# I, ROBOT



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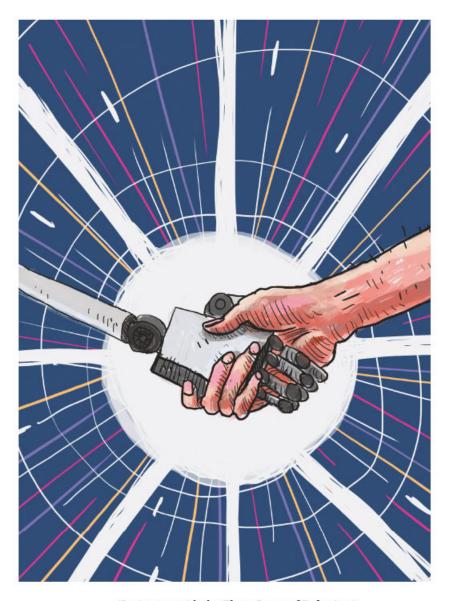
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'Let's start with the Three Laws of Robotics.'

#### INTRODUCTION

J looked at my notes, and I didn't like them. I had spent three days at U.S. Robots. I needed more information for the articles I was going to write for my newspaper, Interplanetary Press. So, I went to interview Dr. Calvin. Maybe she could tell me more.

Susan Calvin had been born in 1982, so she was seventy-five now. At the age of twenty, she had gone to a seminar by Dr. Alfred Lanning of U.S. Robots. There she saw the first robot with a voice.

Susan was a cold girl, plain and colorless, and extremely intelligent. She had a mask-like look on her face to protect herself from the world. But as she watched and listened to Dr. Lanning, she felt more and more excited.

She got her degree at Columbia University when she was twenty-one and began graduate work in cybernetics. Five years later, she obtained her Ph.D. and joined U.S. Robots as the first robot psychologist. She worked there for fifty years and watched the amazing developments in technology. Now she was retiring from the company.

That was all I knew about her. But I needed more than that for my articles.

'Dr. Calvin,' I said to her. 'We'd like to hear some of the things you could tell us about robots. My newspaper reaches the entire Solar System. We have about three billion readers. They would like to know your views on robots.'

'You want the human side of the story?' She didn't smile at me. I

don't think she ever smiles. Her eyes were sharp, but not angry.

'That's right, 'I said.

'The human side of robots?'

'No, doctor. The human side of you.'

'Well, they have called me a robot, too.'

She got up from her chair. She wasn't very tall, and she looked weak. We looked out of the window. We could see the offices and factories of U.S. Robots. It was like a small city.

'When I first came here,' she said, 'I had a little room in a building there.' She pointed. 'It was taken down before you were born. I shared the room with three others. We built our robots all in one building. We built three a week. Now look at us.'

'Fifty years is a long time,' I said.

She went back to her desk and sat down.

'How old are you?' she asked.

'Thirty-two, 'I said.

'Then you don't remember a world without robots. There was a time when humanity faced the universe alone. We had no friends. Now we have robots to help us. They are stronger than us, more faithful, more useful. We are not alone. Have you ever thought of it that way?'

'I'm afraid I haven't.'

'To you, a robot is a robot. Gears and metal; electricity and positrons. Mind and iron! Made by humans! If necessary, destroyed by humans! But you haven't worked with them, so you don't know them. They're cleaner, better creatures than we are.'



'You want the human side of the story?'

She paused for a while. Then she continued. 'In the beginning, we made robots that were used on Earth. They could not talk then. Later, they became more human. The first speaking models were about four meters high, very simple and not very good. We sent them out to Mercury. They were going to build a mining station there, but they failed.'

I looked up in surprise. 'They failed?'

'Well, they failed the first time. If you want to learn about that, you can go to Gregory Powell. He and Michael Donovan were the engineers who were given the most difficult cases. Powell is living here in New York. He's a grandfather now.'

'If you can tell me the story, Dr. Calvin, I can talk to Mr. Powell later.'

She looked at her thin hands. 'There are two or three stories,' she said,

'Start with Mercury,' I suggested.

'Well, the Second Mercury Expedition was sent out in 2015. We used a new-type robot, the SPD. Gregory Powell and Michael Donovan were the engineers.'



#### RUNAROUND

Wike Donovan came running down the stairs toward Gregory Powell. He had red hair. He was sweaty and breathless.

'What have you been doing in the sublevels all day?' Donovan asked excitedly. 'Speedy never returned.'

Powell's eyes opened wide, and he stopped on the stairs. 'You sent him to bring the selenium?'

'Yes.'

'And how long has he been outside?'

'Five hours now.'

Silence. This was not good. They had been on Mercury for only twelve hours, and they were already in trouble.

They went to the radio room. The equipment had been brought here ten years ago, so it was now quite old. Like the whole Station, this room was also very depressing.

Powell said, 'Tell me everything.'

Donovan explained. 'I tried to **locate** him by radio, but I couldn't. Radio doesn't work on the Mercury Sunside. That's one of the reasons why the First Expedition failed. I was able to locate him in the short wave. I followed him for two hours. Look at this map.'

Donovan pointed at the map. 'The red cross is the selenium pool

where I sent Speedy; it's twenty-seven kilometers away. These dots here show Speedy's position.'

Powell looked worried. 'Are you serious? This is impossible.'

The dots that showed Speedy's position formed a circle around the selenium pool. Powell touched his brown mustache. It was a signal of anxiety.

'He went around that pool four times in two hours,' explained Donovan. 'It looks like he'll do that forever. Do you realize the problem?'

Powell looked up and said nothing. Oh, yes, he realized the problem. The photocell banks that protected them from Mercury's giant sun were badly **damaged**. The only thing that could save them was selenium. The only thing that could get the selenium was Speedy. If Speedy didn't come back, they would have no selenium. No selenium, no photocell banks. No photocell banks – well, death by slow boiling is a bad way to die.

Donovan rubbed his red hair and spoke with anger. 'Everyone will laugh at us. How did everything go wrong so soon, Greg? The great team of Powell and Donovan is sent out to Mercury to check the Sunside Mining Station. A simple job. And we fail on the first day. This will hurt our name.'

'If we don't do something quickly,' said Powell quietly, 'it won't only hurt our name. It will probably kill us.'

'Well, what are we going to do?' said Donovan. He looked at Powell. 'Greg, you're very calm. I know you've got an idea. Go on, tell me!'

'Well, we can't go after Speedy ourselves, Mike. Even if we wear the new spacesuits, they won't protect us for more than twenty minutes in direct sunlight. But maybe things aren't so bad. We've got six robots down in the sublevels. We may be able to use them, if they work.'

There was sudden hope in Donovan's eyes. 'Are you sure? You mean the six robots from the First Expedition. But they were built ten years ago.'

'Yes, but they've got positronic brains. They are primitive, of course.' He put the map in his pocket. 'Let's go down.'

They went down to the sublevels and found the robots. There were six of them. They were extremely large.

Donovan whistled. 'Look at their size! The chests must be three meters around.'

'That's because they've got very old machinery. I've examined their insides – very poor quality. But they might talk.'

Powell put an atomic battery into the chest of one of the robots. He turned to the robot and said, 'You! Do you hear me?'

The robot's head bent slowly, and the eyes looked at Powell. Then, it said, 'Yes, Master!' It had a metallic voice.

'Can you go out on the surface? In the light?' Powell asked.

There was a pause while the robot's slow brain worked. 'Yes, Master.'

'Good. We will take you outside the station. You will go twentyseven kilometers, and you will find another robot, smaller than yourself. You will order him to come back. If he does not wish to, you will bring him back by force.'

'Yes, Master.'

'All right. Follow me.'

The robot did not move. 'Pardon, Master, but I cannot. You must ride me.'

Powell stared and then pulled at his mustache. 'Uh... oh!'

'We've got to ride him? Like a horse?' asked Donovan.

'I guess so. It's an old robot. They built it in this way, so he cannot move without human control. What do we do now?'

'We can't go out on the surface, with a robot or without,' said Donovan. 'But wait a minute! Give me that map. This is a mining station. There are many tunnels under the ground. We could use them.'

The mining station was a black circle on the map, and the dotted lines showed the tunnels that stretched out from it. 'Look,' said Donovan. 'We can come out of this exit, number 13a.'

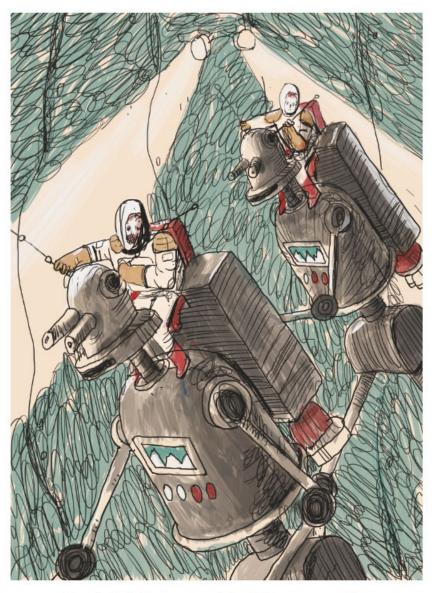
'OK. Let's get our spacesuits,' said Powell happily.

It was the first time they had worn the suits. It was larger and uglier than the normal spacesuit, but it was much lighter. It could survive Mercury's sun for twenty minutes.

Powell turned to the robot. 'Are you ready to take us to Exit 13a?'

'Yes, Master.'

Powell climbed up on one robot and Donovan on another. The seats were quite comfortable. There were two long ears for the rider to hold on to. The enormous robots moved slowly through the door and along a narrow corridor into the long, airless tunnel. They moved at a speed that never changed.



Powell climbed up on one robot and Donovan on another.

'There is lots of light in these tunnel, and the temperature is Earthnormal,' said Powell. 'The Station is like a huge energy generator. The heat from the Sun is turned into energy, which is used for the Station. And at the same time, the Station is cooled.'

'Yes,' said Donovan. 'This is all very good. But we have a problem. What's wrong with Speedy? I can't understand.'

'I don't know, Mike. He was built for this environment. The heat and the low gravity don't affect him.'

They were silent for a while. Finally, they came to the end of the tunnel. They went up into a tiny substation, empty and airless. A tall wall of black rock cut off the sunlight. In front of them they could see the very bright white light of Mercury Sunside. Thankfully, they had light filters in their visiplates. Otherwise, the sunlight would have blinded them.

Donovan looked at the thermometer on his wrist. 'The temperature is eighty Centigrade!'

'Yes,' said Powell. He looked around. 'There's a dark area over there that might be the selenium pool. But I don't see Speedy.' His voice was worried. He stood up on the robot's shoulders to get a better view. 'I think... Yes, I see him now. He's coming this way.'

Donovan followed Powell's pointing finger. 'I see him,' he yelled. 'Let's go!'

The robots began to move.

'Faster,' yelled Donovan. But there was no change in their speed.

'No use,' said Powell. 'They can only move at one speed.'

<sup>1</sup> gravity: the force which causes things to drop to the ground

They came out of the shadow of the rock into the sunlight.

'Wow!' said Donovan. 'It's really hot!'

'It's going to get hotter,' said Powell. 'Keep your eye on Speedy.'

They could see Robot SPD-13 clearly now. The SPD models were one of the fastest robots that were produced by U.S. Robots.

'Speedy!' shouted Powell. 'Come here!'

Speedy looked up and saw them. He stopped suddenly.

'All right, Speedy. Come here, boy,' yelled Powell.

Then they heard Speedy's voice for the first time. 'Let's play games. You catch me, and I catch you.' He turned and ran away in the opposite direction. They heard him singing a children's song now.

'Is he crazy or something?' asked Donovan.

There was a long silence. 'He's not crazy,' Powell said at last. 'A robot's only a robot. There's something wrong with him which is **confusing** him. We have to find out what it is and fix it.'

The two men went back to the shadow of the rock and got down from their robots.

'Listen, Mike, what did you say to Speedy when you sent him after the selenium?' asked Powell.

'Well, I said, 'Speedy, we need some selenium. You can get it at this place. Go get it.' That's all.'

'Did you tell him it was highly important? Did he understand its importance?'

'No. It was a simple order.'

Powell took a deep breath. He was thinking. 'OK, look, let's start with the Three Laws of Robotics. These laws are built into every robot's positronic brain. One: A robot may not injure a human being or allow a human being to come to harm. Two: A robot must obey the orders given by human beings unless they **conflict** with the First Law. And three: A robot must protect itself unless this conflicts with the First or Second Laws.'

'Right! So, how does this help us?'

'Speedy is one of the latest models, and he's very expensive. So, when he was built, the Third Law was strengthened. This means that he is more likely to protect himself. Maybe, there's some kind of danger at the selenium pool that Speedy is avoiding.'

Donovan rose to his feet in excitement. 'I see. The Third Law drives him away from the pool. And when he gets away from the pool, The Second Law drives him towards it again. So, he follows a circle around the selenium pool.'

'And unless we do something about it, he'll stay on that circle forever, giving us the runaround.'

'But what's the danger that he's avoiding?' asked Donovan.

'Now, let's think. Where does the selenium come from?'

'Volcanic action,' said Donovan.

'Right! There may be some gas coming out of the ground somewhere right above the selenium pool. Sulphur dioxide, carbon dioxide, or carbon monoxide.' 'At this temperature carbon monoxide plus iron will cause an explosion. And a robot is mostly made of iron.'

'Yes. It would be very dangerous for Speedy,' said Powell. 'OK, we know the problem now, but we don't have a solution. We can't get the selenium ourselves. We can't send these robot horses, because they can't go themselves, and they can't carry us fast enough. And we can't catch Speedy, because he's running away from us.'

There was a long silence again. But they had to think fast.

'Mike,' said Powell. 'There's always the First Law.'

Donovan looked up.

'All right,' said Powell. 'According to the First Law, a robot can't watch a human being get harmed. The First Law is stronger than the Second and Third Laws, Mike. I'm going out there now to see if this will work.'

'Wait, Greg. You can't go out there just like that. We must choose...'

But before he could finish his sentence, Powell was on his robot off into the sunlight.

Powell's robot moved slowly towards Speedy. The sun was hotter than ever. Speedy was watching him. When he was three hundred meters away from Speedy, Powell stopped and jumped down from the robot's shoulders. He started walking. He could feel the heat under his feet. It was difficult to walk because of the low gravity. He looked over his shoulder and realized that he had come too far. He could not go back now. Only Speedy could take him back.

He came near enough and stopped. 'Speedy,' he called. 'Speedy,

I've got to get back to the shadow or the sun will kill me. I need you.'

Speedy took one step forward and stopped.

It was very hot! Then, Powell saw a movement out of the corner of his eye. He turned and saw that the old horse-robot was moving toward him, and without a rider. Powell was shocked.

'Pardon, Master,' said the old robot. 'I must not move without a human riding me, but you are in danger.'

Of course, the First Law was stronger than everything. But he didn't want the old robot; he wanted Speedy. 'I order you to stay away. I order you to stop!' he shouted at the robot.

It was useless. The robot said stupidly, 'You are in danger, Master.'

Powell looked about him hopelessly. He couldn't see clearly. He was breathing with difficulty. He called for the last time. 'Speedy! I'm dying! Where are you? Speedy, I need you.'

Suddenly he felt steel fingers on his arms and heard a worried metallic voice in his ears. 'Boss, what are you doing here? And what am I doing? I'm so confused.' It was Speedy.

'Never mind,' whispered Powell weakly. 'Get me to the shadow quickly!'

\* \* \*

When Powell woke up, he saw Donovan bending over him and smiling anxiously. 'How are you, Greg?'

'Fine! Where's Speedy?'



'Never mind,' whispered Powell weakly. 'Get me to the shadow quickly!'

'Right here. I sent him out to one of the other selenium pools. This time I told him that it was very important. He got it back in forty-two minutes and three seconds. He's still sorry for the runaround he gave us. He's too scared to come near you.'

Powell held out a hand and held Speedy's metal fingers. 'It's OK, Speedy.' He rubbed his face. The air was nice and cool. Then he turned to Donovan. 'You know, Mike, when we finish our task here, they're going to send us to the space stations next.'

'No! Really?'

'Yes! That's what Dr. Calvin told me just before we left. I was against the idea then. But it's all right with me now. 273 Centigrade below zero. Won't it be pleasant?'

'Space station,' said Donovan. 'Here I come.'



#### ACTIVITIES

A. Word Search: Find the 5 verbs from the chapter. The definitions are given below.

Е	Α	Р	Α	0	Т	С	F	L
G	٧	Р	Q	R	0	U	L	U
Α	0	G	Z	Ν	Ν	С	Ι	Н
М	1	Н	F	Z	С	S	Α	Х
Α	D	U	L	0	С	Α	Т	Е
D	S	Е	٧	Ι	٧	R	U	s
Ε	G	U	N	J	Z	Κ	L	R

- a. keep away from
  b. puzzle, complicate
  c. harm, spoil, destroy
  d. find, discover (the position of smt)
  e. stay alive, continue to live

B. Complete the synonyms of the words in bold.

1. Powell understood that if Speedy didn't bring the selenium, they would die.	rz_d
2. People on earth were saved thanks to robots.	hn
3. Susan Calvin said that robots were loyal and trustworthy.	fh
<b>4.</b> Powell <b>looked closely</b> at the robot to see if they could use it.	e m d
<b>5.</b> Mercury's <b>physical condition</b> was difficult for a human to live in.	e t

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1. 1	The year	the narrato	r interviewed I	Dr. Calvın	_
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- 2. The year Dr. Calvin saw the first robot with a voice
- 3. The year she graduated from Columbia University
- 4. The year she started working at U.S. Robots
- 5. The year the narrator was born

#### D. True or False?

 1. The narrator wrote for a newspaper that had many readers.
 2. Susan Calvin disliked robots because they were stronger than
humans.
 3. Powell and Donovan had special suits that could protect them for
a few days.
 4. The old robots needed a human to ride them because they could
not move without human control

#### E. Answer the following questions.

- 1. Powell and Donovan were worried when Speedy did not come back. Which of the following is NOT a reason for this?
  - a) Speedy was going to bring the selenium.
  - b) The selenium was going to make the photocell banks work.
  - c) The photocell banks protected the humans from the selenium.
- 2. Mercury was difficult to survive on. Which of the following was NOT one of the qualities of Mercury's environment?
  - a) It was extremely dark.
  - b) There was low gravity.
  - c) The temperature was very high.
- 3. Why did Speedy keep going around in circles?
  - a) The First Law pushed him away from the selenium pool, and the Second Law pushed him towards it.
  - b) The Second Law pushed him towards the selenium pool, and the Third Law pushed him away from it.
- 4. Which Law did Powell use to get Speedy back? What did this Law say?
- 5. Did Speedy realize that he was acting strangely and causing a problem?

#### GLOSSARY

#### Introduction & Chapter 1 - Runaround

affect (v) if something affects a person or thing, it influences them or causes them to change in some way.

avoid (v) to keep away from somebody/something; to try not to do something

**conflict** (v) if two ideas, beliefs, stories, etc. conflict, it is not possible for them to exist together or for them both to be true

confuse (v) to make somebody unable to think clearly or understand something confused (adj)

damage (v) to harm or spoil something/somebody

environment (n) the natural world in which people, animals and plants live

examine (v) to look at somebody or something closely, to see if there is anything wrong or to find the cause of a problem

faithful (adj) able to be trusted; that you can rely on

humanity (n) all the people in the world

likely (adj) if someone or something is likely to do a particular thing, they will very probably do it

locate (v) to find the exact position of somebody/something

primitive (adj) very simple and old-fashioned

realize (v) to understand a situation

surface (n) the outside or top layer of something

survive (v) to continue to live or exist, especially after being in a difficult or dangerous situation

survival (n); survivor (n)

#### ABOUT THE AUTHOR

Isaac Asimov (1920-1991) was an American author and biochemist. He is considered one of the three great masters of science fiction. He wrote or edited about 500 books.

Asimov's family immigrated to the U.S. when he was three. He grew up in New York and spent his childhood reading passionately. He studied chemistry in Columbia University and took a Ph.D. in chemistry in 1948. He then became a biochemistry professor at Boston University, where he worked all his life.

Asimov had a passion for writing. His first book, *Pebble in the Sky*, was published in 1950. In the same year, *I, Robot* was published. It was about 21<sup>st</sup>-century robots that operate according to the Three Laws of Robotics. By developing a set of ethics for robots and rejecting the idea of them as metal monsters, Asimov influenced other science fiction writers. Some of his other important works include *The Stars, like Dust* (1951), *The Currents of Space* (1952), *The Caves of Steel* (1954), *The Naked Sun* (1957), *Earth Is Room Enough* (1957), *Foundation's Edge* (1982), and *The Robots of Dawn* (1983).

Asimov also wrote many non-fiction books, including *The Chemicals* of Life (1954), Inside the Atom (1956), The World of Nitrogen (1958), Life and Energy (1962), The Human Brain (1964), The Neutrino (1966), Science, Numbers, and I (1968), Our World in Space (1974), and Views of the Universe (1981). He also wrote two autobiographies and published a science fiction magazine.

Sources:

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