly and caught her up, whirling her round, so that for her the world fell away for a moment with a blue emptiness beneath, and green trees stretching hungrily downward toward the void. Then she was down in the grass again, leaning against Robbie's leg and still holding a hard, metal finger.

After a while, her breath returned. She pushed uselessly at her disheveled hair in vague imitation of one of her mother's gestures and twisted to see if her dress were torn.

She slapped her hand against Robbie's torso, "Bad boy! I'll spank you!"

And Robbie cowered, holding his hands over his face so that she had to add, "No, I won't, Robbie. I won't spank you. But anyway, it's my turn to hide now because you've got longer legs and you promised not to run till I found you."

Robbie nodded his head — a small parallelepiped with rounded edges and corners attached to a similar but much larger parallelepiped that served as torso by means of a short, flexible stalk — and obediently faced the tree. A thin, metal film descended over his glowing eyes and from within his body came a steady, resonant ticking.

“Don’t peek now — and don’t skip any numbers,” warned Gloria, and scurried for cover.

With unvarying regularity, seconds were ticked off, and at the hundredth, up went the eyelids, and the glowing red of Robbie’s eyes swept the prospect. They rested for a moment on a bit of colorful gingham that protruded from behind a boulder. He advanced a few steps and convinced himself that it was Gloria who squatted behind it.

Slowly, remaining always between Gloria and home-tree, he advanced on the hiding place, and when Gloria was plainly in sight and could no longer even theorize to herself that she was not seen, he extended one arm toward her, slapping the other against his leg so that it rang again. Gloria emerged sulkily.

“You peeked!” she exclaimed, with gross unfairness. “Besides I’m tired of playing hide-and-seek. I want a ride.”

But Robbie was hurt at the unjust accusation, so he seated himself carefully and shook his head ponderously from side to side.

Gloria changed her tone to one of gentle coaxing immediately, “Come on, Robbie. I didn’t mean it about the peeking. Give me a ride.”

Robbie was not to be won over so easily, though. He gazed stubbornly at the sky, and shook his head even more emphatically.

“Please, Robbie, please give me a ride.” She encircled his neck with rosy arms and hugged tightly. Then, changing moods in a moment, she moved away. “If you don’t, I’m going to cry,” and her face twisted appallingly in preparation.

Hard-hearted Robbie paid scant attention to this dreadful possibility, and shook his head a third time. Gloria found it necessary to play her trump card.

“If you don’t,” she exclaimed warmly, “I won’t tell you any more stories, that’s all. Not one–”

Robbie gave in immediately and unconditionally before this ultimatum, nodding his head vigorously until the metal of his neck hummed. Carefully, he raised the little girl and placed her on his broad, flat shoulders.

Gloria’s threatened tears vanished immediately and she crowed with delight. Robbie’s metal skin, kept at a constant temperature of seventy by the high resistance coils within, felt nice and comfortable, while the beautifully loud sound her heels made as they bumped rhythmically against his chest was enchanting.

“You’re an air-coaster, Robbie, you’re a big, silver aircoaster. Hold out your arms straight. — You got to, Robbie, if you’re going to be an aircoaster.”

The logic was irrefutable. Robbie’s arms were wings catching the air currents and he was a silver ‘coaster.

Gloria twisted the robot’s head and leaned to the right. He banked sharply. Gloria equipped the ‘coaster with a motor that went “Br-r-r” and then with weapons that went “Powie” and “Sh-sh-

shshsh.” Pirates were giving chase and the ship’s blasters were coming into play. The pirates dropped in a steady rain.

“Got another one. Two more,” she cried.

Then “Faster, men,” Gloria said pompously, “we’re running out of ammunition.” She aimed over her shoulder with undaunted courage and Robbie was a blunt-nosed spaceship zooming through the void at maximum acceleration.

Clear across the field he sped, to the patch of tall grass on the other side, where he stopped with a suddenness that evoked a shriek from his flushed rider, and then tumbled her onto the soft, green carpet.

Gloria gasped and panted, and gave voice to intermittent whispered exclamations of “That was nice!”

Robbie waited until she had caught her breath and then pulled gently at a lock of hair.

“You want something?” said Gloria, eyes wide in an apparently artless complexity that fooled her huge “nursemaid” not at all. He pulled the curl harder.

“Oh, I know. You want a story.”

Robbie nodded rapidly.

“Which one?”

Robbie made a semi-circle in the air with one finger.

The little girl protested, “Again? I’ve told you Cinderella a million times. Aren’t you tired of it? – It’s for babies.”

Another semi-circle.

“Oh, well,” Gloria composed herself, ran over the details of the tale in her mind (together with her own elaborations, of which she had several) and began:

“Are you ready? Well — once upon a time there was a beautiful little girl whose name was Ella. And she had a terribly cruel step-mother and two very ugly and very cruel step-sisters and–”

Gloria was reaching the very climax of the tale — midnight was striking and everything was changing back to the shabby originals lickety-split, while Robbie listened tensely with burning eyes — when the interruption came.

“Gloria!”

It was the high-pitched sound of a woman who has been calling not once, but several times; and had the nervous tone of one in whom anxiety was beginning to overcome impatience.

“Mamma’s calling me,” said Gloria, not quite happily. “You’d better carry me back to the house, Robbie.”

Robbie obeyed with alacrity for somehow there was that in him which judged it best to obey Mrs. Weston, without as much as a scrap of hesitation. Gloria’s father was rarely home in the daytime except on Sunday — today, for instance — and when he was, he proved a genial and understanding person. Gloria’s mother, however, was a source of uneasiness to Robbie and there was always the impulse to sneak away from her sight.

Mrs. Weston caught sight of them the minute they rose above the masking tufts of long grass and retired inside the house to wait.

“I’ve shouted myself hoarse, Gloria,” she said, severely. “Where were you?”

“I was with Robbie,” quavered Gloria. “I was telling him Cinderella, and I forgot it was dinner-time.”

“Well, it’s a pity Robbie forgot, too.” Then, as if that reminded her of the robot’s presence, she whirled upon him. “You may go, Robbie. She doesn’t need you now.” Then, brutally, “And don’t come back till I call you.”

Robbie turned to go, but hesitated as Gloria cried out in his defense, “Wait, Mamma, you got to let him stay. I didn’t finish Cinderella for him. I said I would tell him Cinderella and I’m not finished.”

“Gloria!”

“Honest and truly, Mamma, he’ll stay so quiet, you won’t even know he’s here. He can sit on the chair in the corner, and he won’t say a word, I mean he won’t do anything. Will you, Robbie?”

Robbie, appealed to, nodded his massive head up and down once.

“Gloria, if you don’t stop this at once, you shan’t see Robbie for a whole week.”

The girl’s eyes fell, “All right! But Cinderella is his favorite story and I didn’t finish it. —And he likes it so much.”

The robot left with a disconsolate step and Gloria choked back a sob.

George Weston was comfortable. It was a habit of his to be comfortable on Sunday afternoons. A good, hearty dinner below the hatches; a nice, soft, dilapidated couch on which to sprawl; a copy of the Times; slippered feet and shirtless chest; how could anyone help but be comfortable?

He wasn’t pleased, therefore, when his wife walked in. After ten years of married life, be still was so unutterably foolish as to love her, and there was no question that he was always glad to see her — still Sunday afternoons just after dinner were sacred to him and his idea of solid comfort was to be left in utter solitude for two or three hours. Consequently, he fixed his eye firmly upon the latest reports of the Lefebre-Yoshida expedition to Mars (this one was to take off from Lunar Base and might actually succeed) and pretended she wasn’t there.

Mrs. Weston waited patiently for two minutes, then impatiently for two more, and finally broke the silence.

“George!”

“Hmpph?”

“George, I say! Will you put down that paper and look at me?”

The paper rustled to the floor and Weston turned a weary face toward his wife, “What is it, dear?”

“You know what it is, George. It’s Gloria and that terrible machine.”

“What terrible machine?”

“Now don’t pretend you don’t know what I’m talking about. It’s that robot Gloria calls Robbie. He doesn’t leave her for a moment.”

“Well, why should he? He’s not supposed to. And he certainly isn’t a terrible machine. He’s the best darn robot money can buy and I’m damned sure he set me back half a year’s income. He’s worth it, though — darn sight cleverer than half my office staff.”

He made a move to pick up the paper again, but his wife was quicker and snatched it away.

“You listen to me, George. I won’t have my daughter entrusted to a machine — and I don’t care how clever it is. It has no soul, and no one knows what it may be thinking. A child just isn’t made to be guarded by a thing of metal.”

Weston frowned, “When did you decide this? He’s been with Gloria two years now and I haven’t seen you worry till now.”

“It was different at first. It was a novelty; it took a load off me, and — and it was a fashionable thing to do. But now I don’t know. The neighbors–”

“Well, what have the neighbors to do with it? Now, look. A robot is infinitely more to be trusted than a human nursemaid. Robbie was constructed for only one purpose really — to be the companion of a little child. His entire ‘mentality’ has been created for the purpose. He just can’t help being faithful and loving and kind. He’s a machine-made so. That’s more than you can say for humans.”

“But something might go wrong. Some- some-” Mrs. Weston was a bit hazy about the insides of a robot, “some little jigger will come loose and the awful thing will go berserk and- and-” She couldn’t bring herself to complete the quite obvious thought.

“Nonsense,” Weston denied, with an involuntary nervous shiver. “That’s completely ridiculous. We had a long discussion at the time we bought Robbie about the First Law of Robotics. You know that it is impossible for a robot to harm a human being; that long before enough can go wrong to alter that First Law, a robot would be completely inoperable. It’s a mathematical impossibility. Besides I have an engineer from U. S. Robots here twice a year to give the poor gadget a complete overhaul. Why, there’s no more chance of any thing at all going wrong with Robbie than there is of you or I suddenly going loony — considerably less, in fact. Besides, how are you going to take him away from Gloria?”

He made another futile stab at the paper and his wife tossed it angrily into the next room.

“That’s just it, George! She won’t play with anyone else. There are dozens of little boys and girls that she should make friends with, but she won’t. She won’t go near them unless I make her. That’s no way for a little girl to grow up. You want her to be normal, don’t you? You want her to be able to take her part in society.”

“You’re jumping at shadows, Grace. Pretend Robbie’s a dog. I’ve seen hundreds of children who would rather have their dog than their father.”

“A dog is different, George. We must get rid of that horrible thing. You can sell it back to the company. I’ve asked, and you can.”

“You’ve asked? Now look here, Grace, let’s not go off the deep end. We’re keeping the robot until Gloria is older and I don’t want the subject brought up again.” And with that he walked out of the room in a huff.

Mrs. Weston met her husband at the door two evenings later. “You’ll have to listen to this, George. There’s bad feeling in the village.”

“About what?” asked Weston? He stepped into the washroom and drowned out any possible answer by the splash of water.

Mrs. Weston waited. She said, “About Robbie.”

Weston stepped out, towel in hand, face red and angry, “What are you talking about?”

“Oh, it’s been building up and building up. I’ve tried to close my eyes to it, but I’m not going to any more. Most of the villagers consider Robbie dangerous. Children aren’t allowed to go near our place in the evenings.”

“We trust *our* child with the thing.”

“Well, people aren’t reasonable about these things.”

“Then to hell with them.”

“Saying that doesn’t solve the problem. I’ve got to do my shopping down there. I’ve got to meet them every day. And it’s even worse in the city these days when it comes to robots. New York has just passed an ordinance keeping all robots off the streets between sunset and sunrise.”

“All right, but they can’t stop us from keeping a robot in our home. Grace, this is one of your campaigns. I recognize it. But it’s no use. The answer is still, no! We’re keeping Robbie!”

And yet he loved his wife — and what was worse, his wife knew it. George Weston, after all, was only a man — poor thing — and his wife made full use of every device which a clumsier and more scrupulous sex has learned, with reason and futility, to fear.

Ten times in the ensuing week, he cried, “Robbie stays, and that’s final!” and each time it was weaker and accompanied by a louder and more agonized groan.

Came the day at last, when Weston approached his daughter guiltily and suggested a “beautiful” visivox show in the village.

Gloria clapped her hands happily, “Can Robbie go?”

“No, dear,” he said, and winced at the sound of his voice, “they won’t allow robots at the visivox — but you can tell him all about it when you get home.” He stumbled all over the last few words and looked away.

Gloria came back from town bubbling over with enthusiasm, for the visivox had been a gorgeous spectacle indeed.

She waited for her father to maneuver the jet-car into the sunken garage, “Wait till I tell Robbie, Daddy. He would have liked it like anything. Especially when Francis Fran was backing away so-o-o quietly, and backed right into one of the Leopard-Men and had to run.” She laughed again, “Daddy, are there really Leopard-Men on the Moon?”

“Probably not,” said Weston absently. “It’s just funny make-believe.” He couldn’t take much longer with the car. He’d have to face it.

Gloria ran across the lawn. “Robbie. —Robbie!”

Then she stopped suddenly at the sight of a beautiful collie which regarded her out of serious brown eyes as it wagged its tail on the porch.

“Oh, what a nice dog!” Gloria climbed the steps, approached cautiously and patted it. “Is it for me, Daddy?”

Her mother had joined them. “Yes, it is, Gloria. Isn’t it nice — soft and furry? It’s very gentle. It likes little girls.”

“Can he play games?”

“Surely. He can do any number of tricks. Would you like to see some?”

“Right away. I want Robbie to see him, too. Robbie!” She stopped, uncertainly, and frowned, “I’ll bet he’s just staying in his room because he’s mad at me for not taking him to the visivox. You’ll have to explain to him, Daddy. He might not believe me, but he knows if you say it, it’s so.”

Weston’s lip grew tighter. He looked toward his wife but could not catch her eye.

Gloria turned precipitously and ran down the basement steps, shouting as she went, “Robbie— Come and see what Daddy and Mamma brought me. They brought me a dog, Robbie.”

In a minute she had returned, a frightened little girl. “Mamma, Robbie isn’t in his room. Where is he?” There was no answer and George Weston coughed and was suddenly extremely interested in an aimlessly drifting cloud. Gloria’s voice quavered on the verge of tears, “Where’s Robbie, Mamma?”

Mrs. Weston sat down and drew her daughter gently to her, “Don’t feel bad, Gloria. Robbie has gone away, I think.”

“Gone away? Where? Where’s he gone away, Mamma?”

“No one knows, darling. He just walked away. We’ve looked and we’ve looked and we’ve looked for him, but we can’t find him.”

“You mean he’ll never come back again?” Her eyes were round with horror.

“We may find him soon. We’ll keep looking for him. And meanwhile you can play with your nice new doggie. Look at him! His name is Lightning and he can–”

But Gloria’s eyelids had overflown, “I don’t want the nasty dog — I want Robbie. I want you to find me Robbie.” Her feelings became too deep for words, and she spluttered into a shrill wail.

Mrs. Weston glanced at her husband for help, but he merely shuffled his feet morosely and did not withdraw his ardent stare from the heavens, so she bent to the task of consolation, “Why do you cry, Gloria? Robbie was only a machine, just a nasty old machine. He wasn’t alive at all.”

“He was not no machine!” screamed Gloria, fiercely and ungrammatically. “He was a person just like you and me and he was my friend. I want him back. Oh, Mamma, I want him back.”

Her mother groaned in defeat and left Gloria to her sorrow.

“Let her have her cry out,” she told her husband. “Childish griefs are never lasting. In a few days, she’ll forget that awful robot ever existed.”

But time proved Mrs. Weston a bit too optimistic. To be sure, Gloria ceased crying, but she ceased smiling, too, and the passing days found her ever more silent and shadowy. Gradually, her attitude of passive unhappiness wore Mrs. Weston down and all that kept her from yielding was the impossibility of admitting defeat to her husband.

Then, one evening, she flounced into the living room, sat down, folded her arms and looked boiling mad.

Her husband stretched his neck in order to see her over his newspaper, “What now, Grace?”

“It’s that child, George. I’ve had to send back the dog today. Gloria positively couldn’t stand the sight of him, she said. She’s driving me into a nervous breakdown.”

Weston laid down the paper and a hopeful gleam entered his eye, “Maybe— Maybe we ought to get Robbie back. It might be done, you know. I can get in touch with–”

“No!” she replied, grimly. “I won’t hear of it. We’re not giving up that easily. My child shall not be brought up by a robot if it takes years to break her of it.”

Weston picked up his paper again with a disappointed air. “A year of this will have me prematurely gray.”

“You’re a big help, George,” was the frigid answer. “What Gloria needs is a change of environment? Of course she can’t forget Robbie here. How can she when every tree and rock reminds her of him? It is really the silliest situation I have ever heard of. Imagine a child pining away for the loss of a robot.”

“Well, stick to the point. What’s the change in environment you’re planning?”

“We’re going to take her to New York.”

“The city! In August! Say, do you know what New York is like in August? It’s unbearable.”

“Millions do bear it.”

“They don’t have a place like this to go to. If they didn’t have to stay in New York, they wouldn’t.”

“Well, we have to. I say we’re leaving now — or as soon as we can make the arrangements. In the city, Gloria will find sufficient interests and sufficient friends to perk her up and make her forget that machine.”

“Oh, Lord,” groaned the lesser half, “those frying pavements!”

“We have to,” was the unshaken response. “Gloria has lost five pounds in the last month and my little girl’s health is more important to me than your comfort.”

“It’s a pity you didn’t think of your little girl’s health before you deprived her of her pet robot,” he muttered — but to himself.

Gloria displayed immediate signs of improvement when told of the impending trip to the city. She spoke little of it, but when she did, it was always with lively anticipation. Again, she began to smile and to eat with something of her former appetite.

Mrs. Weston hugged herself for joy and lost no opportunity to triumph over her still skeptical husband.

“You see, George, she helps with the packing like a little angel, and chatters away as if she hadn’t a care in the world. It’s just as I told you — all we need do is substitute other interests.”

“Hmpph,” was the skeptical response, “I hope so.”

Preliminaries were gone through quickly. Arrangements were made for the preparation of their city home and a couple were engaged as housekeepers for the country home. When the day of the trip

finally did come, Gloria was all but her old self again, and no mention of Robbie passed her lips at all.

In high good-humor the family took a taxi-gyro to the airport (Weston would have preferred using his own private ‘gyro, but it was only a two-seater with no room for baggage) and entered the waiting liner.

“Come, Gloria,” called Mrs. Weston. “I’ve saved you a seat near the window so you can watch the scenery.”

Gloria trotted down the aisle cheerily, flattened her nose into a white oval against the thick clear glass, and watched with an intentness that increased as the sudden coughing of the motor drifted backward into the interior. She was too young to be frightened when the ground dropped away as if let through a trap door and she herself suddenly became twice her usual weight, but not too young to be mightily interested. It wasn’t until the ground had changed into a tiny patchwork quilt that she withdrew her nose, and faced her mother again.

“Will we soon be in the city, Mamma?” she asked, rubbing her chilled nose, and watching with interest as the patch of moisture which her breath had formed on the pane shrank slowly and vanished.

“In about half an hour, dear.” Then, with just the faintest trace of anxiety, “Aren’t you glad we’re going? Don’t you think you’ll be very happy in the city with all the buildings and people and things to see? We’ll go to the visivox every day and see shows and go to the circus and the beach and–”

“Yes, Mamma,” was Gloria’s unenthusiastic rejoinder. The liner passed over a bank of clouds at the moment, and Gloria was instantly absorbed in the usual spectacle of clouds underneath one. Then they were over clear sky again, and she turned to her mother with a sudden mysterious air of secret knowledge.

“I know why we’re going to the city, Mamma.”

“Do you?” Mrs. Weston was puzzled. “Why, dear?”

“You didn’t tell me because you wanted it to be a surprise, but I know.” For a moment, she was lost in admiration at her own acute penetration, and then she laughed gaily. “We’re going to New York so we can find Robbie, aren’t we? —With detectives.”

The statement caught George Weston in the middle of a drink of water, with disastrous results. There was a sort of strangled gasp, a geyser of water, and then a bout of choking coughs. When all was over, he stood there, a red-faced, water-drenched and very, very annoyed person.

Mrs. Weston maintained her composure, but when Gloria repeated her question in a more anxious tone of voice, she found her temper rather bent.

“Maybe,” she retorted, tartly. “Now sit and be still, for Heaven’s sake.”

New York City, 1998 A.D., was a paradise for the sightseer more than ever in its history. Gloria’s parents realized this and made the most of it.

On direct orders from his wife, George Weston arranged to have his business take care of itself for a month or so, in order to be free to spend the time in what he termed, “dissipating Gloria to the verge of ruin.” Like everything else Weston did, this was gone about in an efficient, thorough, and business-like way. Before the month had passed, nothing that could be done had not been done.

She was taken to the top of the half-mile tall Roosevelt Building, to gaze down in awe upon the jagged panorama of rooftops that blended far off in the fields of Long Island and the flatlands of New Jersey. They visited the zoos where Gloria stared in delicious fright at the “real live lion” (rather disappointed that the keepers fed him raw steaks, instead of human beings, as she had expected), and asked insistently and peremptorily to see “the whale.”

The various museums came in for their share of attention, together with the parks and the beaches and the aquarium.

She was taken halfway up the Hudson in an excursion steamer fitted out in the archaism of the mad Twenties. She traveled into the stratosphere on an exhibition trip, where the sky turned deep purple and the stars came out and the misty earth below looked like a huge concave bowl. Down under the waters of the Long Island Sound she was taken in a glass-walled sub-sea vessel, where in a green and wavering world, quaint and curious sea-things ogled her and wiggled suddenly away.

On a more prosaic level, Mrs. Weston took her to the department stores where she could revel in another type of fairyland.

In fact, when the month had nearly sped, the Westons were convinced that everything conceivable had been done to take Gloria’s mind once and for all off the departed Robbie — but they were not quite sure they had succeeded.

The fact remained that wherever Gloria went, she displayed the most absorbed and concentrated interest in such robots as happened to be present. No matter how exciting the spectacle before her, nor how novel to her girlish eyes, she turned away instantly if the corner of her eye caught a glimpse of metallic movement.

Mrs. Weston went out of her way to keep Gloria away from all robots.

And the matter was finally climaxed in the episode at the Museum of Science and Industry. The Museum had announced a special “children’s program” in which exhibits of scientific witchery scaled down to the child mind were to be shown. The Westons, of course, placed it upon their list of “absolutely.”

It was while the Westons were standing totally absorbed in the exploits of a powerful electro-magnet that Mrs. Weston suddenly became aware of the fact that Gloria was no longer with her. Initial panic gave way to calm decision and, enlisting the aid of three attendants, a careful search was begun.

Gloria, of course, was not one to wander aimlessly, however. For her age, she was an unusually determined and purposeful girl, quite full of the maternal genes in that respect. She had seen a huge sign on the third floor, which had said, “This Way to the Talking Robot” Having spelled it out to herself and having noticed that her parents did not seem to wish to move in the proper direction, she did the obvious thing. Waiting for an opportune moment of parental distraction, she calmly disengaged herself and followed the sign.

The Talking Robot was a tour de force, a thoroughly impractical device, possessing publicity value only. Once an hour, an escorted group stood before it and asked questions of the robot engineer in charge in careful whispers. Those the engineer decided were suitable for the robot’s circuits were transmitted to the Talking Robot.

It was rather dull. It may be nice to know that the square of fourteen is one hundred ninety-six, that the temperature at the moment is 72 degrees Fahrenheit, and the air-pressure 30.02 inches of

mercury, that the atomic weight of sodium is 23, but one doesn't really need a robot for that. One especially does not need an unwieldy, totally immobile mass of wires and coils spreading over twenty-five square yards.

Few people bothered to return for a second helping, but one girl in her middle teens sat quietly on a bench waiting for a third. She was the only one in the room when Gloria entered.

Gloria did not look at her. To her at the moment, another human being was but an inconsiderable item. She saved her attention for this large thing with the wheels. For a moment, she hesitated in dismay. It didn't look like any robot she had ever seen.

Cautiously and doubtfully she raised her treble voice; "Please, Mr. Robot, sir, are you the Talking Robot, sir?" She wasn't sure, but it seemed to her that a robot that actually talked was worth a great deal of politeness.

(The girl in her mid-teens allowed a look of intense concentration to cross her thin, plain face. She whipped out a small notebook and began writing in rapid pothooks.)

There was an oily whir of gears and a mechanically timbered voice boomed out in words that lacked accent and intonation, "I- am- the- robot- that- talks."

Gloria stared at it ruefully. It did talk, but the sound came from inside somewheres. There was no face to talk to. She said, "Can you help me, Mr. Robot, sir?"

The Talking Robot was designed to answer questions, and only such questions as it could answer had ever been put to it. It was quite confident of its ability, therefore, "I– can– help– you."

"Thank you, Mr. Robot, sir. Have you seen Robbie?"

"Who –is Robbie?"

"He's a robot, Mr. Robot, sir." She stretched to tiptoes. "He's about so high, Mr. Robot, sir, only higher, and he's very nice. He's got a head, you know. I mean you haven't, but he has, Mr. Robot, sir."

The Talking Robot had been left behind, "A– robot?"

"Yes, Mr. Robot, sir. A robot just like you, except he can't talk, of course, and — looks like a real person."

"A– robot– like– me?"

"Yes, Mr. Robot, sir."

To which the Talking Robot's only response was an erratic splutter and an occasional incoherent sound. The radical generalization offered it, i.e., its existence, not as a particular object, but as a member of a general group, was too much for it. Loyally, it tried to encompass the concept and half a dozen coils burnt out. Little warning signals were buzzing.

(The girl in her mid-teens left at that point. She had enough for her Physics-1 paper on "Practical Aspects of Robotics." This paper was Susan Calvin's first of many on the subject.)

Gloria stood waiting, with carefully concealed impatience, for the machine's answer when she heard the cry behind her of "There she is," and recognized that cry as her mother's.

"What are you doing here, you bad girl?" cried Mrs. Weston, anxiety dissolving at once into anger. "Do you know you frightened your mamma and daddy almost to death? Why did you run away?"

The robot engineer had also dashed in, tearing his hair, and demanding who of the gathering crowd had tampered with the machine. “Can’t anybody read signs?” he yelled. “You’re not allowed in here without an attendant.”

Gloria raised her grieved voice over the din, “I only came to see the Talking Robot, Mamma. I thought he might know where Robbie was because they’re both robots.” And then, as the thought of Robbie was suddenly brought forcefully home to her, she burst into a sudden storm of tears, “And I got to find Robbie, Mamma. I got to.”

Mrs. Weston strangled a cry, and said, “Oh, good Heavens. Come home, George. This is more than I can stand.”

That evening, George Weston left for several hours, and the next morning, he approached his wife with something that looked suspiciously like smug complacence.

“I’ve got an idea, Grace.”

“About what?” was the gloomy, uninterested query?

“About Gloria.”

“You’re not going to suggest buying back that robot?”

“No, of course not.”

“Then go ahead. I might as well listen to you. Nothing I’ve done seems to have done any good.”

“All right. Here’s what I’ve been thinking. The whole trouble with Gloria is that she thinks of Robbie as a person and not as a machine. Naturally, she can’t forget him. Now if we managed to convince her that Robbie was nothing more than a mess of steel and copper in the form of sheets and wires with electricity its juice of life, how long would her longings last? It’s the psychological attack, if you see my point.”

“How do you plan to do it?”

“Simple. Where do you suppose I went last night? I persuaded Robertson of U. S. Robots and Mechanical Men, Inc. to arrange for a complete tour of his premises tomorrow. The three of us will go, and by the time we’re through, Gloria will have it drilled into her that a robot is not alive.”

Mrs. Weston’s eyes widened gradually and something glinted in her eyes that was quite like sudden admiration, “Why, George, that’s a good idea.”

And George Weston’s vest buttons strained. “Only kind I have,” he said.

Mr. Struthers was a conscientious General Manager and naturally inclined to be a bit talkative. The combination, therefore, resulted in a tour that was fully explained, perhaps even over-abundantly explained, at every step. However, Mrs. Weston was not bored. Indeed, she stopped him several times and begged him to repeat his statements in simpler language so that Gloria might understand. Under the influence of this appreciation of his narrative powers, Mr. Struthers expanded genially and became ever more communicative, if possible.

George Weston, himself, showed a gathering impatience.

“Pardon me, Struthers,” he said, breaking into the middle of a lecture on the photoelectric cell, “haven’t you a section of the factory where only robot labor is employed?”

“Eh? Oh, yes! Yes, indeed!” He smiled at Mrs. Weston. “A vicious circle in a way, robots creating more robots. Of course, we are not making a general practice out of it. For one thing, the unions would never let us. But we can turn out a very few robots using robot labor exclusively, merely as a sort of scientific experiment. You see,” he tapped his pince-nez into one palm argumentatively, “what the labor unions don’t realize — and I say this as a man who has always been very sympathetic with the labor movement in general — is that the advent of the robot, while involving some dislocation to begin with, will inevitably–”

“Yes, Struthers,” said Weston, “but about that section of the factory you speak of — may we see it? It would be very interesting, I’m sure.”

“Yes! Yes, of course!” Mr. Struthers replaced his pince-nez in one convulsive movement and gave vent to a soft cough of discomfiture. “Follow me, please.”

He was comparatively quiet while leading the three through a long corridor and down a flight of stairs. Then, when they had entered a large well-lit room that buzzed with metallic activity, the sluices opened and the flood of explanation poured forth again.

“There you are!” he said with pride in his voice. “Robots only! Five men act as overseers and they don’t even stay in this room. In five years, that is, since we began this project, not a single accident has occurred. Of course, the robots here assembled are comparatively simple, but...”

The General Manager’s voice had long died to a rather soothing murmur in Gloria’s ears. The whole trip seemed rather dull and pointless to her, though there were many robots in sight. None were even remotely like Robbie, though, and she surveyed them with open contempt.

In this room, there weren’t any people at all, she noticed. Then her eyes fell upon six or seven robots busily engaged at a round table halfway across the room. They widened in incredulous surprise. It was a big room. She couldn’t see for sure, but one of the robots looked like — looked like — it was!

“Robbie!” Her shriek pierced the air, and one of the robots about the table faltered and dropped the tool he was holding. Gloria went almost mad with joy. Squeezing through the railing before either parent could stop her, she dropped lightly to the floor a few feet below, and ran toward her Robbie, arms waving and hair flying.

And the three horrified adults, as they stood frozen in their tracks, saw what the excited little girl did not see, — a huge, lumbering tractor bearing blindly down upon its appointed track.

It took split-seconds for Weston to come to his senses, and those split-seconds meant everything, for Gloria could not be overtaken. Although Weston vaulted the railing in a wild attempt, it was obviously hopeless. Mr. Struthers signaled wildly to the overseers to stop the tractor, but the overseers were only human and it took time to act.

It was only Robbie that acted immediately and with precision.

With metal legs eating up the space between himself and his little mistress he charged down from the opposite direction. Everything then happened at once. With one sweep of an arm, Robbie snatched up Gloria, slackening his speed not one iota, and, consequently, knocking every breath of air out of her. Weston, not quite comprehending all that was happening, felt, rather than saw, Robbie brush past him, and came to a sudden bewildered halt. The tractor intersected Gloria’s path half a second after Robbie had, rolled on ten feet further and came to a grinding, long drawn-out stop.

“There was a man who almost came to harm there, wasn’t there?”

“Yes, ma’am.”

“You did nothing, did you?”

“No, ma’am.”

“The man might have been hurt because of your inaction. Do you know that?”

“Yes, ma’am. I couldn’t help it, ma’am.” It is hard to picture a large expressionless metallic figure cringing, but it managed.

“I want you to tell me exactly why you did nothing to save him.”

“I want to explain, ma’am. I certainly don’t want to have you... have anyone... think that I could do a thing that might cause harm to a master. Oh, no, that would be a horrible... an inconceivable–”

“Please don’t get excited, boy. I’m not blaming you for anything. I only want to know what you were thinking at the time.”

“Ma’am, before it all happened you told us that one of the masters would be in danger of harm from that weight that keeps falling and that we would have to cross electric cables if we were to try to save him. Well, ma’am, that wouldn’t stop me. What is my destruction compared to the safety of a master? But... but it occurred to me that if I died on my way to him, I wouldn’t be able to save him anyway. The weight would crush him and then I would be dead for no purpose and perhaps some day some other master might come to harm who wouldn’t have, if I had only stayed alive. Do you understand me, ma’am?”

“You mean that it was merely a choice of the man dying, or both the man and yourself dying. Is that right?”

“Yes, ma’am. It was impossible to save the master. He might be considered dead. In that case, it is inconceivable that I destroy myself for nothing — without orders.”

The robopsychologist twiddled a pencil. She had heard the same story with insignificant verbal variations twenty-seven times before. This was the crucial question now.

“Boy,” she said, “your thinking has its points, but it is not the sort of thing I thought you might think. Did you think of this yourself?”

The robot hesitated. “No.”

“Who thought of it, then?”

“We were talking last night, and one of us got that idea and it sounded reasonable.”

“Which one?”

The robot thought deeply. “I don’t know. Just one of us.”

She sighed, “That’s all.”

Number Twenty-nine was next. Thirty-four after that.

Major-general Kallner, too, was angry. For one week all of Hyper Base had stopped dead, barring some paper work on the subsidiary asteroids of the group. For nearly one week, the two top experts

in the field had aggravated the situation with useless tests. And now they — or the woman, at any rate — made impossible propositions.

Fortunately for the general situation, Kallner felt it impolitic to display his anger openly.

Susan Calvin was insisting, “Why not, sir? It’s obvious that the present situation is unfortunate. The only way we may reach results in the future — or what future is left us in this matter — is to separate the robots. We can’t keep them together any longer.”

“My dear Dr. Calvin,” rumbled the general, his voice sinking into the lower baritone registers. “I don’t see how I can quarter sixty-three robots all over the place–”

Dr. Calvin raised her arms helplessly. “I can do nothing then. Nestor 10 will either imitate what the other robots would do, or else argue them plausibly into not doing what he himself cannot do. And in any case, this is bad business. We’re in actual combat with this little lost robot of ours and he’s winning out. Every victory of his aggravates his abnormality.”

She rose to her feet in determination. “General Kallner, if you do not separate the robots as I ask, then I can only demand that all sixty-three be destroyed immediately.”

“You demand it, do you?” Bogert looked up suddenly, and with real anger. “What gives you the right to demand any such thing? Those robots remain as they are. I’m responsible to the management, not you.”

“And I,” added Major-general Kallner, “am responsible to the World Co-ordinator — and I must have this settled.”

“In that case,” flashed back Calvin, “there is nothing for me to do but resign. If necessary to force you to the necessary destruction, I’ll make this whole matter public. It was not I that approved the manufacture of modified robots.”

“One word from you, Dr. Calvin,” said the general, deliberately, “in violation of security measures, and you would be certainly imprisoned instantly.”

Bogert felt the matter to be getting out of hand. His voice grew syrupy, “Well, now, we’re beginning to act like children, all of us. We need only a little more time. Surely we can outwit a robot without resigning, or imprisoning people, or destroying two millions.”

The psychologist turned on him with quiet fury, “I don’t want any unbalanced robots in existence. We have one Nestor that’s definitely unbalanced, eleven more that are potentially so, and sixty-two normal robots that are being subjected to an unbalanced environment. The only absolute safe method is complete destruction.”

The signal-burr brought all three to a halt, and the angry tumult of growingly unrestrained emotion froze.

“Come in,” growled Kallner.

It was Gerald Black, looking perturbed. He had heard angry voices. He said, “I thought I’d come myself... didn’t like to ask anyone else–”

“What is it? Don’t orate–”

“The locks of Compartment C in the trading ship have been played with. There are fresh scratches on them.”

“Compartment C?” explained Calvin quickly. “That’s the one that holds the robots, isn’t it? Who did it?”

“From the inside,” said Black, laconically.

“The lock isn’t out of order, is it?”

“No. It’s all right. I’ve been staying on the ship now for four days and none of them have tried to get out. But I thought you ought to know, and I didn’t like to spread the news. I noticed the matter myself.”

“Is anyone there now?” demanded the general.

“I left Robbins and McAdams there.”

There was a thoughtful silence, and then Dr. Calvin said, ironically, “Well?”

Kallner rubbed his nose uncertainly, “What’s it all about?”

“Isn’t it obvious? Nester 10 is planning to leave. That order to lose himself is dominating his abnormality past anything we can do. I wouldn’t be surprised if what’s left of his First Law would scarcely be powerful enough to override it. He is perfectly capable of seizing the ship and leaving with it. Then we’d have a mad robot on a spaceship. What would he do next? Any idea? Do you still want to leave them all together, general?”

“Nonsense,” interrupted Bogert. He had regained his smoothness. “All that from a few scratch marks on a lock.”

“Have you, Dr. Bogert, completed the analysis I’ve required, since you volunteer opinions?”

“Yes.”

“May I see it?”

“No.”

“Why not? Or mayn’t I ask that, either?”

“Because there’s no point in it, Susan. I told you in advance that these modified robots are less stable than the normal variety, and my analysis shows it. There’s a certain very small chance of breakdown under extreme circumstances that are not likely to occur. Let it go at that. I won’t give you ammunition for your absurd claim that sixty-two perfectly good robots be destroyed just because so far you lack the ability to detect Nestor 10 among them.”

Susan Calvin stared him down and let disgust fill her eyes. “You won’t let anything stand in the way of the permanent directorship, will you?”

“Please,” begged Kallner, half in irritation. “Do you insist that nothing further can be done, Dr. Calvin?”

“I can’t think of anything, sir,” she replied, wearily. “If there were only other differences between Nestor 10 and the normal robots, differences that didn’t involve the First Law. Even one other difference. Something in impressionment, environment, specification–” And she stopped suddenly.

“What is it?”

“I’ve thought of something... I think–” Her eyes grew distant and hard, “These modified Nestors, Peter. They get the same impressioning the normal ones get, don’t they?”

“Yes. Exactly the same.”

“And what was it you were saying, Mr. Black,” she turned to the young man, who through the storms that had followed his news had maintained a discreet silence. “Once when complaining of the Nestors’ attitude of superiority, you said the technicians had taught them all they knew.”

“Yes, in etheric physics. They’re not acquainted with the subject when they come here.”

“That’s right,” said Bogert, in surprise. “I told you, Susan, when I spoke to the other Nestors here that the two new arrivals hadn’t learned etheric physics yet.”

“And why is that?” Dr. Calvin was speaking in mounting excitement. “Why aren’t NS-2 models impressioned with etheric physics to start with?”

“I can tell you that,” said Kallner. “It’s all of a piece with the secrecy. We thought that if we made a special model with knowledge of etheric physics, used twelve of them and put the others to work in an unrelated field, there might be suspicion. Men working with normal Nestors might wonder why they knew etheric physics. So there was merely an impressionment with a capacity for training in the field. Only the ones that come here, naturally, receive such a training. It’s that simple.”

“I understand. Please get out of here, the lot of you. Let me have an hour or so.”

Calvin felt she could not face the ordeal for a third time. Her mind had contemplated it and rejected it with an intensity that left her nauseated. She could face that unending file of repetitious robots no more.

So Bogert asked the question now, while she sat aside, eyes and mind half closed.

Number Fourteen came in — forty-nine to go.

Bogert looked up from the guide sheet and said, “What is your number in line?”

“Fourteen, sir.” The robot presented his numbered ticket.

“Sit down, boy.”

Bogert asked, “You haven’t been here before on this day?”

“No, sir.”

“Well, boy, we are going to have another man in danger of harm soon after we’re through here. In fact, when you leave this room, you will be led to a stall where you will wait quietly, till you are needed. Do you understand?”

“Yes, sir.”

“Now, naturally, if a man is in danger of harm, you will try to save him.”

“Naturally, sir.”

“Unfortunately, between the man and yourself, there will be a gamma ray field.”

Silence.

“Do you know what gamma rays are?” asked Bogert sharply.

“Energy radiation, sir?”

The next question came in a friendly, offhand manner, “Ever work with gamma rays?”

“No, sir.” The answer was definite.

“Mm-m. Well, boy, gamma rays will kill you instantly. They’ll destroy your brain. That is a fact you must know and remember. Naturally, you don’t want to destroy yourself.”

“Naturally.” Again the robot seemed shocked. Then, slowly, “But, sir, if the gamma rays are between myself and the master that may be harmed, how can I save him? I would be destroying myself to no purpose.”

“Yes, there is that,” Bogert seemed concerned about the matter. “The only thing I can advise, boy, is that if you detect the gamma radiation between yourself and the man, you may as well sit where you are.”

The robot was openly relieved. “Thank you, sir. There wouldn’t be any use, would there?”

“Of course not. But if there weren’t any dangerous radiation, that would be a different matter.”

“Naturally, sir. No question of that.”

“You may leave now. The man on the other side of the door will lead you to your stall. Please wait there.”

He turned to Susan Calvin when the robot left. “How did that go, Susan?”

“Very well,” she said, dully.

“Do you think we could catch Nestor 10 by quick questioning on etheric physics?”

“Perhaps, but it’s not sure enough.” Her hands lay loosely in her lap. “Remember, he’s fighting us. He’s on his guard. The only way we can catch him is to outsmart him — and, within his limitations, he can think much more quickly than a human being.”

“Well, just for fun — suppose I ask the robots from now on a few questions on gamma rays. Wave length limits, for instance.”

“No!” Dr. Calvin’s eyes sparked to life. “It would be too easy for him to deny knowledge and then he’d be warned against the test that’s coming up — which is our real chance. Please follow the questions I’ve indicated, Peter, and don’t improvise. It’s just within the bounds of risk to ask them if they’ve ever worked with gamma rays. And try to sound even less interested than you do when you ask it.”

Bogert shrugged, and pressed the buzzer that would allow the entrance of Number Fifteen.

The large Radiation Room was in readiness once more. The robots waited patiently in their wooden cells, all open to the center but closed off from each other.

Major-general Kallner mopped his brow slowly with a large handkerchief while Dr. Calvin checked the last details with Black.

“You’re sure now,” she demanded, “that none of the robots have had a chance to talk with each other after leaving the Orientation Room?”

“Absolutely sure,” insisted Black. “There’s not been a word exchanged.”

“And the robots are put in the proper stalls?”

“Here’s the plan.”

The psychologist looked at it thoughtfully, “Um-m-m.”

The general peered over her shoulder. “What’s the idea of the arrangement, Dr. Calvin?”

“I’ve asked to have those robots that appeared even slightly out of true in the previous tests concentrated on one side of the circle. I’m going to be sitting in the center myself this time, and I wanted to watch those particularly.”

“You’re going to be sitting there–,” exclaimed Bogert.

“Why not?” she demanded coldly. “What I expect to see may be something quite momentary. I can’t risk having anyone else as main observer. Peter, you’ll be in the observing booth, and I want you to keep your eye on the opposite side of the circle. General Kallner, I’ve arranged for motion pictures to be taken of each robot, in case visual observation isn’t enough. If these are required, the robots are to remain exactly where they are until the pictures are developed and studied. None must leave, none must change place. Is that clear?”

“Perfectly.”

“Then let’s try it this one last time.”

Susan Calvin sat in the chair, silent, eyes restless. A weight dropped, crashed downward; then pounded aside at the last moment under the synchronized thump of a sudden force beam.

And a single robot jerked upright and took two steps.

And stopped.

But Dr. Calvin was upright, and her finger pointed to him sharply. “Nestor 10, come here,” she cried, “come here! COME HERE!”

Slowly, reluctantly, the robot took another step forward. The psychologist shouted at the top of her voice, without taking her eyes from the robot, “Get every other robot out of this place, somebody. Get them out quickly, and keep them out.”

Somewhere within reach of her ears there was noise, and the thud of hard feet upon the floor. She did not look away.

Nestor 10 — if it was Nestor 10 — took another step, and then, under force of her imperious gesture, two more. He was only ten feet away, when he spoke harshly, “I have been told to be lost–”

Another stop. “I must not disobey. They have not found me so far — He would think me a failure — He told me — But it’s not so — I am powerful and intelligent–”

The words came in spurts.

Another step. “I know a good deal — He would think... I mean I’ve been found — Disgraceful — Not I — I am intelligent — And by just a master... who is weak — Slow–”

Another step — and one metal arm flew out suddenly to her shoulder, and she felt the weight bearing her down. Her throat constricted, and she felt a shriek tear through.

Dimly, she heard Nestor 10’s next words, “No one must find me. No master–” and the cold metal was against her, and she was sinking under the weight of it.

And then a queer, metallic sound, and she was on the ground with an unfelt thump, and a gleaming arm was heavy across her body. It did not move. Nor did Nestor 10, who sprawled beside her.

And now faces were bending over her.

Gerald Black was gasping, “Are you hurt, Dr. Calvin?”

She shook her head feebly. They pried the arm off her and lifted her gently to her feet, “What happened?”

Black said, “I bathed the place in gamma rays for five seconds. We didn’t know what was happening. It wasn’t till the last second that we realized he was attacking you, and then there was no time for anything but a gamma field. He went down in an instant. There wasn’t enough to harm you though. Don’t worry about it.”

“I’m not worried.” She closed her eyes and leaned for a moment upon his shoulder. “I don’t think I was attacked exactly. Nestor 10 was simply trying to do so. What was left of the First Law was still holding him back.”

Susan Calvin and Peter Bogert, two weeks after their first meeting with Major-general Kallner had their last. Work at Hyper Base had been resumed. The trading ship with its sixty-two normal NS-2’s was gone to wherever it was bound, with an officially imposed story to explain its two weeks’ delay. The government cruiser was making ready to carry the two roboticists back to Earth.

Kallner was once again a-gleam in dress uniform. His white gloves shone as he shook hands.

Calvin said, “The other modified Nestors are, of course, to be destroyed.”

“They will be. We’ll make shift with normal robots, or, if necessary, do without.”

“Good.”

“But tell me — you haven’t explained — how was it done?”

She smiled tightly, “Oh, that. I would have told you in advance if I had been more certain of its working. You see, Nestor 10 had a superiority complex that was becoming more radical all the time. He liked to think that he and other robots knew more than human beings. It was becoming very important for him to think so.

“We knew that. So we warned every robot in advance that gamma rays would kill them, which it would, and we further warned them all that gamma rays would be between them and myself. So they all stayed where they were, naturally. By Nestor 10’s own logic in the previous test they had all decided that there was no point in trying to save a human being if they were sure to die before they could do it.”

“Well, yes, Dr. Calvin, I understand that. But why did Nestor 10 himself leave his seat?”

“AH! That was a little arrangement between myself and your young Mr. Black. You see it wasn’t gamma rays that flooded the area between myself and the robots — but infrared rays. Just ordinary heat rays, absolutely harmless. Nestor 10 knew they were infrared and harmless and so he began to dash out, as he expected the rest would do, under First Law compulsion. It was only a fraction of a second too late that he remembered that the normal NS-2’s could detect radiation, but could not identify the type. That he himself could only identify wavelengths by virtue of the training he had received at Hyper Base, under mere human beings, was a little too humiliating to remember for just

a moment. To the normal robots the area was fatal because we had told them it would be, and only Nestor 10 knew we were lying.

“And just for a moment he forgot, or didn’t want to remember, that other robots might be more ignorant than human beings. His very superiority caught him. Good-by, general.”

Escape!

WHEN SUSAN CALVIN RETURNED FROM HYPER BASE, Alfred Tanning was waiting for her. The old man never spoke about his age, but everyone knew it to be over seventy-five. Yet his mind was keen, and if he had finally allowed himself to be made Director-Emeritus of Research with Bogert as acting Director, it did not prevent him from appearing in his office daily.

“How close are they to the Hyperatomic Drive?” he asked.

“I don’t know,” she replied irritably, “I didn’t ask.”

“Hmm. I wish they’d hurry. Because if they don’t, Consolidated might beat them to it, and beat us to it as well.”

“Consolidated. What have they got to do with it?”

“Well, we’re not the only ones with calculating machines. Ours may be positronic, but that doesn’t mean they’re better. Robertson is calling a big meeting about it tomorrow. He’s been waiting for you to come back.”

Robertson of U. S. Robot & Mechanical Men Corporation, son of the founder, pointed his lean nose at his general manager and his Adam’s apple jumped as he said, “You start now. Let’s get this straight.”

The general manager did so with alacrity, “Here’s the deal now, chief. Consolidated Robots approached us a month ago with a funny sort of proposition. They brought about five tons of figures, equations, all that sort of stuff. It was a problem, see, and they wanted an answer from The Brain. The terms were as follows–”

He ticked them off on thick fingers: “A hundred thousand for us if there is no solution and we can tell them the missing factors. Two hundred thousand if there is a solution, plus costs of construction of the machine involved, plus quarter interest in all profits derived therefrom. The problem concerns the development of an interstellar engine–”

Robertson frowned and his lean figure stiffened, “Despite the fact that they have a thinking machine of their own. Right?”

“Exactly what makes the whole proposition a foul ball, chief? Levver, take it from there.”

Abe Levver looked up from the far end of the conference table and smoothed his stubbled chin with a faint rasping sound. He smiled:

“It’s this way, sir. Consolidated had a thinking machine. It’s broken.”

“What?” Robertson half rose.

“That’s right. Broken! It’s kaput. Nobody knows why, but I got hold of some pretty interesting guesses — like, for instance, that they asked it to give them an interstellar engine with the same set of information they came to us with, and that it cracked their machine wide open. It’s scrap — just scrap now.”

“You get it, chief?” The general manager was wildly jubilant. “You get it? There isn’t any industrial research group of any size that isn’t trying to develop a space-warp engine, and Consolidated and U. S. Robots have the lead on the field with our super robot-brains. Now that they’ve managed to foul theirs up, we have a clear field. That’s the nub, the... uh... motivation. It

will take them six years at least to build another and they're sunk, unless they can break ours, too, with the same problem."

The president of U. S. Robots bulged his eyes, "Why, the dirty rats–"

"Hold on, chief. There's more to this." He pointed a finger with a wide sweep, "Lanning, take it!"

Dr. Alfred Lanning viewed the proceedings with faint scorn — his usual reaction to the doings of the vastly better-paid business and sales divisions. His unbelievable gray eyebrows hunched low and his voice was dry:

"From a scientific standpoint the situation, while not entirely clear, is subject to intelligent analysis. The question of interstellar travel under present conditions of physical theory is... uh... vague. The matter is wide open — and the information given by Consolidated to its thinking machine, assuming these we have to be the same, was similarly wide open. Our mathematical department has given it a thorough analysis, and it seems Consolidated has included everything. Its material for submission contains all known developments of Franciacci's space-warp theory, and, apparently, all pertinent astrophysical and electronic data. It's quite a mouthful."

Robertson followed anxiously. He interrupted, "Too much for The Brain to handle?"

Lanning shook his head decisively, "No. There are no known limits to The Brain's capacity. It's a different matter. It's a question of the Robotic Laws. The Brain, for instance, could never supply a solution to a problem set to it if that solution, would involve the death or injury of humans. As far as it would be concerned, a problem with only such a solution would be insoluble. If such a problem is combined with an extremely urgent demand that it be answered, it is just possible that The Brain, only a robot after all, would be presented with a dilemma, where it could neither answer nor refuse to answer. Something of the sort must have happened to Consolidated's machine."

He paused, but the general manager urged on, "Go ahead, Dr. Tanning. Explain it the way you explained it to me."

Lanning set his lips and raised his eyebrows in the direction of Dr. Susan Calvin who lifted her eyes from her precisely folded hands for the first time. Her voice was low and colorless.

"The nature of a robot reaction to a dilemma is startling," she began. "Robot psychology is far from perfect — as a specialist, I can assure you of that but it can be discussed in qualitative terms, because with all the complications introduced into a robot's positronic brain, it is built by humans and is therefore built according to human values.

"Now a human caught in an impossibility often responds by a retreat from reality: by entry into a world of delusion, or by taking to drink, going off into hysteria, or jumping off a bridge. It all comes to the same thing — a refusal or inability to face the situation squarely. And so, the robot, a dilemma at its mildest will disorder half its relays; and at its worst it will burn out every positronic brain path past repair."

"I see," said Robertson, who didn't. "Now what about this information Consolidated's wishing on us?"

"It undoubtedly involves," said Dr. Calvin, "a problem of a forbidden sort. But The Brain is considerably different from Consolidated's robot."

"That's right, chief. That's right." The general manager was energetically interruptive. "I want you to get this, because it's the whole point of the situation."

Susan Calvin's eyes glittered behind the spectacles, and she continued patiently, "You see, sir, Consolidated's machines, their Super-Thinker among them, are built without personality. They go in for functionalism, you know — they have to, without U. S. Robot's basic patents for the emotional brain paths. Their Thinker is merely a calculating machine on a grand scale, and a dilemma ruins it instantly.

"However, The Brain, our own machine, has a personality — a child's personality. It is a supremely deductive brain, but it resembles an idiot savant. It doesn't really understand what it does — it just does it. And because it is really a child, it is more resilient. Life isn't so serious, you might say."

The robopsychologist continued: "Here is what we're going to do. We have divided all of Consolidated's information into logical units. We are going to feed the units to The Brain singly and cautiously. When the factor enters — the one that creates the dilemma — The Brain's child personality will hesitate. Its sense of judgment is not mature. There will be a perceptible interval before it will recognize a dilemma as such. And in that interval, it will reject the unit automatically — before its brainpaths can be set in motion and ruined."

Robertson's Adam's apple squirmed, "Are you sure, now?"

Dr. Calvin masked impatience, "It doesn't make much sense, I admit, in lay language; but there is no conceivable use in presenting the mathematics of this. I assure you, it is as I say."

The general manager was in the breach instantly and fluently, "So here's the situation, chief. If we take the deal, we can put it through like this. The Brain will tell us which unit of information involves the dilemma. From there, we can figure why the dilemma. Isn't that right, Dr. Bogert? There you are, chief, and Dr. Bogert is the best mathematician you'll find anywhere. We give Consolidated a 'No Solution' answer, with the reason, and collect a hundred thousand. They're left with a broken machine; we're left with a whole one. In a year, two maybe, we'll have a space-warp engine or a hyper-atomic motor some people call it. Whatever you name it, it will be the biggest thing in the world."

Robertson chuckled and reached out, "Let's see the contract. I'll sign it."

When Susan Calvin entered the fantastically guarded vault that held The Brain, one of the current shift of technicians had just asked it: "If one and a half chickens lay one and a half eggs in one and a half days, how many eggs will nine chickens lay in nine days?"

The Brain had just answered, "Fifty-four."

And the technician had just said to another, "See, you dope!"

Dr. Calvin coughed and there was a sudden impossible flurry of directionless energy. The psychologist motioned briefly, and she was alone with The Brain.

The Brain was a two-foot globe merely — one which contained within it a thoroughly conditioned helium atmosphere, a volume of space completely vibration-absent and radiation-free — and within that was that unheard-of complexity of positronic brain-paths that was The Brain. The rest of the room was crowded with the attachments that were the intermediaries between The Brain and the outside world — its voice, its arms, its sense organs.

Dr. Calvin said softly, "How are you, Brain?"

The Brain's voice was high-pitched and enthusiastic, "Swell, Miss Susan. You're going to ask me something. I can tell. You always have a book in your hand when you're going to ask me something."

Dr. Calvin smiled mildly, "Well, you're right, but not just yet. This is going to be a question. It will be so complicated we're going to give it to you in writing. But not just yet; I think I'll talk to you first."

"All right. I don't mind talking."

"Now, Brain, in a little while, Dr. Lanning and Dr. Bogert will be here with this complicated question. We'll give it to you a very little at a time and very slowly, because we want you to be careful. We're going to ask you to build something, if you can, out of the information, but I'm going to warn you now that the solution might involve... uh... damage to human beings."

"Gosh!" The exclamation was hushed, drawn-out.

"Now you watch for that. When we come to a sheet which means damage, even maybe death, don't get excited. You see, Brain, in this case, we don't mind — not even about death; we don't mind at all. So when you come to that sheet, just stop, give it back — and that'll be all. You understand?"

"Oh, sure. By golly, the death of humans! Oh, my!"

"Now, Brain, I hear Dr. Lanning and Dr. Bogert coming. They'll tell you what the problem is all about and then we'll start. Be a good boy, now–"

Slowly the sheets were fed in. After each one came the interval of the queerly whispery chuckling noise that was The Brain in action. Then the silence that meant readiness for another sheet. It was a matter of hours — during which the equivalent of something like seventeen fat volumes of mathematical physics were fed into The Brain.

As the process went on, frowns appeared and deepened. Lanning muttered ferociously under his breath. Bogert first gazed speculatively at his fingernails, and then bit at them in abstracted fashion. It was when the last of the thick pile of sheets disappeared that Calvin, white-faced, said:

"Something's wrong."

Lanning barely got the words out, "It can't be. Is it — dead?"

"Brain?" Susan Calvin was trembling. "Do you hear me, Brain?"

"Huh?" came the abstracted rejoinder. "Do you want me?"

"The solution–"

"Oh, that! I can do it. I'll build you a whole ship, just as easy — if you let me have the robots. A nice ship, it'll take two months maybe."

"There was — no difficulty?"

"It took long to figure," said The Brain.

Dr. Calvin backed away. The color had not returned to her thin cheeks. She motioned the others away.

In her office, she said, "I can't understand it. The information, as given, must involve a dilemma — probably involves death. If something has gone wrong–"

Bogert said quietly, “The machine talks and makes sense. It can’t be a dilemma.”

But the psychologist replied urgently, “There are dilemmas and dilemmas. There are different forms of escape. Suppose The Brain is only mildly caught; just badly enough, say, to be suffering from the delusion that he can solve the problem, when he can’t. Or suppose it’s teetering on the brink of something really bad, so that any small push shoves it over.”

“Suppose,” said Lanning, “there is no dilemma. Suppose Consolidated’s machine broke down over a different question, or broke down for purely mechanical reasons.”

“But even so,” insisted Calvin, “we couldn’t take chances. Listen, from now on, no one is to as much as breathe to The Brain. I’m taking over.”

“All right,” sighed Lanning, “take over, then. And meanwhile we’ll let The Brain build its ship. And if it does build it, we’ll have to test it.”

He was ruminating, “We’ll need our top field men for that.”

Michael Donovan brushed down his red hair with a violent motion of his hand and a total indifference to the fact that the unruly mass sprang to attention again immediately.

He said, “Call the turn now, Greg. They say the ship is finished. They don’t know what it is, but it’s finished. Let’s go, Greg. Let’s grab the controls right now.”

Powell said wearily, “Cut it, Mike. There’s a peculiar overripe flavor to your humor at its freshest, and the confined atmosphere here isn’t helping it.”

“Well, listen,” Donovan took another ineffectual swipe at his hair, “I’m not worried so much about our cast-iron genius and his tin ship. There’s the matter of my lost leave. And the monotony! There’s nothing here but whiskers and figures — the wrong kind of figures. Oh, why do they give us these jobs?”

“Because,” replied Powell, gently, “we’re no loss, if they lose us. O.K., relax! — Doc Lanning’s coming this way.”

Lanning was coming, his gray eyebrows as lavish as ever, his aged figure unbent as yet and full of life. He walked silently up the ramp with the two men and out into the open field, where, obeying no human master, silent robots were building a ship.

Wrong tense. Had built a ship!

For Lanning said, “The robots have stopped. Not one has moved today.”

“It’s completed then? Definitely?” asked Powell.

“Now how can I tell?” Lanning was peevish, and his eyebrows curled down in an eye-hiding frown. “It seems done. There are no spare pieces about, and the interior is down to a gleaming finish.”

“You’ve been inside?”

“Just in, then out. I’m no space-pilot. Either of you two know much about engine theory?”

Donovan looked at Powell, who looked at Donovan.

Donovan said, “I’ve got my license, sir, but at last reading it didn’t say anything about hyper-engines or warp-navigation. Just the usual child’s play in three dimensions.”

Alfred Lanning looked up with sharp disapproval and snorted the length of his prominent nose.

He said frigidly, “Well, we have our engine men.”

Powell caught at his elbow as he walked away, “Sir, is the ship still restricted ground?”

The old director hesitated, then rubbed the bridge of his nose, “I suppose not. For you two anyway.”

Donovan looked after him as he left and muttered a short, expressive phrase at his back. He turned to Powell, “I’d like to give him a literary description of himself, Greg.”

“Suppose you come along, Mike.”

The inside of the ship was finished, as finished as a ship ever was; that could be told in a single eye-blinking glance. No martinet in the system could have put as much spit-and-polish into a surface as those robots had. The walls were of a gleaming silvery finish that retained no fingerprints.

There were no angles; walls, floors, and ceiling faded gently into each other and in the cold, metallic glittering of the hidden lights, one was surrounded by six chilly reflections of one’s bewildered self.

The main corridor was a narrow tunnel that led in a hard, clatter-footed stretch along a line of rooms of no interdistinguishing features.

Powell said, “I suppose furniture is built into the wall. Or maybe we’re not supposed to sit or sleep.”

It was in the last room, the one nearest the nose, that the monotony broke. A curving window of non-reflecting glass was the first break in the universal metal, and below it was a single large dial, with a single motionless needle hard against the zero mark.

Donovan said, “Look at that!” and pointed to the single word on the finely-marked scale.

It said, “Parsecs” and the tiny figure at the right end of the curving, graduated meter said “1,000,000.”

There were two chairs; heavy, wide-flaring, uncushioned. Powell seated himself gingerly, and found it molded to the body’s curves, and comfortable.

Powell said, “What do you think of it?”

“For my money, The Brain has brain-fever. Let’s get out.”

“Sure you don’t want to look it over a bit?”

“I have looked it over. I came, I saw, I’m through!” Donovan’s red hair bristled into separate wires, “Greg, let’s get out of here. I quit my job five seconds ago, and this is a restricted area for non-personnel.”

Powell smiled in an oily self-satisfied manner and smoothed his mustache, “O.K., Mike, turn off that adrenalin tap you’ve got draining into your bloodstream. I was worried, too, but no more.”

“No more, huh? How come, no more? Increased your insurance?”

“Mike, this ship can’t fly.”

“How do you know?”

“Well, we’ve been through the entire ship, haven’t we?”

“Seems so.”

“Take my word for it, we have. Did you see any pilot room except for this one port and the one gauge here in parsecs? Did you see any controls?”

“No.”

“And did you see any engines?”

“Holy Joe, no!”

“Well, then! Let’s break the news to Lanning, Mike.”

They cursed their way through the featureless corridors and finally hit-and-missed their way into the short passage to the air lock.

Donovan stiffened, “Did you lock this thing, Greg?”

“No, I never touched it. Yank the lever, will you?”

The lever never budged, though Donovan’s face twisted appallingly with exertion.

Powell said, “I didn’t see any emergency exits. If something’s gone wrong here, they’ll have to melt us out.”

“Yes, and we’ve got to wait until they find out that some fool has locked us in here,” added Donovan, frantically.

“Let’s get back to the room with the port. It’s the only place from which we might attract attention.”

But they didn’t.

In that last room, the port was no longer blue and full of sky. It was black, and hard yellow pin-point stars spelled space.

There was a dull, double thud, as two bodies collapsed separately into two chairs.

Alfred Lanning met Dr. Calvin just outside his office. He lit a nervous cigar and motioned her in.

He said, “Well, Susan, we’ve come pretty far, and Robertson’s getting jumpy. What are you doing with The Brain?”

Susan Calvin spread her hands, “It’s no use getting impatient. The Brain is worth more than anything we forfeit on this deal.”

“But you’ve been questioning it for two months.”

The psychologist’s voice was flat, but somehow dangerous, “You would rather run this yourself?”

“Now you know what I meant.”

“Oh, I suppose I do,” Dr. Calvin rubbed her hands nervously. “It isn’t easy. I’ve been pampering it and probing it gently, and I haven’t gotten anywhere yet. Its’ reactions aren’t normal. Its answers — they’re queer, somehow. But nothing I can put my finger on yet. And you see, until we know what’s wrong, we must just tiptoe our way through. I can never tell what simple question or remark

will just... push him over... and then — Well, and then we'll have on our hands a completely useless Brain. Do you want to face that?"

"Well, it can't break the First Law."

"I would have thought so, but–"

"You're not even sure of that?" Lanning was profoundly shocked.

"Oh, I can't be sure of anything, Alfred–"

The alarm system raised its fearful clangor with a horrifying suddenness. Lanning clicked on communications with an almost paralytic spasm. The breathless words froze him.

He said, "Susan... you heard that... the ship's gone. I sent those two field men inside half an hour ago. You'll have to see The Brain again."

Susan Calvin said with enforced calm, "Brain, what happened to the ship?"

The Brain said happily, "The ship I built, Miss Susan?"

"That's right. What has happened to it?"

"Why, nothing at all. The two men that were supposed to test it were inside, and we were all set. So I sent it off."

"Oh — Well, that's nice." The psychologist felt some difficulty in breathing. "Do you think they'll be all right?"

"Right as anything, Miss Susan. I've taken care of it all. It's a bee-yootiful ship."

"Yes, Brain, it is beautiful, but you think they have enough food, don't you? They'll be comfortable?"

"Plenty of food."

"This business might be a shock to them, Brain. Unexpected, you know."

The Brain tossed it off, "They'll be all right. It ought to be interesting for them."

"Interesting? How?"

"Just interesting," said The Brain, slyly.

"Susan," whispered Lanning in a fuming whisper, "ask him if death comes into it. Ask him what the dangers are."

Susan Calvin's expression contorted with fury, "Keep quiet!" In a shaken voice, she said to The Brain, "We can communicate with the ship, can't we Brain?"

"Oh, they can hear you if you call by radio. I've taken care of that."

"Thanks. That's all for now."

Once outside, Lanning lashed out ragingly, "Great Galaxy, Susan, if this gets out, it will ruin all of us. We've got to get those men back. Why didn't you ask it if there was danger of death — straight out?"

"Because," said Calvin, with a weary frustration, "that's just what I can't mention. If it's got a case of dilemma, it's about death. Anything that would bring it up badly might knock it completely out.

Will we be better off then? Now, look, it said we could communicate with them. Let's do so, get their location, and bring them back. They probably can't use the controls themselves; The Brain is probably handling them remotely. Come!"

It was quite a while before Powell shook himself together.

"Mike," he said, out of cold lips, "did you feel an acceleration?"

Donovan's eyes were blank, "Huh? No... no."

And then the redhead's fists clenched and he was out of his seat with sudden frenzied energy and up against the cold, wide-curving glass. There was nothing to see — but stars.

He turned, "Greg, they must have started the machine while we were inside. Greg, it's a put-up job; they fixed it up with the robot to jerry us into being the try-out boys, in case we were thinking of backing out."

Powell said, "What are you talking about? What's the good of sending us out if we don't know how to run the machine? How are we supposed to bring it back? No, this ship left by itself, and without any apparent acceleration." He rose, and walked the floor slowly. The metal walls dinned back the clangor of his steps.

He said tonelessly, "Mike, this is the most confusing situation we've ever been up against."

"That," said Donovan, bitterly, "is news to me. I was just beginning to have a very swell time, when you told me."

Powell ignored that. "No acceleration — which means the ship works on a principle different from any known."

"Different from any we know, anyway."

"Different from any known. There are no engines within reach of manual control. Maybe they're built into the walls. Maybe that's why they're thick as they are."

"What are you mumbling about?" demanded Donovan.

"Why not listen? I'm saying that whatever powers this ship is enclosed, and evidently not meant to be handled. The ship is running by remote control."

"The Brain's control?"

"Why not?"

"Then you think we'll stay out here till The Brain brings us back."

"It could be. If so, let's wait quietly. The Brain is a robot. It's got to follow the First Law. It can't hurt a human being."

Donovan sat down slowly, "You figure that?" Carefully, he flattened his hair, "Listen, this junk about the space-warp knocked out Consolidated's robot, and the longhairs said it was because interstellar travel killed humans. Which robot are you going to trust? Ours had the same data, I understand."

Powell was yanking madly at his mustache, "Don't pretend you don't know your robotics, Mike. Before it's physically possible in any way for a robot to even make a start to breaking the First

Law, so many things have to break down that it would be a ruined mess of scrap ten times over. There's some simple explanation to this."

"Oh sure, sure. Just have the butler call me in the morning. It's all just too, too simple for me to bother about before my beauty nap."

"Well, Jupiter, Mike, what are you complaining about so far? The Brain is taking care of us. This place is warm. It's got light. It's got air. There wasn't even enough of an acceleration jar to muss your hair if it were smooth enough to be mussable in the first place."

"Yeah? Greg, you must've taken lessons. No one could put Pollyanna that far out of the running without. What do we eat? What do we drink? Where are we? How do we get back? And in case of accident, to what exit and in what spacesuit do we run, not walk? I haven't even seen a bathroom in the place, or those little conveniences that go along with bathrooms. Sure, we're being taken care of — but good?"

The voice that interrupted Donovan's tirade was not Powell's. It was nobody's. It was there, hanging in open air — stentorian and petrifying in its effects.

"GREGORY POWELL! MICHAEL DONOVAN! GREGORY POWELL! MICHAEL DONOVAN! PLEASE REPORT YOUR PRESENT POSITIONS. IF YOUR SHIP ANSWERS CONTROLS, PLEASE RETURN TO BASE. GREGORY POWELL! MICHAEL DONOVAN! –"

The message was repetitious, mechanical, broken by regular, untiring intervals.

Donovan said, "Where's it coming from?"

"I don't know." Powell's voice was an intense whisper, "Where do the lights come from? Where does anything come from?"

"Well, how are we going to answer?" They had to speak in the intervals between the loudly echoing, repeating message.

The walls were bare — as bare and as unbroken as smooth, curving metal can be. Powell said, "Shout an answer."

They did. They shouted, in turns, and together, "Position unknown! Ship out of control! Condition desperate!"

Their voices rose and cracked. The short businesslike sentences became interlarded and adulterated with screaming and emphatic profanity, but the cold, calling voice repeated and repeated and repeated unwearyingly.

"They don't hear us," gasped Donovan. "There's no sending mechanism. Just a receiver." His eyes focused blindly at a random spot on the wall.

Slowly the din of the outside voice softened and receded. They called again when it was a whisper, and they called again, hoarsely, when there was silence.

Something like fifteen minutes later, Powell said lifelessly, "Let's go through the ship again. There must be something to eat somewheres." He did not sound hopeful. It was almost an admission of defeat.

They divided in the corridor to the right and left. They could follow one another by the hard footsteps resounding, and they met occasionally in the corridor, where they would glare at each other and pass on.

Powell's search ended suddenly and as it did, he heard Donovan's glad voice rise boomingly.

"Hey, Greg," it howled, "The ship has got plumbing. How did we miss it?"

It was some five minutes later that he found Powell by hit-and-miss. He was saying, "Still no shower baths, though," but it got choked off in the middle.

"Food," he gasped.

The wall had dropped away, leaving a curved gap with two shelves. The upper shelf was loaded with unlabeled cans of a bewildering variety of sizes and shapes. The enameled cans on the lower shelf were uniform and Donovan felt a cold draft about his ankles. The lower half was refrigerated.

"How... how–"

"It wasn't there, before," said Powell, curtly. "That wall section dropped out of sight as I came in the door."

He was eating. The can was the preheating type with enclosed spoon and the warm odor of baked beans filled the room. "Grab a can, Mike!"

Donovan hesitated, "What's the menu?"

"How do I know! Are you finicky?"

"No, but all I eat on ships are beans. Something else would be first choice." His hand hovered and selected a shining elliptical can whose flatness seemed reminiscent of salmon or similar delicacy. It opened at the proper pressure.

"Beans!" howled Donovan, and reached for another. Powell hauled at the slack of his pants. "Better eat that, sonny boy. Supplies are limited and we may be here a long, long time."

Donovan drew back sulkily, "Is that all we have? Beans?"

"Could be."

"What's on the lower shelf?"

"Milk."

"Just milk?" Donovan cried in outrage.

"Looks it."

The meal of beans and milk was carried through in silence, and as they left, the strip of hidden wall rose up and formed an unbroken surface once more.

Powell sighed, "Everything automatic. Everything just so. Never felt so helpless in my life. Where's your plumbing?"

"Right there. And that wasn't among those present when we first looked, either."

Fifteen minutes later they were back in the glassed-in room, staring at each other from opposing seats.

Powell looked gloomily at the one gauge in the room. It still said "parsecs," the figures still ended in "1,000,000" and the indicating needle was still pressed hard against the zero mark.

In the innermost offices of the U. S. Robot & Mechanical Men Corp. Alfred Lanning was saying wearily, “They won’t answer. We’ve tried every wavelength, public, private, coded, straight, even this subether stuff they have now. And The Brain still won’t say anything?” He shot this at Dr. Calvin.

“It won’t amplify on the matter, Alfred,” she said, emphatically. “It says they can hear us... and when I try to press it, it becomes... well, it becomes sullen. And it’s not supposed to — whoever heard of a sullen robot?”

“Suppose you tell us what you have, Susan,” said Bogert.

“Here it is! It admits it controls the ship itself entirely. It is definitely optimistic about their safety, but without details. I don’t dare press it. However, the center of disturbance seems to be about the interstellar jump itself. The Brain definitely laughed when I brought up the subject. There are other indications, but that is the closest it’s come to an open abnormality.”

She looked at the others, “I refer to hysteria. I dropped the subject immediately, and I hope I did no harm, but it gave me a lead. I can handle hysteria. Give me twelve hours! If I can bring it back to normal, it will bring back the ship.”

Bogert seemed suddenly stricken. “The interstellar jump!”

“What’s the matter?” The cry was double from Calvin and Lanning.

“The figures for the engine The Brain gave us. Say... I just thought of something.”

He left hurriedly.

Lanning gazed after him. He said brusquely to Calvin, “You take care of your end, Susan.”

Two hours later, Bogert was talking eagerly, “I tell you, Lanning, that’s it. The interstellar jump is not instantaneous not as long as the speed of light is finite. Life can’t exist... matter and energy as such can’t exist in the space warp. I don’t know what it would be like — but that’s it. That’s what killed Consolidated’s robot.”

Donovan felt as haggard as he looked. “Only five days?”

“Only five days. I’m sure of it.”

Donovan looked about him wretchedly. The stars through the glass were familiar but infinitely indifferent. The walls were cold to the touch; the lights, which had recently flared up again, were unfeelingly bright; the needle on the gauge pointed stubbornly to zero; and Donovan could not get rid of the taste of beans.

He said, morosely, “I need a bath.”

Powell looked up briefly, and said, “So do I. You needn’t feel self-conscious. But unless you want to bathe in milk and do without drinking”

“We’ll do without drinking eventually, anyway. Greg, where does this interstellar travel come in?’

“You tell me. Maybe we just keep on going. We’d get there, eventually. At least the dust of our skeletons would — but isn’t our death the whole point of The Brain’s original breakdown?”

Donovan spoke with his back to the other, “Greg, I’ve been thinking. It’s pretty bad. There’s not much to do — except walk around or talk to yourself. You know those stories about guys marooned

in space. They go nuts long before they starve. I don't know, Greg, but ever since the lights went on, I feel funny."

There was a silence, then Powell's voice came thin and small, "So do I. What's it like?"

The redheaded figure turned, "Feel funny inside. There's a pounding in me with everything tense. It's hard to breathe. I can't stand still."

"Um-m-m. Do you feel vibration?"

"How do you mean?"

"Sit down for a minute and listen. You don't hear it, but you feel it — as if something's throbbing somewheres and it's throbbing the whole ship, and you, too, along with it. Listen–"

"Yeah . . . yeah. What do you think it is, Greg? You don't suppose it's us?"

"It might be." Powell stroked his mustache slowly. "But it might be the ship's engines. It might be getting ready."

"For what?"

"For the interstellar jump. It may be coming and the devil knows what it's like."

Donovan pondered. Then he said, savagely, "If it does, let it. But I wish we could fight. It's humiliating to have to wait for it."

An hour later, perhaps, Powell looked at his hand on the metal chair-arm and said with frozen calm, "Feel the wall, Mike."

Donovan did, and said, "You can feel it shake, Greg."

Even the stars seemed blurred. From somewhere came the vague impression of a huge machine gathering power with the walls, storing up energy for a mighty leap, throbbing its way up the scales of strength.

It came with a suddenness and a stab of pain. Powell stiffened, and half-jerked from his chair. His sight caught Donovan and blanked out while Donovan's thin shout whimpered and died in his ears. Something writhed within him and struggled against a growing blanket of ice, that thickened.

Something broke loose and whirled in a blaze of flickering light and pain. It fell — and whirled and fell headlong into silence!

It was death!

It was a world of no motion and no sensation. A world of dim, unsensing consciousness; a consciousness of darkness and of silence and of formless struggle.

Most of all a consciousness of eternity.

He was a tiny white thread of ego — cold and afraid.

Then the words came, unctuous and sonorous, thundering over him in a foam of sound:

"Does your coffin fit differently lately? Why not try Morbid M. Cadaver's extensible caskets? They are scientifically designed to fit the natural curves of the body, and are enriched with Vitamin B1. Use Cadaver's caskets for comfort. Remember – you're – going – to – be – dead – a – long – long – time!"

It wasn't quite sound, but whatever it was, it died away in an oily rumbling whisper.

The white thread that might have been Powell heaved uselessly at the insubstantial eons of time that existed all about him — and collapsed upon itself as the piercing shriek of a hundred million ghosts of a hundred million soprano voices rose to a crescendo of melody:

"I'll be glad when you're dead, you rascal, you.

"I'll be glad when you're dead, you rascal, you.

"I'll be glad–"

It rose up a spiral stairway of violent sound into the keening supersonics that passed hearing, and then beyond–

The white thread quivered with a pulsating pang. It strained quietly–

The voices were ordinary — and many. It was a crowd speaking; a swirling mob that swept through and past and over him with a rapid, headlong motion, that left drifting tatters of words behind them.

"What did they getcha for, boy? Y'look banged up–"

"—A hot fire, I guess, but I got a case–"

"—I've made Paradise, but old St. Pete–"

"Naaah, I got a pull with the boy. Had dealings with him–"

"Hey, Sam, come this way–"

"Ja get a mouthpiece? Beelzebub says–"

"—Going on, my good imp? My appointment is with Sa–"

And above it all the original stentorian roar, that plunged across all:

"HURRY! HURRY! HURRY!!! Stir your bones, and don't keep us waiting — there are many more in line. Have your certificates ready, and make sure Peter's release is stamped across it. See if you are at the proper entrance gate. There will be plenty of fire for all. Hey, you — YOU DOWN THERE. TAKE YOUR PLACE IN LINE OR–"

The white thread that was Powell groveled backward before the advancing shout, and felt the sharp stab of the pointing finger. It all exploded into a rainbow of sound that dripped its fragments onto an aching brain.

Powell was in the chair, again. He felt himself shaking.

Donovan's eyes were opening into two large popping bowls of glazed blue.

"Greg," he whispered in what was almost a sob. "Were you dead?"

"I... felt dead." He did not recognize his own croak.

Donovan was obviously making a bad failure of his attempt to stand up, "Are we alive now? Or is there more?"

"I... feel alive." It was the same hoarseness. Powell said cautiously, "Did you... hear anything, when... when you were dead?"

Donovan paused, and then very slowly nodded his head, "Did you?"

“Yes. Did you hear about coffins... and females singing... and the lines forming to get into Hell? Did you?”

Donovan shook his head, “Just one voice.”

“Loud?”

“No. Soft, but rough like a file over the fingertips. It was a sermon, you know. About hell-fire. He described the tortures of... well, you know. I once heard a sermon like that — almost.”

He was perspiring.

They were conscious of sunlight through the port. It was weak, but it was blue-white — and the gleaming pea that was the distant source of light was not Old Sol.

And Powell pointed a trembling finger at the single gauge. The needle stood stiff and proud at the hairline whose figure read 300,000 parsecs.

Powell said, “Mike if it’s true, we must be out of the Galaxy altogether.”

Donovan said, “Blazed Greg! We’d be the first men out of the Solar System.”

“Yes! That’s just it. We’ve escaped the sun. We’ve escaped the Galaxy. Mike, this ship is the answer. It means freedom for all humanity — freedom to spread through to every star that exists — millions and billions and trillions of them.”

And then he came down with a hard thud, “But how do we get back, Mike?”

Donovan smiled shakily, “Oh, that’s all right. The ship brought us here. The ship will take us back. Me for more beans.”

“But Mike... hold on, Mike. If it takes us back the way it brought us here–”

Donovan stopped halfway up and sat back heavily into the chair.

Powell went on, “We’ll have to... die again, Mike”

“Well,” sighed Donovan, “if we have to, we have to. At least it isn’t permanent, not very permanent.”

Susan Calvin was speaking slowly now. For six hours she had been slowly prodding The Brain — for six fruitless hours. She was weary of repetitions, weary of circumlocutions, weary of everything.

“Now, Brain, there’s just one more thing. You must make a special effort to answer simply. Have you been entirely clear about the interstellar jump? I mean does it take them very far?”

“As far as they want to go, Miss Susan. Golly, it isn’t any trick through the warp.”

“And on the other side, what will they see?”

“Stars and stuff. What do you suppose?”

The next question slipped out, “They’ll be alive, then?”

“Sure!”

“And the interstellar jump won’t hurt them?”

She froze as The Brain maintained silence. That was it! She had touched the sore spot.

“Brain,” she supplicated faintly, “Brain, do you hear me?”

The answer was weak, quivering. The Brain said, “Do I have to answer? About the jump, I mean?”

“Not if you don’t want to. But it would be interesting — I mean if you wanted to.” Susan Calvin tried to be bright about it.

“Aw-w-w. You spoil everything.”

And the psychologist jumped up suddenly, with a look of flaming insight on her face.

“Oh, my,” she gasped. “Oh, my.”

And she felt the tension of hours and days released in a burst. It was later that she told Lanning, “I tell you it’s all right. No, you must leave me alone, now. The ship will be back safely, with the men, and I want to rest. I will rest. Now go away.”

The ship returned to Earth as silently, as unjarringly as it had left. It dropped precisely into place and the main lock gaped open. The two men who walked out felt their way carefully and scratched their rough and scrubbily-stubbled chins.

And then, slowly and purposefully, the one with red hair knelt down and planted upon the concrete of the runway a firm, loud kiss.

They waved aside the crowd that was gathering and made gestures of denial at the eager couple that had piled out of the down-swooping ambulance with a stretcher between them.

Gregory Powell said, “Where’s the nearest shower?”

They were led away.

They were gathered, all of them, about a table. It was a full staff meeting of the brains of U. S. Robot & Mechanical Men Corp.

Slowly and climactically, Powell and Donovan finished a graphic and resounding story.

Susan Calvin broke the silence that followed. In the few days that had elapsed she had recovered her icy, somewhat acid, calm — but still a trace of embarrassment broke through.

“Strictly speaking,” she said, “this was my fault — all of it. When we first presented this problem to The Brain, as I hope some of you remember, I went to great lengths to impress upon it the importance of rejecting any item of information capable of creating a dilemma. In doing so I said something like ‘Don’t get excited about the death of humans. We don’t mind it at all. Just give the sheet back and forget it.’”

“Hm-m-m,” said Lanning. “What follows?”

“The obvious. When that item entered its calculations which yielded the equation controlling the length of minimum interval for the interstellar jump — it meant death for humans. That’s where Consolidated’s machine broke down completely. But I had depressed the importance of death to The Brain — not entirely, for the First Law can never be broken — but just sufficiently so that The Brain could take a second look at the equation. Sufficiently to give it time to realize that after the interval was passed through, the men would return to life — just as the matter and energy of the ship itself would return to being. This so-called ‘death,’ in other words, was a strictly temporary phenomenon. You see?”

She looked about her. They were all listening.

She went on, “So he accepted the item, but not without a certain jar. Even with death temporary and its importance depressed, it was enough to unbalance him very gently.”

She brought it out calmly, “He developed a sense of humor — it’s an escape, you see, a method of partial escape from reality. He became a practical joker.”

Powell and Donovan were on their feet.

“What?” cried Powell?

Donovan was considerably more colorful about it.

“It’s so,” said Calvin. “He took care of you, and kept you safe, but you couldn’t handle any controls, because they weren’t for you — just for the humorous Brain. We could reach you by radio, but you couldn’t answer. You had plenty of food, but all of it beans and milk. Then you died, so to speak, and were reborn, but the period of your death was made... well... interesting. I wish I knew how he did it. It was The Brain’s prize joke, but he meant no harm.”

“No harm!” gasped Donovan. “Oh, if that cute little tyke only had a neck.”

Lanning raised a quieting hand, “All right, it’s been a mess, but it’s all over. What now?”

“Well,” said Bogert, quietly, “obviously it’s up to us to improve the space-warp engine. There must be some way of getting around that interval of jump. If there is, we’re the only organization left with a grand-scale super-robot, so we’re bound to find it if anyone can. And then — U. S. Robots has interstellar travel, and humanity has the opportunity for galactic empire.”

“What about Consolidated?” said Lanning?

“Hey,” interrupted Donovan suddenly, “I want to make a suggestion there. They landed U. S. Robots into quite a mess. It wasn’t as bad a mess as they expected and it turned out well, but their intentions weren’t pious. And Greg and I bore the most of it.

“Well, they wanted an answer, and they’ve got one. Send them that ship, guaranteed, and U. S. Robots can collect their two hundred thou plus construction costs. And if they test it — then suppose we let The Brain have just a little more fun before it’s brought back to normal.”

Lanning said gravely, “It sounds just and proper to me.”

To which Bogert added absently, “Strictly according to contract, too.”

Evidence

"BUT THAT WASN'T IT, EITHER," SAID DR. CALVIN thoughtfully, "Oh, eventually, the ship and others like it became government property; the Jump through hyperspace was perfected, and now we actually have human colonies on the planets of some of the nearer stars, but that wasn't it."

I had finished eating and watched her through the smoke of my cigarette.

"It's what has happened to the people here on Earth in the last fifty years that really counts. When I was born, young man, we had just gone through the last World War. It was a low point in history — but it was the end of nationalism. Earth was too small for nations and they began grouping themselves into Regions. It took quite a while. When I was born the United States of America was still a nation and not merely a part of the Northern Region. In fact, the name of the corporation is still 'United States Robots–.' And the change from nations to Regions, which has stabilized our economy and brought about what amounts to a Golden Age, when this century is compared with the last, was also brought about by our robots."

"You mean the Machines," I said. "The Brain you talked about was the first of the Machines, wasn't it?"

"Yes, it was, but it's not the Machines I was thinking of. Rather of a man. He died last year." Her voice was suddenly deeply sorrowful. "Or at least he arranged to die, because he knew we needed him no longer. Stephen Byerley."

"Yes, I guessed that was who you meant."

"He first entered public office in 2032. You were only a boy then, so you wouldn't remember the strangeness of it. His campaign for the Mayoralty was certainly the queerest in history–!"

Francis Quinn was a politician of the new school. That, of course, is a meaningless expression, as are all expressions of the sort. Most of the "new schools" we have were duplicated in the social life of ancient Greece, and perhaps, if we knew more about it, in the social life of ancient Sumeria and in the lake dwellings of prehistoric Switzerland as well.

But, to get out from under what promises to be a dull and complicated beginning, it might be best to state hastily that Quinn neither ran for office nor canvassed for votes, made no speeches and stuffed no ballot boxes. Any more than Napoleon pulled a trigger at Austerlitz.

And since politics makes strange bedfellows, Alfred Lanning sat at the other side of the desk with his ferocious white eyebrows bent far forward over eyes in which chronic impatience had sharpened to acuity. He was not pleased.

The fact, if known to Quinn, would have annoyed him not the least. His voice was friendly, perhaps professionally so.

"I assume you know Stephen Byerley, Dr. Lanning."

"I have heard of him. So have many people."

"Yes, so have I. Perhaps you intend voting for him at the next election."

"I couldn't say." There was an unmistakable trace of acidity here. "I have not followed the political currents, so I'm not aware that he is running for office."

"He may be our next mayor. Of course, he is only a lawyer now, but great oaks–"

“Yes,” interrupted Lanning, “I have heard the phrase before. But I wonder if we can get to the business at hand.”

“We are at the business at hand, Dr. Lanning.” Quinn’s tone was very gentle, “It is to my interest to keep Mr. Byerley a district attorney at the very most, and it is to your interest to help me do so.”

“To my interest? Come!” Lanning’s eyebrows hunched low.

“Well, say then to the interest of the U. S. Robot & Mechanical Men Corporation. I come to you as Director Emeritus of Research, because I know that your connection to them is that of, shall we say, ‘elder statesman.’ You are listened to with respect and yet your connection with them is no longer so tight but that you cannot possess considerable freedom of action; even if the action is somewhat unorthodox.”

Dr. Lanning was silent a moment, chewing the cud of his thoughts. He said more softly, “I don’t follow you at all, Mr. Quinn.”

“I am not surprised, Dr. Lanning. But it’s all rather simple. Do you mind?” Quinn lit a slender cigarette with a lighter of tasteful simplicity and his big-boned face settled into an expression of quiet amusement. “We have spoken of Mr. Byerley — a strange and colorful character. He was unknown three years ago. He is very well known now. He is a man of force and ability, and certainly the most capable and intelligent prosecutor I have ever known. Unfortunately he is not a friend of mine”

“I understand,” said Lanning, mechanically. He stared at his fingernails.

“I have had occasion,” continued Quinn, evenly, “in the past year to investigate Mr. Byerley — quite exhaustively. It is always useful, you see, to subject the past life of reform politicians to rather inquisitive research. If you knew how often it helped–” He paused to smile humorlessly at the glowing tip of his cigarette. “But Mr. Byerley’s past is unremarkable. A quiet life in a small town, a college education, a wife who died young, an auto accident with a slow recovery, law school, coming to the metropolis, an attorney.”

Francis Quinn shook his head slowly, then added, “But his present life. Ah, that is remarkable. Our district attorney never eats!”

Lanning’s head snapped up, old eyes surprisingly sharp, “Pardon me?”

“Our district attorney never eats.” The repetition thumped by syllables. “I’ll modify that slightly. He has never been seen to eat or drink. Never! Do you understand the significance of the word? Not rarely, but never!”

“I find that quite incredible. Can you trust your investigators?”

“I can trust my investigators, and I don’t find it incredible at all. Further, our district attorney has never been seen to drink — in the aqueous sense as well as the alcoholic — nor to sleep. There are other factors, but I should think I have made my point.”

Lanning leaned back in his seat, and there was the rapt silence of challenge and response between them, and then the old roboticist shook his head. “No. There is only one thing you can be trying to imply, if I couple your statements with the fact that you present them to me, and that is impossible.”

“But the man is quite inhuman, Dr. Lanning.”

“If you told me he were Satan in masquerade, there would be a faint chance that I might believe you.”

“I tell you he is a robot, Dr. Lanning.”

“I tell you it is as impossible a conception as I have ever heard, Mr. Quinn.”

Again the combative silence.

“Nevertheless,” and Quinn stubbed out his cigarette with elaborate care, “you will have to investigate this impossibility with all the resources of the Corporation.”

“I’m sure that I could undertake no such thing, Mr. Quinn. You don’t seriously suggest that the Corporation take part in local politics.”

“You have no choice. Supposing I were to make my facts public without proof. The evidence is circumstantial enough.”

“Suit yourself in that respect.”

“But it would not suit me. Proof would be much preferable. And it would not suit you, for the publicity would be very damaging to your company. You are perfectly well acquainted, I suppose, with the strict rules against the use of robots on inhabited worlds.”

“Certainly!” — brusquely.

“You know that the U. S. Robot & Mechanical Men Corporation is the only manufacturer of positronic robots in the Solar System, and if Byerley is a robot, he is a positronic robot. You are also aware that all positronic robots are leased, and not sold; that the Corporation remains the owner and manager of each robot, and is therefore responsible for the actions of all.”

“It is an easy matter, Mr. Quinn, to prove the Corporation has never manufactured a robot of a humanoid character.”

“It can be done? To discuss merely possibilities.”

“Yes. It can be done.”

“Secretly, I imagine, as well. Without entering it in your books.”

“Not the positronic brain, sir. Too many factors are involved in that, and there is the tightest possible government supervision.”

“Yes, but robots are worn out, break down, go out of order — and are dismantled.”

“And the positronic brains re-used or destroyed.”

“Really?” Francis Quinn allowed himself a trace of sarcasm. “And if one were, accidentally, of course, not destroyed — and there happened to be a humanoid structure waiting for a brain.”

“Impossible!”

“You would have to prove that to the government and the public, so why not prove it to me now.”

“But what could our purpose be?” demanded Lanning in exasperation. “Where is our motivation? Credit us with a minimum of sense.”

“My dear sir, please. The Corporation would be only too glad to have the various Regions permit the use of humanoid positronic robots on inhabited worlds. The profits would be enormous. But the

prejudice of the public against such a practice is too great. Suppose you get them used to such robots first — see, we have a skillful lawyer, a good mayor, and he is a robot. Won't you buy our robot butlers?"

"Thoroughly fantastic. An almost humorous descent to the ridiculous."

"I imagine so. Why not prove it? Or would you still rather try to prove it to the public?"

The light in the office was dimming, but it was not yet too dim to obscure the flush of frustration on Alfred Lanning's face. Slowly, the roboticist's finger touched a knob and the wall illuminators glowed to gentle life.

"Well, then," he growled, "let us see."

The face of Stephen Byerley is not an easy one to describe. He was forty by birth certificate and forty by appearance — but it was a healthy, well-nourished good-natured appearance of forty; one that automatically drew the teeth of the bromide about "looking one's age."

This was particularly true when he laughed, and he was laughing now. It came loudly and continuously, died away for a bit, then began again–

And Alfred Lanning's face contracted into a rigidly bitter monument of disapproval. He made a half gesture to the woman who sat beside him, but her thin, bloodless lips merely pursed themselves a trifle.

Byerley gasped himself a stage nearer normality.

"Really, Dr. Lanning... really — I... I... a robot?"

Lanning bit his words off with a snap, "It is no statement of mine, sir. I would be quite satisfied to have you a member of humanity. Since our corporation never manufactured you, I am quite certain that you are — in a legalistic sense, at any rate. But since the contention that you are a robot has been advanced to us seriously by a man of certain standing–"

"Don't mention his name, if it would knock a chip off your granite block of ethics, but let's pretend it was Frank Quinn, for the sake of argument, and continue."

Lanning drew in a sharp, cutting snort at the interruption, and paused ferociously before continuing with added frigidity, "–by a man of certain standing, with whose identity I am not interested in playing guessing games, I am bound to ask your cooperation in disproving it. The mere fact that such a contention could be advanced and publicized by the means at this man's disposal would be a bad blow to the company I represent — even if the charge were never proven. You understand me?"

"Oh, yes, your position is clear to me. The charge itself is ridiculous. The spot you find yourself in is not. I beg your pardon, if my laughter offended you. It was the first I laughed at, not the second. How can I help you?"

"It could be very simple. You have only to sit down to a meal at a restaurant in the presence of witnesses, have your picture taken, and eat." Lanning sat back in his chair, the worst of the interview over. The woman beside him watched Byerley with an apparently absorbed expression but contributed nothing of her own.

Stephen Byerley met her eyes for an instant, was caught by them, then turned back to the roboticist. For a while his fingers were thoughtful over the bronze paperweight that was the only ornament on his desk.

He said quietly, “I don’t think I can oblige you.”

He raised his hand, “Now wait, Dr. Lanning. I appreciate the fact that this whole matter is distasteful to you, that you have been forced into it against your will, that you feel you are playing an undignified and even ridiculous part. Still, the matter is even more intimately concerned with myself, so be tolerant.

“First, what makes you think that Quinn — this man of certain standing, you know — wasn’t hoodwinking you, in order to get you to do exactly what you are doing?”

“Why it seems scarcely likely that a reputable person would endanger himself in so ridiculous a fashion, if he weren’t convinced he were on safe ground.”

There was little humor in Byerley’s eyes, “You don’t know Quinn. He could manage to make safe ground out of a ledge a mountain sheep could not handle. I suppose he showed the particulars of the investigation he claims to have made of me?”

“Enough to convince me that it would be too troublesome to have our corporation attempt to disprove them when you could do so more easily.”

“Then you believe him when he says I never eat. You are a scientist, Dr. Lanning. Think of the logic required. I have not been observed to eat, therefore, I never eat Q.E.D. After all!”

“You are using prosecution tactics to confuse what is really a very simple situation.”

“On the contrary, I am trying to clarify what you and Quinn between you are making a very complicated one. You see, I don’t sleep much, that’s true, and I certainly don’t sleep in public. I have never cared to eat with others — an idiosyncrasy which is unusual and probably neurotic in character, but which harms no one. Look, Dr. Lanning, let me present you with a suppositious case. Supposing we had a politician who was interested in defeating a reform candidate at any cost and while investigating his private life came across oddities such as I have just mentioned.

“Suppose further that in order to smear the candidate effectively, he comes to your company as the ideal agent. Do you expect him to say to you, ‘So-and-so is a robot because he hardly ever eats with people, and I have never seen him fall asleep in the middle of a case; and once when I peeped into his window in the middle of the night, there he was, sitting up with a book; and I looked in his frigidaire and there was no food in it.’

“If he told you that, you would send for a straitjacket. But if he tells you, ‘He never sleeps; he never eats,’ then the shock of the statement blinds you to the fact that such statements are impossible to prove. You play into his hands by contributing to the to-do.”

“Regardless, sir,” began Lanning, with a threatening obstinacy, “of whether you consider this matter serious or not, it will require only the meal I mentioned to end it.”

Again Byerley turned to the woman, who still regarded him expressionlessly. “Pardon me. I’ve caught your name correctly, haven’t I? Dr. Susan Calvin?”

“Yes, Mr. Byerley.”

“You’re the U. S. Robot’s psychologist, aren’t you?”

“Robopsychologist, please.”

“Oh, are robots so different from men, mentally?”

“Worlds different.” She allowed herself a frosty smile, “Robots are essentially decent.”

Humor tugged at the corners of the lawyer’s mouth, “Well, that’s a hard blow. But what I wanted to say was this. Since you’re a psycho — a robopsychologist, and a woman, I’ll bet that you’ve done something that Dr. Lanning hasn’t thought of.”

“And what is that?”

“You’ve got something to eat in your purse.”

Something caught in the schooled indifference of Susan Calvin’s eyes. She said, “You surprise me, Mr. Byerley.”

And opening her purse, she produced an apple. Quietly, she handed it to him. Dr. Lanning, after an initial start, followed the slow movement from one hand to the other with sharply alert eyes.

Calmly, Stephen Byerley bit into it, and calmly he swallowed it

“You see, Dr. Lanning?”

Dr. Lanning smiled in a relief tangible enough to make even his eyebrows appear benevolent A relief that survived for one fragile second.

Susan Calvin said, “I was curious to see if you would eat it, but, of course, in the present case, it proves nothing.”

Byerley grinned, “It doesn’t?”

“Of course not. It is obvious, Dr. Lanning, that if this man were a humanoid robot, he would be a perfect imitation. He is almost too human to be credible. After all, we have been seeing and observing human beings all our lives; it would be impossible to palm something merely nearly right off on us. It would have to be all right. Observe the texture of the skin, the quality of the irises, the bone formation of the hand. If he’s a robot, I wish U. S. Robots had made him, because he’s a good job. Do you suppose then, that anyone capable of paying attention to such niceties would neglect a few gadgets to take care of such things as eating, sleeping, elimination? For emergency use only, perhaps; as, for instance, to prevent such situations as are arising here. So a meal won’t really prove anything.”

“Now wait,” snarled Lanning, “I am — not quite the fool both of you make me out to be. I am not interested in the problem of Mr. Byerley’s humanity or nonhumanity. I am interest in getting the corporation out of a hole. A public meal will end the matter and keep it ended no matter what Quinn does. We can leave the finer details to lawyers and robopsychologists.”

“But, Dr. Lanning,” said Byerley, “you forget the politics of the situation. I am as anxious to be elected, as Quinn is to stop me. By the way, did you notice that you used his name? It’s a cheap shyster trick of mine; I knew you would, before you were through.”

Lanning flushed, “What has the election to do with it?”

“Publicity works both ways, sir. If Quinn wants to call me a robot, and has the nerve to do so, I have the nerve to play the game his way.”

“You mean you–” Lanning was quite frankly appalled.

“Exactly. I mean that I’m going to let him go ahead, choose his rope, test its strength, cut off the right length, tie the noose, insert his head and grin. I can do what little else is required.”

“You are mighty confident.”

Susan Calvin rose to her feet, “Come, Alfred, we won’t change his mind for him.”

“You see.” Byerley smiled gently. “You’re a human psychologist, too.”

But perhaps not all the confidence that Dr. Lanning had remarked upon was present that evening when Byerley’s car parked on the automatic treads leading to the sunken garage, and Byerley himself crossed the path to the front door of his house.

The figure in the wheel chair looked up as he entered and smiled. Byerley’s face lit with affection. He crossed over to it.

The cripple’s voice was a hoarse, grating whisper that came out of a mouth forever twisted to one side, leering out of a face that was half scar tissue, “You’re late, Steve.”

“I know, John, I know. But I’ve been up against a peculiar and interesting trouble today.”

“So?” Neither the torn face nor the destroyed voice could carry expression but there was anxiety in the clear eyes. “Nothing you can’t handle?”

“I’m not exactly certain. I may need your help. You’re the brilliant one in the family. Do you want me to take you out into the garden? It’s a beautiful evening.”

Two strong arms lifted John from the wheel chair. Gently, almost caressingly, Byerley’s arms went around the shoulders and under the swathed legs of the cripple. Carefully, and slowly, he walked through the rooms, down the gentle ramp that had been built with a wheel chair in mind, and out the back door into the walled and wired garden behind the house.

“Why don’t you let me use the wheel chair, Steve? This is Silly.”

“Because I’d rather carry you. Do you object? You know that you’re as glad to get out of that motorized buggy for a while, as I am to see you out. How do you feel today?” He deposited John with infinite care upon the cool grass.

“How should I feel? But tell me about your troubles.”

“Quinn’s campaign will be based on the fact that he claims I’m a robot.”

John’s eyes opened wide, “How do you know? It’s impossible. I won’t believe it.”

“Oh, come, I tell you it’s so. He had one of the big-shot scientists of U. S. Robot & Mechanical Men Corporation over at the office to argue with me.”

Slowly John’s hands tore at the grass, “I see. I see.”

Byerley said, “But we can let him choose his ground. I have an idea. Listen to me and tell me if we can do it “

The scene as it appeared in Alfred Lanning’s office that night was a tableau of stares. Francis Quinn stared meditatively at Alfred Lanning. Lanning’s stare was savagely set upon Susan Calvin, who stared impassively in her turn at Quinn.

Francis Quinn broke it with a heavy attempt at lightness, “Bluff. He’s making it up as he goes along.”

“Are you going to gamble on that, Mr. Quinn?” asked Dr. Calvin, indifferently.

“Well, it’s your gamble, really.”

“Look here,” Lanning covered definite pessimism with bluster, “we’ve done what you asked. We witnessed the man eat. It’s ridiculous to presume him a robot.”

“Do you think so?” Quinn shot toward Calvin. “Lanning said you were the expert.”

Lanning was almost threatening, “Now, Susan–”

Quinn interrupted smoothly, “Why not let her talk, man? She’s been sitting there imitating a gatepost for half an hour.”

Lanning felt definitely harassed. From what he experienced then to incipient paranoia was but a step. He said, “Very well. Have your say, Susan. We won’t interrupt you.”

Susan Calvin glanced at him humorlessly, then fixed cold eyes on Mr. Quinn. “There are only two ways of definitely proving Byerley to be a robot, sir. So far you are presenting circumstantial evidence, with which you can accuse, but not prove — and I think Mr. Byerley is sufficiently clever to counter that sort of material. You probably think so yourself, or you wouldn’t have come here.

“The two methods of proof are the physical and the psychological. Physically, you can dissect him or use an X-ray. How to do that would be your problem. Psychologically, his behavior can be studied, for if he is a positronic robot, he must conform to the three Rules of Robotics. A positronic brain cannot be constructed without them. You know the Rules, Mr. Quinn?”

She spoke them carefully, clearly, quoting word for word the famous bold print on page one of the “Handbook of Robotics.”

“I’ve heard of them,” said Quinn, carelessly.

“Then the matter is easy to follow,” responded the psychologist, dryly. “If Mr. Byerley breaks any of those three rules, he is not a robot. Unfortunately, this procedure works in only one direction. If he lives up to the rules, it proves nothing one way or the other.”

Quinn raised polite eyebrows, “Why not, doctor?”

“Because, if you stop to think of it, the three Rules of Robotics are the essential guiding principles of a good many of the world’s ethical systems. Of course, every human being is supposed to have the instinct of self-preservation. That’s Rule Three to a robot. Also every ‘good’ human being, with a social conscience and a sense of responsibility, is supposed to defer to proper authority; to listen to his doctor, his boss, his government, his psychiatrist, his fellow man; to obey laws, to follow rules, to conform to custom — even when they interfere with his comfort or his safety. That’s Rule Two to a robot. Also, every ‘good’ human being is supposed to love others as himself, protect his fellow man, risk his life to save another. That’s Rule One to a robot. To put it simply — if Byerley follows all the Rules of Robotics, he may be a robot, and may simply be a very good man.”

“But,” said Quinn, “you’re telling me that you can never prove him a robot.”

“I may be able to prove him not a robot”

“That’s not the proof I want.”

“You’ll have such proof as exists. You are the only one responsible for your own wants.”

Here Lanning's mind leaped suddenly to the sting of an idea, "Has it occurred to anyone," he ground out, "that district attorney is a rather strange occupation for a robot? The prosecution of human beings — sentencing them to death — bringing about their infinite harm–"

Quinn grew suddenly keen, "No, you can't get out of it that way. Being district attorney doesn't make him human. Don't you know his record? Don't you know that he boasts that he has never prosecuted an innocent man; that there are scores of people left untried because the evidence against them didn't satisfy him, even though he could probably have argued a jury into atomizing them? That happens to be so."

Lanning's thin cheeks quivered, "No, Quinn, no. There is nothing in the Rules of Robotics that makes any allowance for human guilt. A robot may not judge whether a human being deserves death. It is not for him to decide. He may not harm a human-variety skunk, or variety angel."

Susan Calvin sounded tired. "Alfred," she said, "don't talk foolishly. What if a robot came upon a madman about to set fire to a house with people in it? He would stop the madman, wouldn't he?"

"Of course."

"And if the only way he could stop him was to kill him–"

There was a faint sound in Lanning's throat. Nothing more.

"The answer to that, Alfred, is that he would do his best not to kill him. If the madman died, the robot would require psychotherapy because he might easily go mad at the conflict presented him — of having broken Rule One to adhere to Rule One in a higher sense. But a man would be dead and a robot would have killed him."

"Well, is Byerley mad?" demanded Lanning; with all the sarcasm he could muster.

"No, but he has killed no man himself. He has exposed facts which might represent a particular human being to be dangerous to the large mass of other human beings we call society. He protects the greater number and thus adheres to Rule One at maximum potential. That is as far as he goes. It is the judge who then condemns the criminal to death or imprisonment, after the jury decides on his guilt or innocence. It is the jailer who imprisons him, the executioner who kills him. And Mr. Byerley has done nothing but determine truth and aid society.

"As a matter of fact, Mr. Quinn, I have looked into Mr. Byerley's career since you first brought this matter to our attention. I find that he has never demanded the death sentence in his closing speeches to the jury. I also find that he has spoken on behalf of the abolition of capital punishment and contributed generously to research institutions engaged in criminal neurophysiology. He apparently believes in the cure, rather than the punishment of crime. I find that significant."

"You do?" Quinn smiled. "Significant of a certain odor of roboticity, perhaps?"

"Perhaps. Why deny it? Actions such as his could come only from a robot, or from a very honorable and decent human being. But you see, you just can't differentiate between a robot and the very best of humans."

Quinn sat back in his chair. His voice quivered with impatience. "Dr. Lanning, it's perfectly possible to create a humanoid robot that would perfectly duplicate a human in appearance, isn't it?"

Lanning harrumphed and considered, “It’s been done experimentally by U. S. Robots,” he said reluctantly, “without the addition of a positronic brain, of course. By using human ova and hormone control, one can grow human flesh and skin over a skeleton of porous silicone plastics that would defy external examination. The eyes, the hair, the skin would be really human, not humanoid. And if you put a positronic brain, and such other gadgets as you might desire inside, you have a humanoid robot.”

Quinn said shortly, “How long would it take to make one?”

Lanning considered, “If you had all your equipment — the brain, the skeleton, the ovum, the proper hormones and radiations — say, two months.”

The politician straightened out of his chair. “Then we shall see what the insides of Mr. Byerley look like. It will mean publicity for U. S. Robots — but I gave you your chance.”

Lanning turned impatiently to Susan Calvin, when they were alone. “Why do you insist–”?

And with real feeling, she responded sharply and instantly, “Which do you want — the truth or my resignation? I won’t lie for you. U. S. Robots can take care of itself. Don’t turn coward.”

“What,” said Lanning, “if he opens up Byerley, and wheels and gears fall out what then?”

“He won’t open Byerley,” said Calvin, disdainfully. “Byerley is as clever as Quinn, at the very least”

The news broke upon the city a week before Byerley was to have been nominated. But “broke” is the wrong word. It staggered upon the city, shambled, crawled. Laughter began, and wit was free. And as the far off hand of Quinn tightened its pressure in easy stages, the laughter grew forced, an element of hollow uncertainty entered, and people broke off to wonder.

The convention itself had the sir of a restive stallion. There had been no contest planned. Only Byerley could possibly have been nominated a week earlier. There was no substitute even now. They had to nominate him, but there was complete confusion about it.

It would not have been so bad if the average individual were not torn between the enormity of the charge, if true, and its sensational folly, if false.

The day after Byerley was nominated perfunctorily, hollowly — a newspaper finally published the gist of a long interview with Dr. Susan Calvin, “world famous expert on robopsychology and positronics.”

What broke loose is popularly and succinctly described as hell.

It was what the Fundamentalists were waiting for. They were not a political party; they made pretense to no formal religion. Essentially they were those who had not adapted themselves to what had once been called the Atomic Age, in the days when atoms were a novelty. Actually, they were the Simple-Lifers, hungering after a life, which to those who lived it had probably appeared not so Simple, and who had been, therefore, Simple-Lifers themselves.

The Fundamentalists required no new reason to detest robots and robot manufacturers; but a new reason such as the Quinn accusation and the Calvin analysis was sufficient to make such detestation audible.

The huge plants of the U. S. Robot & Mechanical Men Corporation was a hive that spawned armed guards. It prepared for war.

Within the city the house of Stephen Byerley bristled with police.

The political campaign, of course, lost all other issues, and resembled a campaign only in that it was something filling the hiatus between nomination and election.

Stephen Byerley did not allow the fussy little man to distract him. He remained comfortably unperturbed by the uniforms in the background. Outside the house, past the line of grim guards, reporters and photographers waited according to the tradition of the caste. One enterprising ‘visor station even had a scanner focused on the blank entrance to the prosecutor’s unpretentious home, while a synthetically excited announcer filled in with inflated commentary.

The fussy little man advanced. He held forward a rich, complicated sheet. “This, Mr. Byerley, is a court order authorizing me to search these premises for the presence of illegal... uh... mechanical men or robots of any description.”

Byerley half rose, and took the paper. He glanced at it indifferently, and smiled as he handed it back. “All in order. Go ahead. Do your job. Mrs. Hoppen” — to his housekeeper, who appeared reluctantly from the next room –” please go with them, and help out if you can.”

The little man, whose name was Harroway, hesitated, produced an unmistakable blush, failed completely to catch Byerley’s eyes, and muttered, “Come on,” to the two policemen.

He was back in ten minutes.

“Through?” questioned Byerley, in just the tone of a person who is not particularly interested in the question, or its answer.

Harroway cleared his throat, made a bad start in falsetto, and began again, angrily, “Look here, Mr. Byerley, our special instructions were to search the house very thoroughly.”

“And haven’t you?”

“We were told exactly what to look for.”

“Yes?”

“In short, Mr. Byerley, and not to put too fine a point on it, we were told to search you.”

“Me?” said the prosecutor with a broadening smile. “And how do you intend to do that?”

“We have a Penet-radiation unit–”

“Then I’m to have my X-ray photograph taken, hey? You have the authority?”

“You saw my warrant.”

“May I see it again?”

Harroway, his forehead shining with considerably more than mere enthusiasm, passed it over a second time.

Byerley said evenly, “I read here as the description of what you are to search; I quote: ‘the dwelling place belonging to Stephen Allen Byerley, located at 355 Willow Grove, Evanstron, together, with any garage, storehouse or other structures or buildings thereto appertaining, together with all grounds thereto appertaining’... um... and so on. Quite in order. But, my good man, it doesn’t say anything about searching my interior. I am not part of the premises. You may search my clothes if you think I’ve got a robot hidden in my pocket.”

Harroway had no doubt on the point of to whom he owed his job. He did not propose to be backward, given a chance to earn a much better — i.e., more highly paid — job.

He said, in a faint echo of bluster, “Look here. I’m allowed to search the furniture in your house, and anything else I find in it. You are in it, aren’t you?”

“A remarkable observation. I am in it. But I’m not a piece of furniture. As a citizen of adult responsibility — I have the psychiatric certificate proving that — I have certain rights under the Regional Articles. Searching me would come under the heading of violating my Right of Privacy. That paper isn’t sufficient.”

“Sure, but if you’re a robot, you don’t have Right of Privacy.”

“True enough but that paper still isn’t sufficient. It recognizes me implicitly as a human being.”

“Where?” Harroway snatched at it.

“Where it says ‘the dwelling place belonging to’ and so on. A robot cannot own property. And you may tell your employer, Mr. Harroway, that if he tries to issue a similar paper which does not implicitly recognize me as a human being, he will be immediately faced with a restraining injunction and a civil suit which will make it necessary for him to prove me a robot by means of information now in his possession, or else to pay a whopping penalty for an attempt to deprive me unduly of my Rights under the Regional Articles. You’ll tell him that, won’t you?”

Harroway marched to the door. He turned. . “You’re a slick lawyer–” His hand was in his pocket. For a short moment, he stood there. Then he left, smiled in the direction of the ‘visor scanner, still playing away — waved to the reporters, and shouted, “We’ll have something for you tomorrow, boys. No kidding.”

In his ground car, he settled back, removed the tiny mechanism from his pocket and carefully inspected it. It was the first time he had ever taken a photograph by X-ray reflection. He hoped he had done it correctly.

Quinn and Byerley had never met face-to-face alone. But visorphone was pretty close to it. In fact, accepted literally, perhaps the phrase was accurate, even if to each, the other were merely the light and dark pattern of a bank of photocells.

It was Quinn who had initiated the call. It was Quinn, who spoke first, and without particular ceremony, “Thought you would like to know, Byerley, that I intend to make public the fact that you’re wearing a protective shield against Penet-radiation.”

“That so? In that case, you’ve probably already made it public. I have a notion our enterprising press representatives have been tapping my various communication lines for quite a while. I know they have my office lines full of holes; which is why I’ve dug in at my home these last weeks.” Byerley was friendly, almost chatty.

Quinn’s lips tightened slightly, “This call is shielded — thoroughly. I’m making it at a certain personal risk.”

“So I should imagine. Nobody knows you’re behind this campaign. At least, nobody knows it officially. Nobody doesn’t know it unofficially. I wouldn’t worry. So I wear a protective shield? I suppose you found that out when your puppy dog’s Penet-radiation photograph, the other day, turned out to be overexposed.”

“You realize, Byerley, that it would be pretty obvious to everyone that you don’t dare face X-ray analysis.”

“Also that you, or your men, attempted illegal invasion of my Rights of Privacy.”

“The devil they’ll care for that.”

“They might. It’s rather symbolic of our two campaigns isn’t it? You have little concern with the rights of the individual citizen. I have great concern. I will not submit to X-ray analysis, because I wish to maintain my Rights on principle. Just as I’ll maintain the rights of others when elected.”

“That will, no doubt make a very interesting speech, but no one will believe you. A little too high-sounding to be true. Another thing,” a sudden, crisp change, “the personnel in your home was not complete the other night.”

“In what way?”

“According to the report,” he shuffled papers before him that were just within the range of vision of the visiplate, “there was one person missing — a cripple.”

“As you say,” said Byerley, tonelessly, “a cripple. My old teacher, who lives with me and who is now in the country — and has been for two months. A ‘much-needed rest’ is the usual expression applied in the case. He has your permission?”

“Your teacher? A scientist of sorts?”

“A lawyer once — before he was a cripple. He has a government license as a research biophysicist, with a laboratory of his own, and a complete description of the work he’s doing filed with the proper authorities, to whom I can refer you. The work is minor, but is a harmless and engaging hobby for a — poor cripple. I am being as helpful as I can, you see.”

“I see. And what does this... teacher... know about robot manufacture?”

“I couldn’t judge the extent of his knowledge in a field with which I am unacquainted.”

“He wouldn’t have access to positronic brains?”

“Ask your friends at U. S. Robots. They’d be the ones to know.”

“I’ll put it shortly, Byerley. Your crippled teacher is the real Stephen Byerley. You are his robot creation. We can prove it. It was he who was in the automobile accident, not you. There will be ways of checking the records.”

“Really? Do so, then. My best wishes.”

“And we can search your so-called teacher’s ‘country place,’ and see what we can find there.”

“Well, not quite, Quinn.” Byerley smiled broadly. “Unfortunately for you, my so-called teacher is a sick man. His country place is his place of rest. His Right of Privacy as a citizen of adult responsibility is naturally even stronger, under the circumstances. You won’t be able to obtain a warrant to enter his grounds without showing just cause. However, I’d be the last to prevent you from trying.”

There was a pause of moderate length, and then Quinn leaned forward, so that his imaged-face expanded and the fine lines on his forehead were visible, “Byerley, why do you carry on? You can’t be elected.”

“Can’t I?”

“Do you think you can? Do you suppose that your failure to make any attempt to disprove the robot charge — when you could easily, by breaking one of the Three Laws — does anything but convince the people that you are a robot?”

“All I see so far is that from being a rather vaguely known, but still largely obscure metropolitan lawyer, I have now become a world figure. You’re a good publicist.”

“But you are a robot.”

“So it’s been said, but not proven.”

“It’s been proven sufficiently for the electorate.”

“Then relax you’ve won.”

“Good-by,” said Quinn, with his first touch of viciousness, and the visorphone slammed off.

“Good-by,” said Byerley imperturbably, to the blank plate.

Byerley brought his “teacher” back the week before election. The air car dropped quickly in an obscure part of the city.

“You’ll stay here till after election,” Byerley told him. “It would be better to have you out of the way if things take a bad turn.”

The hoarse voice that twisted painfully out of John’s crooked mouth might have had accents of concern in it. “There’s danger of violence?”

“The Fundamentalists threaten it, so I suppose there is, in a theoretical sense. But I really don’t expect it. The Fundies have no real power. They’re just the continuous irritant factor that might stir up a riot after a while. You don’t mind staying here? Please, I won’t be myself if I have to worry about you.”

“Oh, I’ll stay. You still think it will go well?”

“I’m sure of it. No one bothered you at the place?”

“No one. I’m certain.”

“And your part went well?”

“Well enough. There’ll be no trouble there.”

“Then take care of yourself, and watch the televisor tomorrow, John.” Byerley pressed the gnarled hand that rested on his.

Lenton’s forehead was a furrowed study in suspense. He had the completely unenviable job of being Byerley’s campaign manager in a campaign that wasn’t a campaign, for a person that refused to reveal his strategy, and refused to accept his manager’s.

“You can’t!” It was his favorite phrase. It had become his only phrase. “I tell you, Steve, you can’t!”

He threw himself in front of the prosecutor, who was spending his time leafing through the typed pages of his speech.

“Put that down, Steve. Look, that mob has been organized by the Fundies. You won’t get a hearing. You’ll be stoned more likely. Why do you have to make a speech before an audience? What’s wrong with a recording, a visual recording?”

“You want me to win the election, don’t you?” asked Byerley, mildly.

“Win the election! You’re not going to win, Steve. I’m trying to save your life.”

“Oh, I’m not in danger.”

“He’s not in danger. He’s not in danger.” Lenton made a queer, rasping sound in his throat. “You mean you’re getting out on that balcony in front of fifty thousand crazy crackpots and try to talk sense to them — on a balcony like a medieval dictator?”

Byerley consulted his watch. “In about five minutes — as soon as the televisor lines are free.”

Lenton’s answering remark was not quite transliterable.

The crowd filled a roped off area of the city. Trees and houses seemed to grow out of a mass-human foundation. And by ultra-wave, the rest of the world watched. It was a purely local election, but it had a world audience just the same. Byerley thought of that and smiled.

But there was nothing to smile at in the crowd itself. There were banners and streamers, ringing every possible change on his supposed roboticity. The hostile attitude rose thickly and tangibly into the atmosphere.

From the start the speech was not successful. It competed against the inchoate mob howl and the rhythmic cries of the Fundie claques that formed mob-islands within the mob. Byerley spoke on, slowly, unemotionally–

Inside, Lenton clutched his hair and groaned — and waited for the blood.

There was a writhing in the front ranks. An angular citizen with popping eyes, and clothes too short for the lank length of his limbs, was pulling to the fore. A policeman dived after him, making slow, struggling passage. Byerley waved the latter off, angrily.

The thin man was directly under the balcony. His words tore unheard against the roar.

Byerley leaned forward. “What do you say? If you have a legitimate question, I’ll answer it.” He turned to a flanking guard. “Bring that man up here.”

There was a tensing in the crowd. Cries of “Quiet” started in various parts of the mob, and rose to a bedlam, then toned down raggedly. The thin man, red-faced and panting, faced Byerley.

Byerley said, “Have you a question?”

The thin man stared, and said in a cracked voice, “Hit me!”

With sudden energy, he thrust out his chin at an angle. “Hit me! You say you’re not a robot. Prove it. You can’t hit a human, you monster.”

There was a queer, flat, dead silence. Byerley’s voice punctured it. “I have no reason to hit you.”

The thin man was laughing wildly. “You can’t hit me. You won’t hit me. You’re not a human. You’re a monster, a make-believe man.”

And Stephen Byerley, tight-lipped, in the face of thousands who watched in person and the millions, who watched by screen, drew back his fist and caught the man crackingly upon the chin.

The challenger went over backwards in sudden collapse, with nothing on his face but blank, blank surprise.

Byerley said, “I’m sorry. Take him in and see that he’s comfortable. I want to speak to him when I’m through.”

And when Dr. Calvin, from her reserved space, turned her automobile and drove off, only one reporter had recovered sufficiently from the shock to race after her, and shout an unheard question.

Susan Calvin called over her shoulder, “He’s human.”

That was enough. The reporter raced away in his own direction.

The rest of the speech might be described as “Spoken but not heard.”

Dr. Calvin and Stephen Byerley met once again — a week before he took the oath of office as mayor. It was late — past midnight.

Dr. Calvin said, “You don’t look tired.”

The mayor-elect smiled. “I may stay up for a while. Don’t tell Quinn.”

“I shan’t. But that was an interesting story of Quinn’s, since you mention him. It’s a shame to have spoiled it. I suppose you knew his theory?”

“Parts of it.”

“It was highly dramatic. Stephen Byerley was a young lawyer, a powerful speaker, a great idealist — and with a certain flare for biophysics. Are you interested in robotics, Mr. Byerley?”

“Only in the legal aspects.”

“This Stephen Byerley was. But there was an accident. Byerley’s wife died, he himself, worse. His legs were gone; his face was gone; his voice was gone. Part of his mind was bent. He would not submit to plastic surgery. He retired from the world, legal career gone — only his intelligence, and his hands left. Somehow he could obtain positronic brains, even a complex one, one which had the greatest capacity of forming judgments in ethical problems — which is the highest robotic function so far developed.

“He grew a body about it. Trained it to be everything he would have been and was no longer. He sent it out into the world as Stephen Byerley, remaining behind himself as the old, crippled teacher that no one ever saw–”

“Unfortunately,” said the mayor-elect, “I ruined all that by hitting a man. The papers say it was your official verdict on the occasion that I was human.”

“How did that happen? Do you mind telling me? It couldn’t have been accidental.”

“It wasn’t entirely. Quinn did most of the work. My men started quietly spreading the fact that I had never hit a man; that I was unable to hit a man; that to fail to do so under provocation would be sure proof that I was a robot. So I arranged for a silly speech in public, with all sorts of publicity overtones, and almost inevitably, some fool fell for it. In its essence, it was what I call a shyster trick. One in which the artificial atmosphere which has been created does all the work. Of course, the emotional effects made my election certain, as intended.”

The robopsychologist nodded. “I see you intrude on my field — as every politician must, I suppose. But I’m very sorry it turned out this way. I like robots. I like them considerably better than I do

human beings. If a robot can be created capable of being a civil executive, I think he'd make the best one possible. By the Laws of Robotics, he'd be incapable of harming humans, incapable of tyranny, of corruption, of stupidity, of prejudice. And after he had served a decent term, he would leave, even though he were immortal, because it would be impossible for him to hurt humans by letting them know that a robot had ruled them. It would be most ideal."

"Except that a robot might fail due to the inherent inadequacies of his brain. The positronic brain has never equaled the complexities of the human brain."

"He would have advisers. Not even a human brain is capable of governing without assistance."

Byerley considered Susan Calvin with grave interest. "Why do you smile, Dr. Calvin?"

"I smile because Mr. Quinn didn't think of everything."

"You mean there could be more to that story of his."

"Only a little. For the three months before election, this Stephen Byerley that Mr. Quinn spoke about, this broken man, was in the country for some mysterious reason. He returned in time for that famous speech of yours. And after all, what the old cripple did once, he could do a second time, particularly where the second job is very simple in comparison to the first."

"I don't quite understand."

Dr. Calvin rose and smoothed her dress. She was obviously ready to leave. "I mean there is one time when a robot may strike a human being without breaking the First Law. Just one time."

"And when is that?"

Dr. Calvin was at the door. She said quietly, "When the human to be struck is merely another robot."

She smiled broadly, her thin face glowing. "Good-by Mr. Byerley. I hope to vote for you five years from now — for Co-ordinator."

Stephen Byerley chuckled. "I must reply that that is a somewhat farfetched idea."

The door closed behind her.

—

I stared at her with a sort of horror, "Is that true?"

"All of it," she said.

"And the great Byerley was simply a robot."

"Oh, there's no way of ever finding out. I think he was. But when he decided to die, he had himself atomized, so that there will never be any legal proof. Besides, what difference would it make?"

"Well–"

"You share a prejudice against robots which is quite unreasoning. He was a very good Mayor; five years later he did become Regional Co-ordinator. And when the Regions of Earth formed their

Federation in 2044, he became the first World Co-ordinator. By that time it was the Machines that were running the world anyway."

"Yes, but–"

"No buts! The Machines are robots, and they are running the world. It was five years ago that I found out all the truth. It was 2052; Byerley was completing his second term as World Co-ordinator–"

The Evitable Conflict

THE CO-ORDINATOR, IN HIS PRIVATE STUDY, HAD that medieval curiosity, a fireplace. To be sure, the medieval man might not have recognized it as such, since it had no functional significance. The quiet, licking flame lay in an insulated recess behind clear quartz.

The logs were ignited at long distance through a trifling diversion of the energy beam that fed the public buildings of the city. The same button that controlled the ignition first dumped the ashes of the previous fire, and allowed for the entrance of fresh wood. — It was a thoroughly domesticated fireplace, you see.

But the fire itself was real. It was wired for sound, so that you could hear the crackle and, of course, you could watch it leap in the air stream that fed it.

The Co-ordinator's ruddy glass reflected, in miniature, the discreet gamboling of the flame, and, in even further miniature, it was reflected in each of his brooding pupils.

And in the frosty pupils of his guest, Dr. Susan Calvin of U. S. Robots & Mechanical Men Corporation.

The Co-ordinator said, "I did not ask you here entirely for social purposes, Susan."

"I did not think you did, Stephen," she replied.

"—And yet I don't quite know how to phrase my problem. On the one hand, it can be nothing at all. On the other, it can mean the end of humanity."

"I have come across so many problems, Stephen, that presented the same alternative. I think all problems do."

"Really? Then judge this — World Steel reports an overproduction of twenty thousand long tons. The Mexican Canal is two months behind schedule. The mercury mines at Almaden have experienced a production deficiency since last spring, while the Hydroponics plant at Tientsin has been laying men off. These items happen to come to mind at the moment. There is more of the same sort."

"Are these things serious? I'm not economist enough to trace the fearful consequences of such things."

"In themselves, they are not serious. Mining experts can be sent to Almaden, if the situation were to get worse. Hydroponics engineers can be used in Java or in Ceylon, if there are too many at Tientsin. Twenty thousand long tons of steel won't fill more than a few days of world demand, and the opening of the Mexican Canal two months later than the planned date is of little moment. It's the Machines that worry me; I've spoken to your Director of Research about them already."

"To Vincent Silver? — He hasn't mentioned anything about it to me."

"I asked him to speak to no one. Apparently, he hasn't."

"And what did he tell you?"

"Let me put that item in its proper place. I want to talk about the Machines first. And I want to talk about them to you, because you're the only one in the world who understands robots well enough to help me now. — May I grow philosophical?"

“For this evening, Stephen, you may talk how you please and of what you please, provided you tell me first what you intend to prove.”

“That such small unbalances in the perfection of our system of supply and demand, as I have mentioned, may be the first step towards the final war.”

“Hmp. Proceed.”

Susan Calvin did not allow herself to relax, despite the designed comfort of the chair she sat in. Her cold, thin-lipped face and her flat, even voice were becoming accentuated with the years. And although Stephen Byerley was one man she could like and trust, she was almost seventy and the cultivated habits of a lifetime are not easily broken.

“Every period of human development, Susan,” said the Co-ordinator, “has had its own particular type of human conflict — its own variety of problem that, apparently, could be settled only by force. And each time, frustratingly enough, force never really settled the problem. Instead, it persisted through a series of conflicts, then vanished of itself, — what’s the expression, — ah, yes ‘not with a bang, but a whimper,’ as the economic and social environment changed. And then, new problems, and a new series of wars, — apparently endlessly cyclic.

“Consider relatively modern times. There were the series of dynastic wars in the sixteenth to eighteenth centuries, when the most important question in Europe was whether the houses of Hapsburg or Valois-Bourbon were to rule the continent. It was one of those ‘inevitable conflicts,’ since Europe could obviously not exist half one and half the other.

“Except that it did, and no war ever wiped out the one and established the other, until the rise of a new social atmosphere in France in 1789 tumbled first the Bourbons and, eventually, the Hapsburgs down the dusty chute to history’s incinerator.

“And in those same centuries there were the more barbarous religious wars, which revolved about the important question of whether Europe was to be Catholic or Protestant. Half and half she could not be. It was ‘inevitable’ that the sword decide. — Except that it didn’t. In England, a new industrialism was growing, and on the continent, a new nationalism. Half and half Europe remains to this day and no one cares much.

“In the nineteenth and twentieth centuries, there was a cycle of nationalist-imperialist wars, when the most important question in the world was which portions of Europe would control the economic resources and consuming capacity of which portions of non-Europe. All non-Europe obviously could not exist part English and part French and part German and so on. — Until the forces of nationalism spread sufficiently, so that non-Europe ended what all the wars could not, and decided it could exist quite comfortably all non-European.

“And so we have a pattern–”

“Yes. Stephen, you make it plain,” said Susan Calvin. “These are not very profound observations.”

“No. — But then, it is the obvious which is so difficult to see most of the time. People say ‘It’s as plain as the nose on your face.’ But how much of the nose on your face can you see, unless someone holds a mirror up to you? In the twentieth century, Susan, we started a new cycle of wars — what shall I call them? Ideological wars? The emotions of religion applied to economic systems, rather than to extra-natural ones? Again the wars were ‘inevitable’ and this time there were atomic weapons, so that mankind could no longer live through its torment to the inevitable wasting away of inevitability. — And positronic robots came.

“They came in time, and, with it and alongside it, interplanetary travel. — So that it no longer seemed so important whether the world was Adam Smith or Karl Marx. Neither made very much sense under the new circumstances. Both had to adapt and they ended in almost the same place.”

“A deus ex machina, then, in a double sense,” said Dr. Calvin, dryly.

The Co-ordinator smiled gently, “I have never heard you pun before, Susan, but you are correct. And yet there was another danger. The ending of every other problem had merely given birth to another. Our new worldwide robot economy may develop its own problems, and for that reason we have the Machines. The Earth’s economy is stable, and will remain stable, because it is based upon the decisions of calculating machines that have the good of humanity at heart through the overwhelming force of the First Law of Robotics.”

Stephen Byerley continued, “And although the Machines are nothing but the vastest conglomeration of calculating circuits ever invented, they are still robots within the meaning of the First Law, and so our Earth-wide economy is in accord with the best interests of Man. The population of Earth knows that there will be no unemployment, no over-production or shortages. Waste and famine are words in history books. And so the question of ownership of the means of production becomes obsolescent. Whoever owned them (if such a phrase has meaning), a man, a group, a nation, or all mankind, they could be utilized only as the Machines directed. — Not because men were forced to but because it was the wisest course and men knew it.

“It puts an end to war — not only to the last cycle of wars, but to the next and to all of them. Unless–”

A long pause, and Dr. Calvin encouraged him by repetition. “Unless–”

The fire crouched and skittered along a log, then popped up.

“Unless,” said the Co-ordinator, “the Machines don’t fulfill their function.”

“I see. And that is where those trifling maladjustments come in which you mentioned awhile ago — steel, hydroponics and so on.”

“Exactly. Those errors should not be. Dr. Silver tells me they cannot be.”

“Does he deny the facts? How unusual!”

“No, he admits the facts, of course. I do him an injustice. What he denies is that any error in the machine is responsible for the so-called (his phrase) errors in the answers. He claims that the Machines are self-correcting and that it would violate the fundamental laws of nature for an error to exist in the circuits of relays. And so I said –”

“And you said, ‘Have your boys check them and make sure, anyway.’”

“Susan, you read my mind. It was what I said, and he said he couldn’t.”

“Too busy?”

“No, he said that no human could. He was frank about it. He told me, and I hope I understand him properly, that the Machines are a gigantic extrapolation. Thus, a team of mathematicians work several years calculating a positronic brain equipped to do certain similar acts of calculation. Using this brain they make further calculations to create a still more complicated brain, which they use again to make one still more complicated and so on. According to Silver, what we call the Machines are the result of ten such steps.”

“Ye-es, that sounds familiar. Fortunately, I’m not a mathematician. Poor Vincent. He is a young man. The Directors before him, Alfred Lanning and Peter Bogert, are dead, and they had no such problems. Nor had I. Perhaps roboticists as a whole should now die, since we can no longer understand our own creations.”

“Apparently not. The Machines are not super-brains in Sunday supplement sense, — although they are so pictured in the Sunday supplements. It is merely that in their own particular province of collecting and analyzing a nearly infinite number of data and relationships thereof, in nearly infinitesimal time, they have progressed beyond the possibility of detailed human control.

“And then I tried something else. I actually asked the Machine. In the strictest secrecy, we fed it the original data involved in the steel decision, its own answer, and the actual developments since, — the overproduction, that is, — and asked for an explanation of the discrepancy.”

“Good, and what was its answer?”

“I can quote you that word for word: ‘The matter admits of no explanation.’ “

“And how did Vincent interpret that?”

“In two ways. Either we had not given the Machine enough data to allow a definite answer, which was unlikely. Dr. Silver admitted that. — Or else, it was impossible for the Machine to admit that it could give any answer to data which implied that it could harm a human being. This, naturally, is implied by the First Law. And then Dr. Silver recommended that I see you.”

Susan Calvin looked very tired, “I’m old, Stephen. When Peter Bogert died, they wanted to make me Director of Research and I refused. I wasn’t young then, either, and I did not wish the responsibility. They let young Silver have it and that satisfied me; but what good is it, if I am dragged into such messes.

“Stephen, let me state my position. My researches do indeed involve the interpretation of robot behavior in the light of the Three Laws of Robotics. Here, now, we have these incredible calculating machines. They are positronic robots and therefore obey the Laws of Robotics. But they lack personality; that is, their functions are extremely limited. Must be, since they are so specialized. Therefore, there is very little room for the interplay of the Laws, and my one method of attack is virtually useless. In short, I don’t know that I can help you, Stephen.”

The Co-ordinator laughed shortly, “Nevertheless, let me tell you the rest. Let me give you my theories, and perhaps you will then be able to tell me whether they are possible in the light of robopsychology.”

“By all means. Go ahead.”

“Well, since the Machines are giving the wrong answers, then, assuming that they cannot be in error, there is only one possibility. They are being given the wrong data! In other words, the trouble is human, and not robotic. So I took my recent planetary inspection tour–”

“From which you have just returned to New York.”

“Yes. It was necessary, you see, since there are four Machines, one handling each of the Planetary Regions. And all four are yielding imperfect results.”

“Oh, but that follows, Stephen. If any one of the Machines is imperfect, that will automatically reflect in the result of the other three, since each of the others will assume as part of the data on

which they base their own decisions, the perfection of the imperfect fourth. With a false assumption, they will yield false answers."

"Uh-huh. So it seemed to me. Now, I have here the records of my interviews with each of the Regional Vice-Coordinators. Would you look through them with me? — Oh, and first, have you heard of the 'Society for Humanity'?"

"Umm, yes. They are an outgrowth of the Fundamentalists who have kept U. S. Robots from ever employing positronic robots on the grounds of unfair labor competition and so on. The 'Society for Humanity' itself is anti-Machine, is it not?"

"Yes, yes, but — Well, you will see. Shall we begin? We'll start with the Eastern Region."

"As you say–"

The Eastern Region

a. Area: 7,500,000 square miles
b. Population: 1,700,000,000
c. Capital: Shanghai

Ching Hso-lin's great-grandfather had been killed in the Japanese invasion of the old Chinese Republic, and there had been no one beside his dutiful children to mourn his loss or even to know he was lost. Ching Hso-lin's grandfather had survived the civil war of the late forties, but there had been no one beside his dutiful children to know or care of that.

And yet Ching Hso-lin was a Regional Vice-Co-ordinator, with the economic welfare of half the people of Earth in his care.

Perhaps it was with the thought of all that in mind, that Ching had two maps as the only ornaments on the wall of his office. One was an old hand-drawn affair tracing out an acre or two of land, and marked with the now outmoded pictographs of old China. A little creek trickled aslant the faded markings and there were the delicate pictorial indications of lowly huts, in one of which Ching's grandfather had been born.

The other map was a huge one, sharply delineated, with all markings in neat Cyrillic characters. The red boundary that marked the Eastern Region swept within its grand confines all that had once been China, India, Burma, Indo-China, and Indonesia. On it, within the old province of Szechuan, so light and gentle that none could see it, was the little mark placed there by Ching which indicated the location of his ancestral farm.

Ching stood before these maps as he spoke to Stephen Byerley in precise English, "No one knows better than you, Mr. Co-ordinator, that my job, to a large extent, is a sinecure. It carries with it a certain social standing, and I represent a convenient focal point for administration, but otherwise it is the Machine! — The Machine does all the work. What did you think, for instance, of the Tientsin Hydroponics works?"

"Tremendous!" said Byerley.

"It is but one of dozens, and not the largest. Shanghai, Calcutta, Batavia, Bangkok — They are widely spread and they are the answer to feeding the billion and three quarters of the East."

“And yet,” said Byerley, “you have an unemployment problem there at Tientsin. Can you be over-producing? It is incongruous to think of Asia as suffering from too much food.”

Ching’s dark eyes crinkled at the edges. “No. It has not come to that yet. It is true that over the last few months, several vats at Tientsin have been shut down, but it is nothing serious. The men have been released only temporarily and those who do not care to work in other fields have been shipped to Colombo in Ceylon, where a new plant is being put into operation.”

“But why should the vats be closed down?”

Ching smiled gently, “You do not know much of hydroponics, I see. Well, that is not surprising. You are a Northerner, and there soil farming is still profitable. It is fashionable in the North to think of hydroponics, when it is thought of at all, as a device of growing turnips in a chemical solution, and so it is — in an infinitely complicated way.

“In the first place, by far the largest crop we deal with (and the percentage is growing) is yeast. We have upward of two thousand strains of yeast in production and new strains are added monthly. The basic food-chemicals of the various yeasts are nitrates and phosphates among the inorganics together with proper amounts of the trace metals needed, down to the fractional parts per million of boron and molybdenum which are required. The organic matter is mostly sugar mixtures derived from the hydrolysis of cellulose, but, in addition, there are various food factors which must be added.

“For a successful hydroponics industry — one which can feed seventeen hundred million people — we must engage in an immense reforestation program throughout the East; we must have huge wood-conversion plants to deal with our southern jungles; we must have power, and steel, and chemical synthetics above all.”

“Why the last, sir?”

“Because, Mr. Byerley, these strains of yeast have each their peculiar properties. We have developed, as I said, two thousand strains. The beefsteak you thought you ate today was yeast. The frozen fruit confection you had for dessert was iced yeast. We have filtered yeast juice with the taste, appearance, and all the food value of milk.

“It is flavor, more than anything else, you see, that makes yeast feeding popular and for the sake of flavor we have developed artificial, domesticated strains that can no longer support themselves on a basic diet of salts and sugar. One needs biotin; another needs pteroylglutamic acid; still others need seventeen different amino acids supplied them as well as all the Vitamins B, but one (and yet it is popular and we cannot, with economic sense, abandon it) —”

Byerley stirred in his seat, “To what purpose do you tell me all this?”

“You asked me, sir, why men are out of work in Tientsin. I have a little more to explain. It is not only that we must have these various and varying foods for our yeast; but there remains the complicating factor of popular fads with passing time; and of the possibility of the development of new strains with the new requirements and new popularity. All this must be foreseen, and the Machine does the job–”

“But not perfectly.”

“Not very imperfectly, in view of the complications I have mentioned. Well, then, a few thousand workers in Tientsin are temporarily out of a job. But, consider this, the amount of waste in this past

year (waste that is, in terms of either defective supply or defective demand) amounts to not one-tenth of one percent of our total productive turnover. I consider that–"

"Yet in the first years of the Machine, the figure was nearer one-thousandth of one percent."

"Ah, but in the decade since the Machine began its operations in real earnest, we have made use of it to increase our old pre-Machine yeast industry twenty-fold. You expect imperfections to increase with complications, though–"

"Though?"

"There was the curious instance of Rama Vrasayana."

"What happened to him?"

"Vrasayana was in charge of a brine-evaporation plant for the production of iodine, with which yeast can do without, but human beings not. His plant was forced into receivership."

"Really? And through what agency?"

"Competition, believe it or not. In general, one of the chiefest functions of the Machine's analyses is to indicate the most efficient distribution of our producing units. It is obviously faulty to have areas insufficiently serviced, so that the transportation costs account for too great a percentage of the overhead. Similarly, it is faulty to have an area too well serviced, so that factories must be run at lowered capacities, or else compete harmfully with one another. In the case of Vrasayana, another plant was established in the same city, and with a more efficient extracting system."

"The Machine permitted it?"

"Oh, certainly. That is not surprising. The new system is becoming widespread. The surprise is that the Machine failed to warn Vrasayana to renovate or combine. — Still, no matter. Vrasayana accepted a job as engineer in the new plant, and if his responsibility and pay are now less, he is not actually suffering. The workers found employment easily; the old plant has been converted to — something or other. Something useful. We left it all to the Machine."

"And otherwise you have no complaints."

"None!"

The Tropic Region:

a. Area: 22,000,000 square miles
b. Population: 500,000,000
c. Capital: Capital City

The map in Lincoln Ngoma's office was far from the model of neat precision of the one in Ching's Shanghai dominion. The boundaries of Ngoma's Tropic Region were stenciled in dark, wide brown and swept about a gorgeous interior labeled "jungle" and "desert" and "here be Elephants and all Manner of Strange Beasts."

It had much to sweep, for in land area the Tropic Region enclosed most of two continents: all of South America north of Argentina and all of Africa south of the Atlas. It included North America south of the Rio Grande as well, and even Arabia and Iran in Asia. It was the reverse of the Eastern

Region. Where the ant hives of the Orient crowded half of humanity into 15 percent of the land mass, the Tropics stretched its 15 per cent of Humanity over nearly half of all the land in the world.

But it was growing. It was the one Region whose population increase through immigration exceeded that through births. — And for all who came it had use.

To Ngoma, Stephen Byerley seemed like one of these immigrants, a pale searcher for the creative work of carving a harsh environment into the softness necessary for man, and he felt some of that automatic contempt of the strong man born to the strong Tropics for the unfortunate pallards of the colder suns.

The Tropics had the newest capital city on Earth, and it was called simply that: "Capital City," in the sublime confidence of youth. It spread brightly over the fertile uplands of Nigeria and outside Ngoma's windows, far below, was life and color; the bright, bright sun and the quick, drenching showers. Even the squawking of the rainbowed birds was brisk and the stars were hard pinpoints in the sharp night.

Ngoma laughed. He was a big, dark man, strong faced and handsome.

"Sure," he said, and his English was colloquial and mouth-filling, "the Mexican Canal is overdue. What the hell? It will get finished just the same, old boy."

"It was doing well up to the last half year."

Ngoma looked at Byerley and slowly crunched his teeth over the end of a big cigar, spitting out one end and lighting the other, "Is this an official investigation, Byerley? What's going on?"

"Nothing. Nothing at all. It's just my function as Coordinator to be curious."

"Well, if it's just that you are filling in a dull moment, the truth is that we're always short on labor. There's lots going on in the Tropics. The Canal is only one of them–"

"But doesn't your Machine predict the amount of labor available for the Canal, — allowing for all the competing projects?"

Ngoma placed one hand behind his neck and blew smoke rings at the ceiling, "It was a little off."

"Is it often a little off?"

"Not oftener than you would expect. — We don't expect too much of it, Byerley. We feed it data. We take its results. We do what it says. — But it's just a convenience, just a laborsaving device. We could do without it, if we had to. Maybe not as well, maybe not as quickly, but we'd get there.

"We've got confidence out here, Byerley, and that's the secret. Confidence! We've got new land that's been waiting for us for thousands of years, while the rest of the world was being ripped apart in the lousy fumblings of pre-atomic time. We don't have to eat yeast like the Eastern boys, and we don't have to worry about the stale dregs of the last century like you Northerners.

"We've wiped out the tsetse fly and the Anopheles mosquito, and people find they can live in the sun and like it, now. We've thinned down the jungles and found soil; we've watered the deserts and found gardens. We've got coal and oil in untouched fields, and minerals out of count.

"Just step back. That's all we ask the rest of the world to do. — Step back, and let us work."

Byerley said, prosaically, "But the Canal, — it was on schedule six months ago. What happened?"

Ngoma spread his hands, “Labor troubles.” He felt through a pile of papers skeltered about his desk and gave it up.

“Had something on the matter here,” he muttered, “but never mind. There was a work shortage somewhere in Mexico once on the question of women. There weren’t enough women in the neighborhood. It seemed no one had thought of feeding sexual data to the Machine.”

He stopped to laugh, delightedly, then sobered, “Wait a while. I think I’ve got it. — Villafranca!”

“Villafranca?”

“Francisco Villafranca. — He was the engineer in charge. Now let me straighten it out. Something happened and there was a cave-in. Right. Right. That was it. Nobody died, as I remember, but it made a hell of a mess. — Quite a scandal.”

“Oh?”

“There was some mistake in his calculations. — Or at least, the Machine said so. They fed through Villafranca’s data, assumptions, and so on. The stuff he had started with. The answers came out differently. It seems the answers Villafranca had used didn’t take account of the effect of a heavy rainfall on the contours of the cut. — Or something like that. I’m not an engineer, you understand.

“Anyway, Villafranca put up a devil of a squawk. He claimed the Machine’s answer had been different the first time. That he had followed the Machine faithfully. Then he quit! We offered to hold him on — reasonable doubt, previous work satisfactory, and all that — in a subordinate position, of course — had to do that much — mistakes can’t go unnoticed — bad for discipline — Where was I?”

“You offered to hold him on.”

“Oh yes. He refused. — Well, take all in all, we’re two months behind. Hell, that’s nothing.”

Byerley stretched out his hand and let the fingers tap lightly on the desk, “Villafranca blamed the Machine, did he?”

“Well, he wasn’t going to blame himself, was he? Let’s face it; human nature is an old friend of ours. Besides, I remember something else now — Why the hell can’t I find documents when I want them? My filing system isn’t worth a damn — This Villafranca was a member of one of your Northern organizations. Mexico is too close to the North! that’s part of the trouble.”

“Which organization are you speaking of?’

“The Society of Humanity, they call it. He used to attend the annual conference in New York, Villafranca did. Bunch of crackpots, but harmless. — They don’t like the Machines; claim they’re destroying human initiative. So naturally Villafranca would blame the Machine. — Don’t understand that group myself. Does Capital City look as if the human race were running out of initiative?”

And Capital City stretched out in golden glory under a golden sun, — the newest and youngest creation of Homo metropolis.

The European Region

a. Area: 4,000,000 square miles
b. Population: 300,000,000

c. Capital: Geneva

The European Region was an anomaly in several ways. In area, it was far the smallest, not one-fifth the size of the Tropic Region in area, and not one-fifth the size of the Eastern Region in population. Geographically, it was only somewhat similar to pre-Atomic Europe, since it excluded what had once been European Russia and what had once been the British Isles, while it included the Mediterranean coasts of Africa and Asia, and, in a queer jump across the Atlantic, Argentina, Chile, and Uruguay as well.

Nor was it likely to improve its relative status vis-à-vis the other regions of Earth, except for what vigor the South American provinces lent it. Of all the Regions, it alone showed a positive population decline over the past half century. It alone had not seriously expanded its productive facilities, or offered anything radically new to human culture.

“Europe,” said Madame Szegeczowska, in her soft French, “is essentially an economic appendage of the Northern Region. We know it, and it doesn’t matter.”

And as though in resigned acceptance of a lack of individuality, there was no map of Europe on the wall of the Madame Co-ordinator’s office.

“And yet,” pointed out Byerley, “you have a Machine of your own, and you are certainly under no economic pressure from across the ocean.”

“A Machine! Bah!” She shrugged her delicate shoulders, and allowed a thin smile to cross her little face as she tamped out a cigarette with long fingers. “Europe is a sleepy place. And such of our men as do not manage to immigrate to the Tropics are tired and sleepy along with it. You see for yourself that it is myself, a poor woman, to whom falls the task of being Vice-Co-ordinator. Well, fortunately, it is not a difficult job, and not much is expected of me.

“As for the Machine — What can it say but ‘Do this and it will be best for you.’ But what is best for us? Why, to be an economic appendage of the Northern Region.

“And is it so terrible? No wars! We live in peace — and it is pleasant after seven thousand years of war. We are old, monsieur. In our borders, we have the regions where Occidental civilization was cradled. We have Egypt and Mesopotamia; Crete and Syria; Asia Minor and Greece. — But old age is not necessarily an unhappy time. It can be a fruition–”

“Perhaps you are right,” said Byerley, affably. “At least the tempo of life is not as intense as in the other Regions. It is a pleasant atmosphere.”

“Is it not? — Tea is being brought, monsieur. If you will indicate your cream and sugar preference, please. Thank you.

She sipped gently, then continued, “It is pleasant. The rest of Earth is welcome to the continuing struggle. I find a parallel here, a very interesting one. There was a time when Rome was master of the world. It had adopted the culture and civilization of Greece, a Greece which had never been united, which had ruined itself with war, and which was ending in a state of decadent squalor. Rome united it, brought it peace and let it live a life of secure non-glory. It occupied itself with its philosophies and its art, far from the clash of growth and war. It was a sort of death, but it was restful, and it lasted with minor breaks for some four hundred years.”

“And yet,” said Byerley, “Rome fell eventually, and the opium dream was over.”

“There are no longer barbarians to overthrow civilization.”

“We can be our own barbarians. Madame Szegeczowska. — Oh, I meant to ask you. The Almaden mercury mines have fallen off quite badly in production. Surely the ores are not declining more rapidly than anticipated?”

The little woman’s gray eyes fastened shrewdly on Byerley, “Barbarians — the fall of civilization — possible failure of the Machine. Your thought processes are very transparent, monsieur.”

“Are they?” Byerley smiled. “I see that I should have had men to deal with as hitherto. — You consider the Almaden affair to be the fault of the Machine?”

“Not at all, but I think you do. You, yourself, are a native of the Northern Region. The Central Co-ordination Office is at New York. — And I have noticed for quite a while that you Northerners lack somewhat of faith in the Machine.”

“We do?”

“There is your ‘Society for Humanity’ which is strong in the North, but naturally fails to find many recruits in tired, old Europe, which is quite willing to let feeble Humanity alone for a while. Surely, you are one of the confident North and not one of the cynical old continent.”

“This has a connection with Almaden?”

“Oh, yes, I think so. The mines are in the control of Consolidated Cinnabar, which is certainly a Northern company, with headquarters at Nikolaev. Personally, I wonder if the Board of Directors have been consulting the Machine at all. They said they had in our conference last month, and, of course, we have no evidence that they did not, but I wouldn’t take the word of a Northerner in this matter — no offense intended — under any circumstances. — Nevertheless, I think it will have a fortunate ending.”

“In what way, my dear madam?”

“You must understand that the economic irregularities of the last few months, which, although small as compared with the great storms of the past, are quite disturbing to our peace-drenched spirits, have caused considerable restiveness in the Spanish province. I understand that Consolidated Cinnabar is selling out to a group of native Spaniards. It is consoling. If we are economic vassals of the North, it is humiliating to have the fact advertised too blatantly. — And our people can be better trusted to follow the Machine.”

“Then you think there will be no more trouble?”

“I am sure there will not be — In Almaden, at least.”

The Northern Region

a. Area: 18,000,000 square miles
b. Population: 800,000,000
c. Capital: Ottawa

The Northern Region, in more ways than one, was at the top. This was exemplified quite well by the map in the Ottawa office of Vice-Co-ordinator Hiram Mackenzie, in which the North Pole was

centered. Except for the enclave of Europe with its Scandinavian and Icelandic regions, all the Arctic area was within the Northern Region.

Roughly, it could be divided into two major areas. To the left on the map was all of North America above the Rio Grande. To the right was included all of what had once been the Soviet Union. Together these areas represented the centered power of the planet in the first years of the Atomic Age. Between the two was Great Britain, a tongue of the Region licking at Europe. Up at the top of the map, distorted into odd, huge shapes, were Australia and New Zealand, also member provinces of the Region.

Not all the changes of the past decades had yet altered the fact that the North was the economic ruler of the planet.

There was almost an ostentatious symbolism thereof in the fact that of the official Regional maps Byerley had seen, Mackenzie's alone showed all the Earth, as though the North feared no competition and needed no favoritism to point up its pre-eminence.

"Impossible," said Mackenzie, dourly, over the whiskey. "Mr. Byerley, you have had no training as a robot technician, I believe."

"No, I have not."

"Hmp. Well, it is, in my opinion, a sad thing that Ching, Ngoma and Szegeczowska haven't either. There is too prevalent an opinion among the peoples of Earth that a Co-ordinator need only be a capable organizer, a broad generalizer, and an amiable person. These days he should know his robotics as well, no offense intended."

"None taken. I agree with you."

"I take it, for instance, from what you have said already, that you worry about the recent trifling dislocation in world economy. I don't know what you suspect, but it has happened in the past that people — who should have known better — wondered what would happen if false data were fed into the Machine."

"And what would happen, Mr. Mackenzie?"

"Well," the Scotsman shifted his weight and sighed, "all collected data goes through a complicated screening system which involves both human and mechanical checking, so that the problem is not likely to arise. — But let us ignore that. Humans are fallible, also corruptible, and ordinary mechanical devices are liable to mechanical failure.

"The real point of the matter is that what we call a 'wrong datum' is one which is inconsistent with all other known data. It is our only criterion of right and wrong. It is the Machine's as well. Order it for instance, to direct agricultural activity on the basis of an average July temperature in Iowa of 57 degrees Fahrenheit. It won't accept that. It will not give an answer. — Not that it has any prejudice against that particular temperature, or that an answer is impossible; but because, in the light of all the other data fed it over a period of years, it knows that the probability of an average July temperature of 57 is virtually nil. It rejects that datum.

"The only way a 'wrong datum' can be forced on the Machine is to include it as part of a self-consistent whole, all of which is subtly wrong in a manner either too delicate for the Machine to detect or outside the Machine's experience. The former is beyond human capacity, and the latter is almost so, and is becoming more nearly so as the Machine's experience increases by the second."

Stephen Byerley placed two fingers to the bridge of his nose, “Then the Machine cannot be tampered with — And how do you account for recent errors, then?”

“My dear Byerley, I see that you instinctively follow that great error — that the Machine knows all. Let me cite you a case from my personal experience. The cotton industry engages experienced buyers who purchase cotton. Their procedure is to pull a tuft of cotton out of a random bale of a lot. They will look at that tuft and feel it, tease it out, listen to the crackling perhaps as they do so, touch it with their tongue, and through this procedure they will determine the class of cotton the bales represent. There are about a dozen such classes. As a result of their decisions, purchases are made at certain prices; blends are made in certain proportions. — Now these buyers cannot yet be replaced by the Machine.”

“Why not? Surely the data involved is not too complicated for it?”

“Probably not. But what data is this you refer to? No textile chemist knows exactly what it is that the buyer tests when he feels a tuft of cotton. Presumably there’s the average length of the threads, their feel, the extent and nature of their slickness, the way they hang together, and so on. — Several dozen items, subconsciously weighed, out of years of experience. But the quantitative nature of these tests is not known; maybe even the very nature of some of them is not known. So we have nothing to feed the Machine. Nor can the buyers explain their own judgment. They can only say, ‘Well, look at it. Can’t you tell it’s class-such-and-such?’ “

“I see.”

“There are innumerable cases like that. The Machine is only a tool after all, which can help humanity progress faster by taking some of the burdens of calculations and interpretations off its back. The task of the human brain remains what it has always been, that of discovering new data to be analyzed, and of devising new concepts to be tested. A pity the Society for Humanity won’t understand that.”

“They are against the Machine?”

“They would be against mathematics or against the art of writing if they had lived at the appropriate time. These reactionaries of the Society claim the Machine robs man of his soul. I notice that capable men are still at a premium in our society; we still need the man who is intelligent enough to think of the proper questions to ask. Perhaps if we could find enough of such, these dislocations you worry about, Coordinator, wouldn’t occur.”

Earth (Including the uninhabited continent, Antarctica)

a. Area: 54,000,000 square miles (land surface)
b. Population: 3,300,000,000
c. Capital: New York

The fire behind the quartz was weary now, and sputtered its reluctant way to death.

The Co-ordinator was somber, his mood matching the sinking flame.

“They all minimize the state of affairs.” His voice was low. “Is it not easy to imagine that they all laugh at me? And yet Vincent Silver said the Machines cannot be out of order, and I must believe him. Hiram Mackenzie says they cannot be fed false data, and I must believe him. But the

Machines are going wrong, somehow, and I must believe that, too; and so there is still an alternative left."

He glanced sidewise at Susan Calvin, who, with closed eyes, for a moment seemed asleep.

"What is that?" she asked, prompt to her cue, nevertheless.

"Why, that correct data is indeed given, and correct answers are indeed received, but that they are then ignored. There is no way the Machine can enforce obedience to its dictates."

"Madame Szegeczowska hinted as much, with reference to Northerners in general, it seems to me."

"So she did."

"And what purpose is served by disobeying the Machine? Let's consider motivations."

"It's obvious to me, and should be to you. It is a matter of rocking the boat, deliberately. There can be no serious conflicts on Earth, in which one group or another can seize more power than it has for what it thinks is its own good despite the harm to Mankind as a whole, while the Machines rule. If popular faith in the Machines can be destroyed to the point where they are abandoned, it will be the law of the jungle again. — And not one of the four Regions can be freed of the suspicion of wanting just that.

"The East has half of humanity within its borders, and the Tropics more than half of Earth's resources. Each can feel itself the natural rulers of all Earth, and each has a history of humiliation by the North, for which it can be human enough to wish a senseless revenge. Europe has a tradition of greatness, on the other hand. It once did rule the Earth, and there is nothing so eternally adhesive as the memory of power.

"Yet, in another way, it's hard to believe. Both the East and the Tropics are in a state of enormous expansion within their own borders. Both are climbing incredibly. They cannot have the spare energy for military adventures. And Europe can have nothing but its dreams. It is a cipher, militarily."

"So, Stephen," said Susan, "you leave the North."

"Yes," said Byerley, energetically, "I do. The North is now the strongest, and has been for nearly a century, or its component parts have been. But it is losing relatively, now. The Tropic Regions may take their place in the forefront of civilization for the first time since the Pharaohs, and there are Northerners who fear that.

"The 'Society for Humanity' is a Northern organization, primarily, you know, and they make no secret of not wanting the Machines. — Susan, they are few in numbers, but it is an association of powerful men. Heads of factories; directors of industries and agricultural combines who hate to be what they call 'the Machine's office-boy' belong to it. Men with ambition belong to it. Men who feel themselves strong enough to decide for themselves what is best for themselves, and not just to be told what is best for others."

"In short, just those men who, by together refusing to accept the decisions of the Machine, can, in a short time, turn the world topsy-turvy; just those belong to the Society.

"Susan, it hangs together. Five of the Directors of World Steel are members, and World Steel suffers from overproduction. Consolidated Cinnabar, which mined mercury at Almaden, was a Northern concern. Its books are still being investigated, but one, at least, of the men concerned was

a member. Francisco Villafranca, who, single-handed, delayed the Mexican Canal for two months, was a member, we know already — and so was Rama Vrasayana, I was not at all surprised to find out."

Susan said, quietly, "These men, I might point out, have all done badly–"

"But naturally," interjected Byerley. "To disobey the Machine's analyses is to follow a non-optimal path. Results are poorer than they might be. It's the price they pay. They will have it rough now but in the confusion that will eventually follow–"

"Just what do you plan doing, Stephen?"

"There is obviously no time to lose. I am going to have the Society outlawed, every member removed from any responsible post. And all executive and technical positions, henceforward, can be filled only by applicants signing a non-Society oath. It will mean a certain surrender of basic civil liberties, but I am sure the Congress–"

"It won't work!"

"What! — Why not?"

"I will make a prediction. If you try any such thing, you will find yourself hampered at every turn. You will find it impossible to carry out. You will find your every move in that direction will result in trouble."

Byerley was taken aback, "Why do you say that? I was rather hoping for your approval in this matter."

"You can't have it as long as your actions are based on a false premise. You admit the Machine can't be wrong, and can't be fed wrong data. I will now show you that it cannot be disobeyed, either, as you think is being done by the Society."

"That I don't see at all."

"Then listen. Every action by any executive which does not follow the exact directions of the Machine he is working with becomes part of the data for the next problem. The Machine, therefore, knows that the executive has a certain tendency to disobey. He can incorporate that tendency into that data, — even quantitatively, that is, judging exactly how much and in what direction disobedience would occur. Its next answers would be just sufficiently biased so that after the executive concerned disobeyed, he would have automatically corrected those answers to optimal directions. The Machine knows, Stephen!"

"You can't be sure of all this. You are guessing."

"It is a guess based on a lifetime's experience with robots. You had better rely on such a guess, Stephen."

"But then what is left? The Machines themselves are correct and the premises they work on are correct. That we have agreed upon. Now you say that it cannot be disobeyed. Then what is wrong?"

"You have answered yourself. Nothing is wrong! Think about the Machines for a while, Stephen. They are robots, and they follow the First Law. But the Machines work not for any single human being, but for all humanity, so that the First Law becomes: 'No Machine may harm humanity; or, through inaction, allow humanity to come to harm.'

“Very well, then, Stephen, what harms humanity? Economic dislocations most of all, from whatever cause. Wouldn’t you say so?”

“I would.”

“And what is most likely in the future to cause economic dislocations? Answer that, Stephen.”

“I should say,” replied Byerley, unwillingly, “the destruction of the Machines.”

“And so should I say, and so should the Machines say. Their first care, therefore, is to preserve themselves, for us. And so they are quietly taking care of the only elements left that threaten them. It is not the ‘Society for Humanity’ which is shaking the boat so that the Machines may be destroyed. You have been looking at the reverse of the picture. Say rather that the Machine is shaking the boat very slightly — just enough to shake loose those few which cling to the side for purposes the Machines consider harmful to Humanity.

“So Vrasayana loses his factory and gets another job where he can do no harm — he is not badly hurt, he is not rendered incapable of earning a living, for the Machine cannot harm a human being more than minimally, and that only to save a greater number. Consolidated Cinnabar loses control at Almaden. Villafranca is no longer a civil engineer in charge of an important project. And the directors of World Steel are losing their grip on the industry — or will.”

“But you don’t really know all this,” insisted Byerley, distractedly. “How can we possibly take a chance on your being right?”

“You must. Do you remember the Machine’s own statement when you presented the problem to him? It was: ‘The matter admits of no explanation.’ The Machine did not say there was no explanation, or that it could determine no explanation. It simply was not going to admit any explanation. In other words, it would be harmful to humanity to have the explanation known, and that’s why we can only guess — and keep on guessing.”

“But how can the explanation do us harm? Assume that you are right, Susan.”

“Why, Stephen, if I am right, it means that the Machine is conducting our future for us not only simply in direct answer to our direct questions, but in general answer to the world situation and to human psychology as a whole. And to know that may make us unhappy and may hurt our pride. The Machine cannot, must not, make us unhappy.

“Stephen, how do we know what the ultimate good of Humanity will entail? We haven’t at our disposal the infinite factors that the Machine has at its! Perhaps, to give you a not unfamiliar example, our entire technical civilization has created more unhappiness and misery than it has removed. Perhaps an agrarian or pastoral civilization, with less culture and less people would be better. If so, the Machines must move in that direction, preferably without telling us, since in our ignorant prejudices we only know that what we are used to, is good — and we would then fight change. Or perhaps a complete urbanization, or a completely caste-ridden society, or complete anarchy, is the answer. We don’t know. Only the Machines know, and they are going there and taking us with them.”

“But you are telling me, Susan, that the ‘Society for Humanity’ is right; and that Mankind has lost its own say in its future.”

“It never had any, really. It was always at the mercy of economic and sociological forces it did not understand — at the whims of climate, and the fortunes of war. Now the Machines understand

them; and no one can stop them, since the Machines will deal with them as they are dealing with the Society, — having, as they do, the greatest of weapons at their disposal, the absolute control of our economy.”

“How horrible!”

“Perhaps how wonderful! Think, that for all time, all conflicts are finally evitable. Only the Machines, from now on, are inevitable!”

And the fire behind the quartz went out and only a curl of smoke was left to indicate its place.

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“And that is all,” said Dr. Calvin, rising. “I saw it from the beginning, when the poor robots couldn’t speak, to the end, when they stand between mankind and destruction. I will see no more. My life is over. You will see what comes next.”

I never saw Susan Calvin again. She died last month at the age of eighty-two.

—— end ——