

## THE SPONTANEOUS REFLEX

Urm had gotten bored.

Strictly speaking, boredom, as a reaction to uniformity and monotonous surroundings or an internal dissatisfaction – a loss of interest in life – is intrinsic only to humans and certain animals. In order to be bored, one needs, so to speak, a means of being bored: a finely and perfectly organized nervous system. One needs to be able to think, or at least to suffer. Urm did not have a nervous system in the usual sense of the word, and he was not able to think, let alone suffer. He only perceived, remembered, and acted. But just the same, he had gotten bored.

The thing was that, after the Master had left, there was nothing new around for Urm to remember. Add to this the fact that the accumulation of new impressions was the basic stimulus that directed Urm's actions and motivated him to said actions. He was driven by an inexhaustible curiosity, an inexhaustible thirst to perceive and remember as much as

possible. If there were no unknown facts and phenomena, then some had to be found.

But Urm's surroundings were familiar to him to the last visual detail, to the last undertone. He remembered the vast square room with rough cement walls, low ceiling, and iron door from the first moment of his existence. It always smelled here of heated metal and transformer oil. An indistinct low hum could be heard from somewhere above. People could not hear it without special instruments, but Urm heard it perfectly well. The fluorescent lights on the ceiling were extinguished, but just the same Urm saw the room perfectly well in infrared and in the pulse signals of his locators.

And so, Urm had gotten bored, and he resolved to set out in search of new impressions. A half-hour had passed since the Master had gone. Experience suggested to Urm that he would not return anytime soon. This was very important, because Urm had once embarked on a little stroll around the room without having been ordered to do so, and the Master, who caught him in this activity, made it so that Urm could not even move his locator horn. Now, it seemed he did not have to worry about this.

Urm teetered and heavily stepped forward. The cement floor rang out under his thick rubber soles, and Urm stopped for a moment to listen, and even bent over. But in the range of sounds emitted by the vibrating cement there was not a single new one, and Urm again made for the opposite wall. He walked right up to it and took a sniff. The wall smelled of wet concrete and rusted metal. Nothing new. Then Urm turned around, gouging the wall with his sharp steel elbow, cut diagonally across the room and stopped in front of the door. Opening the door was not a simple matter, and Urm did not grasp right away how it should be done. Then, extending his toothed claw of a left hand, he nimbly grabbed the lock lever and turned it. The door opened with a weak, drawn-out groan. This was diverting, and Urm spent several minutes opening and closing the door, now quickly, now slowly, listening closely and committing the sounds to memory. Then he stepped across the high threshold and found himself facing

a staircase. The staircase was narrow, with stone steps to the first landing, and fairly long. Urm in an instant counted eighteen steps to the first landing, where a light was burning. Then, taking his time, he went up. From the landing another staircase led upward, wooden, with ten steps, and a wide corridor opened to the right. Hesitating for a moment, Urm turned right. He did not know why. The corridor was no less interesting than the stairs. But it is probable that Urm did not like the look of the wooden steps.

Warmth emanated from the corridor, and it was brightly illuminated in infrared. The infrared light was being emitted by some ribbed cylinders, mounted not far above the floor. Urm had never before seen steam radiators, and the ribbed cylinders interested him. He bent over and hooked one of them with both claws. A brief crack rang out along with the groaning of metal, and a thick cloud of hot steam swelled up to the ceiling. A stream of boiling water gushed under Urm's feet. Urm raised the cylinder up to his head, attentively looked it over, and examined the torn edge of the pipe. Then the cylinder was cast aside, and Urm's soles squelched through the puddles. Urm went to the end of the corridor. There above the low door blazed a red sign. "Caution! No Entry Without Protective Suit!" Urm read. He knew the word "caution," but also knew that this word always applied to people. To him, to Urm, this word could not apply. He extended his arm and gave the door a shove.

Yes, here there was a great deal that was interesting and new. He stood in the entrance to a vast room, filled with objects of metal, stone, and plastic. In the middle of the room, a meter above the floor, rose a round concrete structure resembling a low pillar, covered with a shield of iron or lead. Numerous cables ran from it in all directions toward the walls, along which stretched marble panels with gleaming instruments and switch handles. An enclosure made of copper wire surrounded the concrete pillar, and gleaming articulated rods hung from the ceiling. The rods ended in pincers and claws, just like the ones on Urm's arms.

Urm, treading inaudibly across the ceramic tiles of the floor, walked up to the copper meshwork and made a circuit around it. Then he

stood for a moment and walked around it a second time. There was no opening in the meshwork. Then Urm lifted his foot and effortlessly strode through the meshwork. Torn shreds of copper cobweb hung from his shoulders. But, before he took the two steps to the concrete pillar, he stopped stock-still. His head, round as a schoolroom globe, warily turned right and left: the ebonite shells of his acoustic receptors extended and stirred, his locator horns shuddered. The leaden lid on the pillar emitted infrared light, apparent even in the heated building. But, in addition to this, it was emitting some sort of ultra-radiant emanation. Urm saw well in x- and gamma rays, and it seemed to him that the lid was transparent, with a narrow concrete well opening under it, filled with glowing dust. In the depths of Urm's memory a command surfaced: *leave this place at once*. Urm did not know when and by whom this command had been issued. Probably, Urm came into the world already knowing it, as he knew many other things. But Urm did not obey the command. Curiosity turned out to be stronger. He bent over the pillar, extended his claws and with some effort lifted the lid.

The flood of gamma rays blinded him. Red lights on the marble panels blinked on, and a siren began howling. He saw for a moment, through the transparent silhouettes of his arms, the interior of the concrete pit, then threw the lid down, proclaiming in a low, hoarse voice:

"Opasnost! Gefahr! Danger! Weixian! Abunai!"

A booming echo bounded around the room and faded away. Urm turned the upper portion of his body one hundred and eighty degrees and hastily made for the exit. The shock in his status meters brought about by the flood of radioactive particles drove him away from the concrete pillar. Of course, neither the hardest radiation nor a mighty flood of particles could do Urm the slightest harm; even spending some time in the active zone of a reactor would not threaten Urm with serious consequences. But, in creating Urm, his masters had embedded in him a tendency to stay as far away as possible from sources of intense radiation. Urm went out into the corridor, painstakingly closed the door behind him, and, stepping over the ribbed cylinder of the radiator,

once again found himself on the staircase landing. Right away he saw a Human hurriedly coming down the wooden staircase.

The Human was considerably shorter than the Master. It had on loose-fitting, light-colored clothing, and its hair was strangely long, and golden in color. Urm had never seen such people before. He drew in some air and sensed the familiar smell of white lilac. At times the Master gave off the same scent, though much more faintly.

Half-darkness reigned on the landing, and the staircase behind the woman was brightly illuminated, so she could not immediately discern the outline of Urm's enormous body. Rather, hearing his footsteps, she stopped and called out angrily:

"Who's that? It is you, Ivashev?"

"Hello, how do you do?" said Urm huskily.

The woman screamed. From the half-darkness a gleaming head with bulging glass eyes, excessively wide armor-plated shoulders, and thick articulated arms advanced on her. Urm set foot on the lowest step of the wooden staircase, and the woman began shrieking again.

Never before had a Human failed to answer Urm's greeting. But this strange, high sound, shrill, penetrating and certainly inarticulate, did not resemble any of the standard answer templates that Urm knew. Intrigued, Urm purposefully moved forward after the retreating woman. The wooden steps groaned and cracked under his feet.

"Back!" screamed the woman.

Urm stopped and tilted his head, listening closely.

"Back, you monster!"

The command "back" was familiar to Urm. According to this command, he was to turn the upper portion of his body around and take several steps in the opposite direction until he heard the command "stop." But commands usually originated from the Master, and, besides that, Urm wanted to investigate. He once again began to ascend the steps, until he found himself in front of the entrance of a small, brightly lit room.

"Back! Back! Back!" screamed the woman.

By now Urm did not stop anymore, though he was going slower than he might. The room interested him: two desks, chairs, a drafting board, a bookcase, and thick folders. While he opened drawers, untied the strings on the folders and read aloud the notes that had been made in black ink in the margins of technical diagrams, the woman slipped into the room next door, hid behind the couch and grabbed the telephone handset. Urm saw this, as he had an optical receptor on the back of his head, but the small longhaired human no longer interested him. Walking across the papers spread all over the floor, he set off on his way. Behind his back the woman shouted into the telephone:

"Nikolai Petrovich! Nikolai Petrovich, it's me, Galya! Nikolai Petrovich, Urm broke into our office. Your Urm! Urm! Uniform, Romeo, Mike... Didn't you hear the siren? Yes! I don't know... When I ran into him he was coming out of the big reactor room... Yes, yes, he was in the reactor room... What? Apparently not. They already know about it at the central station."

Urm did not bother to listen. He went into the foyer and there stopped stock-still, redoubling the movements of his black locator horns. Something large, gleaming, and cold hung on the opposite wall. It seemed in infrared to be a grey, impenetrable square, and it flashed and shone silver in ordinary light, but this was not what confused Urm. In the strange square stood a black monstrosity with wiggling horns on its head, which was round like a schoolroom globe, and Urm could not understand just where it was located. His visual diastimeter instantly informed him that it was twelve meters, eight centimeters to the unfamiliar object, but his locator negated this report. *There is no object there. There is a smooth, nearly vertical surface at a distance of... six meters, four centimeters.* Urm had never before seen the like, and his locator and his visual receptors had never before given him such contradictory readings. At the beginning of his existence a desire had been inlaid in his very physical being to make everything he happened to come into contact with clear and understood. So he resolutely walked forward, noting and recording on the way the relation that had emerged: "The distance according to the visual diastimeter is equal to the distance

according to the locator, divided by two"... He walked into the mirror. The glass flew apart in a clangorous rain of shards, and Urm, leaning against the wall, stopped. Clearly, there was nothing left to do here. Urm scraped at the wall, sniffed, turned; paying no attention to the police officer on duty who, white as a sheet, was hanging from the lever of the air-raid siren, and, crunching through broken glass, he strode towards the exit. The driving snow surrounded him.

As Nikolai Petrovich was throwing down the handset, Piskunov was already in the entryway, hurriedly buttoning his fur coat.

"Where are you going?"

"There, of course..."

"Wait, we have to decide what to do. If that hunk of metal starts horsing around in the electrical station..."

"It'll be fine if it's just the electrical station," Ryabkin interrupted him. "What about the lab? Or the warehouse? Or what if he drops by over here, in the village?"

Nikolai Petrovich was thinking intensely. Piskunov shifted impatiently from one foot to the other, holding onto the doorknob.

"We have to run over there all together," gingerly suggested Kostenko, "Find him and... well, grab him!"

Piskunov just winced, while Ryabkin, rooting around the rack in search of his fur coat, shouted angrily, "That's a great idea: grab him! What do you think we should grab him by? His pants? He weighs half a ton, one of his fists can punch with a force of three thousand kilos. It's ridiculous. You're new here, Kostenko, so you should just keep quiet..."

"Everybody listen," said Korolev. "Here's what we'll do. I'll call the dorm and raise the student trainees. You, Ryabkin, run to the motor pool... Dammit, everyone is probably at the club... Run over there anyway, find at least three drivers. We have to get the tracked bulldozers... Is that right, Piskunov?"

"Yes, yes, and as soon as possible. But..."

"Piskunov, you get over to the Institute. Figure out where Urm is and call the motor pool right away. Kostenko, you go with him. Clear? I just hope that devil doesn't get through the gate!"

Jostling and stepping on each other's feet, they tumbled out onto the porch. Ryabkin slipped and butted his head into Kostenko's back, and Kostenko fell on all fours with a crash.

"Dammit, just dammit!"

"What, your glasses?"

"No, everything's fine."

A fierce wind drove clouds of dry snow over the ground, mournfully howled in the power lines, and hummed deeply in the iron lacework of the high-voltage towers. Dim rectangles of light fell from the windows of the cottage, and all else was plunged into impenetrable darkness.

"Well, I'm off," said Ryabkin. "Be careful over there, friends, don't stick your necks out if you don't have to."

He stumbled again and for a minute floundered in the snowdrift, muttering obscene obscenities at the damned snowstorm, that pig of an Urm and generally all those accessory to the incident. Then his light-colored fur coat was glimpsed by the wicket gate before it disappeared in the eddies of swirling snow.

Piskunov and Kostenko were left alone.

Kostenko huddled up against the bitter cold.

"I don't understand," he said. "What on earth are the tractors for?"

"And what would you recommend?" inquired Piskunov.

"No, I just don't understand... Do you want to destroy Urm?"

Piskunov exhaled sharply.

"Urm is a unique machine, the creative result of the last several years of work by the Institute of Experimental Cybernetics. Do you understand? Why would I want him destroyed?"

He lifted up the tails of his fur coat and made his way through the snowdrift. A confused and timid Kostenko followed after him. The snow-covered field lay before them, the highway behind them. Right across the highway was the electrical station.

So as to shorten their path, Piskunov turned off of the highway and went through the vacant lot where a foundation pit had been excavated in the fall for a new building. Kostenko could hear Piskunov muttering something as he stumbled over an ice-covered pile of bricks and rods of rebar. It was difficult going. Beyond the shroud of the snowstorm they could just make out the Institute's sparse chain of lights.

"Wait a second," Kostenko said finally. "By God, it's hard going! Let's rest for a minute."

Piskunov squatted down next to him. What had happened, after all? He knew Urm like no one else at the Institute. Every little screw, every electrode, every lens of that marvelous mechanism had passed through his hands. He had thought he could calculate and predict each of his movements under any circumstances. And now this. Urm had "willfully" come out of his basement and was now strolling around the electrical station. Why?

Urm's behavior was governed by his "brain," an extraordinarily complex and delicate apparatus composed of germanium-platinum foam and ferrite. While an ordinary digital machine has tens of thousands of circuits (the elementary parts that receive, store, and deliver information), Urm's brain employed nearly eighteen million logic cells. They held the programmed reactions for a multitude of situations, for different variations of changes in circumstances, and they anticipated the execution of an enormous number of different operations. What could have influenced the "brain," the program? Emissions from his atomic engine? No, his engine is surrounded by thick shielding made of zirconium, gadolinium, and boron steel. In practical terms, not a single neutron, not a single gamma ray could pierce the shielding. Then his receptors? No, the receptors had been in ideal working order just this evening. Then the whole of the matter is in the "brain" itself. The program. The complex new program. Piskunov himself had overseen the programming and... The programming... That was it!

Piskunov stood up slowly.

"A spontaneous reflex!" he said. "Of course, it's a spontaneous reflex! I'm an idiot!"

Kostenko looked at him fearfully.

"I don't understand..."

"But I do. It's obvious... But who would have thought? Everything was going so well."

"Look!" Kostenko suddenly yelled.

He gasped and jumped to his feet. The greyish-black sky over the Institute was lit up by a tremulous blue explosion, and against this blaze, surprisingly well defined and at the same time unreal, the silhouettes of black buildings sprang up out of the whirling of the snowstorm. The sparsely lit chain of lights that defined the walls of the Institute blinked and went out.

"It's the transformer!" said Piskunov hoarsely. "The substation's right across from the reactor tower. That's where Urm is... and the guards..."

"Let's run!" Kostenko proposed.

They set off running. This was no simple matter. The oncoming wind swept them off of their legs, and they tripped in holes filled with dry snow, fell, got up, and fell again.

"Faster, faster!" Piskunov urged.

Tears, either from the wind or from the excitement, covered his face, froze on his eyelashes as blurry little drops of ice, made it hard for him to see. He grabbed Kostenko's arm and dragged him, still muttering hoarsely:

"Faster, faster!"

Apparently, the explosion over the Institute had been noticed in the village. On the outskirts, a siren began howling anxiously, the windows of the cottages where the guards were stationed lit up, and the blinding ray of a searchlight skimmed over the field. It plucked snowy barchans and the latticed pillars of the of the high-voltage towers out of the darkness, slid along the stone wall that surrounded the Institute, and, finally, came to a stop at the gate. Next to the gate small black figures moved around rapidly.

"Who's that... over there?" asked Kostenko, catching his breath.

"The guards. The police, probably..." Piskunov stopped, wiped his eyes, his voice was failing him. "They've locked... the gate. Good thinking! That means... Urm's still over there."

Apparently, the alarm had been raised. Now not one, but three searchlights were feeling along the walls of the Institute. One could see snowy whirlwinds dancing in the blue light. Through the noise and the wind's howling the sound of shouts reached them; someone was cursing angrily. Finally, motors roared to life, the clank of treads could be heard. The gigantic bulldozers were coming out of the vehicle fleet.

"Look, Kostenko," said Piskunov. "Look closely. We are present at the most unusual round-up in the history of humanity. Look closely, Kostenko!"

Kostenko looked skeptically at Piskunov. It seemed to him that tears were running down the engineer's face. Of course, they could have been from the wind.

Meanwhile, they could now hear the clank of treads not only from behind, but also to the right. The bulldozers were on the highway. They could already see the shaky sparks of headlights. There were five such sparks.

"Five against one," whispered Piskunov. "He doesn't have a chance. His spontaneous reflex arc won't help him here."

And then something suddenly changed all around them. Kostenko could not even tell right away just what had happened. As before, the snowstorm howled; as before, clouds of dry snow tore around over the ground; as before, the motors of the bulldozers roared, threatening and confident. But the searchlights were no longer gliding along the field. They had come to a dead stop at the gate. But the gate was wide open, and no one was next to it.

"What the devil?" said Kostenko.

"Surely he didn't..."

Piskunov did not finish, and, not bothering to consult one another, they set off running to the Institute. They were not two hundred meters from the gate when Piskunov, running in front, flew into a



man with a rifle. The man cried out in terror and was about to flee in another direction, but Piskunov grabbed him by the shoulders and stopped him.

"What's happening?"

The man crazily turned his head, clad in its police cap, swore, and finally came to his senses.

"He broke out," he said. "He broke out. He pushed the gate over and left. Almost stomped on Makeyev. I'm heading into the village for back-up..."

"Where did he go?"

The police officer waved to the left without conviction.

"That way, I think... To the highway..."

"That means he'll run into the tractors any minute. Let's go."

They would remember what happened next for the rest of their lives. Out of the whirling snowy darkness something huge and formless came towards them, red and green blinking lights stung their eyes, and a sharp voice with no intonation pronounced,

"Hello, how do you do?"

"Urm, stop!" screamed Piskunov desperately.

Kostenko saw the policeman run, saw Piskunov raise his arms and shake his fists. Then a monstrous figure, wreathed in steam, a baleful scarecrow, went past him, raising high its legs, thick as logs, and melted into the snowstorm.

After carefully closing the door behind him, as he always did if the door was not broken, Urm took a step and stopped. Everything around him was full of sounds, movements, and emanations. He saw the night as a multicolored faery kaleidoscope of radio waves. Thirteen and a half meters in front of him was a squat building with wide windows, covered with iron grating. Its walls emitted bright infrared light. From the building he heard a low, powerful hum. A million snowflakes swirled around in the air. As they settled down on Urm's faceted sides, hot from the fire of his atomic engine, they instantly melted and vaporized.

Urm swiveled his head and decided that the nearest and most interesting object of study could only be the squat building across the way. He found the entrance immediately, noting a path on the downwind side. Low fir trees were planted all around the building, and pausing for a moment, he broke off one of them and examined it. Then he opened the door and went in.

Two humans were sitting next to a table in the close, narrow little room. As he appeared they leapt up and stared at him in horror. He closed the door behind him (and even threw the bolt) and stopped before them.

"How do you do?" he said.

"Comrade Piskunov?" one of the humans asked in confusion.

"Comrade Piskunov has stepped out. Would you like to leave a message?" Urm informed him coolly.

The humans did not interest him. His attention was drawn by a small, hairy creature that was cowering against the wall. *Warm, alive, smells strongly, not a Human*, determined Urm and said, "Hello, how do you do?"

"Grrr..." answered the creature with a bravery born of despair, baring its sharp, white teeth and pressing still more firmly into the corner.

Urm was absorbed by the dog and completely indifferent to the fact that the policemen had deftly barricaded themselves behind the table and filing cabinet and had begun to hurriedly undo their holsters.

Whining piteously, with its tail between its legs, the little dog dashed past Urm. But Urm was far more nimble than a dog. He was more nimble than the most nimble animal in the world. His torso turned a half circle in a lightning-quick and silent motion, and a long extending arm, like a telescope, snatched the dog up by its side. At that moment a shot rang out: one policeman's nerve had failed him. The bullet rang off the armor that covered Urm's back, and ricocheted deep into the wall. Plaster rained down.

"Sidorenko, stop shooting!" yelled the other policeman.

Urm released the quivering little dog and set his sights on the humans, pale but very resolute, holding their weapons at the ready. He sniffed the air with curiosity. The unfamiliar smell of smokeless gunpowder was diffusing in the air. The little dog cowered under the policemen's legs, but Urm had already lost interest in it. He turned and went to the next door, which was adorned with the image of a skull and crossbones pierced by a red lightning bolt. The policemen, struck dumb in wonderment, watched his clawlike fingers fumbling with the ribbed barrel of the lock. The door opened. Then they got a grip on themselves and both raced after him:

"Stop! Get back! You can't!"

They clung to his armored sides, grabbing his pillar-like legs, hot as a stove, forgetting everything in the world in terror at the single thought of what chaos this iron monster could wreak in the substation. But Urm simply did not notice them. Their efforts made no impression whatever on him; they may as well have been trying to stop a moving tractor. Then one of them, pushing his comrade aside, emptied his entire magazine into Urm's head, point-blank, from below. The substation chamber, flooded with light, rang with the din of gunshots.

Urm reeled. The ebonite shell of his right acoustic receptor flew apart in splinters. His crooked locator horn broke loose and hung there, dangling on a wire. The sound of broken glass rang from the ceiling.

Urm had never before been subjected to an attack. He lacked an instinct for self-preservation and had no experience fighting with humans. But Urm could put facts together, could make logical conclusions and choose a behavior path that maximally ensured his safety. All these mental operations took him a fraction of a second. In the next moment he turned around and started towards the humans, threateningly displaying his terrible claws.

The policemen split up. One ran behind the panelboard, and the other leapt behind the massive steel housing of the closest transformer, hurriedly reloading his pistol.

"Sidorenko! Run to the watchman's booth, call them, raise the alarm!" he shouted.

But Sidorenko had no success in running to the door. Urm moved far faster than a human, and the moment the policeman came out from behind the panelboard, Urm took two steps and stood before him. Then the humans resolved to run out simultaneously. This, too, was unsuccessful: Urm zipped from the panelboard to the transformer with the speed of an express train.

The panelboard broke in half from Urm's ungainly lunging, the wind whistled through the bullet holes in the windows and the glass ceiling.

Finally, Urm got tired of that game, and he resolved to leave the humans in peace. He stopped suddenly in front of the transformer and decisively thrust his hands under the housing. The policemen took this opportunity to go hurtling headlong to the watchman's booth. At the same instant, a deafening crack rang out, everything around was lit up by a blinding blue flash, and the lights went out. The acrid smell of burnt metal, smoke, and hot varnish poured out of the room. The deafened, dispirited policemen did not comprehend right away what had happened. And then the watchman's booth shivered from heavy footsteps, and a reedy voice pronounced in the darkness:

"Hello, how do you do?"

The door bolt clicked, and the door opened with a creak. For a moment the outline of the iron monster could be seen in the dim rectangle, and the door closed once again.

Urm walked around the grounds of the Institute, sinking into the snow and lifting his legs high. The Institute was plunged in darkness, and darkness offered little to help even Urm's infrared vision. He could make out only the weak radiance around his stomach and legs, on which snowflakes melted and vaporized. A few weakly phosphorescent human silhouettes could be glimpsed between the buildings. Urm paid no attention to them and went along, orienting himself by locator readings – though one locator horn had been smashed by the bullet, making it impossible for him to determine distances correctly.



The faraway lights of the village, barely visible gleams through the snowstorm, drew Urm's attention. Then the bright blue rays of the searchlights blazed on. He went up to the wall, hesitated for a moment and turned left. He was well aware that walls always have doors. And before long he ended up at the gate. It was a large gate, made of iron. The main thing, though, was that it was locked. On the other side of the gate he could hear the alarmed voices of the humans; a bright blue light pierced through the chink.

"Hello," said Urm, and heaved at the gate. The gate did not give way: it was firmly locked. From somewhere far away he could hear the clank of metal. There, beyond the gate, something very interesting was taking place. Urm pressed harder, then stepped away, threw back his head and struck the gate at a run with his armored chest. The voices beyond the gate fell silent, and then someone yelled uncertainly:

"Back! Hey, careful you don't shoot that devil!"

"Hello, how do you do?" said Urm, ran back and struck again. The gate collapsed. The bolt turned out to be stronger than the hinges built into the concrete wall, and the gate fell flat as a plank onto the snow. Urm walked over it past the scattered policemen and plunged into the snowstorm that was raging in the open field.

He marched onward, continuously struggling to recover his balance on the dug-up earth covered by a swelling sea of dry snow. Suddenly, an emptiness opened up beneath him, and he fell. The snow sizzled underneath him. He had never fallen before, but an instant later he had already dug his hands into the earth, extended them to their full length, and drew his legs up under him.

He regained his footing and stood for a moment, looking about. The lights of the cottages gleamed before him. To the left, very close by, loomed three human figures; further away vehicles growled, moving towards the gates in a line. Urm turned to the left. Going past the humans, he recognized one of them as the Master. The Master could deprive him of his ability to move. Urm remembered this very well and began to walk faster. The Master dropped out of sight behind him in the whirls of the shifting snow.

He emerged on a flat place where the snow was plowed smooth. A bright light illuminated him from head to foot. Unwieldy metal monsters, carrying heavy shields before them, moved towards him and came to a stop, snorting angrily.

Urm stood five steps from the lead bulldozer, slowly turning his round head to the right and to the left and repeating:

"Hello, how do you do?"

Nikolai Petrovich Korolev jumped down from the tractor. The driver yelled in a panic:

"Comrade engineer, where are you going?"

At that moment, Piskunov appeared on the highway. Disheveled, his hair standing on end (his fur hat was left behind somewhere in the vacant lot), his hands thrust deep into the pockets of his wide-open fur coat, he went around the bulldozer and stopped before Urm. There were not more than five steps between them. Urm loomed like a giant over the engineer, like a tower, his faceted sides gleamed in the headlights, his stomach, wreathed in steam, shone with moisture; his round head with its large glass eyes, splayed-out receptor ears, and locator horn resembled the frightful and ridiculous pumpkin masks that village boys use to scare girls. His head danced smoothly as his eyes followed Piskunov's every move.

"Urm," said Piskunov loudly.

Urm's head froze in place; his articulated arms were glued to his sides.

"Urm, listen to my command!"

Urm answered:

"I am ready."

Someone laughed nervously.

Piskunov stepped forward and placed his gloved hand on Urm's chest. His fingers quickly slid along the armor, feeling for what would settle the matter: the switch that linked the computational-analytic portion of Urm's brain to his power and movement system. And then something unexpected happened, unexpected for everyone

except Piskunov, who feared it more than anything. Apparently, Urm's memory had saved an association linking this movement by the Master to an instant inability to move. Piskunov's fingers had barely touched the key when Urm turned sharply. His armored hand cut through the air above the head of Piskunov, who just managed to duck, and Urm, in no rush, started back along the highway. Nikolai Petrovich was the first to come to his senses.

"Hey, guys!" he yelled. "Bring the bulldozers around from the right and the left. Cut off his path to the gate... Piskunov, hey, Piskunov!"

But Piskunov did not hear him. While the bulldozers crawled in both directions away from the highway, diving into the clouds of snow, he set off running after Urm.

"Urm, stop!" he yelled in a high, breaking voice. "Stop, you brute! Come back! Back!"

He ran out of breath. Urm was going ever faster, and the distance between them gradually widened. Finally, Piskunov stopped, shoved his hands into his pockets, and, drawing his head into his shoulders, watched him go. Nikolai Petrovich and Ryabkin ran up to him. Kostenko came up last.

"What's gotten into you?" asked Korolev angrily.

Piskunov did not answer.

"He's not obeying," he said. "You understand, Kolya? He's not obeying. It's clearly a spontaneous reflex."

Nikolai Petrovich nodded.

"I was thinking the same thing."

"Obviously!" exclaimed Piskunov. "You'd have the same degree of success letting a train pick its own time and itinerary..."

"What's a spontaneous reflex?" asked Kostenko timidly.

No one answered him.

"And just the same, in spite of everything, this is really something." Nikolai Petrovich blew his nose and shoved his handkerchief into his inner pocket. "He's not obeying! Of all things..."

"Let's go!" said Piskunov decisively.

Meanwhile, the bulldozers had spread out in a half-circle and began to converge around Urm, who was unhurriedly shuffling along the highway. One of the bulldozers crawled out onto the highway ahead of him, with its back end to the gate, another came up at him from behind, the remaining three approached from the sides: two from the left, one from the right. Of course, Urm had long since noticed that he was being surrounded, but he probably thought nothing of it. He continued moving along the highway until his chest ran up against the bulldozer. He pressed, the tractor teetered just a bit; the driver grabbed at the levers with a tense face. Urm took a step back and hit it at a run. Iron clanged against iron, and bright sparks could be seen cutting the snowy darkness under the straight beams of the headlights. At that moment the blade of the rear bulldozer hit Urm's back. Urm froze stock-still, only his head slowly turned on its axis, just like a school globe. From the right and left approached two more bulldozers and securely closed the remaining avenues of retreat. Urm found himself in captivity.

"Comrade engineers! Comrade Piskunov! What should we do now?" yelled the driver of the first machine.

"Comrade Piskunov has stepped out. Would you like to leave a message?" said Urm.

He took a swing and struck the blade. Then he did so again and again. He hit steadily, like a boxer in a training session, knocked back slightly with every blow, and splashes of sparks hailed from under the clanging of his club-like hands.

Piskunov, accompanied by Nikolai Petrovich, Ryabkin, and Kostenko, approached him.

"We have to do something quickly, or he'll disable himself," said Ryabkin anxiously.

Piskunov climbed without speaking onto the tread of the tractor, but Ryabkin grabbed him and pulled him back down.

"What's the matter?" asked Piskunov with annoyance.

"You're the only person who knows Urm intimately. If he lays you out... this whole thing could last for months. Someone else should do it."

"He's right," said Nikolai Petrovich hastily. "I'll go."

One of the workers who were standing around the engineers broke in:

"Maybe you could choose one of us? We're younger, quicker..."

"I'll do it," said Kostenko somberly.

"That won't work," said Nikolai Petrovich. "Don't let Piskunov go."

He threw off his fur coat and climbed onto the tractor. Then Piskunov tore loose from Ryabkin's embrace.

"Let me go, Ryabkin."

Ryabkin did not answer. Kostenko approached from the other side and firmly gripped Piskunov by the shoulders.

And Urm was raging. The lower half of his body was securely clamped by the bulldozers, but the upper part moved freely, and he turned from side to side with lightening speed, pounding the iron blades with backhanded blows of his steel fists. Shreds of steam circled above him in the snowy darkness. "The force of one blow of his fist is three thousand kilos," recalled Kostenko.

Nikolai Petrovich, setting his teeth, squatted down between the bulldozers at Urm's feet and waited for the right moment. His ears hurt from the clanging and crashing. He knew that Urm had noticed him: the glass eyes, now and then glimmering warily, would turn to him.

"Easy, easy," whispered Nikolai Petrovich soundlessly. "Easy, my dear Urm. Take it easy, you scoundrel!"

Some sort of new sound arose amid the blows, something cracked, either Urm's steel hand or the blade of the bulldozer. There was no more time to delay. Nikolai Petrovich dove under Urm's fist and pressed up to his side. And then Urm surprised everyone. His arms fell to his sides. The crashing ceased, and once again they could hear the snowstorm howling over the field and the tractors snorting. Nikolai

Petrovich, pale and sweating, straightened up and reached his hand to Urm's chest. A dry click rang out. The green and red lights on Urm's shoulders went out.

"It's over," Piskunov croaked out and closed his eyes.

People began talking right away in exaggeratedly loud voices; laughter and jokes could be heard. The drivers helped Nikolai Petrovich get out from under Urm and lowered him to the ground. Piskunov embraced and kissed him.

"And now," he said abruptly, "to the Institute. We will work. It will take a week, a month... We'll have to beat this nonsense out of him and finally make him an Urm: a Universal Roving Machine.

"But what was it that happened with Urm?" asked Kostenko. And what is a spontaneous reflex?"

Nikolai Petrovich, tired and drawn after the sleepless night, said, "You see, Urm was constructed by order of the Department for Interplanetary Communications. He differs from other highly complex cybernetic machines in that he is intended for work in conditions that cannot be predicted by even the most ingenious programmer. On Venus, for instance. Who knows what the conditions are there? Maybe it is covered by oceans. But maybe by deserts. Or jungles. For the time being people cannot be sent there: it's too dangerous. Urms will be sent, dozens of Urms. But how should they be programmed? The trouble is that, at the current level of cybernetics, it is still impossible to teach a machine to 'think' abstractly..."

"What do you mean?"

"For a machine there is no general dog. There is only this one, that one, a third dog. If it meets a fourth dog that doesn't resemble the first three, the machine won't know what to do. Roughly speaking, if Urm is programmed for a definite reaction only in relation to a mutt, he will be unable to react the same way in relation to a pug. It's a simplistic example, of course, but I presume that you understand me. And *this* is one of the basic differences between the smartest machine and the dumbest person: an inability to operate in abstract categories. Anyway,

Piskunov attempted to compensate for this shortcoming by creating a self-programming machine. He gave Urm's 'brain' a reflex chain, the essence of which boils down to filling vacant memory cells in a self-governing fashion. Piskunov calculated that, once he "fills up on impressions," Urm will be capable of picking the most beneficial line of behavior for every new event. This is the most advanced model of consciousness in the world. But we got an unexpected result. Well, Piskunov had theoretically allowed for such a phenomenon, but in practice... To put it succinctly, the new reflex arc generated dozens of secondary reflexes not anticipated by the programmers. Piskunov has christened them spontaneous reflexes. With their appearance, Urm ceased to function according to his basic programming and began to 'direct himself.'"

"What do we need to do now?"

"We'll try a different approach." Nikolai Petrovich stretched and yawned. "We will perfect the analytic capabilities of the 'brain,' the receptor system..."

"But what about the spontaneous reflex? No one is interested in it?"

"Oh, Piskunov has already thought something up... In a word, the first ones on unexplored planets and in unexplored oceans will still be Urms. We will not have to risk people... Listen, Kostenko, let's get some sleep, OK? You'll be working here and will learn everything, I give you my word."

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MIKHAIL ANCHAROV

1961

## SODA-SUN

*The author of a hypothesis implicitly acknowledges the possibility of a mistake, so that in the course of rigorous experimentation the hypothesis can be overturned, verified, or transformed into something different.*

— Academician N. Semenov

*The richest ideas are the most specific and subjective ones. That which is truly individual represents infinity in embryonic form.*

— V. I. Lenin

### 1. For What, Actually?

**They said that he wasn't serious, just chasing after sensations. As I left, I looked at him and thought that it was the other way around: he's very serious, because he seriously loves what is sensational. This was his position:**