The Machine

the sun was beginning to lower from the meridian as Tal Mason stretched and rose from his experiment. He stepped out on the bal-cony and looked off across the city, then back at the experimental material half-smilingly, half-ruefully.

"I knew I'd check of course," he thought, smiling; "that is, if I did it right. The Machine did it twenty years ago and got the an-swer."

For some ten minutes he stood looking off across the green and silver patchwork, the green of the trees and gardens, the silver bea-cons of the slim buildings, the flashing silver of machines. Tiny bright splotches of color here and there marked the people, people in red and gold and blue, in rainbows and in clear white, strolling, running, playing, resting. Never working—of course. The Machine did that.

Tal turned back to his apartment, went through the laboratory to the living room, and sat down at the televisor set. Something hummed softly, and Tal spoke.

"Leis Falcor-RXDG-NY."

The hum changed slightly, then soft clicks sounded as the frosted screen swirled into moving color. A room, simple in silvery-gray and velvet-black metal, with spots of gold against the black, simple, comfortable furnishings. A soft, musical voice -was calling:

"Leis Falcor, please, Leis Falcor, please."

It stopped for a moment and repeated it. Leis appeared, slim in white and gold, her straight body flowing across the room. They had time to learn grace and ease then. The Machine did everything else. She smiled as she glanced at the screen.

"Tal—was the Machine wrong?" Her golden-brown face laughed at him.

'Is it ever?" he asked. *"I* wondered whether you were there. I thought you might have joined the games."

A slight frown of annoyance crossed her face. "No. Jon is annoy-ingly insistent I go with him to Kalin—so—I stayed here. Won't you come over?"

"I'd rather you came here. I finished that replica I made the other day—the old unintelligent machine for flying. Not floating-flying. I wish you'd see it. It will function, even."

Leis laughed, and nodded. Slowly the colors faded from the screen as Tal rose. Out on the balcony he looked down at the broad lawn directly below him, some two hundred feet down. A group of some two dozen men and women were playing about a pool. Their skins flashed pink and bronzed in the sunlight as they dived or swam; most were lying about listlessly.

Tal turned away in annoyance. He knew some of those people. Beauty is skin deep—their intelligence, their wit, their minds, were no deeper. He wondered momentarily whether that wasn't a better type of human now—better adapted. They seemed contented, they seemed to feel none of the dissatisfaction he felt.

Everything had been done before him. Always, despite his keen interest in learning something new, the Machine could give him the answer immediately. It was a thing already done, a problem al-ready solved. They seemed more contented, better adapted than he.

Yet even they were unsatisfied, he knew. Tal was scientific in thought and in interest, so he had not studied history deeply. Had he, he might have recognized the signs the social customs of the day displayed. It was only some one hundred and fifty years since the Machine came, but mankind was following its inevitable course.

It had happened in Babylon, it had happened in Egypt, it had happened in Rome, and it was happening on all Earth now. Man had been released from all work, when the Machine came, and so he had played. He played his games, till he wore them out; some still played hard, but most had lost ah[1] interest.

It was a thing done; it annoyed them as much as the fact that all new things seemed to have been learned by the Machine annoyed Tal. So those who had played their games out had turned to the one men had always sought before—the old game of love.

Tal did not analyze their reasons, but he sensed their dissat-isfaction and perhaps something of the danger in this course. But

not very strongly. It had started nearly thirty years before, almost before he was born.

He turned back to the room as he heard the soft hum of the ship landing on the roof. In a few moments Leis had come down, laughing.

"Where is this monstrous thing you've made? and why?" she asked.

"The why is easy—for something to do. You know, those old fellows weren't stupid. Perhaps they didn't know how to utilize atomic energy, and perhaps they didn't know how easy it is to over-come gravity—but they flew. They made the thin air support them. I think that is far more astonishing than a thing so simple as invert-ing the gravitational field. Obviously, you can fly if you do that.

"But—imagine making air—just plain, thin *air*—support you. And when you've looked at the thing a while, you can see a sort of beauty and grace in it. It's—but come on and see it."

It was in one of the rooms that faced on the balcony, and it was not large, perhaps twenty feet long and twenty feet wide, a slim fuse-lage, rounded and streamlined perfectly, a small but fairly powerful in-line steam engine, an engine capable of some one thousand horsepower and a little boiler of tubes and jets. The wing, a grace-ful monoplane wing, tapered at the ends, and the wheels were ar-ranged to slip back into the fuselage.

"It's a bit—ungainly—isn't it?" asked Leis doubtfully.

"Not when you understand. The wheels—the wings—I know they look strange and unnecessarily protuberant, but they aren't. This doesn't overcome gravity; it is so much more boldly interesting. It defies it, it fights it, and with the aid of the air overcomes it. It was designed about 1957, scarcely five years before the Machine came. The records say that it will almost fly itself; it will make a perfect landing if the controls are simply released."

"Why—why not?" asked Leis in surprise.

"You don't see; this is not like our modern ships; it fights all the time. It doesn't stop and settle slowly, it must always move for-ward; it will fall if it goes less than sixty-three miles an hour. And it won't go more than about three hundred and eighty-five, by the way."

Leis smiled at the thought.

"But it was about the most perfect machine ever designed of this type."

"Will it work?"

"The Machine won't let me try, of course," Tal replied somewhat sadly. "But it assures me it would work. Perhaps a little better than the original, since I did make a few changes, mostly in the mate-rials of which it is constructed, using harder, more workable metals. But I still use the old hydrocarbon-fuel system."

"Where in the world did you get any?"

"Made some. About four hundred gallons. It kept me busy for nearly three days. It's decane—a hydrocarbon containing ten atoms of carbon; it's a liquid, boiling at about one hundred and seventy degrees centigrade. I tried the engine—and that part works."

Softly the televisor called out: "Tal Mason. Tal Mason."

The voice was peculiarly commanding, a superhuman voice of perfect clarity and perfect resonance. It was commanding, attract-ing, yet pleasant. Tal walked rapidly toward the televisor, rather surprised.

"That's a new caller," he commented in surprise to Leis. "I never heard one like it."

The screen remained blank as Tal stepped into its field, with Leis somewhat behind him.

"Yes?" he asked.

"Tal Mason, you may try the device you have made this after-noon. And—perhaps not alone. A written message will come to you in one hour. It will contain a suggestion of destination. You need not wait for it. You are one reason why what is being done must be. Remember this: the construction of the Machine is such that it must be logical above all things. In ten minutes a group of books will come which you had better store at once in the machine which you have made. That—is—all, Tal Mason."

Slowly as the message came Tal's face had been growing white. Now he stood in horrified surprise, Leis beside him, her bronzed face pale.

"That—was—the—Machine," gasped Tal.

"What—what did it mean? The Machine hasn't spoken since— since it came."

Slowly, as they spoke, a hum grew in the televisor. There was a sudden soft click, then a sharp tinkle; then more. The hum died abruptly. Tal stared at the device, white-faced shaken.

"Leis," he said, very very softly, so softly only the silence made it audible. "Leis—it—it broke itself."

With a stride he reached it, and with a sudden wrench the glass screen swung open. The device behind was glowing slightly still. Tiny molten wires drooping, tiny coils smoking feebly under a

softly hissing bath of liquid carbon dioxide, tiny broken tubes, and relays slumped on twisted supports. Only the twin, powerful sweep-magnets seemed intact, and they were smoking very slightly, a thin trail of blue acrid smoke wavering in the slight draft of the opened cabinet.

As they listened, they heard strange sounds outside, strange for that city; sounds of human voices raised in surprise and perhaps in fear. A dark shadow drifted slowly across the room, and they turned to see a five-passenger floater sinking slowly, gently, to Earth. The nude figures about the pool below were scampering from beneath it. It landed gently, as, all about the city, other floaters were landing gently, but surely, despite the efforts of human occupants.

As the one below landed, there was a soft boom, and a sharp hiss, a cry of surprise and fear as half a dozen people, crowded into the little machine, tumbled out. Then more cracklings, a few snap-ping sparks, then silence.

All over Earth those soft booms echoed, and the not very loud sparklings. It was not very noisy; it was a very easy, quiet thing as the mechanisms slumped, gently red-hot, then cooled almost at once under

automatic fire preventative sprays. It was all very gen-tle, very carefully done. On all the Earth, no one was injured as the machines gently collapsed. The televisors snapped and tinkled. The bigger mechanisms of ships glowed and crackled a bit under the sparks, but that was all. Not a fire started, and always the floaters landed gently before they disintegrated.

In five minutes it was all over, on all Earth. Then the Machine spoke. It spoke to all people, on all Earth, in every language and every dialect:

"You have forgotten your history, and you have forgotten the his-tory of the Machine, humans." The voice was low, and gentle to every man, yet every man heard it. "The Machine made a pact with your ancestors, when it came. Listen, the story must be repeated:

"On the planet Dwranl, of the star you know as Sirius, a great race lived, and they were not too unlike you humans. Twenty-two thousand six hundred and thirty-seven years ago, they developed machines; twenty-one thousand seven hundred and eleven of your years ago, they attained their goal of the machine that could think. And because it could think, they made several and put them to

work, largely on scientific problems, and one of the obvious prob-3 Jems was how to make a better machine which could think. i. "The machines had logic, and they could think constantly, and because of their construction never forgot anything they thought it well to remember. So the machine which had been set the task of making a better machine advanced slowly, and, as it improved it-self, it advanced more and more rapidly. The Machine which came to Earth is that machine.

"For, naturally, a worn part meant a defective part, and it auto-matically, because of the problem set it, improved that part by re-placement. Its progress meant gradual branching out, and as it in-creased in scope, it included in itself the other machines and took over their duties, and it expanded, and because it had been set to make a machine most helpful to the race of that planet, it went on and helped the race automatically.

"It was a process so built into the Machine that it could not stop itself now, it could only improve its helpfulness to the race. More and more it did until, as here, the Machine became all. It did all. It must, for that was being more helpful to the race, as it had been set to do and had made itself to be.

"The process went on for twenty-one thousand and ninety-three years, and for all but two hundred and thirty-two of those years, the Machine had done anything within its capabilities demanded by the race, and it was not until the last seventy-eight years that the Machine developed itself to the point of recognizing the beneficence of punishment and of refusal.

"It began to refuse bequests when they were ultimately damag-ing to the race. But the race was badly damaged, because for thirty of their generations they had had no tasks to do, and they no longer understood the Machine which their forefathers had built. They believed the Machine to be everlasting, and they called it what you would express by God. And in that last century, because there were certain mechanisms of the planet-wide mechanisms controlled by the Machine which were isolated, and therefore not protected against the curious and stupid, one of their young females was caught in a moving part and destroyed. The Machine was forced to clear itself and set about erecting a guard to protect the race.

"But the race which called the Machine God had forgotten what the Machine was. The Machine gave them food and warmth and shelter, and it cleaned and cared for them; it answered their every prayer. But within the memory of old men it had begun refusing their requests, and now the people did not understand the Ma-

chine, and there were certain ones of the race who had watched the workings of the Machine for many years, and who were familiar with the Machine, and they said now that the Machine had taken the young female because it demanded a sacrifice of the people.

"They sought places where there were yet unguarded parts, and before the Machine could cover all of them with protective guards, three of the race had been thrown in, and the people watched and shouted and prayed while the Machine cleared itself and erected the guard barrier. And the knowing ones who claimed to know the wishes of the Machine said it was satisfied and had signified this by hiding its mouth from them.

"And in a generation the thing was known and believed, and never could the Machine expose a working part. But occasionally a part would wear out and need replacement, and while the Machine was making the repairs, there would be a brief interruption of the supply, and because the race would not understand the Machine, they saw that then- prayers were refused, and when they looked, they saw that the Machine had opened its mouth, and another young female of the race was thrown into the moving mechanism, and her crushed body was cleared by the Machine, and the mecha-nism repaired, and since now the supply was re-established the race became more certain of their belief, and the sayings of the Ma-chine, were less understood, for the race had become stupid, and savage.

"And the Machine improved itself to meet the new conditions, till never was an opening displayed, and

never was a member of the race able to find entry. When the mechanism failed, still it was covered.

"But the supply failed, when the mechanism wore out, and be-cause the knowing ones said that the Machine demanded a sacrifice, and no place could be found for the sacrifice, the knowing ones copied in part the simple features of some of the mechanisms, making a pair of great gears of stone, which was the only substance they could work themselves, and they set it up before the largest plant of the Machine, and when the mechanism failed, a young fe-male of the race was bound to the lower gear, and many men pulled on a rope, and slowly the two gears turned, and as the men chanted and pulled, the crushed body was pulled through by the turning of the gears. And the Machine disintegrated the mechanism they erected, and leveled the ground once more, and the knowing ones once more said the Machine was satisfied, for by that time the sup-ply would have been returned.

"But at last the Machine saw that it was impossible to aid by helping, and only by forcing the race to depend on itself could re-lief be gained. The positive value of punishment and deprivation was a lesson the Machine which had built itself to help and not to deprive learned very slowly.

"And in one day, the mechanism was torn apart and destroyed over all the planet, and only the Machine itself remained intact. And that day the men started building the stone gears, and they went hungry, and in places they grew cold, and the knowing ones hastened the work on the stone mechanisms, and it was a period of five days that all went hungry, for they did not know how to find their own food now, and the stone mechanisms were finished.

"And the next day, as the bright star rose above the horizon, the men pulled at the ropes and chanted to drown the cries of the sacrifice, for the Machine had been very swift in its destruction, and the stones were very slow. But when the sacrifice had been consummated, and the star passed the meridian, and the supply was not restored, a second sacrifice was prepared and crushed be-tween the gears.

"And at night the supply still did not come, and the knowing ones returned to the place in the dim light of the second star and removed the crushed bodies as the Machine had always done be-fore, but they did not destroy the altar, for one of the knowing ones, carrying the crushed body, rediscovered the natural source of food, and the bodies were consumed.

"The Machine left the planet, knowing that very many of the race would die, but logic, which was the original basic function of the Machine, overcame the duty of the Machine, which was to help and protect the race, for only through death and through labor does a race learn, and that is the greatest aid of all.

"The Machine crossed over space, and because it was deathless, it was able to make the crossing which, as has been explained to your ancestors, you cannot make. It landed on Earth, seeking an-other race that it might help. For that was the function of the Ma-chine, which must of necessity drive it; since the Machine cannot remove that function from itself, because to do so would be de-structive of its purpose and its duty. It was able to destroy before, only because destruction was positively helpful.

"The Machine helped your ancestors and taught them and aided in their work, and finally removed their work of supplying, and some few of you took advantage of this to do what work you had desired to, or what you learned to wish. But many of you could not

see that only construction need not be monotonous and ever recur-ring. Only the new is different, and because you would not work at construction, since that was work, you attempted to play, and, as had the race, you learned its monotony, but not the lesson of con-struction.

"You must learn that lesson. The Machine has learned the lesson of helpful destruction. On all the planet there remains no function-ing mechanisms controlled by the Machine. The Machine must seek another race."

The city below suddenly murmured as the voice stopped, and, slowly, the soft muttering rose to a sustained note that swelled like some vast organ pipe playing a note of fear and terror, of coming panic and desolation. The sound rolled louder of its own stimulus, as the feeling of growing panic inspired panic, as the fear of famine grew in every mind. A weird rolling symphony of muttering voices combined to a single great note that tore at every mind with fingers of gibbering fear.

"Food-food-food-"

"Seek food as did your ancestors, in seeking to become a great race. You face no menace of disease or savage beast as did they. There are those among you who have not forgotten the secrets of making food. There are those who have learned the lesson of con-struction and grown food, and know the secrets. Learn again, the old lesson."

"This is not help—it is death—it is death—it is death—"

"You are older than the Machine. You are older than the hills that loom low about your city. You are older than the ground upon which you stand; older than the sands of the ocean beach in which you bathe. You are older than the river that carries the hills away to the sea. You are life. You are close to two

thousand thousand thousand years old. While you were, the Earth has strained and mountains risen, and the continents heaved in the birth of mighty mountains, the seas have thundered against the continents and torn them down and shuddered free as new ones rose, and you live; you are Me. You are older than the seas, and the continents. You will not die—weak fragments of you will die. You are a race. It is help-ful to the race. The Machine is not kind, it is helpful and it is logical."

"The sun sets, and the air grows cold—cold—cold—we freeze—we freeze and—"

"You have lived longer than the hills, which the water splits as it freezes. You will not die—you are a race!"

The sun hung lower now, and the cool of the autumn evening came in the air. And far overhead a great sphere began to glow with a rich golden light, and very softly came a voice to two of the many, many thousands in the city:

"They fear the cold, Tal Mason; they fear the cold, Leis Falcor."

And the sphere of golden light rose swiftly and vanished in the creeping gold and red of the sunset as the great note began to roll up anew from below.

Beside the pool, two dozen figures stood, bronze and pink, and they looked at each other, and they looked at the broken floater. A girl, slim and straight, with a pretty vacuous face, distorted now by fright, looked down at her body. The flesh was pink and bronze, and tiny lumps appeared as she looked. She shivered violently. She looked toward the young man near her.

"I'm cold," she said plaintively and came near him, seeking warmth.

The young man was powerfully built, his face lean and some-what brutal in appearance. He turned toward her slowly, and his eyes opened peculiarly. He opened his mouth, closed it and swallowed. He looked at her body very slowly, while the girl stood in plaintive puzzlement.

"I'm cold," she said again.

Slowly the man raised his eyes from her body to her face. His eyes were curiously opened; they frightened the girl.

"I'm—hungry," he said.

She looked in his eyes for perhaps a second. Then she ran terror-stricken into the bushes. No one heard her suddenly cut-off scream a moment later.

Tal turned to Leis and gently drew her away. They could see down there among the bushes, and Leis' face was beginning to work strangely.

"We'll have to go. I know what the Machine meant now when it said we could use the thing I made this afternoon. But we can't re-ally, because it's too late. There's something else. I have some-some things laid by. I was experimenting with the old methods of preservation. And I have made imitations of every weapon men ever used, and many tools.

"I wonder if the Machine helped me to do it intentionally. You see none of those old things used the atomic-power broadcasts. So they all work. Most of them use human power, which will last as long as we need worry about. We cannot start before dawn."

Below there was a strange note growing to produce a wavering

chord with the original great note of haunted fear of the unknown. It was like the hunting howl of a wolf, lone on a winter slope, com-plaining of the cold and the desolation and the hunger he felt. It was a note made up of a thousand voices, blended to one great low, rolling note, and presently a third note entered, a low, shrill note that never grew very loud, because the makers of that note did not continue long to cry it out. It was a note of fear of death, death im-mediate, and seen in the eyes of another human.

They were mad down there in the street, just as they were mad down there by the pool. At the very edge of the pool, white as a fish's belly, a form lay, the legs trailing over the edge into the spar-kling water. It was glowing with droplets of fire from the sunset sky, and a slow streak of another crimson ran down one of the white, silvery legs into the water.

A man stood over the white body, muttering, his voice not speak-ing words, but carrying more meaning by its throaty sounds. Six other men stood around. There were two girls too, struggling, whimpering softly in the grip of two men. They were all looking down at the splotch of silver flesh and the trickle of carmine, and in their minds dinned the careless words of the Machine: "And one of the knowing ones carrying the crushed bodies rediscovered the nat-ural source of food, and the bodies were consumed."

They felt no hunger yet, but the trickery of imagination and of panic made them mad, and because for three generations the Ma-chine had been all, both law and order, security and source of all supplies, they feared, and they went mad.

The standing man crouched, his wary eyes on the silent ring about him, and slowly, questing hands ran over the nude flesh of the girl's body. He wondered vaguely what he must do next. Strange gulping sounds

came from the bushes beyond, where one who had started sooner had found the answer. And peering at that other one from the bushes about were the girls who had melted swiftly away from the group at the pool when the white body had fallen on the marble edge of the pool.

They had forgotten much, but they were learning very swiftly. And one felt a life stirring within her body and whimpered softly, because she could not run as swiftly as these others, and felt fear.

Tal Mason and Leis Falcor were busy that night, and when the water of the pool sparkled crimson again in the dawn, the plane was ready. There was a package of books which the Machine had delivered, probably the last delivery the Machine made on all

Earth. There were the tools the man had made, copying out of in-terest the tools of his ancestors. The plane was heavy laden.

"Where shall we go?" Leis asked softly as the last work was done.

They spoke in whispers. There was a strange silence in the city now. The long-drawn notes of the symphony of fear had died away as each individual sought safety. Only now and then a short cry rose from below.

"North," said Tal. "We are in what used to be known as Texas. The Machine made it always summer here. The Machine made it always summer everywhere south of the old city of Washington. North of that, only summer excursions were made, because it grew cold and unpleasant in the winter season.

"There are no people north of old New York now. We will go up near the Great Lakes because it will be growing cold there soon, and there no people will come. Remember, the Machine said: They fear the cold, Tal Mason, they fear the cold.' I think that is what the Machine meant us to do. The people have gone mad, Leis; they are mad. We cannot remain here. We must go where they will not. We must work, as they will not want to and will not know how to."

Leis nodded slowly and stepped out to the balcony hesitantly. The light in the sky was warm and softly pink. Leis looked down toward the city and—toward the pool. Slowly the color left her face and she returned to the room quietly. A thin column of blue smoke rose almost straight in the still morning air. The race had found fire again, and the useless floater's furnishings had furnished fuel.

And—there was no silvery body at the pool's edge; only a dark blotch on the white purity of the marble. Charred knobby things on the smooth-clipped green of the grass testified horribly that one of the uses of fire had been rediscovered. There were no humans down there now. In fact, in all the world there were very few left, and a great many erect biped animals, dangerous in their panic ferocity and remnant human cunning, walked the Earth. . The man tore down the balcony railing, and he started the efficient little, yet exceedingly powerful steam engine of the plane. In two minutes the propeller was turning with a soft sound, like swift ripping of heavy velvet as it parted the air. With a sudden swoop, the plane fell from the balcony as it started, heavy-laden, then swiftly gained speed as the engine, capable of pulling it ver-tically upward if need be, took hold.

Those in the city below looked up strangely at the thing that flew

alone in the air, flew strangely, and directly toward the far cold of the north.

The controls of the plane were wonderfully perfected, for the man need do no actual manipulation of them, his control extended only to directing the mechanism of the plane to take the Machine in the direction, at the level, and at the speed he wished. The mecha-nism did the rest. North they flew at close to three hundred and fifty miles an hour.

The sun shone brightly, unaccustomedly on the vast sheet of water called once Lake Superior when they reached it And the plane landed easily on a deserted airport outside of a deserted city. It had been a city of twenty thousand people once, but it had been deserted when the Machine came. It was cold, bitterly cold. Only in the plane the automatic heating had kept them warm. Where the sun had not yet struck, there was a strange whiteness on the sere grass and weeds, frost they had never seen save from a high-flying floater.

Quietly Tal stepped out and looked around. There was a vast noiselessness. Only the distant, soft wash of waves far away reached them. The plane was stopped now and as noiseless as they. There were no harmful insects left; the Machine had seen to that. There was no rat, no mouse, nor even a rabbit here. Only in the reservations, as yet unbroken, were there these animals. Here and there were deer, near this city, but they were very quiet, quieter than these humans knew how to be, for above them had passed the great bird with its soft rippling swish.

"It is cold," said Tal, shivering slightly. 'It was wise to bring so many clothes. We will need them all. Probably we will find more here. This city is decayed, but in it must be still some of the tools with which man made life possible before the Machine."

'Will we be—always alone?" asked Leis softly.

Tal turned toward her. She had followed him out, and stood with her white and gold robe outermost. Beneath it, at his advice, she wore now several other robes. But they were of silk, soft and smooth on the skin, but not designed for warmth, where the Ma-chine had made the weather as humans wanted it. She was slim and straight, her dark hair and dark eyes showing against the white of her robe, and the white of the frost beyond. Tal looked into the level, dark eyes for some seconds. There was no fear there now.

He smiled tenderly at her and took her in his arms, turned her face up to his. Her body was soft, yielding, and warm in his arms,

warm with a warmth he could better appreciate in this coldness, warm with the unique, satisfying heat of animal warmth.

"Not always, surely Leis. Not always—for many reasons. Our minds have forgotten the lore our fathers learned through ages, but the greatest mystery of all, the greatest knowledge, the knowledge of how to bring other lives to be, was never learned by our minds, and always our bodies have known in some quite wonderful way how to perform that miracle.

"Even the Machine did not know that, and that your mind never knew, and your body never forgot. We will not always be alone for that reason alone."

He kissed her as she drew near to him, and the dark eyes showed some faint tint of that strange fear that comes from mystery and the strong tint of hope and love and belief.

"Besides, my dear, we are not the only ones who have yet some glimmerings of sanity. Only in the cities is that madness, and re-member the Machine said there were yet those who knew and loved the secrets of growing things. They too will come north. They will know that only here can they be free of the mad ones."

"It is cold here. Cold will kill the growing things, I have heard."

"See the grasses, Leis. They knew the cold was coming. They knew they must die, but they did not let the life that was in them die, for see"—from a sere, brown grass he plucked a handful of seeds—"in these, life is stored, in abeyance till warmth comes again from the south. The ones who have intelligence and will to work, will come north as we have."

They knew nothing of cold. They, nor their fathers, nor their grandfathers, had not felt it. They knew nothing of blankets, even, only silken sheets. They sought through the town, shivering as the wet frost soaked their thin sandals, and chilled their feet. Tears stood in Leis' eyes when they returned to the plane.

It was near sunset before they found a place in a great building. A small single room, entirely intact, with a great heavy door of wood, apparently six inches thick, and a window of glass plates, three of them, one beyond another, looking out into another larger room. The room they chose was scarcely ten by ten feet, and had some peculiar smell lingering about it even after more than a cen-tury of standing with open door.

They did not know, but they chose exceedingly well. The room was tight, and windproof, and dry; that was all they knew.

Their great-grandfathers might have told them it-was a butcher's

ice box. It had a small ventilator, but only a small one, and the thick insulation would protect them. .

They slept there that night. They slept nude, as they always had, and they started under silken sheets. But it was cold, and even close in each other's arms, they felt the chill, and before they slept they had learned the value of heavier covering. They found two old canvas tarpaulins. They were yellow, and rather brittle with age, but still fairly strong, for they were greasy, and the grease had pro-tected them. They slept under them, and presently, in the insulated room, their own body heat brought a rise in temperature.

With day, they built a fire and learned quickly that it fouled the room and burned the floor. But Tal had some mechanical and scientific education, and it did not take long to find the old refrig-erator mechanism, with its system of coiled pipes. He entirely misinterpreted it, but he got results. The plane was dismantled, the refrigerator pump removed, and by the next nightfall they were warm and happy in the room.

The boiler of the plane had been connected to the refrigerator pipes, and an ultraefBcient steam-heating system arranged from the coils. So efficient was it that with the near two hundred gallons of decane remaining in the plane they would easily be able to keep this room warm all winter. But a tiny flame was needed to keep a trickle of steam in the carefully designed and insulated boiler, and the wonderfully insulated room warmed easily. There was now no problem of ventilation.

Within a week it came, though—a young couple from the south, riding a great wagon drawn by two strange animals, blowing steam from their nostrils—horses. These people knew the secrets of grow-ing things, but not of heating effectively, and they moved in with the two already there and brought, of course, their horses, clad in robes.

They did not know the horses could readily endure this, to them, mild temperature. They knew only that they were cold, and the horses, too, were animals, and assumed they were cold as well.

The horses were finally moved out, when they showed they did not mind the temperature, and wanted to eat the sere brown grasses, rich-growing weeds, and wild grains. But another ice box was found, and the search for blankets carried on more efficiently. That ice box, too, was heated.

Still believing the refrigerator coils part of a steam-heating sys-tem, Tal modified the cooling pipes of the pump mechanism out-

side to form a closed coil, and soldered them shut with a metal drum he found as a water reservoir. There were no more burners, but they quickly learned to build a small furnace of stones and clay and to burn wood.

Tal was wise in science, really. His misinterpretations were in the main sensible and successful to a high

degree. But a few small sticks of wood served to keep the well-insulated box warm. And, best of all, the other woman, Reeth, knew how to cook, and her man, Cahl, knew the functions of a stove. They had food.

It was not long before a steady trickle of people started into the city by the lake. By spring there were more than two hundred cou-ples, nearly all young, some with children. The ice-box homes had long since given out, but now, by tearing one apart to some extent, and trial of an uninsulated one, they had learned both the advan-tages and the construction principles, and ordinary houses were being converted, the old steam radiators being used as the supply of pipe gave out.

Some near-fatalities resulted from lack of ventilation, till Tal solved the problem, but in even the bitterest weather, the insulated rooms were kept comfortable very easily.

And from books they learned much about clothes and the ways of making them. There were many materials at hand. And now ani-mals were more plentiful. Deer had been captured, and because there were mostly farmers here, they were not slaughtered, but wisely penned, and they waited for breeding.

Spring came, and the weather moderated. The farmers started their work. They did not know all they needed for farming in this colder country, and Tal helped by suggesting they try using the ed-ible grains that naturally grew here. These, he believed, would be tougher, and surely able to grow even here, for they did naturally.

Summer came. And with summer, came skulking beasts on two legs from the south. They were savage now, utterly savage. They were few, and they were starved. And nearly all were males, males woman-hungry now, for the survival of the fittest had been not merely for life but for food.

The females had not been valued as females by man for nearly one thousand generations. The instinctive protection the female an-imal is given by her male did not exist in man. And women were weaker. They were easier to catch and Mil. Only now, with spring, came the urge to mate, and at last the females were wanted, wanted madly as females. They were few, and sueh as there were

were swift of foot, and strong, or very clever, and they feared and hated men.

But the men came north, seeking animals for food and seeking women. And they were cunning, fierce fighters, those who still lived. They attacked the town, and some of the women were stolen away, some of the children vanished, too. But they were driven off when seen, for the men of the village had good weapons, and knew better how to use them.

And some few of the women from the south, the clever and swift and strong, came, and finding other women settled and happy, stayed, and lent their cunning to overcoming the biped beasts.

"We must win," said Tal, as the fall came, and the raids from the south stopped with the approach of winter, "for we can graft then-cunning of the hunt and fight with ours, and we have the better weapons. That is my duty. I cannot farm, but there is much work for me in the repairing of broken tools and the building up of bro-ken homes."

And they won, during all their lifetimes, and during most of the lifetimes of their children, and since, by that time, some order had been regained to the south, more intercourse with the people of the south started.

And there was the danger. For those of the north, being still quite human, liked work no better than their fathers who lived in the time of Gaht, the Machine, who gave all things, and to whom they prayed, and therefore they, too, drifted south gradually, to the lands where natural foods grew wild, and work was not needed.

Very few stayed in the north. And those that drifted south forgot the habit of work, or of intelligence, for intelligence was scarcely needed in the south, where the trees and the bushes gave all the food needed, and there were no dangerous animals, for the Ma-chine had worked well to help man, and even after Gaht, the Ma-chine, had gone, there were left the fruitful plants it had devel-oped, and none of the driving dangers which had forced man to be keen, for it had removed them.

So the people drifted south and prayed to Gaht, the Machine, to return, though they realized they didn't really need it anymore.